CONCESSION AGREEMENT

BETWEEN

National Highways Authority of India

(Ministry of Shipping, Road Transport & Highways)
Government of India
G – 5& 6, Sector-10, Dwarka, New Delhi – 110 075

AND

M/s Trichy-Thanjavur Expressways Limited

"Madhucon House", Plot No. 1129/A, Road No. 36, Hitec City Road,
Jubilee Hills, Hyderabad – 500 033

DESIGN, ENGINEERING, FINANCE, CONSTRUCTION, OPERATION AND MAINTENANCE OF THANJAVUR – TRICHY SECTION FROM KM 80.000 TO KM 135.750 OF NH - 67 IN THE STATE OF TAMIL NADU UNDER NHDP PHASE IIIA ON BUILD, OPERATE AND TRANSFER (BOT) BASIS

Volume II of III

15th June 2006

National Highways Authority of India

(Ministry of Shipping, Road Transport & Highways)
Government of India

UPGRADATION OF 10,000 Kms NATIONAL HIGHWAYS UNDER NHDP PHASE III ON BUILD, OPERATE AND TRANSFER (BOT) BASIS

NAME OF WORK: DESIGN, ENGINEERING, FINANCE, CONSTRUCTION, OPERATION AND MAINTENANCE OF THANJAVUR - TRICHY SECTION FROM KM 80.000 TO KM 135.750 OF NH67 UNDER NHDP PHASE IIIA ON BUILD, OPERATE AND TRANSFER (BOT) BASIS

(Package No. : NHDP-III/BOT/TN/03)

INTERNATIONAL COMPETITIVE BIDDING (ICB)

REQUEST FOR PROPOSAL (RFP)

BID DOCUMENT

PART – IV

INSTRUCTIONS TO BIDDERS (ITB)

December 2005

G – 5& 6, Sector-10, Dwarka, New Delhi – 110 075

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SITE OF THE PROJECT

1. General

1.1 The Site

National Highway 67 originates from Nagapattanam (km 0/000), in the State of Tamil Nadu, crosses NH-45 at Trichy, NH7 at Karur and ends at Gundelpet near Mysore at km 530 in the state of Karnataka. It passes through cities such as Thanjavur, Trichy , Karur and Coimbatore

The Project Highway starts from Thanjavur at km 80/000 and terminates at km 135/750 Ariyamangalam (Trichy) and it passes through Thanjavur and Trichy districts in Tamil Nadu.

Thanjavur has been the treasure house of art for centuries. It is called the Rice Bowl of Tamil Nadu. Thanjavur is well-known throughout the world as the capital of the ancient Chola Empire. The city is famous by the presence of the Brahadeeswara temple, the magnificent palace, Rajah Serfoji's Saraswathi Mahal Library, Art Gallery and also for its exquisite handicrafts like the Art Plate, pith work, bronze icons, Thanjavur paintings and the classical South Indian musical instruments. Trichy is situated on the banks of the Cauvery River and its distributaries. Trichy is the fourth largest city in the state of Tamil Nadu. Trichy is 325 km from away Chennai.

There are no major competing roads existing for the project road between Thanjavur and Trichy as it is a through road between Thanjavur and Trichy

1.2 Disclaimer

The data presented in this schedule is for an initial understanding and guidance of the Concessionaire. NHAI will not be responsible for any inaccuracy in the information provided and shall not be liable for or be bound by the data used by the Concessionaire in evaluating the project viability. The Concessionaire will carry out his own Independent surveys for assessing actual position of the project corridor.

The Concessionaire acknowledges that prior to the execution of this Agreement, the Concessionaire has satisfied himself (based on his own Independent assessment) of the survey data, specifications and standards, site and all information provided by the NHAI. The Concessionaire acknowledges and accepts the difficulties, risks and hazards likely to arise during the course of performance of his obligations hereunder.

2. Description of Project Highway

An index map and location plan of the Project Highway is given as **Fig. A.1.** The base plans for the Project Highway showing the existing alignment, buildings utilities, etc., may be seen from the alignment plan and profile given in Schedule B.

2.1 a) Referencing System

Along the existing road, Kilometre stones are fixed in entire length of the Project Highway. It is called as "Existing Chainage". During the topographic survey with Total stations, observations made are referred to "Design Chainage". The relationship between the Existing Chainage and Design Chainage as per field survey is given below in **Table A-1.**

Table A-1

Comparison of Existing and Proposed Chainage

Sl. No	Existing Chainage (km)	Design Chainage (km)
1	80.000	80.000
2	81.000	81.620
3	82.000	82.600
4	83.000	83.610
5	84.000	84.700
6	85.000	85.700
7	86.000	86.700
8	87.000	87.700
9	88.000	88.700
10	89.000	89.693
11	90.000	90.430
12	91.000	91.450
13	92.000	92.460
14	93.000	93.480
15	94.000	94.458
16	95.000	95.436
17	96.000	96.414
18	97.000	97.392
19	98.000	98.370
20	99.000	99.390
21	100.000	100.400
22	101.000	101.400
23	102.000	102.410
24	103.000	103.440
25	104.000	104.450

26	105.000	105.470
27	106.000	106.480
28	107.000	107.490
29	108.000	108.500
30	109.000	109.540
31	110.000	110.560
32	111.000	111.600
33	112.000	112.590
34	113.000	113.650
35	114.000	114.700
36	115.000	115.700
37	116.000	116.770
38	117.000	117.670
39	118.000	118.680
40	119.000	119.680
41	120.000	120.670
42	121.000	121.660
43	122.000	122.650
44	123.000	123.670
45	124.000	124.690
46	125.000	125.659
47	126.000	126.670
48	127.000	127.700
49	128.000	128.640
50	129.000	129.620
51	130.000	130.660
52	131.000	131.700
53	132.000	132.690
54	133.000	133.690
55	134.000	134.715
56	135.750	136.490

The details of Global Positioning System (GPS) Pillars along the Project Highway (km 80/000 to km 135/750) are given in **Annexure A-1.**

2.1b) 'Start' and 'End' of The Project Highway

The Project Highway starts at existing Chainage 80/000 (Design Chainage 80/000) and ends at the existing Chainage 135/750 (Design Chainage 136/490) of NH-67. i.e. it will be dove-tailed with another 4-laning Project of NH 45 under a different Contract. Total length of the Project Highway is 56.490km as per total station survey.

2.2 Latitude & Longitude

The project road is running East -West between Longitudes 79° 51' E at Nagapattanam & 78°.45'E at Trichy and lies between Latitudes 10°45'N & 10°49'N.

2.3 Terrain

The Project Highway traverses through plain/flat terrain. The entire alignment has easy gradients.

2.4 Climate and Environment

The climate of region is essentially tropical. The temperature in summer reaches around 43°C and in winter around 18°C. The lowest temperatures are recorded during December and January, and the highest in April to June. The average annual rainfall, falling mainly between October and December, ranges 635 - 1900 millimetres.

The Project Highway is situated in the Cauvery delta and criss-crossed by lengthy network of irrigation canals. In addition to these numerous ponds are observed all along the Project Highway, which are used by the local people.

2.5 Traffic

Traffic count details as per the 7-days Classified Volume Count survey conducted by design consultants at 2 locations during May to June 2005 on the Project Highway is given in the **Table A-2** below:

Table A-2: Details of Average Annual Daily Traffic (AADT)

Location (Existing Chainage km)	Total Vehicles	PCU	Total CVD
km. 85.000	6382	12122	3130
km. 121.000	10737	17948	4209

Traffic count details as per the confirmatory 3-days Classified Volume Count survey conducted by design consultants at 1 location during May, 2005 on the Project Highway is given in **Table A-3** below:

Table A-3: Details of Average Annual Daily Traffic (AADT)

Location (Existing Chainage km)	Total Vehicles	PCU	Total CVD
km. 129.000	28094	30777	5173

2.6 Road Inventory

The existing road of the Project Highway has generally 2-lane configuration except outskirts of Trichy city and parts in Thanjavur bypass where it has 4-lane divided carriageway. There are paved shoulders in urban locations. Detailed road inventory indicating the carriageway width is given in **Annexure 2**

2.7 Abutting Land Use

Abutting land use on both sides is predominantly agricultural and the balance constitutes residential, commercial and industrial. The detailed land use pattern is given in **Table A-4.**

Table A-4: Abutting Land Use

Existing Chainage (km)		Design Chainage (km)		Land use
From	To	From	To	
80.0	80.6	80.0	81.22	Built up
80.6	82	81.22	82.6	Open
82	82.4	82.6	83.02	Agricultural
82.4	82.8	83.02	83.41	Built up
82.8	84	83.41	84.7	Open
84	84.6	84.7	85.3	Built up
84.6	85	85.3	85.7	Agricultural
85	85.2	85.7	85.89	Built up
85.2	88	85.89	88.7	Agricultural
88	88.8	88.7	89.5	Open
88.8	96	89.5	96.414	Built up
96	98.8	96.414	99.186	Agricultural
98.8	99.8	99.186	100.198	Built up
99.8	100.8	100.198	101.2	Agricultural
100.8	101.2	101.2	101.602	Built up
101.2	102.4	101.602	102.822	Agricultural
102.4	103	102.822	103.44	Built up
103	103.4	103.44	103.844	Agricultural
103.4	104.2	103.844	104.654	Open
104.2	106	104.654	106.48	Agricultural
106	107	106.48	107.49	Built up
107	107.8	107.49	108.32	Agricultural
107.8	108.8	108.32	109.35	Open
108.8	109.2	109.35	109.75	Agricultural
109.2	109.4	109.75	109.96	Open

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Existing Chainage (km)		Design Chainage (km)		Land use
From	To	From	To	
109.4	109.6	109.96	110.16	Built up
109.6	110.4	110.16	110.97	Open
110.4	110.6	110.97	111.16	Agricultural
110.6	111.2	111.16	111.8	Built up
111.2	111.8	111.8	112.4	Agricultural
111.8	112.2	112.4	112.82	Built up
112.2	112.6	112.82	113.21	Open
112.6	113.6	113.21	114.36	Agricultural
113.6	114	114.36	114.7	Built up
114	114.2	114.7	114.895	Open
114.2	114.8	114.895	115.5	Agricultural
114.8	115	115.5	115.7	Built up
115	115.2	115.7	115.914	Agricultural
115.2	115.8	115.914	116.556	Open
115.8	116.2	116.556	116.96	Agricultural
116.2	116.4	116.96	117.15	Open
116.4	116.6	117.15	117.35	Agricultural
116.6	117.8	117.35	118.48	Built up
117.8	118.6	118.48	119.29	Open
118.6	119	119.29	119.68	Built up
119	119.4	119.68	120.1	Agricultural
119.4	120.6	120.1	121.27	Open
120.6	122	121.27	122.65	Industrial area
122	123.2	122.65	123.865	Industrial & Institutional
123.2	126	123.865	126.67	Industrial area
126	135.750	126.67	136.490	Built up

Total built up area is 25.496km and total agricultural area is 15.867km. Open area amounts to 9.727km and 5.4km of industrial area exists along the Project Highway.

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There are total 16 villages/towns/cities along the existing Project Highway, which are given below in **Table A-5.**

Table A-5: Details of Villages/Towns/Cities

Sl No.	Existing Chainage (km)		Design Chainage (km)		Name of builtup
	From	To	From	To	
1	80.000	80.600	80.000	80.800	Puliyamthoppu
2	85.200	85.500	85.900	86.200	Nanjikkottai road
3	88.800	90.100	89.500	90.700	Melavasthan Savadi
4	91.100	91.500	91.600	92.000	Cholan Nagar
5	98.800	100.000	99.200	100.400	SASTRA University
6	101.000	101.500	101.400	101.900	Tirumalaisamudram
7	106.100	107.100	106.600	107.600	Sengipatty
8	107.800	108.300	108.300	108.800	Murugan colony
9	109.100	109.600	109.600	110.100	Kakkan colony
10	110.600	111.200	111.200	111.800	Manayeripatti
11	111.800	112.200	112.400	112.800	Samatvapuram
12	113.300	114.100	114.000	114.800	Pudukkudi
13	114.400	114.800	115.100	115.500	Narikuravarcolony
14	116.800	117.700	117.500	118.400	Devarayaneri
15	118.500	118.900	119.200	119.600	Sivaji Nagar
16	121.300	124.500	122.000	125.200	Thuvakkudimalai
17	124.500	125.100	125.200	125.800	Thuvakkudimalai
18	125.100	127.100	125.800	127.800	BHEL - Kailasapuram
19	127.100	130.200	127.800	130.900	Thiruverumbur
20	130.200	133.000	130.900	133.700	Kattur
21	133.000	135.400	133.700	136.100	Ariyamangalam
22	135.400	135.792	136.100	136.490	Palpannai

2.8 Right-of-Way

The existing right-of-way (ROW) of the Project Highway varies between 10.0 m to 35.0 m. **Table A-6** shows the currently available right-of-way (ROW) with respect to the centre line of existing carriageway at various locations along the Project Highway.

Table A-6: Details of Existing Right-of-Way (ROW)

Existing Chainage (km)		Length (m)	ROW (m)		
From	To		Left	Right	Total
80	82	2000	14.4	14.09	28.48
82	84	2000	14.94	15.3	30.23
84	86	2000	14.69	14.67	29.35
86	88	2000	15.06	27.34	42.39
88	90	2000	15.51	15.77	31.28
90	92	2000	16.74	13.64	30.37

92	94	2000	14.14	11.04	25.18
94	96	2000	8.2	7.52	15.71
96	98	2000	13.88	14.18	28.07
98	100	2000	16.45	16.89	33.33
100	102	2000	15.53	16.63	32.16
102	104	2000	14.91	15.3	30.21
104	106	2000	15.43	14.9	30.32
106	108	2000	9.58	10.93	20.51
108	110	2000	13.13	14.31	27.43
110	112	2000	12.21	12.88	25.08
111.2	114.2	3000	11.21	12.34	23.55
114.2	114.4	200	17.1	23	40.1
114.4	115.2	800	11.3	13.73	25.03
115.2	115.6	400	13.73	13.83	27.55
115.6	116.2	600	8.45	12.48	20.93
116.2	116.8	600	30.93	12.43	43.37
116.8	117	200	18.45	16.45	34.9
117	117.6	600	12.97	14.45	27.42
117.6	117.8	200	21.5	13.75	35.25
117.8	119.2	1400	15.09	13.5	28.59
119.2	120.2	1000	16.35	20	36.35
120.2	120.4	200	17.4	17.85	35.25
120.4	120.8	400	15.5	17.8	33.3
120.8	122.6	1800	15.82	16.4	32.22
122.6	124.4	1800	16.52	18.35	34.87
124.4	125.2	800	13.36	18.35	31.71
125.2	127	1800	13.7	15.35	29.05
127	127.4	400	26.38	13.3	39.68
127.4	128	600	15.65	17.4	33.05
128	128.6	600	16.65	23.4	40.05
128.6	131.8	3200	14.32	15.4	29.72
131.8	132.2	400	16.38	15.65	32.03
132.2	133.8	1600	14.29	24.4	38.69
133.8	134.6	800	15.2	11.4	26.6
134.6	135.2	600			12
135.2	135.6	400	10.35	38.5	48.85
135.6	136	400	14.8	16	30.8

It is the policy of NHAI to have 60m wide ROW for 4 laning projects under NHDP. The Concessionaire shall work out requirement of additional land based on detailed design, get the same approved from NHAI and take necessary action for acquisition of additional land as required vide draft Concessionaire Agreement.





2.9 Road Crossings/Junctions

There are in total 196 intersections, out of which, 11 intersections have been categorized as major intersections and remaining 185 are minor junctions. The details of major intersections are given in **Table A-7**. Details of minor intersections are given in **Annexure A-3.**

Table A-7: Details of Major intersections

Sl. No.	Existing Chainage (km)	Existing Type of Junction	Classification of Cross Road
1	80.470	Round about	ODR (LHS),SH(RHS)
2	81.950	Round about	SH(RHS &LHS)
3	83.530	Round about	ODR(RHS &LHS)
4	85.380	Round about	ODR(RHS &LHS)
5	88.500	4 legged	ODR(RHS &LHS)
6	89.050	Skew major junction	SH(RHS &LHS)
7	104.940	3-legged	SH-99
8	106.600	3-legged	SH-99
9	126.000	4-legged	Arterial Road to BHEL
10	127.000	Skew	Arterial Road to BHEL
11	135.7	Crossing	NH45

At the Junction with NH45 at existing Chainage km 135.750 a flyover is proposed to be constructed for NH45 under a separate BOT Agreement.

2.10 Railway Crossings

The Project Highway crosses the Trichy – Thanjavur Railway line at three points. There is a level crossing at km 80.800 (Design Chainage km 81.400). Project Highway also crosses the same railway line at km 128.525 and 135.000 (Design Chainage km 129.183 and 135.729 respectively) where 2-lane ROB already exists. Inventory and condition survey of ROBs is given in Annexure A7.

2.11 Geometry

It is observed that the Project Highway predominantly has a straight alignment and traverses through plain terrain. The horizontal curves in general conform to acceptable geometric standards in terms of horizontal curve radius and sight distance. But in general superelevation/camber need improvement at some locations. There are-21 number of substandard curves on the existing alignment The substandard curves are either proposed to be bypassed or improved to design standards as given in schedule D.

2.12 Road Condition Survey and Pavement Composition

As per the pavement condition data gathered in July 2005, the average total thickness of existing pavement varies from 200 mm to 870 mm. The pavement mainly comprises of WBM base course over sub grade, overlaid by mainly two layers of bituminous macadam and mix seal surfacing/semi dense bituminous carpet over the years. The bituminous course layer's thickness varies between 30 mm to 370 mm, while that of WBM between 75 mm to 350 mm and GSB between 80 mm to 500mm. Detailed pavement condition of the existing road of the Project Highway is given below in **Table A-8**

Pavement condition of Project Highway section from existing Chainage km 80.0 to km 135.750 is generally fair to good. **Annexure A-4** shows the summary of condition survey of existing road. Benkelman Beam Deflection survey results' summary is given in **Annexure A-5.**

Table A-8: Details of Existing Pavement Composition

Location (Existing Chainage (km))	Side (LHS. RHS)	Bituminous Surfacing (mm)	Base Course (mm)	Sub Base Course (mm)	Subgrade Material (mm)	Total Thickness (mm)
80.400	RHS	230	100	120	400	850
81.000	LHS	170	190	210		570
82.000	RHS	110	160	150	210	630
83.000	LHS	70	100	410		580
84.000	RHS	120	190	140		450
85.200	LHS	150	120	200	150	620
86.000	LHS	130	120	150		400
87.000	RHS	130	150	130		410
88.800	RHS	130	200	100		430
90.000	LHS	120	80	100		300
91.000	RHS	100	220			320
92.000	LHS	100	240			340
93.000	RHS	140	90		500	730
94.000	LHS	100	90	50		240

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95.000	RHS	370		100		470
96.000	LHS	70	130	100		300
97.000	RHS	80	80	50		210
98.000	LHS	120	200			320
99.000	RHS	120	100	500		720
100.000	LHS	150	100			250
101.000	RHS	120	100			220
102.000	LHS	70	80	60		210
103.000	RHS	120	170			290
104.000	LHS	120	150	40		310
105.000	LHS	110	100			210
106.000	RHS	140	300			440
107.000	LHS	260	140			400
108.000	RHS	150	290			440
109.000	LHS	190	120			310
110.000	RHS	220		300		520
111.000	LHS	310		70	400	780
112.000	RHS	270	70		180	520
113.000	LHS	130	70		500	700
114.000	RHS	230	150			380
115.000	LHS	230	100		300	630
115.600	LHS	190	100	50	200	540
117.000	RHS	210	70		260	540
118.000	LHS	140	230	150		520
119.000	RHS	80	150	230	100	560
120.200	LHS	180	100		900	1180
121.000	LHS	170		60	470	700
122.000	RHS	190	130			320
123.000	LHS	50	230	150	50	480
124.000	RHS	40	180	80	120	420
125.000	LHS	50	130	230	150	560
126.400	LHS	210	350	90		650
127.000	RHS	280	160	430		870
128.000	LHS	210	220	270	280	980
129.000	RHS	110	100	250		460
130.000	LHS	210	120	160		490
131.000	LHS	230	380	200		810
132.000	RHS	50	160		400	610
133.000	RHS	240		100		340
134.000	LHS	130	170	430		730

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2.13 Cross Drainage Structures

The Project Highway is predominantly aligned through rural areas with cultivated fields on both sides. The surface flow during precipitation is generally drained to the adjoining areas on either side. The roadside drainage along the Project Highway needs some improvements, predominantly in urban stretches. The road is crossed by a number of rivers, streams, nallahs etc. The Project Highway has total 96 culverts, consisting of 70 Hume Pipe, and remaining 26 are box/arch/pipe+arch/slab+arch culverts. Inventory and condition survey of the culverts are given in **Annexure A-6.**

There are total 22 bridges on the project road, out of which only one is major bridge. **Annexure A-7** shows the inventory and condition survey of bridges.

2.14 Existing Facilities

Details of existing features such as Bus shelters, retail outlet for fuel etc are summarised in the sub sections below

2.14.1 Bus shelters

There are total 50 bus shelters/stops existing at 42 locations along the existing road of the Project Highway. Details of the existing bus shelters are given below in **Table A-9**

Table A-9 Details of Bus shelters

Sl.No	Design Chainage (km)	Existing Chainage (km)	Side
1	89.880	89.177	R
2	89.950	89.271	L
3	91.050	90.602	L
4	91.830	91.378	R
5	98.450	98.080	R
6	99.220	98.831	R
7	100.080	99.681	R
8	100.120	99.721	L&R
9	101.750	101.349	R
10	103.070	102.632	R
11	105.990	105.518	R
12	108.670	108.170	R
13	111.600	111.000	L&R
14	112.700	112.109	L
15	113.800	113.140	L
16	114.420	113.660	L&R
17	115.200	114.400	L
18	115.820	115.119	L&R
19	117.750	117.080	L
20	118.300	117.630	L

21	119.390	118.699	R
22	123.000	122.339	L
23	123.700	123.030	L
24	125.000	124.349	L&R
25	125.500	124.847	L
26	125.880	125.214	L
27	125.940	125.274	L
28	126.800	126.129	L
29	128.750	128.109	R
30	128.840	128.199	L
31	130.120	129.498	L
32	130.500	129.841	R
33	131.080	130.383	
34	131.900	131.199	L&R
35	132.550	131.861	L
36	132.940	132.249	R
37	133.000	132.308	L
38	133.200	131.516	L&R
39	133.700	133.010	R
40	134.720	133.986	L
41	135.500	134.761	L
42	136.400	135.656	L&R

2.14.2 Retail outlets

There are total 15 numbers of retail outlets along the existing Project Highway. Details of the existing Retail Outlets are given below in **Table A-10.**

Table A-10.Detials of Retail outlets

Sl No	Chainage (km)		Side
	Existing	Design	
1	80.200	80.220	LHS
2	81.300	81.900	LHS
3	82.800	83.420	RHS
4	87.550	88.240	LHS
5	89.100	89.790	RHS
6	89.350	90.000	LHS
7	92.050	92.520	LHS
8	107.250	107.750	LHS
9	108.150	108.650	LHS
10	124.650	125.330	LHS
11	125.050	125.730	RHS
12	127.850	128.480	RHS
13	128.050	128.700	LHS
14	129.000	129.640	RHS
15	129.70	130.380	RHS

Annexure A-1: Details of GPS, Reference & Bench Mark Pillars

Sl. No	Point ID	Easting	Northing	Side	Remarks
1	GPS12	301113.4	1192576.7	Right	At Existing Chainage km 79
2	GPS11R	297017.9	1188189.6	Left	At Existing Chainage km 84.76
3	GPS11	296817.4	1188121.6	Left	At Existing Chainage km 85
4	GPS10R	292033	1187239.3	Right	At Existing Chainage km 90.2
5	GPS10	291889.9	1187186.2	Right	At Existing Chainage km 90.35
6	GPS9R	286971.7	1185892.7	left	At Existing Chainage km 95.7
7	GPS9	286827.3	1185964	Right	At Existing Chainage km 95.85
8	GPS8	282621.9	1186880.2	Left	At Existing Chainage km 99.85
9	GPSr8	282773	1186898.8	Left	At Existing Chainage km 100
10	GPS7R	277892.8	1186008.6	Left	At Existing Chainage km 104.92
11	GPS7	277763.1	1185962.9	Left	At Existing Chainage km 105.05
12	GPS6R	272997.1	1186350.4	Right	At Existing Chainage km 110.03
13	GPS6	272822.5	1186418.2	Right	At Existing Chainage km 110.2
14	GPS5R	268186.2	1187243	Right	At Existing Chainage km 114.79
15	GPS5	268017.5	1187248.6	Right	At Existing Chainage km 114.96
16	GPS4R	263320.5	1188325	Right	At Existing Chainage km 119.95
17	GPS4	263185.5	1188458	Right	At Existing Chainage km 120.15
18	GPS3R	259663.6	1190933.8	Left	At Existing Chainage km 124.53
19	GPS3	259532	1191090.4	Right	At Existing Chainage km 124.75
20	GPS2R	255300.6	1194055.3	Right	At Existing Chainage km 129.96
21	GPS2	255132.8	1194107	Right	At Existing Chainage km 130.18
22	GPS1R	250253.8	1196204.7	Left	At Existing Chainage km 135.37
23	GPS1	250091.8	1196256.2	Right	At Existing Chainage km 135.55

Annexure A2 Road Inventory

Existing Chainage (km)		Landuse (Builtup/Agrt./Forest/Industrial/Barren)	Name of Village / Town	CARRIAGE WAY					SHOULDER (m)				DRAINS				ROW (m)	Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
From	To			Type (BT/CC/GR/ER)	Width LHS (m)	Median/Single CW width (m)	Width RHS (m)	Condition (G/F/P/ VP)	Type (BT/CC/GR/ER)	Width LHS	Width RHS	Condition (G/F/P/ VP)	TypeB/L/E	Width LHS (m)	Type B/L/E	Width RHS (m)				Location (km)	Road No. (km)	CW Width (m)	
80.0	80.6	Built up	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	...	...	...	...	23	1.2	...	80.400	6.8	7.00	Thanjavur Bypass starting Point
80.6	80.8	Open	Thanjavur Bypass	BT	6.8			F	ER	0.8	0.8	F	...	...	...	...	29	1.6	...	80.400	6.8	7.00	Railway Crossing (LC2A / 2E) @ km 80/700 on Thanjavur Bypass
80.8	81.0	Open	Thanjavur Bypass	BT	6.8			F	ER	0.3	0.3	F	...	...	...	...	31	1.6	...	80.4	0	3.75	Thanjavur Bypass
81.0	81.2	Open	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	...	...	...	...	31	1.5	...	...	...	...	Thanjavur Bypass
81.2	81.4	Open	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	...	...	...	...	31	1.4	...	81.400	1.85	7.00	Thanjavur Bypass
81.4	81.6	Open	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	...	...	...	...	31	1.8	...	81.400	1.85	7.00	
81.6	81.8	Open	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	...	...	...	...	31	2.0	...				
81.8	82.0	Open	Puthupattinam (Thanjavur Bypass)	BT	7.0			F	ER	0.5	0.5	F	...	...	...	...	32	4.0	...	...	...	...	Thanjavur Bypass
82.0	82.2	Agrt. Land	Puthupattinam (Thanjavur Bypass)	BT	7.0			F	ER	0.5	0.5	F	E	1.5	E	1.5	32	4.0	...	...	...	...	Minor Bridge across Pudiyar kallanai G A Canal @ km 82/100
82.2	82.4	Agrt. Land	Kangayarthottam (Thanjavur Bypass)	BT	7.0			F	ER	0.5	0.5	F	E	1.5	E	1.5	31	2.0	...	...	...	...	Minor Bridge across Pudiar Canal @ km 82/190
82.4	82.6	Built up	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	E	1.5	E	1.5	28	1.2	...	...	...	...	
82.6	82.8	Built up	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	E	1.5	E	1.5	28	1.2	...				

Annexure A2 Road Inventory

82.8	83.0	Open	Thanjavur Bypass	BT	6.8	F	ER	0.5	0.5	F	E	1.5	E	1.5	32	2.0	...	...	...	...	Minor Bridge across Pudiyar canal @ Km 82/900
83.0	83.2	Open	Thanjavur Bypass	BT	6.9	F	ER	0.5	0.5	F	E	1.5	E	1.5	30	0.5	...				
83.2	83.4	Open	Thanjavur Bypass	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	30	0.5	...				
83.4	83.6	Open	Thanjavur Bypass	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	29	0.5	...				
83.6	83.8	Open	Thanjavur Bypass	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	32	0.5	...				
83.8	84.0	Open	Thanjavur Bypass	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	31	0.5	...	...	...	...	
84.0	84.2	Built up	Thanjavur Bypass	BT	7.0	F	ER	1.0	1.0	F	...	...	...	...	30	1.5	...	...	...	...	
84.2	84.4	Built up	Thanjavur Bypass	BT	7.0	F	ER	1.2	1.0	F	...	...	...	...	29	1.5	...	...	...	...	
84.4	84.6	Built up	Thanjavur Bypass	BT	6.9	F	ER	1.0	1.0	F	E	2	E	2	29	1.8	...	83.45	2	7	Thanjavur Bypass
84.6	84.8	Agrt. Land	Thanjavur Bypass	BT	6.8	F	ER	1.2	0.8	F	E	2	E	2	30	2.6	...	83.45	2	7	
84.8	85.0	Agrt. Land	Thanjavur Bypass	BT	6.9	F	ER	1.0	1.0	F	E	2	E	2	30	1.5	...	...	...	...	
85.0	85.2	Built up	Thanjavur Bypass	BT	7.0	F	ER	1.0	0.5	F	E	2.5	E	2	30	1.8	...	...	...	..	
85.2	85.4	Agrt. Land	Thanjavur Bypass	BT	7.0	F	ER	1.0	1.5	F	E	2.5	E	2	29	1.5	...				
85.4	85.6	Agrt. Land	Thanjavur Bypass	BT	6.9	F	ER	1.0	1.0	F	E	2.5	E	2	29	1.5	...	85.4	4.3	7	Thanjavur Bypass
85.6	85.8	Agrt. Land	Thanjavur Bypass	BT	7.0	F	ER	1.0	1.0	F	E	2	E	2	29	0.3	...	85.4	4.3	5.5	
85.8	86.0	Agrt. Land	Thanjavur Bypass	BT	6.8	F	ER	0.5	1.0	F	E	2	E	2	29	1.2	...	...	...	...	
86.0	86.2	Agrt. Land	Thanjavur Bypass	BT	6.8	F	ER	0.5	0.5	F	E	2	E	2	29	1.0	...	...	...	...	
86.2	86.4	Agrt. Land	Thanjavur Bypass	BT	7.0	F	ER	0.5	0.5	F	E	2	E	2	29	1.0	...	...	...	...	
86.4	86.6	Agrt. Land	Thanjavur Bypass	BT	7.0	F	ER	1.0	0.5	F	E	2	E	2	31	0.8	...	...	...	...	
86.6	86.8	Agrt. Land	Thanjavur Bypass	BT	7.0	F	ER	1.0	0.5	F	E	2	E	2	30	1.2	...	...	...	...	
86.8	87.0	Agrt. Land	Thanjavur	BT	6.9	F	ER	1.0	0.5	F	E	3	E	3	30	1.3	...	...	...	...	

Annexure A2 Road Inventory

			Bypass																			
87.0	87.2	Agrt. Land	Thanjavur Bypass	BT	7.0			F	ER	1.0	0.5	F	E	3	E	3	30	1.5	...	...	...	...	
87.2	87.4	Agrt. Land	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	E	3	E	3	33	1.5	...	...	...	...	
87.4	87.6	Agrt. Land	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	E	3	E	3	29	1.2	...	...	...	...	
87.6	87.8	Agrt. Land	Thanjavur Bypass	BT	7.0			F	ER	0.5	0.5	F	E	3	E	3	29	1.0	...	...	...	...	
87.8	88.0	Agrt. Land	Thanjavur Bypass	BT	13.0			F	ER	0.5	0.5	F	E	3	E	3	29	1.0	...	88.000	2	3.50	Thanjavur Bypass
88.0	88.2	Open	Thanjavur Bypass	BT	13.0			F	ER	0.8	0.8	F	E	2	E	2.5	29	1.0	...	88.000	2	3.50	
88.2	88.4	Open	Thanjavur Bypass	BT	6.9			F	ER	1.0	1.2	F	E	2	E	2.5	29	1.0	...				
88.4	88.6	Open	Thanjavur Bypass	BT	6.9			F	ER	1.0	1.0	F	E	2	E	2.5	30	1.0	...	...	...	...	
88.6	88.8	Open	Thanjavur Bypass	BT	6.9			F	ER	1.0	1.0	F	E	1.5	E	2.5	29	1.0	...	...	...	...	
88.8	89.0	Built up	Thanjavur Bypass	BT	7.5			F	ER	1.0	1.0	F	E	1.5	E	2.5	32	1.0	...	...	...	...	
89.0	89.2	Built up	Melavasthan Savadi	BT	7.0			F	ER	1.0	1.0	F	E	1.5	E	2.5		1.0	...	89.000	77	15.00	Thanjavur Bypass
89.2	89.4	Built up	Melavasthan Savadi	BT	7.0	1.2	7.0	F	ER	0.2	0.2	F	E	2	E	2.5	26	1.2	...	89.000	0	7.00	
89.4	89.6	Built up	Melavasthan Savadi	BT	7.0	1.2	7.0	F	ER	0.5	0.5	F	E	2	E	2.5	27	1.0	...	89.000	77	7.00	
89.6	89.8	Built up	Melavasthan Savadi	BT	7.4	1.2	7.4	F	ER	0.5	0.5	F	E	2	E	2.5	23	1.2	...	...	...	...	
89.8	90.0	Built up	Pillayar Patti	BT	7.5	1.2	7.5	F	ER	0.5	0.5	F	E	2	E	2.5	24	1.0	...	...	...	...	
90.0	90.2	Built up	Thanjavur	BT	7.4	1.2	7.4	F	ER	0.5	0.5	F	E	2	E	2.5	25	1.0	...	...	...	...	
90.2	90.4	Built up	Thanjavur	BT	7.0	1.2	7.0	F	ER	0.5	0.5	F	E	2	E	2.5	25	1.2	...	...	...	...	
90.4	90.6	Built up	Thanjavur	BT	7.3			F	ER	0.5	0.5	F	E	3	E	3.5	25	1.2	...	...	...	...	
90.6	90.8	Built up	Thanjavur	BT	6.9			F	ER	0.5	0.5	F	E	3	E	3.5	42	2.5	...	...	...	...	
90.8	91.0	Built up	Thanjavur	BT	7.0			F	ER	0.5	0.5	F	E	3	E	3.5	30	2.0	...	...	...	...	
91.0	91.2	Built up	Thanjavur	BT	6.9			F	ER	2.0	1.0	F	E	3.5	E	2	30	2.0	...	...	...	...	Minor Bridge across Stream @ Km 91/200
91.2	91.4	Built up	Thanjavur	BT	6.9			F	ER	2.0	1.0	F	E	3.5	E	2	25	2.5	...	...	...	...	

Annexure A2 Road Inventory

91.4	91.6	Built up	Thanjavur	BT	6.9	F	ER	1.0	1.5	F	E	3.5	E	2	25	1.5	...	...	...	...	
91.6	91.8	Built up	Thanjavur	BT	6.8	F	ER	1.0	1.5	F	...	...	...	...	25	1.0	...	...	...	...	
91.8	92.0	Built up	Thanjavur	BT	6.8	F	ER	0.5	0.5	F	...	...	...	...	35	1.5	...	...	...	...	
92.0	92.2	Built up	Thanjavur	BT	6.8	F	ER	0.5	0.5	F	...	...	...	...	36	0.7	...	...	...	...	
92.2	92.4	Built up	Thanjavur	BT	6.8	F	ER	0.5	0.5	F	...	...	...	...	36	1.0	...	...	...	...	
92.4	92.6	Built up	Vallam	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	27	1.2	...	...	...	...	
92.6	92.8	Built up	Vallam	BT	6.9	F	ER	1.0	0.6	F	...	...	...	...	26	1.2	...	...	...	...	
92.8	93.0	Built up	Vallam	BT	6.9	F	ER	0.7	0.7	F	...	...	...	...	27	0.8	...	...	...	...	
93.0	93.2	Built up	Vallam	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	21	1.0	...	...	...	...	
93.2	93.4	Built up	Vallam	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	21	1.2	...	93.4	0	3.75	
93.4	93.6	Built up	Vallam	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	18	1.0	...	...	...	...	
93.6	93.8	Built up	Vallam	BT	6.9	F	ER	1.2	1.2	F	...	...	...	...	18	1.0	...	93.8	11.4	7.00	Thanjavur - Vallam Road
93.8	94.0	Built up	Vallam	BT	6.9	F	ER	1.2	1.2	F	...	...	...	...	23	1.0	...		...	...	Periyar Centenary Womens Polytechnic on RHS at Km 94/0
94.0	94.2	Built up	Vallam	BT	6.8	F	ER	1.0	1.0	F	...	...	...	...	20	0.3	...	...	...	...	Vallam Town
94.2	94.4	Built up	Vallam	BT	6.9	F	ER	0.8	0.6	F	...	...	...	...	18	...	20	...	...	...	Vallam Town
94.4	94.6	Built up	Vallam	BT	7.0	F	ER	0.4	0.6	F	E	1	E	1	13	...	20	94.5	0	3.75	Vallam Town
94.6	94.8	Built up	Vallam	BT	7.0	F	ER	0.5	0.5	F	...	...	...	...	13	...	20	...	...	...	Vallam Town
94.8	95.0	Built up	Vallam	BT	7.2	F	ER	0.5	0.5	F	...	...	...	...	11	...	20	...	...	...	Vallam Town
95.0	95.2	Built up	Vallam	BT	7.2	F	ER	0.5	0.5	F	B	0.5	B	0.5	14	...	20	...	...	...	Vallam Town
95.2	95.4	Built up	Vallam	BT	7.5	F	ER	0.5	0.5	F	B	0.5	B	0.5	14	...	20	...	...	...	Vallam Town
95.4	95.6	Built up	Vallam	BT	8.0	F	ER	0.5	1.5	F	B	0.5	B	0.5	13	1.8	...	...	...	...	Vallam Town
95.6	95.8	Built up	Vallam	BT	7.5	F	ER	1.0	1.0	F	L	0.2	L	0.2	14	2.0	...	...	...	...	Adaikkalamatha Arts & Science College on LHS at Km 96/8
95.8	96.0	Built up	Vallam	BT	7.2	F	ER	1.4	1.4	F	L	0.2	L	0.2	24	2.0	...	...	...	...	Vallam Town
96.0	96.2	Agrt. Land	Vallam	BT	7.2	F	ER	1.5	1.4	F	...	...	E	1.5	24	0.8	...	...	...	...	
96.2	96.4	Agrt. Land	Vallam	BT	6.8	F	ER	1.0	1.0	F	...	...	...	...	25	0.6	...	...	...	...	
96.4	96.6	Agrt. Land	Vallam	BT	6.9	F	ER	1.0	1.0	F	...	...	...	...	22	1.5	...	...	...	...	
96.6	96.8	Agrt. Land	Vallam	BT	6.8	F	ER	1.0	1.0	F	...	...	...	...	32	1.5	...	...	...	...	

Annexure A2 Road Inventory

96.8	97.0	Agrt. Land	Vallam	BT	6.8	F	ER	1.0	1.0	F	...	...	...	...	32	1.2	...	...	...	...	Major Bridge across Mudhalai Muthu Vari @ Km 96/800
97.0	97.2	Agrt. Land	Vallam	BT	6.8	F	ER	1.0	1.5	F	...	...	...	...	29	1.5	...	...	...	...	Canal on LHS
97.2	97.4	Agrt. Land	Vallam	BT	6.6	F	ER	1.5	1.0	F	...	...	...	...	31	1.7	...	...	...	...	Canal on LHS
97.4	97.6	Agrt. Land	Vallam	BT	6.7	F	ER	1.0	1.0	F	...	...	...	...	29	2.0	...	...	...	...	
97.6	97.8	Agrt. Land	Vallam	BT	6.9	F	ER	1.5	1.5	F	...	...	...	...	27	0.5	...	...	...	...	
97.8	98.0	Agrt. Land	Vallam	BT	6.8	F	ER	1.5	2.0	F	...	...	...	...	28	0.5	...	...	...	...	
98.0	98.2	Agrt. Land	Vallam	BT	6.9	F	ER	1.5	1.5	F	...	...	...	...	26	0.3	...	98.2	0	3.75	
98.2	98.4	Agrt. Land	Vallam	BT	6.8	F	ER	1.5	1.5	F	...	...	...	...	28	0.3	...				
98.4	98.6	Agrt. Land	Vallam	BT	7.0	F	ER	1.0	1.5	F	...	...	...	...	26	0.6	...	...	...	...	
98.6	98.8	Agrt. Land	Vallam	BT	7.0	F	ER	1.0	1.0	F	...	...	...	...	31	0.6	...	...	...	...	
98.8	99.0	Built up	Vallam	BT	6.8	F	ER	1.5	1.5	F	...	...	...	...	28	0.5	...	98.8	0	3.75	
99.0	99.2	Built up	Vallam	BT	6.5	F	ER	1.5	1.5	F	E	2	E	2	30	1.0	...	...	...	...	
99.2	99.4	Built up	Vallam	BT	6.5	F	ER	1.5	1.5	F	E	2	E	2	37	0.5	...	...	...	...	
99.4	99.6	Built up	Vallam	BT	6.7	F	ER	1.5	1.5	F	...	...	...	...	41	1.0	...	...	...	...	
99.6	99.8	Built up	Vallam	BT	6.6	F	ER	1.5	1.5	F	...	...	...	...	43	1.0	...	...	...	...	Shanmugha Arts and Science Technology and Research Acadamy (SASTRA)
99.8	100.0	Agrt. Land	Vallam	BT	6.5	F	ER	1.5	1.5	F	...	...	...	...	43	1.2	...	...	...	...	
100.0	100.2	Agrt. Land		BT	6.5	F	ER	1.5	1.5	F	...	...	...	...	37	1.2	...	...	...	...	
100.2	100.4	Agrt. Land		BT	6.5	F	ER	1.5	1.5	F	...	...	...	...	41	1.9	...	...	...	...	
100.4	100.6	Agrt. Land		BT	6.5	F	ER	1.5	1.5	F	...	...	...	...	35	1.8	...	...	...	...	
100.6	100.8	Agrt. Land		BT	6.4	F	ER	1.5	1.5	F	...	...	...	...	34	2.0	...	...	...	...	
100.8	101.0	Built up		BT	6.1	F	ER	1.2	1.2	F	...	...	...	...	38	2.2	...	...	...	...	
101.0	101.2	Built up		BT	6.6	F	ER	1.5	1.5	F	...	...	...	...	30	1.5	...				Minor Bridge across NKHLC Canal @ Km 101/500
101.2	101.4	Agrt. Land		BT	6.9	F	ER	1.5	1.5	F	...	...	...	...	30	0.7	...	101.100	0	3.75	
101.4	101.6	Agrt. Land		BT	6.6	F	ER	1.5	1.5	F	...	...	...	...	30	0.3	...	...	...	...	
101.6	101.8	Agrt. Land		BT	6.6	F	ER	1.5	1.5	F	...	...	...	...	25	0.4	...	...	...	...	
101.8	102.0	Agrt. Land		BT	6.7	F	ER	1.2	1.2	F	...	...	...	...	23	0.5	...	...	...	...	

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102.0	102.2	Agrt. Land		BT	6.7	F	ER	1.5	1.5	F	...	...	...	...	29	0.5	...	...	...	...	
102.2	102.4	Agrt. Land		BT	6.4	F	ER	1.2	1.2	F	...	...	...	...	28	0.7	...	...	...	...	
102.4	102.6	Built up		BT	6.4	F	ER	1.2	2.0	F	...	...	...	...	31	0.5	...				
102.6	102.8	Built up		BT	6.4	F	ER	1.1	1.0	F	...	...	...	...	24	0.3	...	102.600	0	3.75	
102.8	103.0	Built up		BT	6.2	F	ER	1.5	1.2	F	...	...	...	...	25	0.6	...	...	...	...	
103.0	103.2	Agrt. Land		BT	6.4	F	ER	1.3	1.3	F	...	...	...	...	30	0.4	...	...	...	...	
103.2	103.4	Agrt. Land		BT	6.9	F	ER	1.2	1.2	F	...	...	...	...	32	0.5	...	...	...	...	
103.4	103.6	Open		BT	6.9	F	ER	1.1	1.2	F	...	...	...	...	34	0.5	...	...	...	...	
103.6	103.8	Open		BT	6.9	F	ER	1.2	1.3	F	...	...	...	...	32	0.5	...	...	...	...	
103.8	104.0	Open		BT	6.4	F	ER	1.2	1.3	F	...	...	...	...	36	0.5	...	...	...	...	
104.0	104.2	Open		BT	6.8	F	ER	1.0	1.2	F	...	...	...	...	30	0.3	...	...	...	...	
104.2	104.4	Agrt. Land		BT	7.1	F	ER	1.0	1.2	F	...	...	...	...	28	0.4	...	...	...	...	
104.4	104.6	Agrt. Land		BT	6.8	F	GR	1.2	1.2	F	...	...	...	...	37	0.6	...	...	...	...	
104.6	104.8	Agrt. Land		BT	7.0	F	GR	1.2	1.2	F	...	...	...	...	38	0.4	...	...	...	...	
104.8	105.0	Agrt. Land		BT	7.0	F	GR	1.0	1.0	F	...	...	...	...	37	0.7	...				
105.0	105.2	Agrt. Land	Sengippatti	BT	7.0	F	GR	1.0	0.5	F	...	..	...	...	35	0.7	...	105.000	15.5	3.50	Road to Poondi Madha Church at Km 105
105.2	105.4	Agrt. Land	Sengippatti	BT	7.0	F	GR	1.0	1.0	F	...	...	...	...	25	1.0	...				
105.4	105.6	Agrt. Land	Sengippatti	BT	7.0	F	GR	0.5	0.5	F	..	..	...	...	30	0.8	...				
105.6	105.8	Agrt. Land	Sengippatti	BT	7.0	F	GR	1.2	1.2	F	...	...	...	...	22	0.8	...	...	...	...	
105.8	106.0	Agrt. Land	Sengippatti	BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	22	0.4	...	...	...	...	
106.0	106.2	Built up	Sengippatti	BT	7.0	F	GR	1.5	0.5	F	...	..	...	...	18	0.6	...	...	...	...	
106.2	106.4	Built up	Sengippatti	BT	7.0	F	GR	0.5	0.5	F	..	...	...	...	18	0.6	30	106.4	17.2	7	
106.4	106.6	Built up	Sengippatti	BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	18	0.6	30	...	...	...	
106.6	106.8	Built up	Sengippatti	BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	19	0.4	30	...	...	...	Minor Bridge across NKHC canal @ km 106/7 near Sengipatti
106.8	107.0	Built up	Sengippatti	BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	18	0.4	...	...	...	...	
107.0	107.2	Agrt. Land	Sengippatti	BT	6.7	F	GR	0.5	0.5	F	...	...	...	...	23	0.8	...	...	...	...	LHS Bund of height 4.5m

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107.2	107.4	Agrt. Land	Sengippatti	BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	23	0.8	...	...	...	...	
107.4	107.6	Agrt. Land	Sengippatti	BT	6.9	F	GR	0.5	0.8	F	...	...	...	...	22	3.0	...	...	...	...	Minor Bridge across Peivari Stream @ KM 107/800 (Bridge under Reconstruction)
107.6	107.8	Agrt. Land	Sengippatti	BT	7.0	F	GR	0.8	0.8	F	...	...	...	...	24	1.5	...				
107.8	108.0	Open	Sengippatti	BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	23	1.5	...				
108.0	108.2	Open	Murugan Colony	BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	27	1.6	...		...	...	
108.2	108.4	Open	Murugan Colony	BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	27	1.5	...	...	...	...	
108.4	108.6	Open		BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	27	1.4	...	...	...	...	
108.6	108.8	Open		BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	29	0.7	...	...	...	...	Minor Bridge across irrigation Canal @ km 108/600
108.8	109.0	Agrt. Land		BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	28	0.8	...	...	...	...	Minor Bridge across irrigation Canal @ km 108/800
109.0	109.2	Agrt. Land		BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	25	0.7	...	...	...	...	
109.2	109.4	Open	Kakkan Colony	BT	7.0	F	GR	0.5	0.5	F	...	...	...	...	27	1.1	...	...	...	...	
109.4	109.6	Built up	Kakkan Colony	BT	6.8	F	GR	0.5	0.5	F	...	...	...	...	28	0.7	...	...	...	...	
109.6	109.8	Open		BT	6.8	F	GR	1.3	2.0	F	...	...	...	...	29	1.0	...	...	...	...	
109.8	110.0	Open		BT	6.7	F	GR	1.0	1.0	F	...	...	...	...	27	1.4	...	...	...	...	
110.0	110.2	Open		BT	6.8	F	GR	1.0	1.0	F	...	...	...	...	19	1.5	...	...	...	...	
110.2	110.4	Open		BT	6.7	F	GR	1.0	1.0	F	...	...	...	...	22	1.6	...	...	...	...	
110.4	110.6	Agrt. Land		BT	6.8	F	GR	1.0	1.0	F	...	...	...	...	30	1.0	...	...	...	...	
110.6	110.8	Built up	Manyerippatti	BT	7.0	F	GR	1.0	1.0	F	...	...	...	...	30	1.5	...	...	...	...	
110.8	111.0	Built up	Manyerippatti	BT	7.0	F	GR	1.0	1.0	F	...	...	...	...	30	0.1	...	111.0	0	3.75	
111.0	111.2	Built up	Manyerippatti	BT	7.0	F	GR	1.0	1.0	F	...	...	...	...	20	0.0	15	111.2	0	3.75	
111.2	111.4	Agrt. Land		BT	7.0	F	GR	1.0	1.2	F	...	...	...	...	22	0.0	15	...	...	...	

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111.4	111.6	Agrt. Land		BT	6.8	F	GR	1.0	1.0	F	...	...	...	...	20	0.2	...	...	...	...	
111.6	111.8	Agrt. Land		BT	6.8	F	GR	1.0	1.2	F	...	...	...	...	23	0.4	...	...	...	...	
111.8	112.0	Built up	Samatvapuram	BT	6.8	F	GR	1.0	0.5	F	E	1.5	E	1.5	23	0.3	...	...	...	...	
112.0	112.2	Built up	Samatvapuram	BT	6.9	F	GR	0.5	0.5	F	E	1.5	E	1.5	21	0.6	...	...	...	...	
112.2	112.4	Open		BT	7.0	F	GR	0.5	1.0	F	E	1.5	E	1.5	23	0.6	...	...	...	...	Minor Bridge across Nanchi Stream @ Km 112/200
112.4	112.6	Open		BT	6.9	F	GR	0.5	0.7	F	E	1.5	E	1.5	22	0.4	...	...	...	...	
112.6	112.8	Agrt. Land		BT	6.8	F	GR	0.6	0.8	F	E	1.5	E	1.5	21	0.3	...	...	...	...	
112.8	113.0	Agrt. Land		BT	7.0	F	GR	0.5	0.5	F	E	1.5	E	1.5	23	0.4	...	...	...	...	
113.0	113.2	Agrt. Land		BT	7.0	F	GR	1.0	0.8	F	E	1.5	E	1.5	24	0.4	...				
113.2	113.4	Agrt. Land		BT	6.8	F	GR	0.5	0.8	F	E	1.5	E	1.5	22	0.3	...	...	...	...	
113.4	113.6	Agrt. Land	Pudukkudi	BT	7.0	F	GR	1.0	1.0	F	...	...	...	...	20	0.2	...	...	...	...	
113.6	113.8	Built up	Pudukkudi	BT	6.9	F	ER	1.0	1.0	F	...	...	...	...	23	0.2	...				
113.8	114.0	Built up	Pudukkudi	BT	6.9	F	ER	0.5	1.0	F	...	...	...	...	23	0.6	...	114.0	0	3.75	
114.0	114.2	Open	Pudukkudi	BT	7.0	F	ER	0.5	0.5	F	...	...	...	...	28	0.6	...	...	...	...	
114.2	114.4	Agrt. Land	Pudukkudi	BT	7.0	F	ER	0.5	0.5	F	...	...	...	...	40	1.8	...	...	...	...	
114.4	114.6	Agrt. Land	Pudukkudi	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	29	1.7	...	...	...	...	
114.6	114.8	Agrt. Land	Pudukkudi	BT	6.8	F	ER	0.5	0.5	F	...	...	...	...	24	0.4	...	...	...	...	
114.8	115.0	Built up	Pudukkudi	BT	6.7	F	ER	0.5	0.5	F	...	...	...	...	21	0.6	...	...	...	...	
115.0	115.2	Agrt. Land	Pudukkudi	BT	7.0	F	ER	0.5	0.5	F	...	...	...	...	27	0.8	...	...	...	...	
115.2	115.4	Open	Pudukkudi	BT	6.7	F	ER	0.5	0.5	F	...	...	...	...	30	0.7	...	...	...	...	
115.4	115.6	Open	Pudukkudi	BT	6.6	F	ER	0.5	0.5	F	E	1.5	E	1.5	25	0.4	...	...	...	...	
115.6	115.8	Open	Pudukkudi	BT	6.7	F	ER	0.5	0.5	F	E	1.5	E	1.5	21	0.5	...	...	...	...	
115.8	116.0	Agrt. Land	Pudukkudi	BT	6.8	F	ER	0.3	0.3	F	...	...	...	...	20	0.5	...	...	...	...	

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116.0	116.2	Agrt. Land	Pudukkudi	BT	7.0	F	ER	0.3	0.3	F	...	...	...	...	22	0.7	...	...	...	...	Minor Bridge across Uyyakkondan Extention Channel @ Km 116/100.
116.2	116.4	Open	Pudukkudi	BT	7.0	F	GR	1.0	1.0	F	E	1.5	E	1.5	44	1.2	...	...	...	...	
116.4	116.6	Agrt. Land	Pudukkudi	BT	6.8	F	GR	0.5	0.5	F	...	...	...	...	43	1.1	...	...	...	...	
116.6	116.8	Built up	Devaraya neri	BT	6.8	F	GR	1.0	1.0	F	...	...	...	...	43	1.2	...	...	...	...	Minor Bridge across Uyyakkondan Channel @ Km 116/700
116.8	117.0	Built up	Devaraya neri	BT	6.9	F	GR	1.0	2.0	F	..	..	...	...	35	1.3	...	...	...	...	Thanjavur District Boundary Ends & Tiruchirappalli District Boundary Begins
117.0	117.2	Built up	Devaraya neri	BT	6.9	F	GR	1.0	2.0	F	...	...	...	...	28	1.1	...	...	...	...	
117.2	117.4	Built up	Devaraya neri	BT	6.9	F	GR	1.0	1.5	F	...	...	...	..	27	0.8	...	...	...	...	
117.4	117.6	Built up	Devaraya neri	BT	7.0	F	GR	2.0	1.8	F	...	...	...	...	26	0.3	...	117.60	0.00	3.75	
117.6	117.8	Built up	Devaraya neri	BT	7.0	F	GR	2.0	1.8	F	..	...	..	..	42	0.8	...	...	...	...	
117.8	118.0	Open		BT	6.9	F	GR	1.5	1.5	F	..	...	...	...	34	1.2	...	...	...	...	
118.0	118.2	Open		BT	6.8	F	GR	1.5	1.5	F	E	3	E	3	34	0.8	...	...	...	...	Minor Bridge across Uyyakkondan Channel @ Km 118/200
118.2	118.4	Open		BT	6.8	F	GR	1.0	1.0	F	...	...	...	...	33	1.1	...	...	..	...	
118.4	118.6	Open		BT	6.7	F	GR	1.0	1.0	F	...	...	...	...	32	1.4	...	...	...	...	
118.6	118.8	Built up	Sivaji Nagar	BT	6.7	F	GR	1.0	1.0	F	E	5	E	5	32	0.7	...	118.80	0.00	3.75	
118.8	119.0	Built up	Sivaji Nagar	BT	6.7	F	GR	1.0	1.0	F	E	5	E	5	29	0.5	...		...	...	
119.0	119.2	Agrt. Land	Assur	BT	6.6	F	GR	0.5	1.0	F	...	...	...	...	31	0.6	...	...	...	...	Minor Bridge across Uyyakkondan Channel @ KM

Annexure A2 Road Inventory

																					119/200
119.2	119.4	Agrt. Land	Assur	BT	6.8	F	ER	0.5	0.6	F	...	...	...	...	34	0.6	...	...	...	...	
119.4	119.6	Open	Assur	BT	6.8	F	ER	0.5	0.5	F	...	...	...	...	39	2.0	...	...	...	...	
119.6	119.8	Open	Assur	BT	6.8	F	ER	0.5	0.5	F	...	...	...	...	31	2.0	...	...	...	...	Minor Bridge across Uyyakkondan Channel @ KM 119/700
119.8	120.0	Open	Assur	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	34	1.5	...	...	...	...	Minor Bridge across Uyyakkondan Channel @ Km 119/900
120.0	120.2	Open	Assur	BT	6.8	F	ER	0.5	0.5	F	...	...	...	...	41	0.8	...	...	...	...	
120.2	120.4	Open	Assur	BT	6.8	F	ER	0.5	0.8	F	...	...	...	...	29	0.4	...	...	...	...	
120.4	120.6	Open	Assur	BT	7.0	F	ER	0.5	0.5	F	...	...	...	...	54	0.6	...	...	...	...	
120.6	120.8	Industrial area	Thuvakudi	BT.	7.0	F	ER	0.5	0.5	F	...	...	...	..	55	0.8	...	...	...	...	
120.8	121.0	Industrial area	Thuvakudi	BT	7.0	F	ER	0.5	0.5	F	...	...	...	...	31	0.4	...				
121.0	121.2	Industrial area	Thuvakudi	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	31	0.4	...	..	...	...	
121.2	121.4	Industrial area	Thuvakudi	BT	6.9	F	ER	0.5	0.5	F	...	...	...	...	27	0.4	...	..	...	...	
121.4	121.6	Industrial area	Thuvakudi	BT	6.6	F	ER	0.5	0.5	F	...	...	...	...	31	0.3	...	121.60	...	...	SIDCO Road
121.6	121.8	Industrial area	Thuvakudi	BT	6.7	F	ER	0.5	0.5	F	...	...	...	...	30	0.3	...	...	...	...	Thuvakkudi Town
121.8	122.0	Industrial area	Thuvakudi	BT	7.0	F	ER	0.5	0.5	F	...	...	...	...	31	...	10	...	...	..	Thuvakkudi Town
122.0	122.2	Industrial / Instituitional	Thuvakudi	BT	6.8	F	ER	1.3	1.3	F	...	...	...	...	31	...	20	...	...	...	NIT, Trichy on RHS
122.2	122.4	Industrial / Instituitional	Thuvakudi	BT	6.8	F	ER	1.2	1.2	F	...	...	...	...	30	0.3	...	...	...	...	NIT, Trichy on RHS
122.4	122.6	Industrial / Instituitional	Thuvakudi	BT	6.6	F	ER	2.0	2.0	F	...	...	...	...	31	0.7	...	...	...	...	NIT, Trichy on RHS

Annexure A2 Road Inventory

122.6	122.8	Industrial / Instituition al	Thuvakudi	BT	7.0			F	ER	0.5	0.5	F	...	...	...	...	37	...	20				NIT, Trichy on RHS
122.8	123.0	Industrial / Instituition al	Thuvakudi	BT	7.0			F	BT	0.5	0.5	F	...	...	...	...	36	...	20	...	...	...	NIT, Trichy on RHS
123.0	123.2	Industrial / Instituition al	Thuvakudi	BT	7.0			F	BT	0.5	0.5	F	...	...	...	...	36	...	...	...	...	...	
123.2	123.4	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	...	...	...	...	36	...	...	123.20	0.00	3.75	
123.4	123.6	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	...	...	...	...	36	...	...	...	...	...	
123.6	123.8	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	...	...	...	...	36	...	...	...	...	...	
123.8	124.0	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	...	...	...	..	32	...	...				
124.0	124.2	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	...	...	...	...	32	...	...	...	...	...	
124.2	124.4	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	...	...	...	...	32	...	..	..	...	.	
124.4	124.6	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	..	...	...	..	28	..	...	...	...	...	
124.6	124 8	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	B	1.5	B	1.5	25	...	...	125.00	0.00	3.75	
124.8	125.0	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	B	2.5	B	2.5	27	...	...	..	...	...	Government Polytechnic on RHS.
125.0	125.2	Industrial area	Thuvakudi	BT	7.0			F	BT	2.5	2.5	F	B	3.5	B	3.5			...				Minor Bridge across Uyyakondan Channel stream at Km 125.180
125.2	125.4	Industrial area	Thuvakudi	BT	8.9	1.2	8.4	F	ER	2.5	2.5	F	...	...	...	...	32	...	...	...	...	...	Government Arts College on LHS
125.4	125.6	Industrial area	Kailasapuram	BT	8.7	1.2	8.7	F	ER	1.5	1.5	F	...	...	...	...	28	0.3	...				
125.6	125.8	Industrial area	Kailasapuram	BT	8.7	1.2	8.7	F	ER	1.5	1.5	F	E	1.5	E	1.5	28	0.3	...				
125.8	126.0	Industrial area	Kailasapuram	BT	12.8			F	ER	2.5	2.5	F	E	1.5	E	1.5	22	...	...	126.00	0.00	14.00	
126.0	126.2	Built up	Kailasapuram	BT	12.6			F	ER	2.5	2.5	F	E	1.5	E	1.5	22	...	...	126.00	0.00	14.00	Bus lay bye on LHS

Annexure A2 Road Inventory

126.2	126.4	Built up	Kailasapuram	BT	8.8	1.2	8.4	F	ER	1.5	1.5	F	E	1.5	E	1.5	28	...	...				
126.4	126.6	Built up	Kailasapuram	BT	8.8	1.2	8.4	F	ER	1.5	1.5	F	E	1.5	E	1.5	29	...	...	...	...	...	
126.6	126.8	Built up	Kailasapuram	BT	8.8	1.2	8.4	F	ER	1.5	1.5	F	E	1.5	E	1.5	29	...	...	...	...	...	
126.8	127.0	Built up	Kailasapuram	BT	8.8	1.2	8.4	F	ER	1.5	1.5	F	E	1.5	E	1.5	29	...	...				
127.0	127.2	Built up	Tiruverambur	BT	8.8	1.2	8.8	F	ER	1.5	1.5	F	E	1.5	E	1.5	41	...	...	127.00	0.00	14.00	
127.2	127.4	Built up	Tiruverambur	BT	8.8	1.2	8.8	F	ER	1.5	1.5	F	E	1.5	E	1.5	41	...	...	127.00	0.00	14.00	
127.4	127.6	Built up	Tiruverambur	BT	8.9	1.2	8.7	F	ER	1.5	1.5	F	E	1.5	E	1.5	34	...	...	...	...	...	
127.6	127.8	Built up	Tiruverambur	BT	8.9	1.2	8.7	F	ER	1.5	1.5	F	E	1.5	E	1.5	34	...	...	...	...	...	Minor Bridge across Uyyakkondan Channel @ Km 127/600
127.8	128.0	Built up	Tiruverambur	BT	12.4			F	ER	2.5	2.5	F	E	1.5	E	1.5	27	...	...	...	...	...	Tiruverumbur Bus stand on RHS
128.0	128.2	Built up	Tiruverambur	BT	ROB	12.0	ROB	F	CC	0.3	0.3	F	...	..	...	...	12	6.00	...	...	...	..	ROB across Trichy - Thanjavur Railway Line
128.2	128.4	Built up	Tiruverambur	BT	ROB	12.0	ROB	F	CC	0.3	0.3	F	...	...	...	...	12	6.00	...	128.20	0.00	3.75	ROB across Trichy - Thanjavur Railway Line
128.4	128.6	Built up	Tiruverambur	BT	ROB	12.0	ROB	F	CC	0.3	0.3	F	...	...	...	...	12	6.00	...	...	...	...	ROB across Trichy - Thanjavur Railway Line
128.6	128.8	Built up	Tiruverambur	BT	8.6	1.2	8.3	F	ER	1.5	1.5	F	E	12.5	E	12.5	29	...	...	...	...	...	
128.8	129.0	Built up	Tiruverambur	BT	8.6	1.2	8.3	F	ER	1.5	1.5	F	E	13.5	E	13.5	29	...	...	128.800	0	3.75	
129.0	129.2	Built up	Tiruverambur	BT	8.6	1.2	8.3	F	ER	1.5	1.5	F	E	14.5	E	14.5	29	...	...	...	...	...	
129.2	129.4	Built up	Tiruverambur	BT	16.7			F	ER	1.5	1.5	F	...	...	...	...	27	...	...	...	...	...	
129.4	129.6	Built up	Tiruverambur	BT	8.5	1.2	8.7	F	ER	1.5	1.5	F	...	...	...	...	29	...	...	129.40	0.00	3.75	Minor Bridge across Kattuvari canal @ Km 129/500
129.6	129.8	Built up	Tiruverambur	BT	8.5	1.2	8.7	F	ER	1.5	1.5	F	...	...	...	...	28	...	...	...	...	...	

Annexure A2 Road Inventory

129.8	130.0	Built up	Tiruvera mbur	BT	8.5	1.2	8.7	F	ER	1.5	1.5	F	...	...	...	...	27	...	...	...	...	...	
130.0	130.2	Built up	Tiruvera mbur	BT	8.5	1.2	8.7	F	ER	1.5	1.5	F	...	...	...	...	26	0.4	...	...	...	...	Minor Bridge across Kattuvari canal @ Km 130/100
130.2	130.4	Built up	Kattur	BT	8.5	1.2	8.7	F	ER	1.5	1.5	F	...	...	...	...	28	0.3	...	...	...	...	
130.4	130.6	Built up	Kattur	BT	18.0			F	ER	1.5	1.5	F	...	...	...	...	28	1.0	...	...	...	...	Minor Bridge across Kattuvari canal @ KM 130/400
130.6	130.8	Built up	Kattur	BT	9.1	1.2	8.1	F	ER	1.5	1.5	F	...	...	...	...	32	0.6	...	...	...	...	
130.8	131.0	Built up	Kattur	BT	9.1	1.2	8.1	F	ER	1.5	1.5	F	...	...	...	...	32	0.5	...	...	...	...	
131.0	131.2	Built up	Kattur	BT	9.1	1.2	8.1	F	ER	1.5	1.5	F	...	...	...	...	32	0.4	...	...	...	...	
131.2	131.4	Built up	Kattur	BT	8.0	1.2	8.0	F	ER	1.5	1.5	F	...	...	...	...	28	...	...	...	...	...	
131.4	131.6	Built up	Kattur	BT	8.0	1.2	8.0	F	ER	1.5	1.5	F	...	...	...	...	28	...	...	...	...	...	Minor Bridge across Uyyakkondan Channel @ Km 131/400
131.6	131.8	Built up	Kattur	BT	8.0	1.2	8.0	F	ER	1.5	1.5	F	...	...	...	...	28	...	...	...	...	...	
131.8	132.0	Built up	Kattur	BT	8.2	1.2	8.0	F	ER	1.5	1.5	F	...	...	...	...	35	...	...	...	...	...	
132.0	132.2	Built up	Kattur	BT	12.3			F	ER	1.5	1.5	F	...	...	...	...	31	...	...	...	...	...	
132.2	132.4	Built up	Kattur	BT	9.2			F	ER	1.5	1.5	F	...	...	...	...	28	...	...	...	...	...	
132.4	132.6	Built up	Kattur	BT	9.6			F	ER	1.5	1.5	F	B	2	B	2	29	...	...	...	...	...	
132.6	132.8	Built up	Kattur	BT	9.4			F	ER	1.5	1.5	F	...	...	...	...	29	...	...	...	...	...	
132.8	133.0	Built up	Kattur	BT	10.4			F	ER	1.5	1.5	F	...	...	...	...	29	...	...	...	...	...	
133.0	133.2	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	B	2	B	2	29	...	...	...	...	...	
133.2	133.4	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	B	3	B	3	29	...	...	...	...	...	
133.4	133.6	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	B	4	B	4	29	...	...	...	...	...	
133.6	133.8	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	B	5	B	5	29	...	...	...	...	...	
133.8	134.0	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	B	6	B	6	39	...	...	...	...	...	
134.0	134.2	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	B	7	B	7	37	...	...	134.20	0.00	5.50	ROB across Chennai - Trichy Main Line

Annexure A2 Road Inventory

134.2	134.4	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	B	8	B	8	37	...	...	...	...	...	
134.4	134.6	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	B	9	B	9	35	...	...	...	...	...	Service road on B/S 6.2m wide
134.6	134.8	Built up	Ariyaman galam	BT	ROB	12.0	ROB	F	CC	0.25	0.25	F	...	...	...	...	12	6	...	...	...	...	Service road on B/S 6.2m wide
134.8	135.0	Built up	Ariyaman galam	BT	ROB	12.0	ROB	F	CC	0.25	0.25	F	...	...	...	...	12	6	...	...	...	...	Service road on B/S 6.2m wide
135.0	135.2	Built up	Ariyaman galam	BT	ROB	12.0	ROB	F	CC	0.25	0.25	F	...	...	...	...	12	6	...	...	...	...	Service road on B/S 6.2m wide
135.2	135.4	Built up	Ariyaman galam	BT	9.4			F	ER	1.5	1.5	F	...	...	...	...	22	6	...	...	...	...	Service road on B/S 6.2m wide
135.4	135.6	Built up	Ariyaman galam	BT	9.6			F	ER	1.5	1.5	F	...	...	...	...	24	...	...	135.80	319.20	7.00	Minor Bridge across Kamuvari canal @ Km 135/600
135.6	135.8	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	...	...	...	...	29	...	...	135.80	319.20	7.00	Minor Bridge across Uyyakkondan Channel @ Km 135/700
135.8	136.0	Built up	Ariyaman galam	BT	10.0			F	ER	1.5	1.5	F	...	...	..	...	34	...	...	135.80	0.00	7.00	

Annexure A-3: Details of Existing Minor Intersections

Sl. No	Existing Chainage km	Existing Chainage m	Design Chainage, km	Type of Junction	No. of Arms	Arm to	Lead to	Width (m)	Remarks
1	80	340	80.35	T	3	LHS	Pathima Nagar	3.44	Earthen Road
2	80	1070	81.04	T	3	LHS	Sekalavathi Nagar	2.8	Earthen Road
3	80	1220	81.21	T	3	LHS	Sekalavathi Nagar	3.29	Earthen Road
4	80	1410	81.4	Railway Cross	-	Level Crossing			Railway Level crossing
5	80	1440	81.44	T	3	LHS	Magesh Nagar	2.77	Earthen Road
6	80	1490	81.49	T	3	LHS	Magesh Nagar	3.93	Earthen Road
7	82	90	82.7	Cross Road	4	LHS	Vetikadu	2.92	Bituminous Road
						RHS	Thanjavur	2.97	
8	82	710	83.3	Cross Road	4	LHS	Ranganatha Puram	3.7	Bituminous Road
						RHS	Puthuvansaavadi	3.81	
9	84	720	85.42	T	3	RHS	Elango Nagar	3	Earthen Road
10	86	500	87.2	T	3	RHS	Kamaraj Nagar	5.16	Earthen Road
11	88	680	89.37	T	3	LHS	Fields	2.9	Earthen Road
12	88	730	89.44	Cross Road	4	LHS	Thulukkampatty	3.1	Bituminous Road
						RHS	Mathakottai	2.72	Earthen Road
13	89	450	90.14	T	3	LHS	Malavastha Savadi	2.66	Bituminous Road
14	89	550	90.23	T	3	LHS	Pudukkottai	3.42	CC Pavement
15	89	910	90.34	T	3	LHS	M.G.R Nagar	3.34	Bituminous Road
16	90	20	90.46	T	3	LHS		4	CC Pavement
17	90	120	90.56	T	3	LHS		3.74	
18	91	390	91.84	T	3	RHS	Pilliyarpatti	3.18	
19	91	880	92.35	T	3	RHS		2.44	Earthen Road
20	97	970	98.3	T	3	LHS		2.46	Earthen Road
21	98	70	98.43	T	3	RHS	Muniyampatty	3.82	Bituminous Road
22	98	840	99.22	T	3	LHS	Vallam Puthur	3.68	Bituminous Road
23	99	920	100.31	T	3	RHS		2.3	Earthen Road
24	100	140	100.53	T	3	LHS		3.12	Earthen Road

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25	100	280	100.67	T	3	RHS		3	Earthen Road
26	100	750	101.13	Cross Road	4	LHS		2.55	Earthen Road
						RHS		3.45	WBM Road
27	100	930	101.34	T	3	LHS		2.41	Earthen Road
28	101	360	101.74	Cross Road	4	LHS	Tamil Selven Road	2.88	WBM Road
						RHS	Thirumalai Samuthiram	3.64	Bituminous Road
29	101	490	101.89	T	3	LHS	Kurum Poondi	2.77	Bituminous Road
30	101	510	101.89	T	3	RHS		3	Earthen Road
31	101	530	101.93	Cross Road	4	LHS		2.38	
						RHS		2.68	Earthen Road
32	101	560	101.96	T	3	LHS		2.22	Bituminous Road
33	101	650		T	3	LHS		3.52	Bituminous Road
34	102	640	103.05	T	3	RHS	Maruthagudi	3.41	Bituminous Road
35	103	340	103.78	T	3	LHS	Ayothipatti	3.7	Earthen Access Road
36	103	670	104.05	T	3	RHS		2.84	Bituminous Road
37	105	540	106	T	3	RHS		3.51	Bituminous Road
38	106	700		T	3	RHS	Karriapatti	3.74	Cement Road
39	106	710	107.2	T	3	LHS	Putukudi	3.1	Bituminous Road
40	106	885	107.36	Cross Road	4	LHS	Paliapatti	2.7	Earthen Road
						RHS	Putukudi	2.95	Bituminous Road
41	107	700	108.19	T	3	RHS	PalazhakariapaTTI	3.57	Bituminous Road
42	107	920	108.42	T	3	RHS	EB Sub Station	3.2	Bituminous Road
43	108	180	108.68	T	3	RHS		3.2	Earthen Road
44	109	850	110.39	T	3	LHS	Putukudi	2.77	Bituminous Road
45	110	990	111.58	T	3	LHS	Valampakudi	3.99	Bituminous Road
46	111	60	111.65	T	3	RHS	Kottarapatti	4	Bituminous Road
47	111	535	112.1	T	3	RHS		2.9	Earthen Road
48	112	560	113.17	T	3	RHS		2.92	Earthen Road
49	113	160	113.81	T	3	RHS	Kamatchi Puram	3.13	Bituminous Road
50	113	595	114.24	T	3	RHS		3.12	Earthen Road
51	113	800	114.53	T	3	RHS	Rayamundan Patty	3.65	Bituminous Road
52	114	90	114.8	T	3	LHS	Putukudi	3.5	Bituminous Road

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53	115	110	115.83	T	3	RHS	Navallur	3.25	Bituminous Road
54	116	160	116.91	T	3	RHS		2.54	Earthen Road
55	117	290	117.97	T	3	RHS	Devaraya Neri	2.95	Earthen Road
56	117	610	118.29	T	3	RHS	Devaraya Neri	3.6	Bituminous Road
57	118	725	119.39	T	3	LHS	Assur	3.74	Bituminous Road
58	118	785	119.45	T	3	RHS		5	Bituminous Road
59	119	240	119.91	T	3	RHS		3.7	Earthen Road
60	119	380	120.06	T	3	RHS		3	Earthen Road
61	119	530	120.2	T	3	LHS		8.27	Earthen Road
62	119	960	120.62	T	3	RHS		3	Earthen Road
63	120	375	120.94	T	3	LHS	Crusher	3.4	Earthen Road
64	120	680	121.35	T	3	LHS		3.25	WBM Road
65	121	380	122.05	T	3	LHS	Sidco Industrial Estate	3.45	Bituminous Road
66	121	560	122.22	T	3	RHS	Sidco Industrial Estate	3.45	Bituminous Road
67	121	730	122.39	T	3	LHS	Sivan Temple Street	4.32	Bituminous Road
68	121	770	122.43	T	3	RHS	Marakatti Nagar	3.02	Bituminous Road
69	121	870	122.54	T	3	RHS	Parakath Nagar	3.29	Earthen Road
70	122	0	122.67	T	3	LHS	Tiny Sector	3.31	Bituminous Road
71	122	210	122.87	T	3	LHS	Premier Industries	5.59	Earthen Road
72	123	200	123.87	T	3	LHS	Bell Nagar	4.7	Bituminous Road
73	123	575	124.22	T	3	LHS		3.23	Bituminous Road
74	123	800	124.49	T	3	LHS	Thirvakudi	5.58	WBM Road
75	124	730	125.42	T	3	LHS		3.1	Earthen road
76	124	800	125.49	T	3	RHS	Ayyampatti Road	3	Bituminous Road
77	125	221	125.88	T	3	RHS	BHEL quarters	4	Bituminous Road
78	125	530	126.19	T	3	LHS	BHEL quarters	4	Bituminous Road
79			126.3	Cross Road	4	LHS & RHS	BHEL quarters	4	Bituminous Road
80	126	300	127.2	T	3	LHS		2.1	Bituminous Road
81	127	295	128.14	T	3	LHS		4.61	Bituminous Road

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82	127	445	128.3	T	3	LHS		2.89	Bituminous Road
83	127	610	128.48	T	3	LHS	Barathy puram	3.09	WBM Road
84	127	700	128.57	T	3	LHS	Kiranur	3.92	Bituminous Road
85	127	715	128.58	T	3	RHS	Ganesha puram	3.95	Bituminous Road
86	127	750	128.62	T	3	RHS	Amman Kovil	3.55	Bituminous Road
87	128	215	128.85	T	3	RHS	Kaveri nagar	3.1	WBM Road
88	128	285	128.93	T	3	LHS	Naulpet	4	Bituminous Road
89	128	295	128.93	T	3	RHS		3.66	Bituminous Road
90	128	780	129.47	T	3	RHS	Kallanai	6.8	Bituminous Road
91	129	5	129.64	T	3	LHS		2.31	Bituminous Road
92	129	35	129.66	T	3	LHS		1.3	Earthen Road
93	129	60	129.69	T	3	RHS	IAS Nagar	4.13	Bituminous Road
94	129	95	129.72	T	3	LHS		2.91	Bituminous Road
95	129	155	129.79	T	3	LHS		2.45	Earthen Road
96	129	175	129.8	T	3	RHS		2.85	Cement Road
97	129	185	129.82	T	3	LHS		3.59	Bituminous Road
98	129	260	129.91	T	3	RHS		3.62	Bituminous Road
99	129	375	130.03	T	3	LHS		4.22	Bituminous Road
100	129	405	130.09	T	3	LHS		3.04	Bituminous Road
101	129	685	130.33	T	3	RHS		3.55	WBM Road
102	129	745	130.39	T	3	RHS		4.08	Bituminous Road
103	129	825	130.48	T	3	LHS		3.03	Bituminous Road
104	129	870	130.53	T	3	RHS		2.8	Bituminous Road
105	129	945	130.61	T	3	RHS		2.27	WBM Road
106	129	975	130.63	T	3	LHS		3.51	Earthen Road
107	130	5	130.66	T	3	RHS		2.54	WBM Road
108	130	350	131.01	T	3	RHS	Balaji Nagar	3.62	Earthen Road
109	130	410	131.1	T	3	RHS	Balaji Nagar	3.6	WBM Road
110	130	420	131.11	T	3	LHS	Balaji Nagar	3.19	Bituminous Road
111	130	540	131.24	T	3	RHS	Ellakudi	3.34	Earthen Road

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112	130	550	131.25	T	3	LHS	Ellakudi	3.26	Earthen Road
113	130	910	131.6	T	3	RHS		3.54	WBM Road
114	130	920	131.61	T	3	LHS		3.7	Bituminous Road
115	131	0	131.69	T	3	RHS		3.71	Earthen Road
116	131	80	131.77	T	3	LHS		2.47	WBM Road
117	131	120	131.81	T	3	LHS		3.62	WBM Road
118	131	150	131.85	T	3	LHS		3.62	WBM Road
119	131	180	131.88	T	3	LHS		3.54	Bituminous Road
120	131	210	131.91	T	3	LHS		2.7	WBM Road
121	131	210	131.91	T	3	RHS		3.59	Bituminous Road
122	131	365	132.06	T	3	RHS		3.43	WBM Road
123	131	440	132.14	T	3	LHS		3.83	Bituminous Road
124	131	450	132.14	T	3	RHS		4.12	WBM Road
125	131	610	132.31	T	3	RHS		4.09	Earthen Road
126	131	700	132.4	T	3	RHS		3.68	WBM Road
127	131	745	132.44	T	3	RHS		2.86	WBM Road
128	131	850	132.55	T	3	LHS	Ellakudi	3.08	Bituminous Road
129	131	850	132.55	T	3	RHS	Ellakudi	2.8	Bituminous Road
130	131	940	132.63	T	3	RHS		3.11	Bituminous Road
131	131	970	132.66	T	3	LHS		3.06	Bituminous Road
132	131	970	132.66	T	3	RHS		1.54	Bituminous Road
133	132	20	132.69	T	3	RHS		3.55	Bituminous Road
134	132	110	132.78	T	3	RHS		3.76	WBM Road
135	132	130	132.8	T	3	LHS		3.38	Bituminous Road
136	132	180	132.87	T	3	RHS		3.14	Bituminous Road
137	132	220	132.9	T	3	RHS		3.69	Bituminous Road
138	132	270	132.95	T	3	RHS		4.41	Bituminous Road
139	132	320	132.99	T	3	RHS		3.97	Bituminous Road
140	132	330	133.01	T	3	LHS		2.58	Bituminous Road

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141	132	385	133.06	T	3	RHS		2.6	WBM Road
142	132	260	133.14	T	3	RHS		3.38	Bituminous Road
143	132	335	133.21	T	3	LHS		3.44	WBM Road
144	132	385	133.36	T	3	RHS		2.87	WBM Road
145	132	430	133.41	T	3	RHS		2.89	Bituminous Road
146	132	470	133.45	T	3	LHS		2.48	Bituminous Road
147	132	480	133.46	T	3	RHS		3.11	Bituminous Road
148	132	590	133.57	T	3	LHS		2.76	Earthen Road
149	132	620	133.6	T	3	LHS		3.92	Bituminous Road
150	132	995	133.67	T	3	LHS		4.78	Bituminous Road
151	133	70	133.75	T	3	RHS		3.37	Bituminous Road
152	133	150	133.83	T	3	LHS		3.55	Bituminous Road
153	133	165	133.84	T	3	RHS		1.26	Bituminous Road
154	133	260	133.94	T	3	RHS		1.19	Bituminous Road
155	133	275	133.95	T	3	LHS		2.58	Bituminous Road
156	133	315	134	T	3	LHS		3.58	Bituminous Road
157	133	315	134	T	3	RHS		3.02	Bituminous Road
158	133	480	134.16	T	3	RHS		5.21	Bituminous Road
159	133	565	134.25	T	3	LHS		3.18	Bituminous Road
160	133	575	134.3	T	3	RHS		3.18	Bituminous Road
161	133	990	134.68	T	3	RHS	Ariyamangalam	4.12	Bituminous Road
162	134	60	134.74	T	3	LHS	Keelakal kandar kottai	3.08	Bituminous Road
163	134	175	134.84	T	3	LHS		5.85	Bituminous Road
164	134	225	134.9	T	3	LHS		3.76	Bituminous Road
165	134	235	134.92	T	3	LHS		3.13	Bituminous Road
166	134	245	134.92	T	3	RHS	Ariyamangalam	3.02	Bituminous Road
167	134	345	135.02	T	3	RHS	Ariyamangalam	2.41	Bituminous Road
168	134	465	135.14	T	3	LHS		2.53	Bituminous Road
169	134	465	135.14	T	3	RHS		2.3	Bituminous Road
170	134	500	135.18	T	3	LHS		3.55	Bituminous Road
171	134	560	135.24	T	3	RHS		3.67	Bituminous Road

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172	134	680	135.33	T	3	LHS		3.69	WBM Road
173	134	680	135.33	T	3	RHS		1.3	Bituminous Road
174	134	720	135.37	T	3	RHS		1.57	Bituminous Road
175	134	840	135.49	T	3	RHS		2.44	Bituminous Road
176	134	860	135.51	T	3	LHS		3.32	Bituminous Road
177	134	955	135.68	T	3	RHS		2.81	Bituminous Road
178	135	75	135.81	T	3	LHS		2.22	Bituminous Road
179	135	100	135.85	T	3	LHS		2.64	Bituminous Road
180	135	210	135.96	T	3	RHS		2.73	Bituminous Road
181	135	235	135.98	T	3	RHS		2.91	Bituminous Road
182	135	390	136.13	T	3	RHS		1.95	Bituminous Road
183	135	510	136.26	T	3	RHS		1.72	Bituminous Road
184	135	550	136.3	T	3	RHS		3.48	Bituminous Road
185	135	610	136.34	T	3	RHS		2.51	Bituminous Road





Annexure A-4 Pavement Condition

Existing Chainage (km)		Surface Condition		Cracks			% Area covered by			Rut Depth Range	Left Shoulder			Right Shoulder			Comments
From	To	Type B/C/W	Appearance	Type	Width N/W	% area Covered	Pot Holes	Ravelling	Patching		Type	Defect Type	% Length Covered	Type	Defect Type	% Length Covered	
80.000	80.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
80.600	80.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
80.800	81.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
81.000	81.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
81.200	81.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
81.400	81.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
81.600	81.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
81.800	82.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
82.000	82.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
82.200	82.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
82.400	82.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
82.600	82.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
82.800	83.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
83.000	83.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
83.200	83.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
83.400	83.600	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
83.600	83.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
83.800	84.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
84.000	84.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
84.200	84.400	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
84.400	84.600	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
84.600	84.800	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
84.800	85.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
85.000	85.200	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
85.200	85.400	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
85.400	85.600	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	Depressions formed in Shoulders

Annexure A-4 Pavement Condition

85.600	85.800	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
85.800	86.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
86.000	86.200	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
86.200	86.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
86.400	86.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
86.600	86.800	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
86.800	87.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
87.000	87.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
87.200	87.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
87.400	87.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
87.600	87.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
87.800	88.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
88.000	88.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
88.200	88.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
88.400	88.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
88.600	88.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
88.800	89.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
89.000	89.200	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
89.200	89.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
89.400	89.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
89.600	89.800	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
89.800	90.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
90.000	90.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
90.200	90.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
90.400	90.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
90.600	90.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
90.800	91.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
91.000	91.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
91.200	91.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
91.400	91.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
91.600	91.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	

Annexure A-4 Pavement Condition

91.800	92.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
92.000	92.200	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
92.200	92.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
92.400	92.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
92.600	92.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
92.800	93.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
93.000	93.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
93.200	93.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
93.400	93.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
93.600	93.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
93.800	94.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
94.000	94.200	B	G	HC	N	10	-	-	-	-	ES	-	-	ES	-	-	
94.200	94.400	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
94.400	94.600	B	G	HC	N	10	-	-	-	-	ES	-	-	ES	-	-	
94.600	94.800	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
94.800	95.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
95.000	95.200	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
95.200	95.400	B	G	HC	N-W	5	-	-	-	-	ES	-	-	ES	-	-	
95.400	95.600	B	G	AG/HC	N-W	10	-	-	-	-	ES	-	-	ES	-	-	
95.600	95.800	B	G	AG/HC	N-W	10	-	-	-	-	ES	-	-	ES	-	-	
95.800	96.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
96.000	96.200	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
96.200	96.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
96.400	96.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
96.600	96.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
96.800	97.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
97.000	97.200	B	G	AG/HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
97.200	97.400	B	G	AG/HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
97.400	97.600	B	G	AG/HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
97.600	97.800	B	G	AG/HC	N	10	-	-	-	-	ES	-	-	ES	-	-	
97.800	98.000	B	G	AG/HC	N	5	-	-	-	-	ES	-	-	ES	-	-	

Annexure A-4 Pavement Condition

98.000	98.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
98.200	98.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
98.400	98.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
98.600	98.800	B	G	AG/HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
98.800	99.000	B	G	LC	N	30	-	-	5	-	ES	-	-	ES	-	-	
99.000	99.200	B	G	AG/LC	N	40	-	-	5	20mm, 100m	ES	-	-	ES	-	-	Depresssions formrd in patchings,99+150-99+400
99.200	99.400	B	G	AG/LC	N	5	-	-	5	-	ES	-	-	ES	-	-	
99.400	99.600	B	G	AG/LC	N	5	-	-	5	-	ES	-	-	ES	-	-	
99.600	99.800	B	G	AG/HC	N	10	-	-	5	-	ES	-	-	ES	-	-	
99.800	100.000	B	G	AG/HC	N	30	-	-	5	-	ES	-	-	ES	-	-	
100.000	100.200	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
100.200	100.400	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
100.400	100.600	B	G	AG	W	5	-	-	5	-	ES	-	-	ES	-	-	
100.600	100.800	B	G	AG	W	5	-	-	5	-	ES	-	-	ES	-	-	
100.800	101.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
101.000	101.200	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
101.200	101.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
101.400	101.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
101.600	101.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
101.800	102.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
102.000	102.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
102.200	102.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
102.400	102.600	B	G	AG	N	10	-	-	-	-	ES	-	-	ES	-	-	
102.600	102.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
102.800	103.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
103.000	103.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
103.200	103.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
103.400	103.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
103.600	103.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
103.800	104.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	

Annexure A-4 Pavement Condition

104.000	104.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
104.200	104.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
104.400	104.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
104.600	104.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
104.800	105.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	Overlay work in progress
105.000	115.200	B															
115.000	115.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
115.200	115.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
115.400	115.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
115.600	115.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
115.800	116.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
116.000	116.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
116.200	116.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
116.400	116.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
116.600	116.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
116.800	117.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
117.000	117.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
117.200	117.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
117.400	117.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
117.600	117.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
117.800	118.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
118.000	118.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
118.200	118.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
118.400	118.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
118.600	118.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
118.800	119.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES			
119.000	119.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES			
119.200	119.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
119.400	119.600	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
119.600	119.800	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	

Annexure A-4 Pavement Condition

119.800	120.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
120.000	120.200	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
120.200	120.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
120.400	120.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
120.600	120.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
120.800	121.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
121.000	121.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
121.200	121.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
121.400	121.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	Depressions formed in Shoulders
121.600	121.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
121.800	122.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
122.000	122.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
122.200	122.400	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
122.400	122.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
122.600	122.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
122.800	123.000	B	G	HC	N	5	-	-	5	-	ES	-	-	ES	-	-	
123.000	123.200	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
123.200	123.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
123.400	123.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
123.600	123.800	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
123.800	124.000	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
124.000	124.200	B	G	HC	-	10	-	-	-	-	ES	-	-	ES	-	-	
124.200	124.400	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
124.400	124.600	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
124.600	124.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
124.800	125.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
125.000	125.200	B	G	AG	N-W	5	-	-	-	-	ES	-	-	ES	-	-	
125.200	125.400	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	CC Pavement Overlaid by bitiminous courses
125.400	125.600	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
125.600	125.800	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
125.800	126.000	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	

Annexure A-4 Pavement Condition

126.000	126.200	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
126.200	126.400	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
126.400	126.600	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
126.600	126.800	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
126.800	127.000	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
127.000	127.200	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
127.200	127.400	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
127.400	127.600	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
127.600	127.800	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
127.800	128.000	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
128.000	128.200	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
128.200	128.400	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
128.400	128.600	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
128.600	128.800	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
128.800	129.000	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
129.000	129.200	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
129.200	129.400	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
129.400	129.600	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
129.600	129.800	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
129.800	130.000	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
130.000	130.200	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
130.200	130.400	CC+B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-
130.400	130.600	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
130.600	130.800	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
130.800	131.000	CC+B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-
131.000	131.200	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
131.200	131.400	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
131.400	131.600	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
131.600	131.800	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
131.800	132.000	CC+B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-
132.000	132.200	CC+B	G	-	-	-	-	-	15	-	ES	-	-	ES	-	-

Annexure A-4 Pavement Condition

132.200	132.400	CC+B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
132.400	132.600	CC+B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
132.600	132.800	CC+B	G	HC	N	10	-	-	-	-	ES	-	-	ES	-	-	
132.800	133.000	CC+B	G	HC	N	15	-	-	-	-	ES	-	-	ES	-	-	
133.000	133.200	CC+B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
133.200	133.400	CC+B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
133.400	133.600	CC+B	G	HC	N	10	-	-	-	-	ES	-	-	ES	-	-	
133.600	133.800	CC+B	G	HC	N	10	-	-	-	-	ES	-	-	ES	-	-	
133.800	134.000	CC+B	F	HC	N	10	-	-	-	-	ES	-	-	ES	-	-	
134.000	134.200	CC+B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
134.200	134.400	CC+B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
134.400	134.600	B	G	HC	N	5	-	-	-	-	ES	-	-	ES	-	-	
134.600	134.800	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
134.800	135.000	B	G	-	-	-	-	-	-	-	ES	-	-	ES	-	-	
135.000	135.200	B	G	AG/HC	N-W	10	-	-	-	-	ES	-	-	ES	-	-	
135.200	135.400	B	G	AG/HC	N-W	15	-	10	-	-	ES	-	-	ES	-	-	
135.400	135.600	B	G	AG/HC	N	10	-	-	-	-	ES	-	-	ES	-	-	
135.600	135.750	B	G	AG/HC	N	10	-	-	-	-	ES	-	-	ES	-	-	

G-Good, F-Fair, P-Poor, HC- Hairline Cracks, AG- Aligator Cracks, LC-Longitudinal Cracks,
N-Narrow, W-Wide

Annexure A-5: Pavement Characteristics Deflection (Km 80.000 to Km 135.750)

Chainage (km.m)		Temperature (°C)	FMC (%)	Mean Deflection (mm)	Standard Deviation (mm)	Calculated Deflection (mm)	Correction for Temperature (mm)	Moisture Correction factor	Characteristic Deflection (mm)
From	To								
80.000	81.000	39	8	0.32	0.20	0.72	0.04	1.32	0.90
81.000	82.000	36	10	0.37	0.07	0.51	0.01	1.22	0.61
82.000	83.000	35	14	0.46	0.26	0.97	0.00	1.14	1.11
83.000	84.000	35	7	0.31	0.13	0.56	0.00	1.05	0.59
84.000	85.000	35	4	0.32	0.13	0.57	0.00	1.32	0.76
85.000	86.000	36	12	0.23	0.10	0.42	0.01	1.01	0.41
86.000	87.000	36	6	0.35	0.08	0.50	0.01	1.08	0.53
87.000	88.000	38	7	0.33	0.08	0.49	0.03	1.05	0.48
88.000	89.000	40	11	0.46	0.12	0.71	0.05	1.01	0.67
89.000 L	90.000 L	35	11	0.20	0.08	0.37	0.00	1.01	0.37
89.000 R	90.000 R	35	11	0.34	0.22	0.79	0	1.01	0.80
90.000	91.000	34	9	0.30	0.17	0.64	-0.01	1.02	0.66
91.000	92.000	32	12	0.37	0.24	0.85	-0.03	1.01	0.89
92.000	93.000	32	8	0.39	0.12	0.63	-0.03	1.03	0.68
93.000	94.000	34	9	0.30	0.09	0.49	-0.01	1.02	0.50
94.000	95.000	33	7	0.71	0.11	0.93	-0.02	1.05	0.99
95.000	96.000	38	11	0.78	0.11	0.99	0.03	1.01*	0.97
96.000	97.000	36	10	0.94	0.30	1.53	0.01	1.02	1.55
97.000	98.000	34	8	0.64	0.23	1.10	-0.01	1.03	1.14
98.000	99.000	35	6	0.11	0.06	0.23	0.00	1.08	0.25
99.000	100.000	41	13	0.90	0.19	1.27	0.06	1.15	1.40
100.000	101.000	41	10	0.64	0.39	1.42	0.06	1.02	1.38
101.000	102.000	40	10	0.51	0.40	1.31	0.05	1.02	1.28
102.000	103.000	35	5	0.54	0.18	0.91	0.00	1.17	1.06
103.000	104.000	36	10	0.59	0.22	1.03	0.01	1.02	1.04

Annexure A-5: Pavement Characteristics Deflection (Km 80.000 to Km 135.750)

Chainage (km.m)		Temperature (°C)	FMC (%)	Mean Deflection (mm)	Standard Deviation (mm)	Calculated Deflection (mm)	Correction for Temperature (mm)	Moisture Correction factor	Characteristic Deflection (mm)
From	To								
105.000	106.000	38	12	0.37	0.14	0.66	0.03	1.01	0.63
106.000	107.000	40	6	0.79	0.36	1.51	0.05	1.08	1.57
107.000	108.000	41	4	0.66	0.14	0.95	0.06	1.32	1.17
108.000	109.000	40	7	0.97	0.38	1.73	0.05	1.05	1.76
109.000	110.000	37	9	0.67	0.22	1.11	0.02	1.02	1.11
110.000	111.000	36	11	1.13	0.76	2.65	0.01	1.01	2.66
111.000	112.000	38	13	0.81	0.36	1.53	0.03	1.01	1.52
112.000	113.000	39	8	0.37	0.25	0.87	0.04	1.03	0.85
113.000	114.000	37	10	0.29	0.18	0.64	0.02	1.23	0.77
114.000	115.000	38	11	0.69	0.12	0.93	0.03	1.01	0.91
115.000	116.000	42	10	0.55	0.13	0.80	0.07	1.02	0.74
116.000	117.000	32	9	0.87	0.30	1.47	-0.03	1.02	1.53
117.000	118.000	35	4	0.71	0.22	1.16	0.00	1.32	1.53
118.000	119.000	36	9	0.90	0.37	1.65	0.01	1.02	1.67
119.000	120.000	38	8	0.63	0.17	0.98	0.03	1.03	0.97
120.000	121.000	39	4	1.19	0.31	1.81	0.04	1.32	2.33
121.000	122.000	41	6	0.37	0.47	1.30	0.06	1.08	1.34
122.000	123.000	41	6	0.10	0.06	0.22	0.06	1.08	0.17
123.000 L	124.000 L	36	6	0.72	0.27	1.25	0.01	1.08	1.34
123.000 R	124.000 R	36	6	0.54	0.48	1.49	0.03	1.08	1.58
124.000	125.000	41	11	0.63	0.16	0.94	0.06	1.01	0.89
125.000 L	126.000 L	32	7	0.50	0.22	0.94	-0.03	1.05	1.01
125.000 R	126.000 R	32	7	0.42	0.36	1.14	-0.03	1.05	1.22
126.000 L	127.000 L	32	10	0.64	0.20	1.05	-0.03	1.08	1.17
126.000 R	127.000 R	32	10	0.57	0.46	1.49	-0.03	1.01	1.54
127.000 L	128.000 L	32	3	0.56	0.18	0.92	-0.03	1.01	0.96

Annexure A-5: Pavement Characteristics Deflection (Km 80.000 to Km 135.750)

Chainage (km.m)		Temperature (°C)	FMC (%)	Mean Deflection (mm)	Standard Deviation (mm)	Calculated Deflection (mm)	Correction for Temperature (mm)	Moisture Correction factor	Characteristic Deflection (mm)
From	To								
127.000 R	128.000 R	33	3	0.35	0.19	0.72	-0.02	1.01	0.75
129.000 L	130.000 L	34	5	0.62	0.12	0.86	-0.01	1.17	1.02
129.000 R	130.000 R	35	5	0.67	0.17	1.02	0.00	1.17	1.20
130.000 L	131.000 L	36	4	0.80	0.18	1.15	0.01	1.32	1.50
130.000 R	131.000 R	36	4	0.56	0.21	0.97	0.01	1.32	1.27
131.000 L	132.000 L	38	16	0.94	0.17	1.27	0.03	1.10	1.36
131.000 R	132.000 R	38	16	0.64	0.25	1.14	0.03	1.10	1.23
132.000	133.000	32	11	0.40	0.20	0.80	-0.03	1.20	1.00
133.000	134.000	32	12	0.61	0.41	1.43	-0.03	1.01	1.48
134.000	135.000	32	12	0.62	0.28	1.18	-0.03	1.01	1.23

Annexure A-6: Inventory and condition of Culverts

Sl. No.	Exi.Ch (km.m)	Types of structures (Pipe, Slab, Box, Arch)	Pipe arrangement (Diameter of pipe X No. of pipes) (m)	Thicknes s of slab (m)	Span arrangement & Total ventway (Length X No. of spans) (m)		Opening Height (m)	Carriageway width (m)	Width of culvert (m)	Condition of Various features of Culvert			Height above bed level		Presence of scour	Adequacy of waterway	Head wall dimension (Length X width X Height from opening top to parapet top) (m)	Parapet dimension (Length X width X Height from Road top to Parapet top) (m)	Remarks
					T.V.W	S.A				Slab.Pipe.Box.Arch	Head wall	Parapet.Handrail	Upstream side (m)	Downstream side (m)					
1	80.400	Pipe	0.9x1	-	-	-	-	7	20	Fair	Fair	Fair	1.5	1.6	No	Adequate	6.4 X 0.45	2.0 X 0.45 X 0.6	New construction, just 50m after entrance arch
2	80.662	Pipe	Not visible	-	-	-	-	7	12	Not visible	Poor	no parpet wall on LHS	1.3	1.5	No	Adequate	5.1 X 0.45	2.1 X 0.45 x 0.2	Near Durga shopping complex,No Parapet on righthand side. Stone headwall and parapet need to be replaced, L-> R
3	80.751	Pipe	0.9x1	-	-	-	-	6.7	12	Broken	Poor	Fair	1.15	1.3	No	Adequate	6.4 X 0.45	2.1 X 0.45 X 0.6	Near first vulcanizing centre on left, pipe edges are broken.
4	80.834	Pipe	0.9x1	-	-	-	-	6.8	12	Poor	Poor	Fair	1.6	1.4	No	Adequate	6.0X0.45	2.05X0.45X0.45	Pipes are seen on leftside.okay
5	80.901	Pipe	0.9 X 1	-	-	-	-	6.9	12	Poor	Fair	Fair	1.1	0.8	No	Adequate	6.6 X 0.45	2.2 X 0.45 X 0.25	Pipes are totally blocked on left side and the ht from the bottom of GL to road top is less.

Annexure A-6: Inventory and condition of Culverts

6	80.1153	Pipe	0.9 x 1					7.1	12	Poor	Poor	-	1.1	1.25	No	Adequate	6.5 x 4.5	2 x .45 x 0.3	Pipes are clogged. Head walls are damaged. Vegetation at entry and exit of culvert
7	81.187	Pipe	0.9x1	-	-	-	-	6	12	poor	Fair	Not provided	1.2	1.35	No	Adequate	6.4 X 0.45	6.4 X 0.45 X 0.0	Not fully functioning, 0.2 m of opening has been blocked. No parapet. PCC headwall, L-> R
8	81.369	Pipe	0.9x1					7	12	Poor	Poor					Adequate			Fully Choked With waste material
9	81.448	Pipe	0.9x1	-	-	-	-	7	12	Not visible							5.5 X 0.45	2.0 X 0.45 X 0.25	No pipe is seen, fully blocked. Near pattukottai bypass. Widening under progress
10	81.500	Pipe	0.9x1	-	-	-	-	7.1	12	Poor	Fair	Fair	1.0	1.2	Not Seen	Adequate	7.0 X 0.45	2.0 X 0.45 X 0.25	Blocked 2.3rd of pipe and need to be replaced.
11	81.566	Pipe	0.9x1	-	-	-	-	7.2	15.2	Poor	Fair	Fair	1.15	1.35	No	Adequate	6.4 X 0.45	6.4 X 0.45 X 0.2	PCC headwall, parapet wall, Half the opening of pipe has been blocked due to silted.
12	81.634	Pipe	0.9x1	-	-	-	-	7	12	Poor	Fair	Fair	1.3	1.35	Not seen	Adequate	6.00 X 0.45	2.00 X 0.45 X 0.25	Half the pipe has been blocked, the pipes are silted and needs to be replaced. Invert level need to be raised from the present position of the pipe.
13	81.834	pipe	0.9X1					7	12	Poor	Poor	Poor	1.25	1.2			6.4X0.45		

Annexure A-6: Inventory and condition of Culverts

14	82.078	pipe	0.9X2					7	12								5.7X0.45		
15	82.921	pipe	0.9X6					7	12	Poor	Fair	Fair	1.1	1.0			14.15X0.45		
16	83.255	Pipe	0.9x2	-	-	-	-	6.95	12	Poor	Poor	Fair	1.3	1.35	No	Adequate	8.1 X 0.45	3.5 X 0.45 X0.45	Half the pipe is silted, PCC headwall, Parapet wall, condition of pipe is not good. Edges are broken. Reinforcement is seen
17	83.392	Pipe	0.9x2	-	-	-	-	6.9	12	Blocked	Poor	Fair	1.3	1.35	Seen	Adequate	8.7 X 0.45	3.7 X 0.45 X 0.25	Before junction. Silted and blocked by at least 0.6 times the opening
18	83.686	Pipe	0.9x2	-	-	-	-	7	12	Blocked half	Fair	Fair	1.2	1.25	Seen	Inadequate	8.2 X 0.45	3.5 x 0.45 X 0.25	Blocked half of the pipe dia. Hydraulically very poor.
19	83.848	Pipe	0.9x4	-	-	-	-	6.9	12	Poor	Poor	Poor	1.5	1.6	Seen	Adequate	11.5 X 0.45	6.5 X 0.45 X 0.5	Pipes are provided in skew and the conditions are not good. Hence, the culvert is to be replaced with suiotable arrangement.
20	84.244	Pipe	0.9x2	-	-	-	-	6.9	12.3	Good	Fair	Fair	1.95	2.05	No	Adequate	8.1 X 0.45	3.05 X 0.45 X 0.55	Near St. Joseph's Matric.Hr.Sec.School, Pipes are good in condition, Good in condition, overall good in condition, Flow L-> R

Annexure A-6: Inventory and condition of Culverts

21	85.263	Pipe	0.9x1	-	-	-	-	7	15.2	Blocked	Fair	Fair	1.0	1.1	No	Adequate	6.4 x 0.45	2.1 X 0.456 X 0.5	PCC headwall, blocked 1.3rd., PCC headwall and fair.
22	85.495	Pipe	0.9x1	-	-	-	-	7.1	15	Fair	Fair	Fair	1.2	1.2	No	Adequate	6.5 X 0.45	2.0 X 0.45 X 0.5	PCC headwall, Parapet, condition is okay. Looks like a balancer only. No photo
23	86.102	Pipe	0.9x1	-	-	-	-	6.9	15	Fair	Poor	Fair	1.25	1.3	No	Adequate	6.5 X0.45	1.95 X 0.45 X 0.55	On u.s the earth adjacent to headwall has been washed out due to water flow from road. And hence the headwall has been damaged. Need to be repaired.
24	86.218	Pipe	0.9x2	-	-	-	-	7	15.2	Blocked U.S	Fair	Fair	1.1	1.45	No	Adequate	8.0 X 0.45	3.5 X 0.45 X0.35	PCC headwall. Parapet wall, inside pipe sand is filled for about 0.3m. u.s pipe has been blocked. L->R
25	87.513	Pipe	0.9x5	-	-	-	-	7	12.6	Good	Good	Good	1.6	1.65	No	Adequate	15.5 X 0.45	9.5 X 0.45 X 0.3	Near Petrol bunk, PCC headwall, Pipe good. Bushes are seen leftside
26	87.900	Pipe	0.9x2	-	-	-	-	7.3	15.1	Good	Good	Good	1.5	1.65	No	Adequate	8.0 X 0.45	3.5 X 0.45 X 0.5	Pipe condition is good, Headwall condition is good. L-> R.
27	88.128	Pipe	0.9x2	-	-	-	-	14.1	20.2	Good	Good	Good	1.6	1.75	No	Adequate	8.2 X 0.45	3.55 X 0.45 X 0.3	Structure has been provided with tank type of structure on both upstream and downstream. New construction.

Annexure A-6: Inventory and condition of Culverts

28	89.129	Pipe	0.6x2	-	-	-	-	9.2	12.4	Fair	Fair	No parpet wall on LHS	0.95	1	No	Adequate	3.9 X 0.45	2.00 X 0.45 X 0.6	As the circle has been formed at this location and the circle has been used as park, the length of the culvert is more. Pipes are provided with the length of 12.5m and 10.5 m on both ends, inside a park a open drain of length 20 m has been constructed. Hence, to be realigned with the better arrangement. R->L
29	90.017	Pipe	0.9x1	-	-	-	-	15.6	22.85	Poor	Good	Good	0.75	0.95	No	Adequate	5.0 X 0.45	2.0 X 0.45 X 0.7	SS masonary headwall, poor pipe need to be replacement, Water flow is for half height. At the one end of pipe, brick masonary of 0.15 m is constructed and height measured from the top of the masonary.
30	94.450	Pipe	0.9x1	-	-	-	-	7	12.5	Clogged by half the ht.	Poor	Poor	0.95	1.05	No	Not enough	3.0 X 0.45	2.0 X 0.45 X 0.3	Pipes are clogged on both side upto half of its dia. Waste drain water is flowing in the culvert.
31	94.625	Pipe	0.9X1	-	-	-	-	6.5	12	Not seen	Poor	Fair	-	-	-	-	-	-	Except Parapet and marking, pipes are not seen. As per local enquiry, it is blocked

Annexure A-6: Inventory and condition of Culverts

32	95.400	Pipe	0.9x1	-	-	-	-	7.5	12.6	Poor	Poor	Poor	1.55	1.65	No	Inadequate	3.6 X 0.45	2.0 X 0.45 X 0.25	Near Parry matriculation school entrance, Pipe is filled with half by water, clogged. Needs to be replaced.
33	96.310	Cutstone Slab	-	0.2	0.3 X 1	0.6 X 1	1.3	6.7	10.5	Cutstone	Fair	No parpet wall on RHS	1.4	1.8	Yes		4.6 X 0.45	1.3 X 0.2 X 0.25	Pond on rightside and stream on left side. Cutstone has been provided. Built up area is seen on right side. New proposal shall be made if required.
34	97.583	Pipe	0.9x1	-	-	-	-	6.7	12	Good	Good	Good	1.7	1.8	No	Adequate	5.00 X 0.45	2.00 X 0.45 x 0.40	Condition of the culvert is good and can be reatined
35	97.700	Pipe	0.9 X 2	-	-	-	-	6.9	12.6	Good	Fair	Fair	1.75	2.05	No	Adequate	5.5 X 0..45	3.5 x 0.45 X 0.25	Two culverts are constructed one adjacent to another. On LS, clear stream is seen and on U.S the stream is parallel to road. Condition of both are good. Can be replaced with slab culvert of more clear water. L -> R, HFL - 0.7 m.
36	97.700	Slab	-	0.2	1.0 X 1	1.5 X 1	1.5	6.9	12.6	Good	Fair	Fair	1.9	1.95	No	Adequate	6.7 X 0.45	2.0 X 0.45 X 0.4	
37	98.700	Pipe	0.9x1	-	-	-	-	7.10	12.6	Fair	Fair	No Parapet on	1.7	1.75	No	Adequate	5.1 X 0.45	2.1 X 0.45 X 0.4	No parapet on rightside. Overall condition is fair. On d.s, a pond is seen. Flow R -> L
38	98.860	Pipe	0.9x2	-	-	-	-	7.10	12.6	Fair	Fair	Fair	1.35	1.55	No	Adequate	7.1X 0.45	4.1 X 0.45 X 0.35	Around half of the opening is silted and hence the effective opening at this location is less.

Annexure A-6: Inventory and condition of Culverts

39	99.397	Pipe	0.9x1	-	-	-	-	6.6	12.6	Good	Good	Fair	1.35	1.55	Yes	Adequate	5.0 x 0.45	2.0 x 0.3 X 0.5	Pipe is provided within a RCC pipe. Scour is seen on D.S side
40	100.014	Arch Slab	-	0.3	4.2 X 1	3.3 X 1	1.5	7.9	10.45	Poor	-	Fair	1.5	1.5	No	Adequate	7.8 X 0.45	4.2 X 0.45 X 0.45	Widened on one side using slab, brick masonary arch on other sides. Spalling is seen in the extended portion of slab, brick masonary abutment is fair in condition.
41	102.835	Pipe	0.9x1	-	-	-	-	6.3	12.5	Good		Fair	1.5	1.5			5.0X0.45	2.2X0.3 X0.4	Condition is good. New pipe is added on
42	103.000	Pipe	0.9X1	-	-	-	-	6.3	12.5	Clogged		Fair	1.6	1.5			5.0X0.45	2.0X0.3 X0.45	Condition is not good. Clogged. Needs to be raised, New pipe added on D.S. Needs to be replaced.
43	105.372	pipe	0.9X2	-	-	-	-	7.2	12.5	Clogged		Fair	1.7	1.9			5.3X0.45	3.5X0.45X0.5	Clogged, 1.7. Condition is good. Need not be replaced. To be widened as required
44	105.818	Pipe	0.9x1	-	-	-	-	6.9	12.5	Clogged		Fair	1.7	1.8			5.9X0.45	2.0X0.4 X0.45	Clogged, Good in condition
45	105.927	Pipe	0.9x1	-	-	-	-	6.9	12.5	Good		Fair	1.7	1.75			4.0X0.45	2.0X0.4 X0.45	Pipe is in good condition. Clogged in D.S due to vegetation growth.
46	106.600	Pipe	0.9x1	-	-	-	-	6.9	12.5	poor	poor	poor	1.6	1.55			4.0X0.45	2.0X0.4 X0.45	Completely choked & only RHS Parapet wall is Visible.

Annexure A-6: Inventory and condition of Culverts

47	107.170	Pipe	0.9x2	-	-	-	-	7	12.6	Blocked fully		Fair	1.25	1.2			5.4X0.45	3.5X0.4X0.45	Blocked fully. Need to be replaced
48	107.427	Arch. Slab	-	0.2	-	-	-	7.1	10.5	Fair		Fair	2.6	2.5			14.2X0.45	4.9X0.4X0.45	
49	109.874	Slab		0.2	2.00 X 1	2.6 X 1	3	7.05	12.4	Poor	Fair	Fair	3.00	3.00	No	Adequate	9.0 X 0.45	2.6 X 0.45 X 0.35	Reinforcement is exposed on edges, vegetations and bushes are seen on both u.s and d.s.Abutment is SS masonry with the open foundation. Slab is poor in condition. L-> R
50	110.465	Pipe	0.9x3	-	-	-	-	6.8	12.5	poor	Poor	Poor	1.45	1.8	No	Adequate	9.9X 0.45	4.3 X 0.45 X 0.45	Condition of parapet is bad. Headwall is bad. Good pipe.
51	110.939	Pipe	0.9x1	-	-	-	-	7.0	12.5	Poor	Poor	Poor	1.45	1.5			5.0X0.45	1.2X0.4X0.5	Needs to be replaced with 1.0m dia. It can be lowered as the stream on left hand side Widened on oneside. Valambakudi village
52	111.175	Pipe	0.9 x 1					7.0	12	Poor	Poor	Poor	1.3	1.35			6 x 4.5	1.6 x .4 x.25	Pipes and head wakks are damaged.
53	111.663	Pipe	0.9x2	-			-	6.90	12.5	Good	Good	Good	1.35	1.50	No	Adequate	5.6 X 0.45	4.00X 0.45 X 0.35	Good condition. Headwall is good. No scour is seen.

Annexure A-6: Inventory and condition of Culverts

54	113.572	Pipe	0.9x1	-	-	-	-	6.9	12.5	Fair	Fair	Fair	1.00	1.10	No	Adequate	4.10 X 0.45	2.0 X 0.45 X 0.5	Silted, Lat stone formation seen on U.S, Need to shifted to 113.540 or so. Near to Pudikudi Board.
55	113.773	Slab	-	-	-	-	-	6.9	12	Not seen	Blocked fully	Fair	_	-	_	-	3.2 x 0.45	1.5 X 0.45 X 0.3	Blocked fully on both on u.s and d.s. From the local enquiry, this culvert is not necessary.
56	114.435	Pipe	0.9x3	-	-	-	-	6.8	12	Poor	Poor	Fair	1.85	2.0	Seen	Not sufficient	11 X 0.45	5.0 x 0.45 X 0.45	Reinforcement is seen at the edges, scour is seen, Cracks are seen in headwall. Hence, need to replaced with the new pipe culvert.
57	115.373	Pipe	0.9x1	-	-	-	-	7.0	12.6	Fair	Fair	Fair	1.5	1.8	No	Not sufficient	4.35 X 0.45	2.0 X 0.45 X 0.3	As the stream width is more, the pipe numbers are need to be increased. Silting is observed and around 0.15m has been blocked.
58	116.147	Composite		-	6.0 x 1	5.1 x 1	-	8.9	9.6	Very poor		Poor							Widened on both sides by 1.5m. Foundation is at widened side. Open foundation. Steel joist and slab composite structure (4 nos). Clear stream is seen and the steel section is fair in condition.
59	116.187	Composite		0.6	6.0 x 2	5.1 x 2	-	8.7	9.6	Poor		Poor							0.6m depth slab on widened portion kept without bearing. Cracks are seen in abutment. Widened on both sides

Annexure A-6: Inventory and condition of Culverts

																		by 2m. 4 nos of steel I section with depth of 0.4m is provided and the widened portion with slab of depth 0.6m.
60	117.162	Slab	-	0.4	3.7 X 1	4.2 X 1	2.1	6.9	9	Good	Good	Good	2.95	3	No	Adequate	4.6 X 0.45	4.6 X 0.45 X0.4	Constructed recently, Open type foundation, overall good in condition.
61	117.217	Slab	-	0.4	3.00 X 1	3.5 X 1	2.5	6.6	9	Good	Good	Good	2.55	2.5	No	Adequate	4.6 X 0.45	4.3 X 0.45 X 0.40	New Structure provided with a splayed wing wall, the slab is ggod in condition, PCC abutment.
62	118.044	Slab	-	0.400	2.7 X 1	3.2 X1	2.2	6.6	9.8	Fair	Good	Fair	3.05	3.15	No	Adequate	9.1 X 0.45	3.1 X 0.45 X0.45	Overall condition good, requires minor maintanence. On leftside of the culvert a stream with sluice gate is seen. No porjection on abutment (see hydraulic particular table)
63	118.267	Slab	-	0.4	2.7X1	5.6 X1	-	6.7	9.9	Good	Fair	Good	3.0	3.05			13.7X0.45	6.2X0.4 X0.6	Class AA loading. Cutwater is seen in both sides. Pipe is seen on leftside. Rightside industries is under (see hydraulic particular table)
64	118.434	Pipe	0.9x1	-	-	-	-	6.50	10.00	Good	Good	Good	1.25	1.4	Nil	Adequate	4.5 X 0.45	1.85 X 0.45 X 0.35	Pipe good condition. Head wall stone masonry good in condition.,R->L, Silted on U.S

Annexure A-6: Inventory and condition of Culverts

65	118.429	Pipe	0.6x2	-	-	-	-	6.5	10	Fair	Good	Good	1.55	1.6	Nil	Not sufficient	6.25 X 0.45	4.15 X 0.45 X 0.45	SS Masonary headwall, brick paprapet, good. U.s silted.
66	119.242	Pipe	0.9x3	-	-	-	-	6.6	9.7	Fair	Good	Good	2.45	2.5	Nil	Adequate	9 X 0.45	4.5 X 0.45 X 0.25	Brick parapet and headwall, are in good condition. Blocked on D.s. L->R. (see hydraulic particular table)
67	119.354	Pipe	0.9x5	-	-	-	-	6.8	10.10	Fair	Good	Good	2.35	2.35	Nil	Adequate	13.4 X 0.45 X	7.35 X 0.45 X 0.15	Pipe is blocked upto 0.15m on U.S, .SS masonry parapet and headwall.Vegetation. growth seen on d.s (see hydraulic particular table)
68	119.390	Slab	-	0.25	2.4 X 2	2.8 X2		6.40	10.00	Fair	-	Good	2.2	2.3	Nil	Adequate	10.8 X 0.45	6.1 X 0.45 X0.6	Cut water provided, Slab extended on one side by 1.5m and on otherside by 1.6m, HFL - 0.8m below slab bottom, SS Masonary pier with uniform thickness 0.6m,. L->R
69	121.001	Cutstone Slab	-	0.2	0.9 X 1	1.2 X1	0.85	7.00	10.90	Cutstone slab - Good	Good	Good			Nil	Fair	1.8 X 0.45 X 0.9	1.8 X 0.45 X 0.45	Blocked almost fully on U.S, and D.S. Slab is cut stone, Headwall and parapet is SS Masonary. L -> R

Annexure A-6: Inventory and condition of Culverts

70	121.576	Cutstone Slab	-	0.2	1.2 X 1	1.6 X1	0.6	7.1	10.90	Cut stone Slab - Good	Good	Good	0.8	0.85	Nil	Fair	2.45 X 0.45 X 1.1	2.45 X 0.45 X 0.35	Clogged on U.S partially and the culvert is not functioning properly. Can be replaced with Pipe culvert. L-> R
71	122.516	Cutstone Slab	-	0.2	0.75 X 1	1.25 X1	1.00	7.1	8.7	Cut stone Slab - Good	Good	Poor			Nil	Good	1.2 X 0.45	1.2 X 0.45 X 0.35	Clogged on u.s partially, need to replaced with the pipe culvert.
72	123.803	Pipe	0.9 X 2	-	-	-	-	7.00	10.00	Poor	Poor	Poor	1.65	1.55	Nil	Good	5.5 X 0.45	5.5 X 0.45 X 0.3	S.S. Masonry paprapet and headwall, pipe condition is bad. No enough cushion, on rightside lane depression is seen in the road. Headwall condition is poor, L->R
73	124.000	slab culvert						7.5	10										Fully chocked and Needs reconstruction

Annexure A-6: Inventory and condition of Culverts

74	124.170	pipe	0.6X1					7.6	12									Pipe is fully covered with waste material and soil to be reconstructed
75	125.415	Pipe	0.9x1	-	-	-	-	7.8	22.5	Fair	Fair	Fair	1.1	1.1	No	Adequate	5.5 X 0.45	3.0 X 0.45 X 0.2	On RS, cable has been taken and the concrete casing has been provided at the ends. BSNL cable taken inside along with three other cables. Near boiler plant police station
76	126.271	Pipe	0.9x1	-	-	-	-	9.0	10.60	Not good	Poor	Poor	1.25	1.45	No	Adequate	5.0 X 0.45	3.0 X 0.45 X 0.2	Need to be replaced on LHS
77	126.498	Slab		0.3	-	-	-	12.2	22.5	Fair	Fair	Fair	1.1	1.6	No	Adequate		2.6 X 0.45 X 0.3	LS-Cauvery, RS-BHEL cauvery quarters
78	126.711	Pipe	0.9x2	-	-	-	-	12.6	22.5	Fair	Poor	Broken on LHS	0.9	1.6	No	Adequate	7.0 X 0.45	3.0 X 0.45 X 0.2	
79	126.953	Pipe	0.9x1	-	-	-	-	12.0	22.5	Fair	Poor	Poor	1		No	Adequate	5.0 X 0.45	2.0 X 0.45 X 0.35	Ganesha(BHEL) is constructed near the entrance after providing a slab over stream. Hence, pipe is not seen.
80	128.678	Pipe	0.9x1					12.4	22.5										

Annexure A-6: Inventory and condition of Culverts

81	129.080	Pipe	0.9x1	-	-	-	-	15.0	22.5	Poor	Poor	Fair			No	Adequate	5.0 X 0.45	2.0 X 0.45 X 0.35	Needs to be repaired if possible by shifting waterpipe
82	129.690	Pipe	0.9x1	-	-	-	-	15.0-	22.5	Fair	Fair	Fair	1.5	1.6	No	Adequate	5.0 X 0.45	2.5 X 0.45 X 0.4	Near Shekinah Assembly of God, Median is provided
83	129.873	Pipe	0.9x1	-	-	-	-	15.0-	22.5	Good	Good	Good	1.25		No	Adequate	5.0 X 0.45	2.5 X 0.45 X 0.3	Near kaveri Super market
84	129.988	Pipe	0.9x1	-	-	-	-	13.4	22.5	Good	Good	Fair	1.8	1.8	No	Adequate	2.0 X 0.45	2.0 X 0.45 X 0.1	
85	129.998	Pipe	0.9x1	-	-	-	-	13.4-	22.5	Fair	Fair	Fair	1.6	1.8	No	Adequate	4.6 X 0.45	2.5 X 0.45 X 0.2	
86	130.240	Pipe	0.9x1					10	15										Fully Choked With waste material & it is not visible.
87	130.442	Slab		0.5	-	-	-	10	15-	Fair	Fair	Fair	2.2		No	Adequate	3.8 X 0.45	3.2 X 0.45	
88	130.502	Slab	4.0 X 1	0.6	4.0 X 1	4.6 X 1	2.2	10.3	15	Poor	-	Fair	2.2	2.3	No	Okay	10X0.5		Condition of the slab is poor, spalling is seen, reinforcements is exposed.
89	130.753	Pipe	0.9X1			-	-	10.4	15	Poor	Poor	Poor	1.8	1.9				3.5X0.4 X0.4	Written as single row, on LHS single pipe and RHS 2 pipes are seen. Condition of HW not good and pipes are very old.

Annexure A-6: Inventory and condition of Culverts

90	130.991	Pipe	0.9x2	-	-	-	-	10.5	15	Fair	Poor	Poor	0.9		Yes		5.0 X 0.45	3.0 X 0.45 X 0.3	Pipe is blocked upto 0.6 m
91	130.991	Slab			1 x 1	1.5 x1		10	15										
92	131.073	Slab		0.3	3mX1	-	-	9	12	Poor	Poor	Poor	1.15	1.25	No	Adequate	3.6 X 0.45	3.6 X 0.45 X 0.45	Opening height is very less, reinforcement exposed, needs minor repair, the opening height needs to be increased
93	131.354	Pipe	0.9x1	-	-	-	-	9.0	10.4	Poor	Poor	Poor	1.2				5.0X0.4	2.9X0.3 X0.3	On RHS culvert is covered and lead to cross drain parallelly to road. Hence can not be seen.
94	133.218	pipe and slab	0.9X1	0.3	1.5X1	1.0 X1		9.2	10.4	Fair	Fair	Fair	1.9	1.8			14.05X0.4	14.05X0.4	
95	133.670	Cutst one slab		0.2	0.6X1	1.0 X1		9.2	10.4	Poor	Poor	Poor							
96	134.467	Cutst one Slab	0.3X2	0.2	-	-	-	9.7	11.5				1.45	1.45	No	Adequate	4.7 X 0.45	2.0 X 0.45 X 0.55	Need more area

Annexure A-7: Inventory and condition of Bridges

Sl. No	Existing CD No	Existing Chainage (km)	No. of Spans	Clear span (m)	Length of bridge (m)	Slab thickness	Bottom of slab to HFL	Height of opening, m	Design Live Loading	Type Of Superstructure	Type Of Substructure		Type Of Foundation	Conditions of various items			Skew Angle	Existing details			Remarks
											Abutment	Pier		Parapet	slav	Abutment		Total Width	Slab	Abutment	
BRIDGES																					
1	83.2	82.121	3	18.5 x3	59.25	0.25	0.4	2.00	IRC 70R	T-Beam Bridge	RCC	RCC	OPEN	FAIR	FAIR	FAIR	-	8.6	7.6	N.F.	Cracks are seen on the slab and abutment, R.C. Pier shaft 2 Nos. are provided with a pier cap. 3 main girders with 5 cross girders are provided. Elastomeric bearing has been used
2	83.3	82.201	1	9.0 X 1	10.40	0.75	1	2.30	IRC 70R	RCC Slab	PCC	-	OPEN	FAIR	FAIR	FAIR	-	11.9	10.8	N.F	Reinforcement of the slab can be seen from the bottom, Abutment height is 3.65m , 0.75 m slab depth..

Annexure A-7: Inventory and condition of Bridges

3	83.5	82.951	1	7.2 X 1	17.2 (in Skew)	0.8	1	3.00	IRC Class AA	RCC Slab	PCC	-	OPEN	GOOD	GOOD	GOOD	53.52	10.5	9.5	NF	Skew in nature. Sloped protection work. Foundation is open foundation. Foundation at abutment projected by 1.0m and stone pitching by 1.5m..
4	92.1	91.178	3	3 X 3	11.40	0.75	0.9	2.00	IRC Class AA	RCC Slab. Arch	PCC	PCC	OPEN	POOR	POOR	POOR	-	10.7	7	N.F.	Condition is poor, return type wall, spalling is seen. Reinforcement exposed on one side
5	97.2	96.800	12	8.5 X12	100.00	0.75	1.15	4.20	IRC Class AA	RCC Slab	PCC.RCC	PCC.RCC	OPEN	GOOD	GOOD	GOOD	0	8.1	7.2	N.F.	Scour is seen on 7th span. side, open foundation, 3.2 m from foundation step to pier cap top, 0.5m deep pier cap.

Annexure A-7: Inventory and condition of Bridges

6	102.1	101.509	2	3.1 X 2	7.45	0.4	0.7	2.40	IRC Class B	RCC Slab	SSM	SSM	OPEN	Broken	Fair	GOOD	-	8.1	7.2	N.F.	Size stone masonary,Condition is good, Bed is not protected, Lat stone is good condition, Open foundation.
7	107.2	106.857	2	3.5 X 2	8.40	0.4	1.25	2.50	IRC Class A	RCC Slab	SSM	SSM	OPEN	FAIR	POOR	GOOD	-	8.3	6.5	N.F.	SS mas. Abutment, condition of the slab is okay, reinforcement are seen in the slab, 0.75 m wide pier, open foundation.
8	108.3	107.745	2	8.01 x 3	18.00	0.5	1.1	2.50	IRC Class B	RCC Slab. Arch	RCC	RCC	OPEN	GOOD	GOOD	GOOD	-	8.3	7.3	N.F	Arch Bridge widened on both sides by using slab. Bricks of arch masonry are exposed. New structure under progress.

Annexure A-7: Inventory and condition of Bridges

9	109.1	108.745	1	6.8 X 1	7.50	0.6	1	2.30	IRC 70R	RCC Slab	RCC	-	OPEN	GOOD	GOOD	GOOD	-	12.1	7.3	N.F	New bridge, condition is good.
10	109.2	108.789	1	6X 1	6.75	0.6	1.2	2.50	IRC Class B	RCC Slab. Arch	BRICK	-	OPEN	POOR	POOR	POOR	-	9.9	7.2	N.F.	Abutment is cracked and plastering is not there. Scour is seen and the foundation has been exposed.
11	113.1	112.187	3	2.0 X 3	7.70	0.2	0.3	1.90	IRC Class B	RCC Slab. Arch	BRICK	BRICK	OPEN	POOR	POOR	POOR	-	8.3	7.4	N.F.	Brick arch extended on both sides. Condition of arch is very bad, plastering is fallen and brick is exposed.
12	117.3	116.684	3	4.6 X 3	16.30	0.5	1.6	2.20	IRC 70R	RCC Slab	RCC	RCC	OPEN	-	GOOD	GOOD	-	12	11	N.F.	Condition is good, The above slab PCC is broken, Pier cap 1.0m wide, pier 0.9m to 1.2m bottom

Annexure A-7: Inventory and condition of Bridges

13	120.1	119.018	3	3 X 3	10.50	0.3	0.9	2.50	IRC 70R	RCC Slab	SSM	SSM	OPEN	GOOD	POOR	POOR	-	9.5	8.5	N.F	Pier.abutment cap 0.3m slab plastered, no spalling is there. Exposure of reinforcement is seen. Return type wall, no bed protection. At bridge location scour has seen and hence the pitching needs to be recommended.
14	120.5	119.681	1	9.3 X 1	9.80	0.25	1.3	3.20	IRC 70R	T-Beam Bridge	BRICK	-	OPEN	POOR	POOR	POOR	-	7.6	6.2	N.F.	Brick masonry abutment, open foundation in poor condition as well as substructure New structure under progress.

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Annexure A-7: Inventory and condition of Bridges

15	120.6	119.983	1	8.9 X 1	9.40	0.8	0.75	2.30	IRC 70R	RCC Slab	SSM	-	OPEN	POOR	GOOD	GOOD	-	8.55	7.6	N.F.	Stone pitching, slab is good. Abutment cutwater is seen on both U.S and D.S. 0.25 m is projected from slab line.
16	126.2	125.162	1	6.4 X 1	7.30	0.6	1.25	3.00	IRC 70R	RCC Slab	PCC	-	OPEN	FAIR	GOOD	GOOD	-	16.8			Abutment is PCC on left side and SSM on right side, condition is good, Pipes are seen on d.s, abutment resting on stone at extended portion.
17	129.1	127.870	3	6.0 X3	20.10	-	1	2.35	IRC 70R	RCC Slab	PCC	PCC	OPEN	POOR	POOR	POOR	-	-	9.6	1.5	Slab condition is poor and need to be reconstructed.

Annexure A-7: Inventory and condition of Bridges

18	130.2	129.525	3	3.6 X 3	13.30	0.5	1.4	2.50	IRC 70R	RCC Slab	RCC	RCC	OPEN	FAIR	FAIR	GOOD	-	23	19.6	1.7	Reinforcement is seen in slab. Return type wing walls. Head 0.25, depth projected by 0.10m on both side width wise. Designed for class 70R loading at footpath location. Fill is not been provided and no precast slab has been provided.
19	131.1	130.163	4	9.2.9.4+9.4+9.4	37.40	0.7	1.5	4.00	IRC 70R	RCC Slab	PCC	PCC	OPEN	GOOD	GOOD	GOOD	-	23.8	9.6-R, 9.7-L	1.6-R, 1.6-L	Skew bridge, deck slab is good
20	132.3	131.882	3	7.9 X 3	26.45	0.7	1	3.00	IRC 70R	RCC Slab	RCC	RCC	OPEN	FAIR	FAIR	POOR	-	19.85	7.4+ Median+ 7.5	1.9	Footpath has been provided. Filled with sand. Kerb reinforcement is exposed.

Annexure A-7: Inventory and condition of Bridges

21	136.1	135.358	3	8.0 X 3	27.30	0.7	0.9	3.20	IRC 70R	RCC Slab	PCC	PCC	OPEN	FAIR	POOR	POOR	-	14.5	9.8	2	PCC pier, abutment, reinforcement of slab exposed. Slab reinforcement exposed. Arch is good. Beam is cast at the edge of the footpath. On one side, slab widened. At footpath location only, slab(precast) has been provided
22	136.2	135.700	1	8.0 X 1	8.80	0.55	0.75	3.00	IRC 70R	RCC Slab	RCC	PCC	OPEN	POOR	FAIR	GOOD	-	20.6	7.5+ 6.2+ 6.9	1.45 -R, 1.8-L	Slab is in good condition. PCC abutment, at edges of slab spalling has seen. Need minor repairs. Footpath need to be repaired.

Annexure A-7: Inventory and condition of Bridges

ROBS

1		128.524	1	21.0 X 1	23.10	0.2	1	5.60	IRC 70R	T-Beam Bridge	RCC	-	OPEN	FAIR	FAIR	FAIR	50°	13.2	9.8	1.4	Reinforcement seen in almost entire length of exterior beam. Skew in nature. Two track one meter gauge, one broad gauge.
2		134.983	3	5.0 (ST) X 3	15.00	0.65	5.5	5.80	IRC 70R	RCC Slab	RCC	RCC	OPEN	GOOD	POOR	GOOD	-	13.2	9.8	1.7	Single lane broad gauge lane. Bridge in skew (5m straight opening, 8.3m in skew). Abutment have return type wing wall, size stone approach slab. ROB is skew in nature, 3 openings

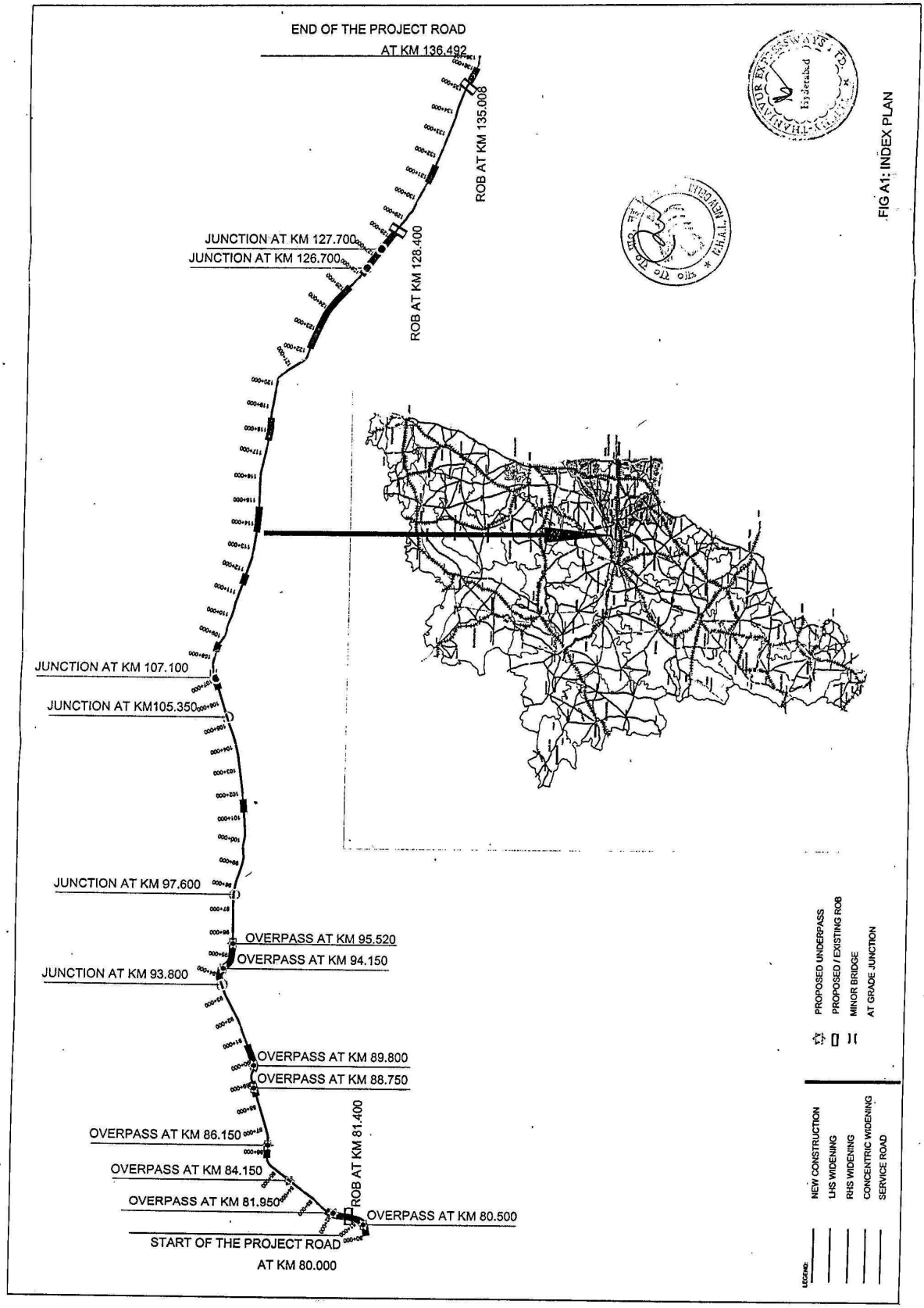

FIG A1: INDEX PLAN

Schedule - B

SCOPE OF THE PROJECT

1 General

Following section of this schedule briefly highlights part of the scope of the work of the 'Project' relevant to the mainline. The descriptions of the requirements for the various elements of the Project Highway given herein under are the bare minimum requirements for the 'Project'. The 'Project' has the same meaning as defined in Para 1.1 of concession agreement.

In the planning, design and execution of the works and other works in connection with the repair, maintenance or improvement of the Project Highway and functions associated with the construction of the Project Highway and roadside facilities, the Concessionaire shall take all such actions and do all such things (including, but not limiting to, organizing itself, adopting measure and standards, executing procedures including inspection procedures and highway patrols and engaging and managing contractors agents and employees) as will:

i) Enable NHAI to provide an acceptably safe highway in respect of its condition (structural safety) and use (road safety) and,
ii) Enable NHAI to fulfil its statutory and common law obligations and,
iii) Enable NHAI to provide a congestion free uninterrupted flow of traffic on the Project Highway and,
iv) Enable NHAI to provide a level of service to the public not inferior to that provided on the trunk road during construction or improvements works and,
v) Enable the Police, local authorities, and others in performing statutory duties or functions in relation to the Project Highway or adjoining roads to fulfil those duties and functions and,
vi) Minimize the risk of damage, destruction or disturbance to third party property and,
vii) Ensure that members of the public are treated with all due courtesy and consideration and,
viii) Provide a safe clear and informative system of road signs and,
ix) Comply with any specified program requirements, including for the completion of the new road and,
x) Enable standards of fitness for the purpose appropriate to a highway to the character of the Project Highway to be achieved throughout the Contract Period and,
xi) Ensure adequate off-street parking facilities for both passenger and goods vehicles and,
xii) Provide adequate bus bays for stopping of buses and bus shelters for commuters to wait under protection and,
xiii) Achieve a high standard in the appearance and aesthetic quality of the Project surrounding landscape through both sensitive design and sensitive management of all visible elements including those on the existing road and,

xiv) Undertake proper safety audit through an appropriate consultant (i.e. apart from the Independent Consultant) before C.O.D. and,
xv) Carry out accident recording and reporting (to IC&NHAI) by classification on regular basis and,
xvi) Ensure adequate safety of the Project Workers on the work site.
xvii) Minimize the occurrence and adverse effects of accidents and ensure that all accidents and emergencies are responded to as quickly as possible.

2 Project Highway

Notwithstanding the base alignment plans enclosed with this document, the Concessionaire shall himself carryout and be responsible for engineering surveys, investigations and detailed engineering designs and prepare the working drawings for all the components relevant for the improvement and up-gradation of the Project Highway to fulfill the scope of the project as envisaged herein under. The designs for different project facilities shall follow the locations and indicative designs given in **Schedule-C** and shall comply with design specifications and standards outlined in **Schedule-D**. The maintenance of the different elements of Project Highway and facilities thereon shall follow the minimum maintenance requirements as described in **Schedule-L**. All the designs and drawings shall be reviewed by the Independent Consultant and NHAI prior to execution.

2.1 (A) Cross Sections

The Project Highway having a length of 56.490km shall be widened (km 80.00 to km 136.490) to have a minimum 4 lane dual carriageway with 1.5m wide paved shoulders etc., and service roads on both sides wherever required. The alignment plan and profile of the Project Highway is given in **Fig B-1**(separately hard bound with pages from **Fig B1-1 to Fig B1-57** together with layout plan for major intersections, GAD of bridges, ROBs and Underpasses). The typical cross sections as given in **Table B1** shall be followed as the minimum design criteria for development of Project Highway. The typical cross sections are presented in **Fig B-2: 1 – 13.**

The alternative cross section of the Project Highway at the cross drainage structures shall follow the typical cross sections in consultation with the Independent Consultant and NHAI at the time of construction. The utility services, including optical fibre cables, shall be provided in the utility corridor earmarked for this purpose on the side where it is convenient to the Concessionaire or the concerned Authority with the approval of Independent Consultant and NHAI. The existing optical fibre cable shall be relocated by the respective owner at a safe place as indicated by I/C&NHAI in such a way that it causes least hindrances to the execution of project.

In urban sections the utility services shall be provided through underground ducts provided for this purpose. For cross connection, the utility services shall be carried through the nearest cross drainage structure / underpass meant for pedestrians and cattle crossing below its deck-slab and above HFL. In absence of such a structure in the vicinity of the proposed location, it shall pass through separate underground

ducts. Location and design of the cross utility ducts shall be finalized at the detailed design stage in consultation with the Independent Consultant. Cross-sectional elements of the suggested cross-sections are the basic minimum requirements. Minor alterations/ modifications can be carried out to the alignment plan within the overall suggested cross-section, along with proper justification, in consultation with Independent Consultant and NHAI.

Table B-1: Type of Road Cross Sections Schedule

Sl.No	DesignChainage (km)		Length in km			
	From	To		Median width	Description	Widening Type
1	80	80.13	0.13	4.5	Widening on Right Side	I
2	80.13	80.25	0.12	4.5	Underpass approach in embankment	XI
3	80.25	82.12	1.87	4.5	Underpass approach with retaining wall	XII
4	82.12	82.23	0.11	4.5	Underpass approach in embankment	XI
5	82.23	83.8	1.57	4.5	Widening on Right Side	I
6	83.8	83.9	0.1	4.5	Underpass approach in embankment	XI
7	83.9	84.34	0.44	4.5	Underpass approach with retaining wall	XII
8	84.34	84.45	0.11	4.5	Underpass approach in embankment	XI
9	84.45	85.67	1.22	4.5	Widening on Right Side	I
10	85.67	85.79	0.12	4.5	Underpass approach in embankment	XI
11	85.79	86.215	0.425	4.5	Underpass approach with retaining wall	XII
12	86.215	86.34	0.125	4.5	Underpass approach in embankment	XI
13	86.34	88.38	2.04	4.5	Widening on Right Side	I
14	88.38	88.5	0.12	4.5	Underpass approach in embankment	XI
15	88.5	88.95	0.45	4.5	Underpass approach with retaining wall	XII
16	88.95	89.05	0.1	4.5	Underpass approach in embankment	XI
17	89.05	89.53	0.48	4.5	Transition	
18	89.53	89.635	0.105	4.5	Underpass approach in embankment	XI
19	89.635	90.08	0.445	4.5	Underpass approach with retaining wall	XII
20	90.08	90.175	0.095	4.5	Underpass approach in embankment	XI

21	90.175	90.82	0.645	4.5	Improvement of existing four lane by addition of paved shoulder & service road	VIII
22	90.82	91.3	0.48	4.5	Transition	
23	91.3	93.15	1.85	4.5	Widening on Right Side	I
24	93.15	93.78	0.63	4.5	New Construction for Four Laning	V
25	93.78	93.88	0.1	4.5	Underpass approach in embankment	XI
26	93.88	94.33	0.45	4.5	Underpass approach with retaining wall	XII
27	94.33	94.44	0.11	4.5	Underpass approach in embankment	XI
28	94.44	94.65	0.21	4.5	New Construction for Four Laning with Service Roads	VI
29	94.65	95.25	0.6	4.5	Underpass approach in embankment	XI
30	95.25	95.78	0.53	4.5	Underpass approach with retaining wall	XII
31	95.78	95.85	0.07	4.5	Underpass approach in embankment	XI
32	95.85	97.7	1.85	4.5	New Construction for Four Laning	V
33	97.7	99.6	1.9	4.5	Widening on Right Side	I
34	99.6	100.5	0.9	4.5	Widening on Left Side	II
35	100.5	101.2	0.7	4.5	Widening on Right Side	I
36	101.2	101.8	0.6	4.5	Widening on Right Side with Service roads	III
37	101.8	106.5	4.7	4.5	Widening on Right Side	I
38	106.5	107.05	0.55	4.5	Concentric Widening with service road	IX
39	107.05	107.9	0.85	4.5	Widening on Right Side with Service roads	III
40	107.9	108.3	0.4	4.5	Widening on Right Side	I
41	108.3	108.57	0.27	4.5	Widening on Right Side with Service roads	III
42	108.57	108.77	0.2	4.5	Widening on Left Side with Service roads	IV
43	108.77	108.97	0.2	4.5	Widening on Left Side	II
44	108.97	109.29	0.32	4.5	Widening on Right Side	I
45	109.29	109.44	0.15	4.5	New Construction for Four Laning	V

46	109.44	110.4	0.96	4.5	Widening on Left Side	II
47	110.4	111.36	0.96	4.5	Widening on Right Side	I
48	111.36	111.86	0.5	4.5	Widening on Right Side with Service roads	III
49	111.86	113.76	1.9	4.5	Widening on Right Side	I
50	113.76	114.64	0.88	4.5	Widening on Right Side with Service roads	III
51	114.64	114.76	0.12	4.5	Widening on Left Side with Service roads	IV
52	114.76	117.6	2.84	4.5	Widening on Left Side	II
53	117.6	118.55	0.95	4.5	Widening on Left Side with Service roads	IV
54	118.55	120.1	1.55	4.5	Widening on Left Side	II
55	120.1	121.5	1.4	4.5	Widening on Right Side	I
56	121.5	121.64	0.14	4.5	Widening on Left Side	II
57	121.64	122.06	0.42	4.5	Transition	
58	122.06	125.26	3.2	4.5	Concentric Widening with service road on left	IX
59	125.26	128.94	3.68	2	Improvement of existing 4 lane by addition of paved shoulder	VII
60	128.94	129.45	0.51	1	ROB approaches	XIII
61	129.45	130.96	1.51	2	Improvement of existing 4 lane by addition of paved shoulder	VII
62	130.96	131.66	0.7	2	Improvement of existing four lane by addition of paved shoulder & service road	VIII
63	131.66	135.42	3.76	2	Concentric Widening by addition of paved shoulder	VII
64	135.42	136.07	0.65	1	ROB approaches	XIII
65	136.07	136.492	0.422	2	Improvement of existing 4 lane by addition of paved shoulder	VII

The alignment plan and typical cross section proposed for Vallam bypass shall be slightly modified towards the end of Vallam bypass. The Vallam bypass start from km 93.400 (Design Chainage) and shall be 4-lane as per **Fig B2-5** till Design Chainage 96.800. Thereafter the 4 lane configuration shall get bifurcated into two separate roads each two lane with paved shoulders. One such two lane road shall utilise the existing two lane bridge located at Km 96.800 (Existing Chainage) and the second two lane road shall have a new 2 lane bridge at Design Chainage km

97.185 and merge the existing road alignment at km 97.400 (Existing Chainage). The existing major bridge at km 96.400 needs to be retained as part of the completed project. The design given in the drawing no. B1-18 thus shall be modified as per above requirement and approval shall be sought from IC/NHAI. The connecting two lane road including the bridge shall follow the typical cross section in **Fig B2 – 10.**

2.1 (B) Longitudinal Section

As a minimum, the Concessionaire shall achieve the finished road level (FRL) as given in the plan and profile drawings is given in **Fig B-1**(separately hard bound with pages from **Fig B1-1 to Fig B1-57)**

2.2 Service Road

The service road shall be provided by the Concessionaire on either side of the main carriageway in built up area, so as to provide safe movement of local traffic, without disturbing the through traffic. The cross section for service road portions shall conform to respective applicable cross section for the location as given in **Fig B2.** The service road shall be provided at the locations, given below in **Table B-2**

Table B-2: Details of Proposed Service Road Locations

Sl.No	Existing Chainage		DesignChainage		Side (LHS/RHS/Both)	Length (km)	Width (m)
	From	To	From	To			
1	80.130	81.612	80.130	82.230	Both	2.10	7.0
2	83.154	83.755	83.800	84.450	Both	0.65	7.0
3	84.981	85.642	85.670	86.340	Both	0.67	7.0
4	87.682	88.351	88.380	89.050	Both	0.67	7.0
5	88.832	90.383	89.530	90.820	Both	1.29	7.0
6	93.405	95.518	93.780	95.850	Both	2.07	7.0
7	100.978	101.591	101.200	101.800	Both	0.60	7.0
8	106.375	107.424	106.500	107.900	Both	1.40	7.0
9	108.265	108.635	108.400	108.770	Both	0.37	7.0
10	111.136	111.635	111.360	111.860	Both	0.50	7.0
11	113.450	114.436	113.760	114.760	Both	1.00	7.0
12	117.265	118.236	117.600	118.550	Both	0.95	7.0
13	121.761	124.975	122.060	125.260	LHS	3.20	7.0
14	128.360	128.470	129.000	129.110	Both	0.11	5.5
15	128.710	128.810	129.350	129.450	Both	0.10	5.5
16	130.390	130.980	131.050	131.660	Both	0.61	7.0
17	134.705	134.915	135.420	135.630	Both	0.21	5.5
18	135.110	135.210	135.850	136.050	Both	0.20	5.5
Total length						30.2	

2.3 Intersections/Junctions (At Grade)

The Concessionaire shall provide Major Intersections improvement as per **Table B-3**. Following aspects shall be considered for design of at-grade junctions:

i) Adequately designed intersections with channelisations, all right turn and left turn (acceleration and deceleration) lanes (auxiliary) at all intersections for safe and smooth movement of traffic.
ii) Auxiliary acceleration and deceleration lanes for left turning traffic at entrances to major roadside facilities such as Wayside Amenities, Service Area and Truck Lay-byes and traffic merging/diverging locations.
iii) Also auxiliary lane of sufficient capacity (length) shall be provided to create storage capacity for stream lining movement of turning vehicular traffic.
iv) Treatment at additional intersections, if any, as found necessary, shall be decided in consultation with the Independent Consultant & NHAI
v) In case adequate ROW could not be made available to accommodate proposed intersection layout, the proposed intersection layout shall be followed upto ROW boundary and therefore suitable tapering shall be provided for the cross road.
vi) Improvement of existing major intersections/junctions and provision of new intersections/junctions shall be as per **Table B-3.** Drawings for these intersections are given in **Fig B-3**(separately hard bound with pages from **Fig B3-1 to Fig B3-8**).
vii) Improvement of existing minor intersections/junctions and provision of new intersections/junctions shall be as per **Annexure B-1** as per MoST standard drawings. The layout plans of minor intersections shall be designed individually and got approved from IC & NHAI
viii) At the junction with NH45 at existing Chainage Km 135.750, a flyover is proposed to be constructed for NH45 vide a separate BOT Agreement. The alignment of the Project Highway at this intersection shall be properly tied to the improvement scheme for the NH45.

Table B-3: Details of Major Intersections for Improvement

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Existing Type of Junction	Classification of Cross Road	Proposed Geometric Improvements
1	80.470	80.500	Round about		Underpass
2	81.370	81.950	Round about		Underpass
3	83.530	84.150	Round about		Underpass
4	85.380	86.150	Round about		Underpass
5	88.050	88.750	Round about		Underpass
6	89.050	89.800	Round about		Underpass
7	93.320	93.800	Vallam Bypass Start Point		Improvements to At grade junction

8	97.350	97.600	Vallam Bypass End Point		Improvements to At grade junction
9	104.900	105.350	3-legged	SH-99	Improvements to At grade junction
10	106.600	107.100	3-legged	SH-99	Improvements to At grade junction
11	126.030	126.700	4-legged	Arterial Road to BHEL	Improvements to At grade junction
12	127.000	127.700	Skew 4-legged	Arterial Road to BHEL	Improvements to At grade junction

MoST standard drawing for T-Junctions shall be followed for intersections at Design Chainage km 105.350 and 107.100

At intersections at Design Chainage 126.700 and 127.700, junction improvement works are in progress. The junction improvement of the Project highway at these intersections shall be made compatible with the ongoing works.

2.4 Structures

2.4.1 Cross-Drainage (Bridges & Culverts)

Existing and new culverts and bridges shall be provided by the Concessionaire wide enough to accommodate the adjacent road cross section. The details of existing culverts and bridges are given in **Annexure A-6 & A-7 of Schedule-A** respectively. Details of all the culverts and bridges given are in **Table B-4a, B4b & B-5.** These shall be designed & provided in accordance with the design standards set in **Schedule-D.**

There are total 94culverts (34 box culverts and 60 pipe culverts) which needs to be widened/reconstructed/newly constructed by the Concessionaire. Out of these 37 shall be extended/widened to accommodate the adjoining prescribed road cross sections and the balance 57 culverts shall be reconstructed. These include three culverts along the Vallam bypass. Details are given in **Table B4a and B4b.** One culvert is found redundant and therefore shall be abandoned.

There are total 23 bridges that need to be widened/reconstructed/newly constructed/retained with minor repairs as per details given in **Table B5**

The GAD of the bridges are given in **Fig B-4**(separately hard bound with pages from **Fig B 4-1 to Fig B4-19**). The Finished road levels, as given in GAD shall be modified to the levels given in the alignment plan and profile given in **Fig B1** foundation levels and other dimensions given in GAD of bridges needs to be finalised based on detailed assessment of hydraulic, geo-technical parameters and detailed structural design

Following guidelines shall be followed:

i) All the bridges located on new carriageway and those located on the existing carriageway and requiring reconstruction shall be 2-lane structure matching with 4-lane roadway geometry. In the under stretch the inner edge of footpath matches with the outer edge of paved shoulder.

ii) The existing structure shall be widened i.e. extended to match the new road cross sections.

iii) For major bridges in urban or rural areas open median shall be provided with minimum 3.50m clear gap between the two 2-lane bridges. However for minor bridges covered median of the same width as of highway shall be provided.

iv) The adequacy of the vent size for all culverts/bridges shall be ascertained through detailed hydrological surveys and finalized in consultation with the IC/NHAI. The Highest Flood Level/Maximum Supply Level shall be properly assessed after collecting flood histories from local authorities/interviews with locals/Irrigation authorities.

v) Canal bridges shall be designed as per hydraulic requirements of Irrigation authorities. The construction plans shall be prepared as per closure schedule of canals. Approval of GAD from Irrigation department may be required. It may be preferred to plan single span canal bridges with foundations not disturbing the canal bunds.

vi) The new bridge shall be so planned to not affect the foundations of the existing bridge.

vii) For drainage purpose the new/reconstruction of pipe culverts of minimum 1.2m dia shall be provided. The existing pipe culverts of 0.900m or more dia shall be extended to new carriageway with same diameter pipe. All pipe culverts of dia less than 0.900m shall be reconstructed.

viii) The culverts for irrigation channels may be of smaller size (not less than 300 mm dia with sump well and screen to prevent entry of leaves and debris.

Further, the cross drainage plan of the highway shall be finalized in consultation with IC & NHAI and if required additional culverts shall be provided as part of the Concessionaire's obligation under this Contract Package.

N.H.A.I., NEW DELHI

Table-B4a- IMPROVEMENT OF CROSS DRAINAGE STRUCTURES (Box Culverts)

Sl. No.	CD No	Design chainage (km)	Existing Chainage (km)	Box Size	Existing Width (m)	Treatment to existing Culvert
1	95/2	94.884	-	(Twin cell) 3 x 2	-	New Construction
2	96/1	95.183	-	(Twin cell) 4 x 3	-	New Construction
3	97/1	96.228	-	(Single cell) 3 x2	-	New Construction
4	99/2	98.060	97.700	(Single cell) 1.5 x 1	12.6	Widening
5	101/1	100.412	100.014	(Single cell) 3.5 x 1.5	10.45	Reconstruction
6	106/1	105.841	105.372	(Single cell) 2.0 x 1.5	12.5	Widening
7	108/1	107.150	106.600	(Single cell) 1.5x1.5	12.5	Reconstruction
8	108/3	107.653	107.170	(Single cell) 1.5x1.5	12.6	Reconstruction
9	108/4	107.918	107.427	(Twin cell) 2 x 1.5	10.5	Reconstruction
10	111/1	110.422	109.874	(Single cell) 2.5 x 3.0	12.4	Reconstruction
11	112/2	111.519	110.939	(Single cell) 1.5x1.5	12.5	Reconstruction
12	115/2	114.504	113.773	(Single cell) 2.0 x 1.5	12	Reconstruction
13	117/2	116.899	116.147	(Twin cell) 2.5 x 2.5	9.6	Reconstruction

Table-B4a- IMPROVEMENT OF CROSS DRAINAGE STRUCTURES (Box Culverts)						
14	117/3	116.930	116.187	(Twin cell) 2.5 x 1.5	9.6	Reconstruction
15	118/2	117.841	117.162	(Single cell) 4.2 x 2.5	9.0	Widening
16	118/3	117.900	117.217	(Single cell) 3.5 x 2.5	9.0	Widening
17	119/1	118.721	118.044	(Single cell) 2.7 x 2.5	9.8	Widening
18	119/2	118.949	118.267	(Twin cell) 2.9 x 2.5	9.9	Reconstruction
19	120/1	119.043	118.429	(Single cell) 1.5x1.5	10	Reconstruction
20	121/2	120.074	119.390	(Twin cell) 2.7 x 2.0	10	Widening
21	122/1	121.672	121.001	(Single cell) 1.5x1.5	10.9	Reconstruction
22	123/1	122.240	121.576	(Single cell) 1.5x1.5	10.9	Reconstruction
23	124/1	123.176	122.516	(Single cell) 1.5x1.5	8.7	Reconstruction
24	125/2	124.800	124.170	(Single cell) 1.5x1.5	12	Reconstruction
25	128/1	127.175	126.498	(Single cell) 2.0 x1.5	15	Reconstruction
26	131/7	130.902	130.240	(Single cell) 1.5x1.5	15	Reconstruction
27	132/1	131.104	130.442	(Single cell) 1.5x1.5	15	Reconstruction

Table-B4a- IMPROVEMENT OF CROSS DRAINAGE STRUCTURES (Box Culverts)						
28	132/2	131.164	130.502	(Twin cell) 2.0 x1.5	15	Reconstruction
29	132/4	131.680	130.991	(Single cell) 1.5x1.5	15	Widening
30	132/6	131.761	131.073	(Single cell) 3 x1.5	12	Reconstruction
31	133/1	132.043	131.354	(Single cell) 1.5x1.5	10.4	Reconstruction
32	134/1	133.901	133.218	(Single cell) 1.5x1.5	10.4	Widening
33	135/1	134.354	133.670	(Single cell) 1.5x1.5	10.4	Reconstruction
34	136/1	135.153	134.467	(Single cell) 1.5x1.5	11.5	Reconstruction

Table-B4b- IMPROVEMENT OF CROSS DRAINAGE STRUCTURES (Pipe Culverts)

Sl. No.	CD No	Design chainage (km)	Existing Chainage (km)	Pipe arrangement (Diameter of pipe X No. of pipes)	Head wall Height from invert level		Existing Pipe length(m)	Treatment to existing Culvert
					LHS	RHS		
1	81/1	80.401	80.400	0.9x1	2.6	2.5	20	Widening
2	81/2	80.663	80.662	1.2x1	2.3	2.2	12	Reconstruction
3	81/3	80.751	80.751	1.2x1	2.4	2.2	12	Reconstruction
4	81/4	80.834	80.834	1.2x1	2.5	2.3	12	Reconstruction
5	81/5	80.902	80.901	1.2x1	2.2	2.1	12	Reconstruction
6	82/1	81.153	80.1153	1.2x1	2.4	2.55	12	Reconstruction
7	82/2	81.800	81.187	1.2x1	2.3	2.45	12	Reconstruction
8	82/3	81.983	81.369	1.2x1	2.35	2.2	12	Reconstruction
9	83/1	82.063	81.448	1.2x1	2.2	2.1	12	Reconstruction
10	83/2	82.115	81.500	1.2x1	2.6	2.3	12	Reconstruction
11	83/3	82.179	81.566	1.2x1	2.3	2.3	15.2	Reconstruction
12	83/4	82.248	81.634	1.2x1	2.3	2.5	12	Reconstruction

Table-B4b- IMPROVEMENT OF CROSS DRAINAGE STRUCTURES (Pipe Culverts)								
13	83/5	82.447	81.834	1.2x1	2.4	2.4	12	Reconstruction
14	83/6	82.688	82.078	1.2x2	2.3	2.2	12	Reconstruction
15	84/1	83.533	82.921	0.9x6	2.2	2.1	12	Widening
16	84/3	83.864	83.255	1.2x2	2.3	2.1	12	Reconstruction
17	85/1	84.000	83.392	1.2x2	2.3	2.3	12	Reconstruction
18	85/2	84.294	83.686	1.2x2	2.3	2.2	12	Reconstruction
19	85/3	84.457	83.848	1.2x4	2.8	2.5	12	Reconstruction
20	85/4	84.929	84.244	0.9x2	2.95	2.4	12.3	Widening
21	86/1	85.944	85.263	0.9x1	2.4	2.1	15.2	Widening
22	87/1	86.173	85.495	0.9x1	2.2	2.1	15	Widening
23	87/2	86.789	86.102	1.2x1	2.3	2.55	15	Reconstruction
24	87/3	86.904	86.218	1.2x2	2.4	2.2	15.2	Reconstruction
25	89/1	88.220	87.513	0.9x5	2.5	2.3	12.6	Widening
26	89/2	88.605	87.900	0.9x2	2.6	2.1	15.1	Widening

Table-B4b- IMPROVEMENT OF CROSS DRAINAGE STRUCTURES (Pipe Culverts)								
27	89/3	88.824	88.128	0.9x2	2.5	2.2	14.1	Widening
28	90/1	89.797	89.129	0.9x2	2.2	2.1	12.4	Widening
29	91/1	90.456	90.017	1.2x1	2.3	2.3	22.8	Reconstruction
30	98/2	97.933	97.583	1.2x1	2.2	2.1	12	Reconstruction
31	99/1	98.059	97.700	0.9x2	2.3	2.4	12.6	Widening
32	100/1	99.071	98.700	0.9x1	2.5	2.4	12.6	Widening
33	100/2	99.234	98.860	0.9x2	2.2	2.2	12.6	Widening
34	100/3	99.788	99.397	0.9x1	2.5	2.4	12.6	Widening
35	104/1	103.258	102.835	0.9x1	2.2	2.1	12.5	Widening
36	104/2	103.421	103.000	1.2x1	2.3	2.5	12.5	Reconstruction
37	107/1	106.301	105.818	0.9x1	2.4	2.3	12.5	Widening
38	107/2	106.407	105.927	0.9x1	2.5	2.45	12.5	Widening
39	112/1	111.025	110.465	09x3	2.4	2.4	12.5	Widening
40	112/3	111.755	111.175	1.2x1	2.3	2.4	12	Reconstruction

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Table-B4b- IMPROVEMENT OF CROSS DRAINAGE STRUCTURES (Pipe Culverts)								
41	113/1	112.252	111.663	0.9x2	2.2	2.3	12.5	Widening
42	115/1	114.215	113.572	0.9x1	2.2	2.1	12.5	Widening
43	116/1	115.120	114.435	1.2x3	2.85	3.05	12	Reconstruction
44	117/1	116.097	115.373	1.2x1	2.4	2.6	12.6	Reconstruction
45	120/2	119.103	118.434	0.9x1	2.6	2.55	10	Widening
46	120/4	119.922	119.242	0.9x3	3.4	3.05	9.7	Widening
47	121/1	120.034	119.354	0.9x5	2.61	2.35	10.1	Widening
48	125/1	124.482	123.803	1.2 X 2	2.6	2.2	10	Reconstruction
49	127/1	126.100	125.415	0.9x1	2.3	2.2	22.5	Widening
50	127/2	126.948	126.271	0.9x1	2.35	2.3	22.5	Widening
51	128/2	127.388	126.711	1.2x2	2.3	2.6	22.5	Reconstruction
52	128/3	127.662	126.953	1.2x1	2.4	2.45	22.5	Reconstruction
53	130/1	129.311	128.678	1.2x4	2.3	2.4	22.5	Reconstruction
54	130/2	129.713	129.080	1.2x1	2.5	2.3	22.5	Reconstruction

Table-B4b- IMPROVEMENT OF CROSS DRAINAGE STRUCTURES (Pipe Culverts)								
55	131/2	130.323	129.690	0.9x1	2.3	2.1	22.5	Widening
56	131/3	130.535	129.873	0.9x1	2.55	2.5	22.5	Widening
57	131/4	130.640	129.988	0.9x1	2.35	2.1	10.4	Widening
58	131/5	130.651	129.998	0.9x1	2.3		10.4	Widening
59	132/3	131.442	130.753	1.2x2	2.4	2.2	10.4	Widening
60	132/5	131.681	130.991	0.9 x2	2.3	2.2	10.4	Widening



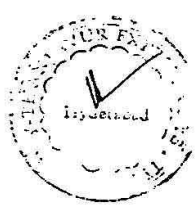

Table B5- Improvement Details for Bridges

Sl. No	Bridge Number	Design Chainage (km)	Existing Chainage (km)	Existing Span Arrangement (m)	Proposed Scheme	Proposed Span Arrangement (m)	Rehabilitation Measures for the existing
1	83/7	82.734	82 . 121	3 x 18.5	Replace existing bridge by a new 4 lane bridge	3 x 19.15	
2	83/8	82.808	82 . 201	1 x 9	Additional Two lane bridge on RHS	1 x 11.4	❖ Eroded roadway on the immediate approach of the bridge shall be rectified ❖ Existing Embankment shall be strengthened by providing revetment ❖ Wearing coat shall be renewed ❖ Handrails shall be replaced ❖ Crash barriers to be provided ❖ Bed protection shall be provided
3	84/2	83.564	82.915	1 x 17.2 Skew 53.52°	Additional Two lane on RHS	1 x 17.2	❖ Existing Embankment shall be strengthened by providing revetment ❖ Wearing coat to be renewed ❖ Handrails to be replaced ❖ Crash barriers to be provided ❖ Bed protection shall be provided
4	92/1	91.632	91.178	3 x 3	Replace existing bridge by a new 4 lane bridge	1 x 11.4	
5	96/2	95.820			New Four lane bridge along bypass location	1 X 15	

Table B5- Improvement Details for Bridges

Sl. No	Bridge Number	Design Chainage (km)	Existing Chainage (km)	Existing Span Arrangement (m)	Proposed Scheme	Proposed Span Arrangement (m)	Rehabilitation Measures for the existing
6a	98/1	97.185			New 2 lane bridge along bypass location	3 x 20	
6b	98/1		96.800		Existing structure retained with minor repairs		❖ Existing Embankment shall be strengthened by providing revetment ❖ Wearing coat to be renewed ❖ Handrails to be replaced ❖ Crash barriers to be provided ❖ Bed protection shall be provided ❖ Expansion joint to be replaced
7	102/1	101.916	101 . 509	2 x 3.1	Replace existing bridge by a new 4 lane bridge	1 x 7.45	
8	108/2	107.347	106 . 857	2 x 3.5	Replace existing bridge by a new 4 lane bridge	1 x 8.4	
9	109/1	108.253	107 . 745	2 x 8.01	Additional Two lane bridge on RHS	1 x 16.5	New 2-lane bridge under construction by PWD
10	110/1	109.221	108 . 701	1x7.5	Additional Two lane bridge on RHS	1 x 7.5	❖ Existing Embankment shall be strengthened by providing revetment ❖ Wearing coat to be renewed ❖ Handrails to be replaced ❖ Crash barriers to be provided ❖ Bed protection shall be provided

Table B5- Improvement Details for Bridges

Sl. No	Bridge Number	Design Chainage (km)	Existing Chainage (km)	Existing Span Arrangement (m)	Proposed Scheme	Proposed Span Arrangement (m)	Rehabilitation Measures for the existing
11	110/2	109.315	108.789	1 x 6.75	Replace existing bridge by a new 4 lane bridge	1 x 6.75	
12	113/2	112.803	112 . 187	2 x 3	Replace existing bridge by a new 4 lane bridge	1 x 7.7	
13	118/1	117.440	116 . 684	3 x 4.6	Additional Two lane bridge on LHS	1 x 16.3	❖ Existing Embankment shall be strengthened by providing revetment ❖ Wearing coat to be renewed ❖ Handrails to be replaced ❖ Crash barriers to be provided ❖ Bed protection shall be provided ❖ Spalling of Concrete shall be rectified ❖ Anti corrosive agents shall be applied on corroded portion before concrete application
14	120/3	119.708	119 . 018	3 x 3	Replace existing bridge by a new 4 lane bridge	1 x 10.5	
15	121/3	120.396	119 . 681	1 x 9.8	Additional Two lane bridge on RHS	1 x 9.8	New 2-lane bridge under construction by PWD

Table B5- Improvement Details for Bridges

Sl. No	Bridge Number	Design Chainage (km)	Existing Chainage (km)	Existing Span Arrangement (m)	Proposed Scheme	Proposed Span Arrangement (m)	Rehabilitation Measures for the existing
16	121/4	120.647	119 . 983	1 x 9.4	Additional Two lane bridge on RHS	1 x9.4	❖ Existing Embankment shall be strengthened by providing revetment ❖ Handrails to be replaced ❖ Crash barriers to be provided ❖ Bed protection shall be provided ❖ Minor damages in deck slab and abutment shall be rectified. ❖ Vent way shall be cleaned
17	126/1	125.847	125.162	1 x 7.3	Existing bridge to be widened on both sides	1 x7.3	❖ Wearing coat to be renewed ❖ Handrails to be replaced ❖ Crash barriers to be provided ❖ Minor damages on the existing abutment shall be rectified
18	129/1	128.526	127.870	3 x 6.0	Replace existing bridge by a new 4 lane bridge	3 x 6	
19	131/1	130.158	129.525	3 x 3.6	Existing structure retained with minor repair.		❖ Spalling of Concrete shall be rectified ❖ Anti corrosive agents shall be applied on corroded portion before concrete application ❖ Wearing coat to be renewed ❖ Handrails to be replaced ❖ Crash barriers to be provided ❖ Expansion joints to be repaired
20	131/6	130.825	130.163	4 x 9.35	Existing structure retained with minor repair.		❖ Wearing coat to be renewed ❖ Handrails to be replaced ❖ Crash barriers to be provided ❖ Spalling of Concrete shall be rectified ❖ Expansion joint shall be replaced
21	133/2	132.572	131.882	3 x 8.8	Existing structure retained with minor repair.		❖ Wearing coat to be renewed ❖ Damage on the abutments shall be rectified. ❖ Handrails to be replaced ❖ Crash barriers to be provided

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Table B5- Improvement Details for Bridges

Sl. No	Bridge Number	Design Chainage (km)	Existing Chainage (km)	Existing Span Arrangement (m)	Proposed Scheme	Proposed Span Arrangement (m)	Rehabilitation Measures for the existing
							❖ The debris and waste shall be removed ❖ Bed protection shall be provided ❖ Expansion joint shall be replaced
22	137/1	136.105	135.358	3 x 9.1	Replace existing bridge by a new 4 lane bridge	3 x9.1	
23	137/2	136.446	135.700	1 x 8.8	Existing structure retained with minor repair	1 x 8.8	❖ Approach slab shall be repaired ❖ Wearing coat shall be renewed ❖ Damage on the abutments shall be rectified. ❖ Handrails to be replaced ❖ Crash barriers shall be provided

2.4.2 Grade Separators/ Underpasses (12 nos)

10 nos of underpasses shall be provided by the Concessionaire as given in **Table B6** .The GADs of the underpasses are given in **Fig B-5**(separately hard bound with pages from **Fig B 5-1 to Fig B5-10**). Further 2 additional nos of underpasses of size 4.0m x 4.0 m shall be provided in the Project Highway at locations to be decided in consultation with IC & NHAI. These two underpasses shall however, require modification of Vertical alignment of Project Highway and all consequential works related to the provision of these 2 underpasses are therefore deem to be covered in the Scope of work under this Contract. No additional compensation shall be payable in this regard.

Table B6 New Underpasses

Sl. No	Chainage (km)		Span Arrangement (m)	Type of Structure
	Existing	Proposed		
1	80.470	80.440	10 x 5.5-VUP (Single cell)	RCC Box
2	80.470	80.510	10 x 5.5-VUP (Single cell)	RCC Box
3	81.370	81.950	10 x 5.5-VUP (Single cell)	RCC Box
4	83.530	84.150	10 x 5.5-VUP (Single cell)	RCC Box
5	85.380	86.150	10 x 5.5-VUP (Single cell)	RCC Box
6	88.050	88.750	10 x 5.5-VUP (Twin cell)	RCC Box
7	89.050	89.800	10 x 5.5-VUP (Twin cell)	RCC Box
8	-	94.17	4 x 4.0-CUP (Single cell)	RCC Box
9	-	94.710	10 x 5.5-CUP (Single cell)	RCC Box
10		95.520	10 x 5.5-VUP (Single cell)	RCC Box





2.4.3 ROB (3 nos)

The two existing ROBs at Design Chainage 129.183 and 135.729 shall be dismantled and provided to 4 lane geometry by the Concessionaire. In addition, new 4 lane ROB shall be provided at Design Chainage 81.400 in lieu of the existing level crossing. Improvement proposal for ROBs is given in **Table B7**. The GAD of the ROBs are given in **Fig B-6** (separately hard bound with pages from **Fig B 6-1 to Fig B6-3**).

Dismantling of existing ROBs and construction of new ROB at the Design Chainage km 129.183 and 135.729 shall be carried out in such a manner that uninterrupted flow of existing traffic shall be ensured throughout by providing suitable diversion roads. Concessionaire shall get detailed methodology of construction approved from IC and if required, from Railways.

Table B7 Improvement Proposals for ROBs

Sl. No	Chainage (km)		Proposed Scheme	Span Arrangement (m)
	Existing	Proposed		
1	81.400	80.780	New Four lane bridge	1 x 28
2	129.183	128.524	Replace the existing ROB by a new 4 lane ROB	1 x 23
3	135.729	134.983	Replace the existing ROB by a new 4 lane ROB	1 x 28

3. Geometric Improvement

Following works shall be provided by the Concessionaire:-

i) The flat gradients shall be corrected in such a way so as to attain an appropriate longitudinal gradient in order to achieve longitudinal drainage. Also vertical curves shall be improvement/introduced so that the vertical curves meet IRC:SP-23/IRC: 73 standards.

ii) The horizontal alignment of the Project Highway shall be improved as per the standards set out in **Schedule-D.**

iii) The Improvement shall be done in consultation with the Independent Consultant ensuring that the proposed improvements are accommodated within the land width available.

4. Slope Protection and Drainage

The improvements in the drainage and the slope erosion shall be made by the Concessionaire as per the following norms:

4.1 Drainage Measures

Following measures shall be provided by the Concessionaire:

i) Earthen drains of required cross Section for area Drainage on Both Side of carriageway in rural section.
ii) Lined drains shall be provided on both sides of the carriageway between service road and main carriageway in built-up sections, wherever service roads are provided.
iii) Covered Pucca drains in urban sections preferably at outer edges of service roads with proper connection to the outfall location in the urban section
iv) Chute drains along with kerbs and channel drains in high embankment (3m and above)
v) Median drains at super elevated sections with proper outfall connections and
vi) Covered pucca drains underneath the sidewalk of proposed facility (bus bays, truck lay bys etc.)
vii) Open lined drains across the median and separators at super elevated sections.

In addition to these, 900mm dia NP-4 hume pipe culverts shall be provided under the cross roads at the intersections to allow rain water to flow. The drainage plan shall be prepared by the concessionaire and got approved from IC & NHAI.

4.2 Slope Protection Measure

Following measures shall be provided by the Concessionaire:

i) Side Slope of embankments 3m high or more shall be protected by pitching or geo-meshes or geo-nets or geo-grids in consultation with the Independent Consultant.
ii) Side Slope of embankments less than 3m in height shall be turfed as per MORT&H specifications.
iii) In case of difference in elevation between two carriageways is more than 2m, RCC/ PCC retaining wall with the Independent Consultant.

5. Traffic Signs and Pavement Markings

The Concessionaire shall provide as follows:
Traffic signs and pavement markings shall include roadside signs, overhead signs, curb mounted signs and road marking along the Project Highway. The design and marking for the Project Highway shall be as per the design standard indicated in

Schedule-D and the location for various treatment shall be finalized in consultation with the Independent Consultant.

The overhead sign shall be the reflectorised type with high intensity retro-reflective sheeting conforming to ASTM D 4956-01, Type VIII and/or Type IX of micro prismatic type. The retro-reflective sheet of Engineering Grade shall NOT be used. The height, lateral clearance, location and instillation shall be as per relevant clauses of MOST specifications. Overhead sign shall be installed ahead of major intersections, toll plazas and urban areas as per detailed design requirements.

The Concessionaire shall provide Aluminium Die Cast Matte Finish (Sand Blasted) conforming to IS 617:1994 Designation 4250 Sparkle Solar road studs powered by energy from the Sun, manufactured by 'TATA BP' Solar India or Equivalent having high intensity reflectivity on the curves, road junctions, zebra crossings, ramps etc. to provide the visibility. At least one thousand solar studs shall be provided on this project at the locations finalized in consultation with IC/NHAI.

6. Highway Lighting

The Concessionaire shall provide as follows:

i) Non-conventional energy like solar lighting system shall be provided at all major intersections as per the design standards indicated in Schedule 'D'.
ii) High mast lightings shall be provided at toll plaza location Grade Separator and at major intersections as per the design standards indicated in Schedule 'D'.
iii) Street Lighting shall be provided in the built up areas ie. Thuvakudi, near Tamil Nadu University, Sengipatti, Tiruvarambur and Trichy urban section.

Lighting shall be provided in built up area as given in **Table B-8** below, rest areas, toll plazas and at major intersections.

Table B-8 : Proposed Locations of Highway Lighting

S.No	Design Chainage	Remarks
1.	90.000 to 90.700	Tamil Nadu University
2.	106.700 to 107.400	Sengipatti village
3.	122.100 to 122.700	Thuvakudi Village
4.	128.000 to 136.490	Tiruvarambur Trichy Urban Area

7. LED

LEDs shall be provided by the Concessionaire at intersections and median openings as per the design standards indicated in Schedule 'D'.

8. Speed Breaker on Cross Roads

Speed Breakers shall be provided by the Concessionaire on all cross roads intersecting the Project Highway as per the design standards indicated in Schedule 'D'.

9. Blinker at Intersection

Blinkers signal shall be provided be provided by the Concessionaire at all major intersections as per the design standards indicated in Schedule 'D'.

10. Delineators and Guard Posts

Delineators and Guard Posts shall be provided by the Concessionaire at all Horizontal curves on either side of the carriageway as per the design standards indicated in Schedule 'D'.

11. Studs

Road studs shall be provided be provided by the Concessionaire at all curves on both carriageways, at median openings and at intersections as per the design standards spelt out in schedule 'D'.

12. Guard Rail and Traffic Safety Devices

i) For the safety of pedestrian at the intersection / Junction, the guard rails in GI pipe shall be provided to enhance the safety in Urban/Semi-Urban locations and at bus bays.

ii) Metal beam / Concrete Barriers shall be provided at locations of bridge approaches and high embankments (3m and more) and at curves having deflection angle more than 30°. Metal beam barrier shall be of w-shape, in Fe 410 grade with single runner hot dip galvanized in 550 gm / sqm. The aggregate length of Metal beam to be provided on this Contract shall be at least eight km.

iii) Safety barrier (Metal beam) shall be provided along the central median at places where median width is 1.50 m and also in the lengths where median tapers from 5.00 m to 1.50 m.

13. Road Land Boundary

Road Land (ROW) Boundary shall be demarcated by putting RCC boundary pillars size 60 cm x 15 cm x 15 cm embedded in concrete (as per IRC) along the Project Highway at 50 m interval on both sides by the Concessionaire. All the components used in delineating road land boundary shall be aesthetically pleasing, sturdy and vandal proof. The road land boundary shall be demarcated in consultation with IC/NHAI. A system for the identification of Chainage along the Project Highway shall be done in consultation with Independent Consultant..

14. Pre-Construction Activities

14.1 Land Acquisition (LA)

Besides bypass alignment, the additional land acquisition in few isolated stretches is foreseen on this project. The cost of L.A as intimated by the concerned agencies shall be borne by NHAI. However the Concessionaire shall be involved pro-actively in this regard submitting relevant L.A. proposals as per NH Act-1956 and pursuing the matter with the concerned State Govt. Revenue Departments and the concerned private people whose land is to be acquired. NHAI shall provide all necessary administrative support in this regard.

14.2 Utility Shifting and Removal of Trees

The ' Project' involves shifting of utilities of certain types. The Concessionaire shall be actively involved to accomplish this task. He shall submit the proposals in this regard. The cost towards utility sifting as per the demand note of the concerned Govt./Semi-Govt. agencies shall be borne by NHAI.

14.3 Clearances to be obtained

The Concessionaire shall obtain all necessary clearances from all the concerned authorities, including clearance from MoEF, required for implementing the project. NHAI shall provide support letters in this regard.

14.4 Encroachment Removal

Encroachments shall be removed by the Concessionaire at his own cost. NHAI/State Government provide administrative support.

14.5 Compensatory Afforestation and Rehabilitation & Resettlement

NHAI shall bear cost in this regard. However, Concessionaire shall proactively be involved for all related activities.

15. Landscaping

The finished road facility shall exhibit adequate landscaping of aesthetically pleasing view. All the borrow areas shall be properly dressed maintaining drain ability outward from the road facility. The side slopes shall be provided with Turfing.

Annexure B-1: Details of Minor Intersections for Improvement

Sl. No	Existing Chainage		Design Chainage, km	Type of Junction	No. of Arms	Side	Lead to	Width (m)	Remarks	Proposal
	km	m								
1	80	340	80.35	T	3	L	Pathima Nagar	3.44	Earthen Road	Earthen Access Road
2	80	1070	81.04	T	3	L	Sekalavathi Nagar	2.8	Earthen Road	Earthen Access Road
3	80	1220	81.21	T	3	L	Sekalavathi Nagar	3.29	Earthen Road	Earthen Access Road
4	80	1440	81.44	T	3	L	Magesh Nagar	2.77	Earthen Road	Earthen Access Road
5	80	1490	81.49	T	3	L	Magesh Nagar	3.93	Earthen Road	Earthen Access Road
6	82	90	82.7	Cross Road	4	L	Vetikadu	2.92	Bitumi nous Road	Bitumino us Access Road
						R	Thanjavur	2.97		
7	82	710	83.3	Cross Road	4	L	Ranganath a Puram	3.7	Bitumi nous Road	Bitumino us Access Road
						R	Puthuvansa avadi	3.81		
8	84	720	85.42	T	3	R	Elango Nagar	3	Earthen Road	Earthen Access Road
9	86	500	87.2	T	3	R	Kamaraj Nagar	5.16	Earthen Road	Earthen Access Road
10	88	680	89.37	T	3	L	Fields	2.9	Earthen Road	Earthen Access Road

						L	Thulukkampatty	3.1	Bituminous Road	Bituminous Access Road
11	88	730	89.44	Cross Road	4	R	Mathakottai	2.72	Earthen Road	
12	89	450	90.14	T	3	L	Malavastha Savadi	2.66	Bituminous Road	Bituminous Access Road
13	89	550	90.23	T	3	L	Pudukkottai	3.42	CC Pavement	Bituminous Access Road
14	89	910	90.34	T	3	L	M.G.R Nagar	3.34	Bituminous Road	Bituminous Access Road
15	90	20	90.46	T	3	L		4	CC Pavement	Bituminous Access Road
16	90	120	90.56	T	3	L		3.74		Bituminous Access Road
17	91	390	91.84	T	3	R	Pilliyarpatti	3.18		Bituminous Access Road
18	91	880	92.35	T	3	R		2.44	Earthen Road	Earthen Access Road
						L		2.7		Earthen Access road on Both Sides
19	93	879	94.34	Cross Road	4	R		2.7	Earthen Road	
				Cross		L		3.2	Earthen	Cattlepass
20	94	247	94.7	Road	4	R		3.2	Road	
21	97	970	98.3	T	3	L		2.46	Earthen Road	Earthen Access Road
22	98	70	98.43	T	3	R	Muniyampatty	3.82	Bituminous Road	Earthen Access Road

23	98	840	99.22	T	3	L	Vallam Puthur	3.68	Bituminous Road	Earthen Access Road
24	99	920	100.31	T	3	R		2.3	Earthen Road	Earthen Access Road
25	100	140	100.53	T	3	L		3.12	Earthen Road	Earthen Access Road
26	100	280	100.67	T	3	R		3	Earthen Road	Earthen Access Road
27	100	750	101.13	Cross Road	4	L		2.55	Earthen Road	Earthen Access road on Both Sides
						R		3.45	WBM Road	
28	100	930	101.34	T	3	L		2.41	Earthen Road	Earthen Access Road
29	101	360	101.74	Cross Road	4	L	Tamil Selven Road	2.88	WBM Road	Earthen Access road on Both Sides
						R	Thirumalai Samuthiram	3.64	Bituminous Road	
30	101	490	101.89	T	3	L	Kurum Poondi	2.77	Bituminous Road	Bituminous Access Road
31	101	510	101.89	T	3	R		3	Earthen Road	Earthen Access Road
32	101	530	101.93	Cross Road	4	L		2.38	Earthen Road	Earthen Access road on Both Sides
						R		2.68		
33	101	560	101.96	T	3	L		2.22	Bituminous Road	Bituminous Access Road

34	101	650		T	3	L		3.52	Bitumi nous Road	Bitumino us Access Road
35	102	640	103.05	T	3	R	Maruthagu di	3.41	Bitumi nous Road	Minor Junction with Median Opening
36	103	340	103.78	T	3	L	Ayothipatti	3.7	Earthen Access Road	Earthen Access Road
37	103	670	104.05	T	3	R		2.84	Bitumi nous Road	Bitumino us Access Road
38	105	540	106	T	3	R		3.51	Bitumi nous Road	Bitumino us Access Road
39	106	700		T	3	R	Karriapatti	3.74	Cement Road	Bitumino us Access Road
40	106	710	107.2	T	3	L	Putukudi	3.1	Bitumi nous Road	Bitumino us Access Road
41	106	885	107.36	Cross Road	4	L	Paliapatti	2.7	Earthen Road	Earthen Access Road
						R	Putukudi	2.95	Bitumi nous Road	Bitumino us Access Road
42	107	700	108.19	T	3	R	Palazhakari apaTTI	3.57	Bitumi nous Road	Bitumino us Access Road
43	107	920	108.42	T	3	R	EB Sub Station	3.2	Bitumi nous Road	Bitumino us Access Road
44	108	180	108.68	T	3	R		3.2	Earthen Road	Earthen Access Road

45	109	850	110.39	T	3	L	Putukudi	2.77	Bituminous Road	Bituminous Access Road
46	110	990	111.58	T	3	L	Valampakudi	3.99	Bituminous Road	Bituminous Access Road
47	111	60	111.65	T	3	R	Kottarapatti	4	Bituminous Road	Bituminous Access Road
48	111	535	112.1	T	3	R		2.9	Earthen Road	Earthen Access Road
49	112	560	113.17	T	3	R		2.92	Earthen Road	Earthen Access Road
50	113	160	113.81	T	3	R	Kamatchi Puram	3.13	Bituminous Road	Bituminous Access Road
51	113	595	114.24	T	3	R		3.12	Earthen Road	Earthen Access Road
52	113	800	114.53	T	3	R	Rayamundan Patty	3.65	Bituminous Road	Bituminous Access Road
53	114	90	114.8	T	3	L	Putukudi	3.5	Bituminous Road	Bituminous Access Road
54	115	110	115.83	T	3	R	Navallur	3.25	Bituminous Road	Bituminous Access Road
55	116	160	116.91	T	3	R		2.54	Earthen Road	Earthen Access Road
56	117	290	117.97	T	3	R	Devaraya Neri	2.95	Earthen Road	Earthen Access Road
57	117	610	118.29	T	3	R	Devaraya Neri	3.6	Bituminous Road	Bituminous Access Road

58	118	725	119.39	T	3	L	Assur	3.74	Bituminous Road	Bituminous Access Road
59	118	785	119.45	T	3	R		5	Bituminous Road	Bituminous Access Road
60	119	240	119.91	T	3	R		3.7	Earthen Road	Earthen Access Road
61	119	380	120.06	T	3	R		3	Earthen Road	Earthen Access Road
62	119	530	120.2	T	3	L		8.27	Earthen Road	Earthen Access Road
63	119	960	120.62	T	3	R		3	Earthen Road	Earthen Access Road
64	120	375	120.94	T	3	L	Crusher	3.4	Earthen Road	Earthen Access Road
65	120	680	121.35	T	3	L		3.25	WBM Road	Earthen Access Road
66	121	380	122.05	T	3	L	Sidco Industrial Estate	3.45	Bituminous Road	Bituminous Access Road
67	121	560	122.22	T	3	R	Sidco Industrial Estate	3.45	Bituminous Road	Bituminous Access Road
68	121	730	122.39	T	3	L	Sivan Temple Street	4.32	Bituminous Road	Bituminous Access Road
69	121	770	122.43	T	3	R	Marakatti Nagar	3.02	Bituminous Road	Bituminous Access Road
70	121	870	122.54	T	3	R	Parakath Nagar	3.29	Earthen Road	Earthen Access Road

71	122	0	122.67	T	3	L	Tiny Sector	3.31	Bitumi nous Road	Bitumino us Access Road
72	122	210	122.87	T	3	L	Premier Industries	5.59	Earthen Road	Earthen Access Road
73	123	200	123.87	T	3	L	Bell Nagar	4.7	Bitumi nous Road	Bitumino us Access Road
74	123	575	124.22	T	3	L		3.23	Bitumi nous Road	Bitumino us Access Road
75	123	800	124.49	T	3	L	Thirvakudi	5.58	WBM Road	Earthen Access Road
76	124	730	125.42	T	3	L		3.1	Earthen road	Earthen Access Road
77	124	800	125.49	T	3	R	Ayyampatt i Road	3	Bitumi nous Road	Junction with Median Opening
78	125	221	125.88	T	3	R	BHEL quarters	4	Bitumi nous Road	Bitumino us Access Road
79	125	530	126.19	T	3	L	BHEL quarters	4	Bitumi nous Road	Bitumino us Access Road
80	125	640	126.3	Cross Road	4	L & R	BHEL quarters	4	Bitumi nous Road	Bitumino us Access road on Both Sides
81	126	300	127.2	T	3	L		2.1	Bitumi nous Road	Bitumino us Access Road
82	127	295	128.14	T	3	L		4.61	Bitumi nous Road	Bitumino us Access Road

83	127	445	128.3	T	3	L		2.89	Bitumi nous road	Bitumino us Access Road
84	127	610	128.48	T	3	L	Barathy puram	3.09	WBM Road	Earthen Access Road
85	127	700	128.57	T	3	L	Kiranur	3.92	Bitumi nous Road	Bitumino us Access Road
86	127	715	128.58	T	3	R	Ganesha puram	3.95	Bitumi nous Road	Bitumino us Access Road
87	127	750	128.62	T	3	R	Amman Kovil	3.55	Bitumi nous Road	Bitumino us Access Road
88	128	215	128.85	T	3	R	Kaveri nagar	3.1	WBM Road	Earthen Access Road
89	128	285	128.93	T	3	L	Naulpet	4	Bitumi nous Road	Bitumino us Access Road
90	128	295	128.93	T	3	R		3.66	Bitumi nous Road	Bitumino us Access Road
91	128	780	129.47	T	3	R	Kallanai	6.8	Bitumi nous Road	Bitumino us Access Road
92	129	5	129.64	T	3	L		2.31	Bitumi nous Road	Bitumino us Access Road
93	129	35	129.66	T	3	L		1.3	Earthen Road	Earthen Access Road
94	129	60	129.69	T	3	R	IAS Nagar	4.13	Bitumi nous Road	Bitumino us Access Road
95	129	95	129.72	T	3	L		2.91	Bitumi nous Road	Bitumino us Access Road

96	129	155	129.79	T	3	L		2.45	Earthen Road	Earthen Access Road
97	129	175	129.8	T	3	R		2.85	Cement Road	Bitumino us Access Road
98	129	185	129.82	T	3	L		3.59	Bitumi nous Road	Bitumino us Access Road
99	129	260	129.91	T	3	R		3.62	Bitumi nous Road	Bitumino us Access Road
100	129	375	130.03	T	3	L		4.22	Bitumi nous Road	Bitumino us Access Road
101	129	405	130.09	T	3	L		3.04	Bitumi nous Road	Bitumino us Access Road
102	129	685	130.33	T	3	R		3.55	WBM Road	Earthen Access Road
103	129	745	130.39	T	3	R		4.08	Bitumi nous Road	Bitumino us Access Road
104	129	825	130.48	T	3	L		3.03	Bitumi nous Road	Bitumino us Access Road
105	129	870	130.53	T	3	R		2.8	Bitumi nous Road	Bitumino us Access Road
106	129	945	130.61	T	3	R		2.27	WBM Road	Earthen Access Road
107	129	975	130.63	T	3	L		3.51	Earthen Road	Earthen Access Road
108	130	5	130.66	T		R		2.54	WBM Road	Earthen Access Road

109	130	350	131.01	T	3	R	Balaji Nagar	3.62	Earthen Road	Earthen Access Road
110	130	410	131.1	T	3	R	Balaji Nagar	3.6	WBM Road	Earthen Access Road
111	130	420	131.11	T	3	L	Balaji Nagar	3.19	Bitumi nous Road	Bitumino us Access Road
112	130	540	131.24	T	3	R	Ellakudi	3.34	Earthen Road	Earthen Access Road
113	130	550	131.25	T	3	L	Ellakudi	3.26	Earthen Road	Earthen Access Road
114	130	910	131.6	T	3	R		3.54	WBM Road	Earthen Access Road
115	130	920	131.61	T	3	L		3.7	Bitumi nous Road	Bitumino us Access Road
116	131	0	131.69	T	3	R		3.71	Earthen Road	Earthen Access Road
117	131	80	131.77	T	3	L		2.47	WBM Road	Earthen Access Road
118	131	120	131.81	T	3	L		3.62	WBM Road	Earthen Access Road
119	131	150	131.85	T	3	L		3.62	WBM Road	Earthen Access Road
120	131	180	131.88	T	3	L		3.54	Bitumi nous Road	Bitumino us Access Road
121	131	210	131.91	T	3	L		2.7	WBM Road	Earthen Access Road

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122	131	210	131.91	T	3	R		3.59	Bituminous Road	Bituminous Access Road
123	131	365	132.06	T	3	R		3.43	WBM Road	Earthen Access Road
124	131	440	132.14	T	3	L		3.83	Bituminous Road	Bituminous Access Road
125	131	450	132.14	T	3	R		4.12	WBM Road	Earthen Access Road
126	131	610	132.31	T	3	R		4.09	Earthen Road	Earthen Access Road
127	131	700	132.4	T	3	R		3.68	WBM Road	Earthen Access Road
128	131	745	132.44	T	3	R		2.86	WBM Road	Earthen Access Road
129	131	850	132.55	T	3	L	Ellakudi	3.08	Bituminous Road	Bituminous Access Road
130	131	850	132.55	T	3	R	Ellakudi	2.8	Bituminous Road	Bituminous Access Road
131	131	940	132.63	T	3	R		3.11	Bituminous Road	Bituminous Access Road
132	131	970	132.66	T	3	L		3.06	Bituminous Road	Bituminous Access Road
133	131	970	132.66	T	3	R		1.54	Bituminous Road	Bituminous Access Road
134	132	20	132.69	T	3	R		3.55	Bituminous Road	Bituminous Access Road

135	132	110	132.78	T	3	R		3.76	WBM Road	Earthen Access Road
136	132	130	132.8	T	3	L		3.38	Bituminous Road	Bituminous Access Road
137	132	180	132.87	T	3	R		3.14	Bituminous Road	Bituminous Access Road
138	132	220	132.9	T	3	R		3.69	Bituminous Road	Bituminous Access Road
139	132	270	132.95	T	3	R		4.41	Bituminous Road	Bituminous Access Road
140	132	320	132.99	T	3	R		3.97	Bituminous Road	Bituminous Access Road
141	132	330	133.01	T	3	L		2.58	Bituminous Road	Bituminous Access Road
142	132	385	133.06	T	3	R		2.6	WBM Road	Earthen Access Road
143	132	260	133.14	T	3	R		3.38	Bituminous Road	Bituminous Access Road
144	132	335	133.21	T	3	L		3.44	WBM Road	Earthen Access Road
145	132	385	133.36	T	3	R		2.87	WBM Road	Earthen Access Road
146	132	430	133.41	T	3	R		2.89	Bituminous Road	Bituminous Access Road
147	132	470	133.45	T	3			2.48	Bituminous Road	Bituminous Access Road

148	132	480	133.46	T	3	R		3.11	Bituminous Road	Bituminous Access Road
149	132	590	133.57	T	3	L		2.76	Earthen Road	Earthen Access Road
150	132	620	133.6	T	3	L		3.92	Bituminous Road	Bituminous Access Road
151	132	995	133.67	T	3	L		4.78	Bituminous Road	Bituminous Access Road
152	133	70	133.75	T	3	R		3.37	Bituminous Road	Bituminous Access Road
153	133	150	133.83	T	3	L		3.55	Bituminous Road	Bituminous Access Road
154	133	165	133.84	T	3	R		1.26	Bituminous Road	Bituminous Access Road
155	133	260	133.94	T	3	R		1.19	Bituminous Road	Bituminous Access Road
156	133	275	133.95	T	3	L		2.58	Bituminous Road	Bituminous Access Road
157	133	315	134	T	3	L		3.58	Bituminous Road	Bituminous Access Road
158	133	315	134	T	3	R		3.02	Bituminous Road	Bituminous Access Road
159	133	480	134.16	T	3	R		5.21	Bituminous Road	Bituminous Access Road
160	133	565	134.25	T	3	L		3.18	Bituminous Road	Bituminous Access Road

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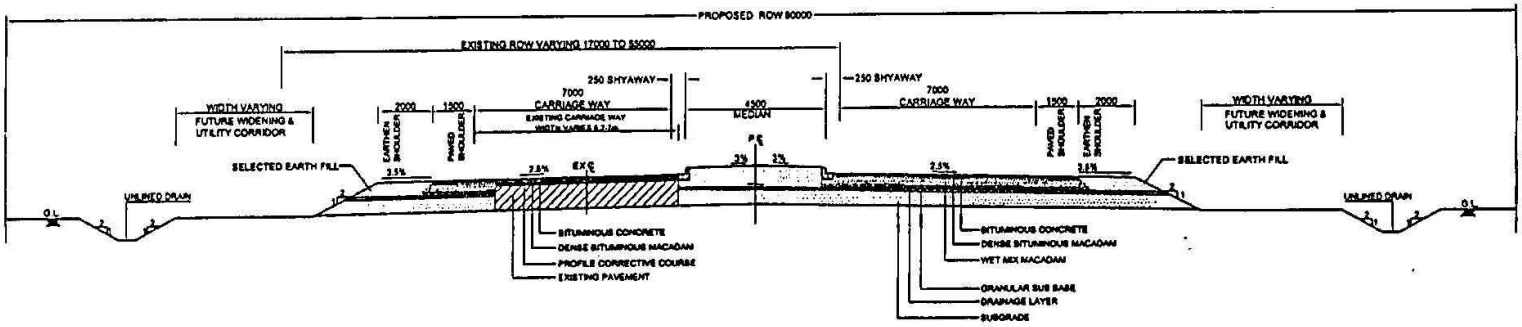
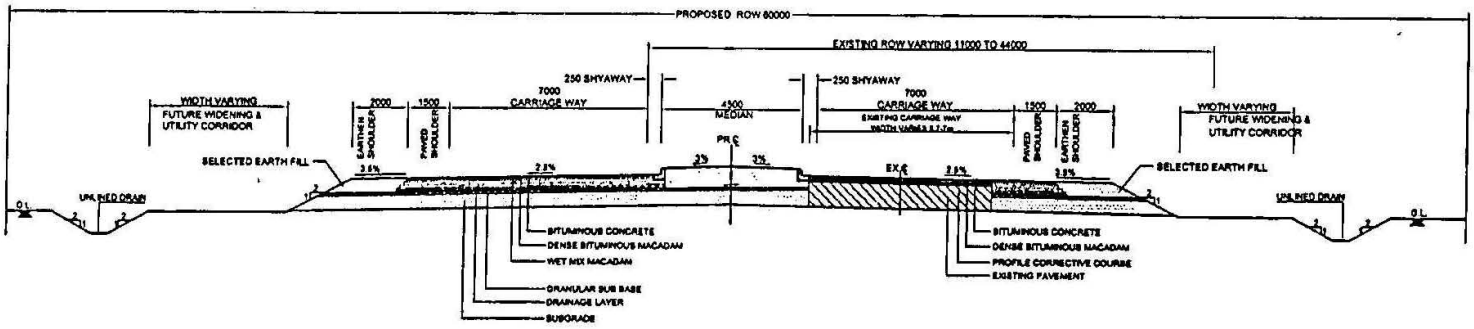
161	133	575	134.3	T	3	R		3.18	Bituminous Road	Bituminous Access Road
162	133	990	134.68	T	3	R	Ariyamangalam	4.12	Bituminous Road	Bituminous Access Road
163	134	60	134.74	T	3	L	Keelakalkandakottai	3.08	Bituminous Road	Bituminous Access Road
164	134	175	134.84	T	3	L		5.85	Bituminous Road	Bituminous Access Road
165	134	225	134.9	T	3	L		3.76	Bituminous Road	Bituminous Access Road
166	134	235	134.92	T	3	L		3.13	Bituminous Road	Bituminous Access Road
167	134	245	134.92	T	3	R	Ariyamangalam	3.02	Bituminous Road	Bituminous Access Road
168	134	345	135.02	T	3	R	Ariyamangalam	2.41	Bituminous Road	Bituminous Access Road
169	134	465	135.14	T	3	L		2.53	Bituminous Road	Bituminous Access Road
170	134	465	135.14	T	3	R		2.3	Bituminous Road	Bituminous Access Road
171	134	500	135.18	T	3	L		3.55	Bituminous Road	Bituminous Access Road
172	134	560	135.24	T	3	R		3.67	Bituminous Road	Bituminous Access Road
173	134	680	135.33	T	3	L		3.69	WBM Road	Earthen Access Road

174	134	680	135.33	T	3	R		1.3	Bituminous Road	Bituminous Access Road
175	134	720	135.37	T	3	R		1.57	Bituminous Road	Bituminous Access Road
176	134	840	135.49	T	3	R		2.44	Bituminous Road	Bituminous Access Road
177	134	860	135.51	T	3	L		3.32	Bituminous Road	Bituminous Access Road
178	134	955	135.68	T	3	R		2.81	Bituminous Road	Bituminous Access Road
179	135	75	135.81	T	3	L		2.22	Bituminous Road	Bituminous Access Road
180	135	100	135.85	T	3	L		2.64	Bituminous Road	Bituminous Access Road
181	135	210	135.96	T	3	R		2.73	Bituminous Road	Bituminous Access Road
182	135	235	135.98	T	3	R		2.91	Bituminous Road	Bituminous Access Road
183	135	390	136.13	T	3	R		1.95	Bituminous Road	Bituminous Access Road
184	135	510	136.26	T	3	R		1.72	Bituminous Road	Bituminous Access Road
185	135	550	136.3	T	3	R		3.48	Bituminous Road	Bituminous Access Road
186	135	610	136.34	T	3	R		2.51	Bituminous Road	Bituminous Access Road



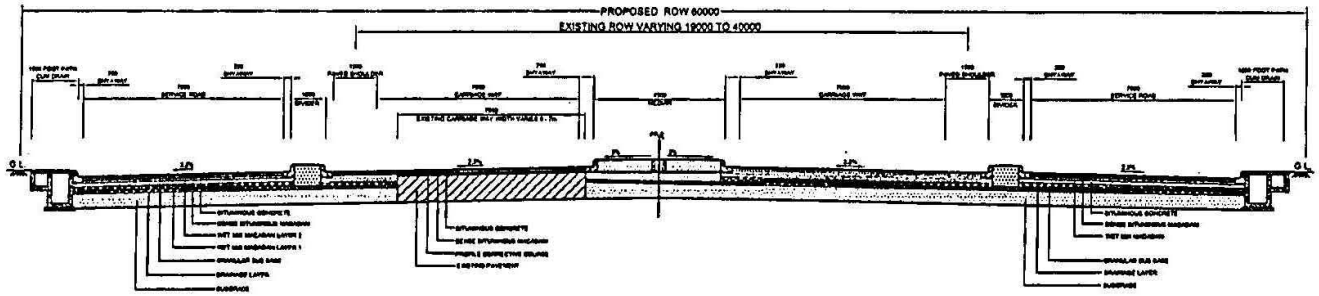
TYPE I . STRENGTHENING AND WIDENNG TO 4 LANE (RIGHT SIDE WIDENING)

Figure B2-1



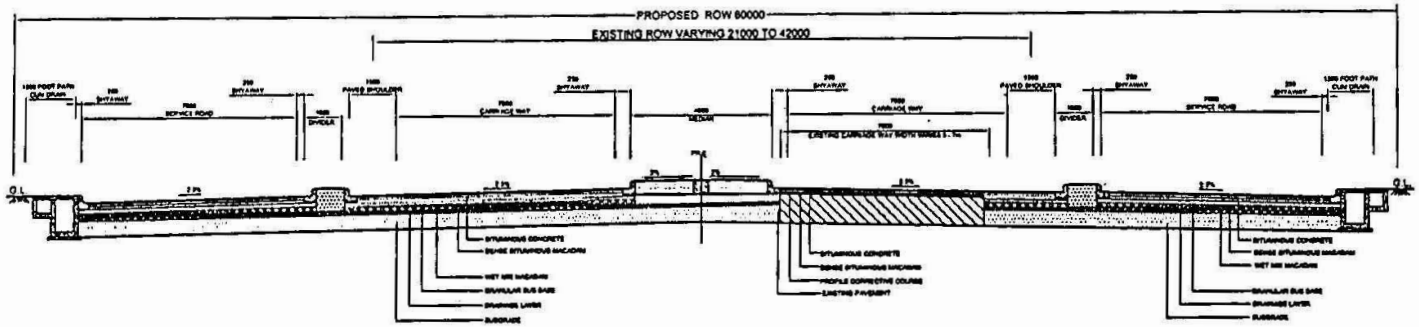
TYPE II . STRENGTHENING AND WIDENNG TO 4 LANE (LEFT SIDE WIDENING)

Figure B2-2



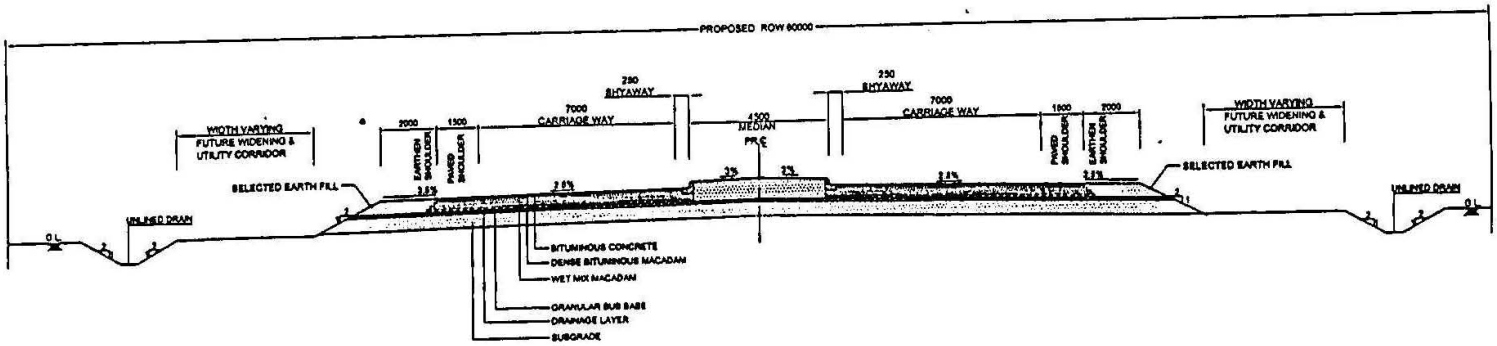
TYPE III. FOUR LANING WITH SERVICE ROADS (RIGHT SIDE WIDENING)

Figure B2-3



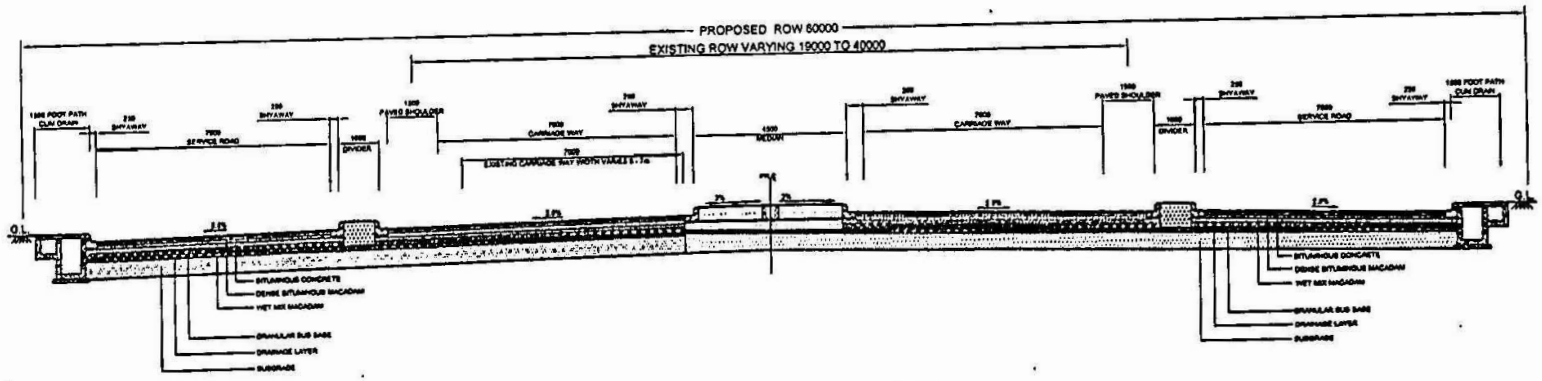
TYPE IV. FOUR LANING WITH SERVICE ROADS (LEFT SIDE WIDENING)

Figure B2-4



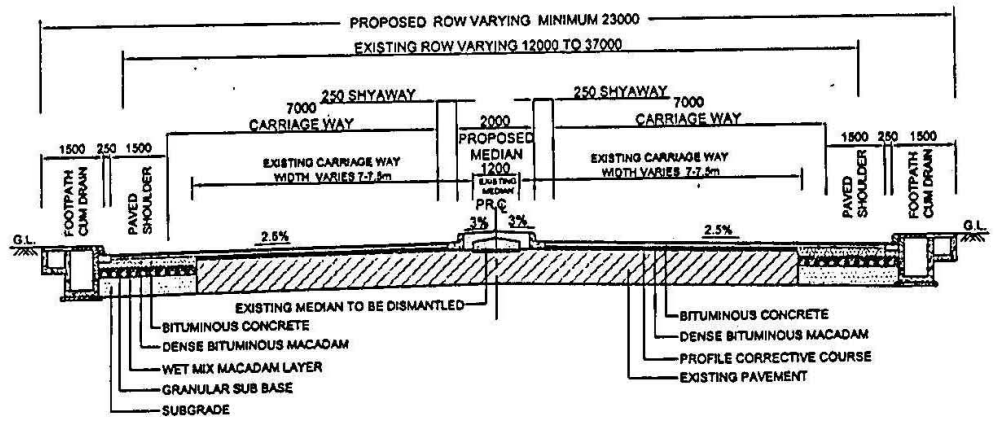
TYPE V. FOUR LANE - NEW CONSTRUCTION

Figure B2-5



TYPE VI. FOUR LANING WITH SERVICE ROADS - NEW CONSTRUCTION

Figure B2-6

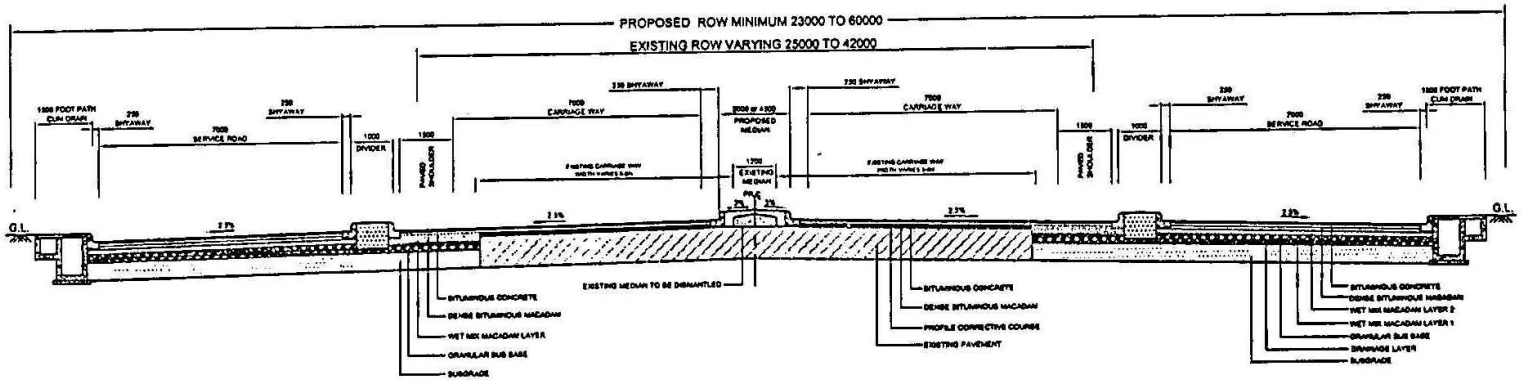


TYPE VII. STRENGTHENING & WIDENING OF EXISTING 4 LANE/ 2 LANE (CONCENTRIC)

*- DRAIN TO BE KEPT AT THE EDGE OF ROW

*- EXTRA WIDTH CAN BE LAID WITH THE SAME CONFIGURATION OF PAVED SHOULDER AND DISCONTINUOUS KERB LIKE SHOULD BE PROVIDED WHEREVER THE PAVED SHOULDER WIDTH EXCEEDS 1.5M

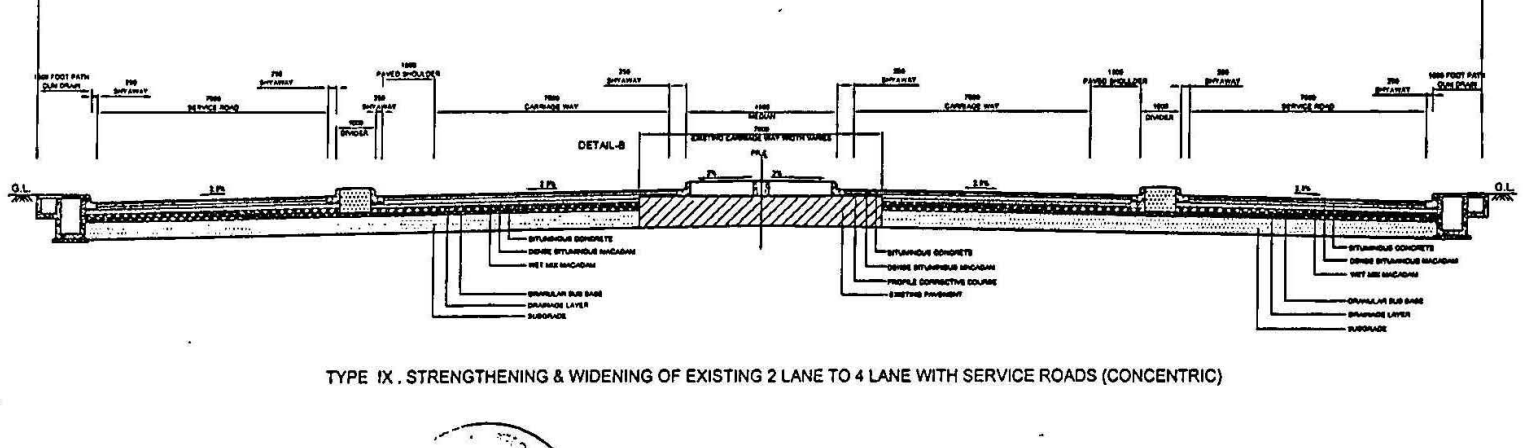
Figure B2-7



TYPE VIII. STRENGTHENING & WIDENING TO FOUR LANE WITH SERVICE ROADS (CONCENTRIC WIDENING)

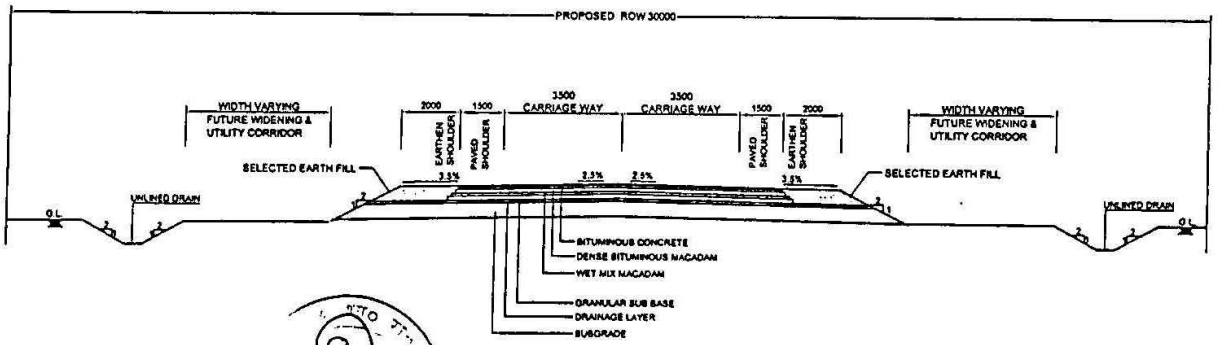
* MINIMUM 60M ROW TO BE ACQUIRED FOR STRETCHES OTHER THAN km 123.000 TO km136.400

Figure B2-8



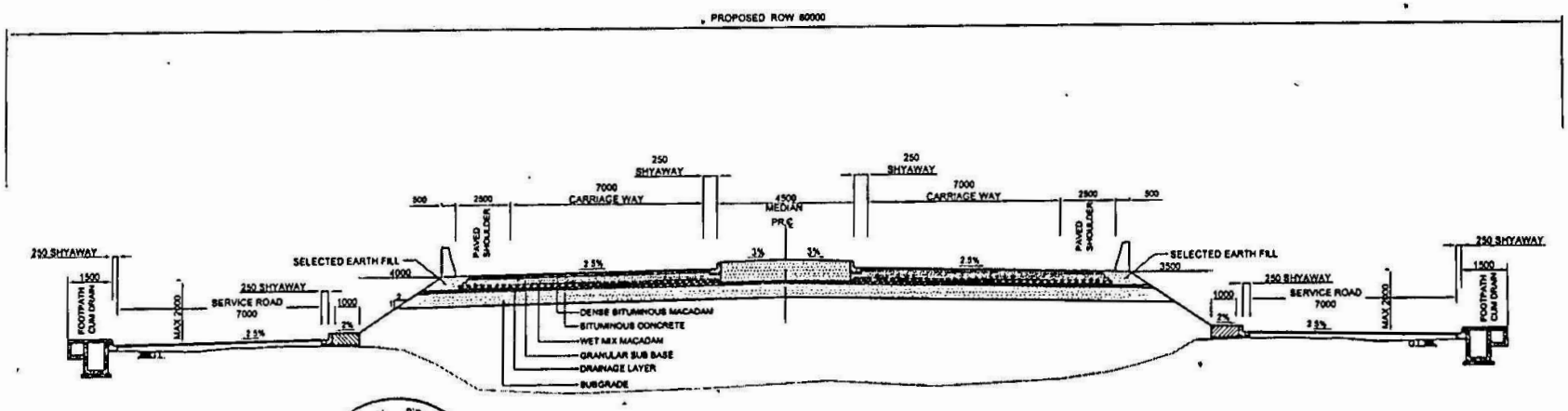
TYPE IX . STRENGTHENING & WIDENING OF EXISTING 2 LANE TO 4 LANE WITH SERVICE ROADS (CONCENTRIC)

Figure B2-9



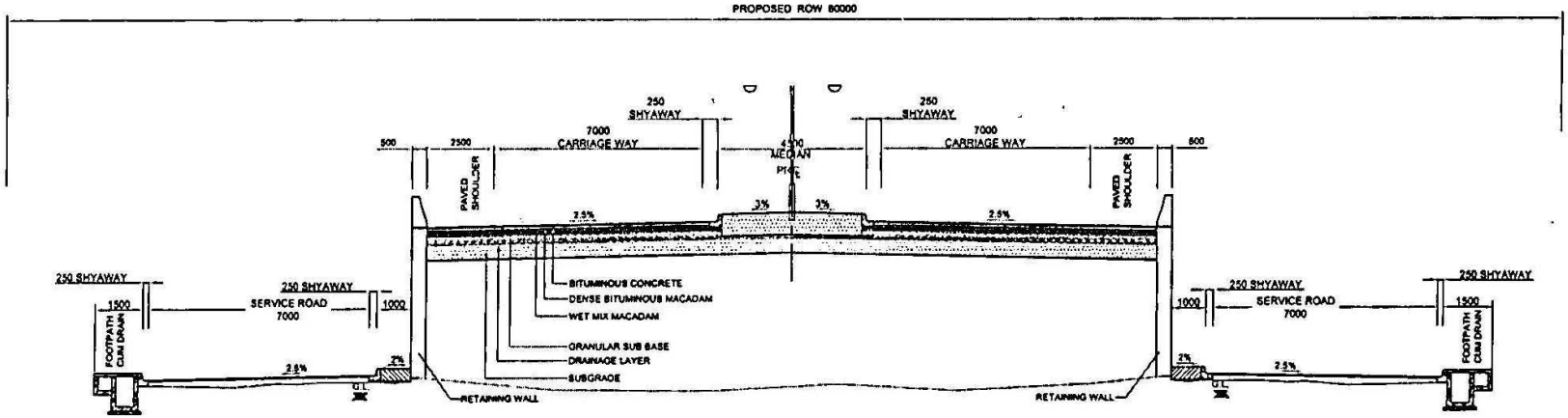
TYPE X. TWO LANE - NEW CONSTRUCTION

Figure B2-10



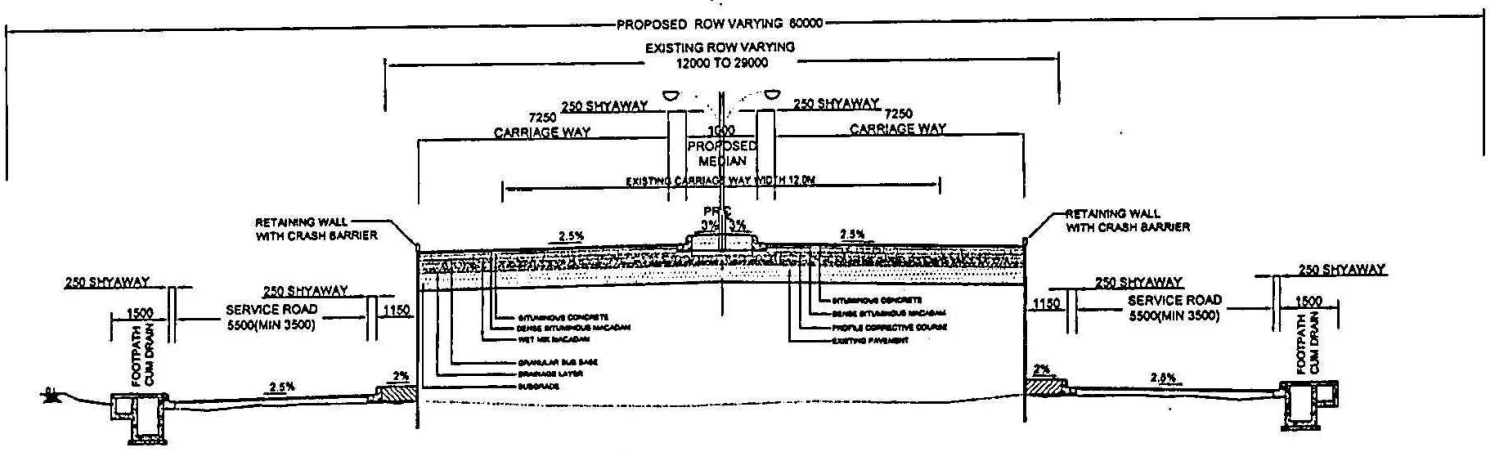
TYPE XI. FOUR LANE WITH SERVICE ROADS - (APPROACHES TO UNDERPASS)

Figure B2-11



TYPE XII, FOUR LANE WITH SERVICE ROADS & RETAINGWALL - (APPROACHES TO UNDERPASS)

Figure B2-12



TYPE XIII, FOUR LANE WITH SERVICE ROADS & RETAINING WALLS- (APPROACHES TO ROB)

Figure B2-13

Schedule - C

PROJECT FACILITIES

1. General

The following sections of this schedule indicate the details of amenities and facilities as situated on site and minimum facilities to be provided on the Project Highway with an aim to cater to the envisaged demand till the end of the concession period.

2. Toll Plaza (1 no.)

In all not more than 1 (one) toll plaza shall be allowed for collecting users fee. The location and layout of this toll plaza shall be finalized in an appropriate location between km 115/000 to km 122/000, in consultation with the Independent Consultant and NHAI.

'Open System' of toll collection shall be provided on the Project Highway with collection of user fee from vehicles only at the toll plaza. There shall be a total of minimum 8 (Eight) lanes having a semi-automatic system of toll collection comprising equipments for registering of vehicle classification, ticket issuing, data processing and power supply. One toll lane in each direction shall be provided for traffic not required to pay user's fee. Appropriate technology for Toll Collection including Electronic Toll Collection (ETC) shall be used so that not more than 6 vehicles/Lane queue up in the peak hours during the entire concession period.

The design for toll plaza shall conform to the standards set out in **Schedule-D** of the Concession Agreement.

3. Bus Bays (24 nos.)

24 bus bays shall be provided as per **Figure C1** conforming to IRC: 80. Adequate drainage arrangements shall be provided at bus bays. Existing location of bus bays is given in **Table C-1**. The new location shall be chosen from **Table C1**. The typical layout of bus bay is given in Fig C1. Concessionaire may modify the location of the bus bays as per requirement in consultation with IC&NHAI.

Table C-1: Bus Bay Locations along Project Highway

Sl No	Name of the Village/Town	Design Chainage (km)	
		LHS	RHS
1	Thanjavur bypass	81+150	81+150
2	Thanjavur bypass	83+150	83+150
3	Thanjavur bypass	88+000	88+000
4	Near Tamil Nadu University	90+500	90+500
5	Cholar nagar	92+000	92+000
6	SASTRA	99+400	99+400
7	Tirumalaisamudram	101+600	101+600
8	Manayeripatti	111+500	111+500

Sl No	Name of the Village/Town	Design Chainage (km)	
9	Samatvapuram	112+650	112+650
10	Pudukudi	114+550	114+550
11	Pudukudi	115+900	115+900
12	Devarayaneri	118+200	118+200
13	Thuvakkudaimalai	122+100	122+100
14	National Institute of Technology, Trichy	123+000	123+000
15	BHELEC	125+000	125+000
16	BHELEC	125+600	125+600
17	BHEL	126+400	126+400
18	BHEL	126+800	126+800
19	Tiruvarambur	128+750	128+750
20	Tiruvarambur	130+300	130+300
21	Kattur	131+900	131+900
22	Kattur	133+100	133+100
23	Ariyamangalam	134+600	134+600
24	Palpannai	136+300	136+300

4. Administrative, Operation and Maintenance Base Camp

A minimum of 300 sqm of covered area for functional base camp shall be provided by the Concessionaire. The base camp shall be located near the toll plaza location. The proposed facilities available at base camp are described hereunder:

a) The main administrative, operation and maintenance base camp shall be provided to cater to the requirements of the following services:

   i) Central Toll Control
   ii) Central Traffic Control
   iii) Highway Maintenance including functional laboratory
   iv) Facilities for storage and repair of maintenance equipments, vehicles and materials
   v) Any other requirement

b) The base camp shall be housed in suitable area. The layout of the different buildings and facilities shall be finalized in consultation with the Independent Consultant.

c) The Administrative building shall primarily house the Main Control Centre, the Security Headquarters, the Central Store, the Toll audit and data processing units in addition to other secondary facilities such as computer room, office space, stores, sanitary facilities, canteen etc. The main base camp shall have adequate parking space for staff and visitors.

d) The maintenance area shall have a centrally located building to overlook the maintenance workshop etc. A separate storage area shall be earmarked for inflammable materials. The maintenance block shall have enough spaces to park the equipments and machinery deployed for maintenance activities. Adequate parking space shall be earmarked for the staff vehicles.

and visitors' vehicles. In addition, there shall be adequate and well-illuminated covered parking space for all the maintenance vehicles.

e) In addition the base camps shall have a power sub-station and supplies room to cater to the power requirements of the camp. The sub-station shall house a standby generator to provide the required power in case of failure of normal power.

f) The camps shall have adequate lighting during dark periods and night.

g) There shall be (preferably) underground fuel storage area with delivery facilities (Petrol/Diesel Filling Station) at the Main Base Camp site to adequately cater to the demands of maintenance and patrolling activities.

h) The base camps shall not have more than one entry and one exit point. Both of these shall be manned by security personnel at all times besides installing effective electronic security system.

i) The camps shall be landscaped so as to protect the area from dust and noise from the Project Highway.

5. Arboriculture & Landscaping

Trees shall be planted in ROW and on either side of the road with staggered pitch as per IRC:SP-21. Indicate arrangements for plantation of trees shall be in accordance with the MORT&H technical Circular No. NH-41 (34) /69. A spacing of 10-15 m c/c is recommended for spacing of trees parallel to the roads. Set back distance of trees needed in different situations shall be as per the IRC:SP-21 and IRC:66 . Shrubs in medians shall not normally exceed 1-1.5 m height and shall be as per IRC: SP-21. The Landscaping shall be carried out as per the extant policy of NHAI as is being done on NHAI's public funded projects.

Plantation scheme shall be prepared in consultation with Forest Department, Government of Tamil Nadu and the Independent Consultant.

6. Road Furniture and Facilities on Roadside

Road furniture on the Project Highway shall be provided in accordance with the standards set in Schedule 'D'.

Roadside facilities such as Litter bins, Pubic Toilets and Drinking water Kiosks shall be provided in accordance with the standards set in Schedule 'D'.

7. Highway lighting

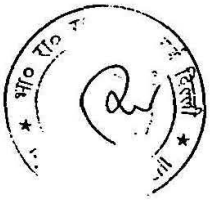
High mast lighting shall be provide by the Concessionaire at the locations of ROBs and Toll Plaza. The locations given below are tentative which could be finalized in Consultation with Independent Consultant / NHAI. IS: 1944 (Part I and II) shall be followed in regard to lighting installations.

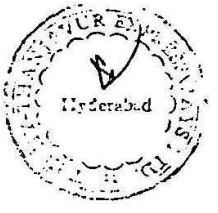
8. Project Vehicle

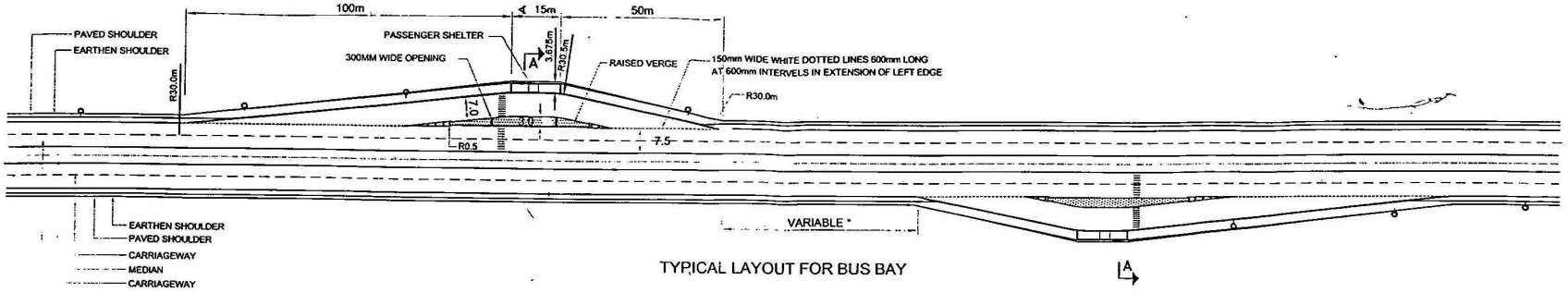
One brand new vehicle (make Mahindra Scorpio/ Toyota Innova or equivalent) shall be provided to the Employer with in 30 days of signing of the Concession Agreement. The cost of running, maintenance, driver's salary, fuel etc, complete shall be borne by the concessionaire. The vehicle shall be required at NHAI (HQ) at Delhi or at site of Project Highway for the use of Project Implementation Unit. The vehicle will run about 4000 km/month including Sundays/Holidays. The vehicles shall be replaced by brand equivalent new vehicles after these have run 150,000 km or 3 years whichever is earlier.

9. Project Laboratory

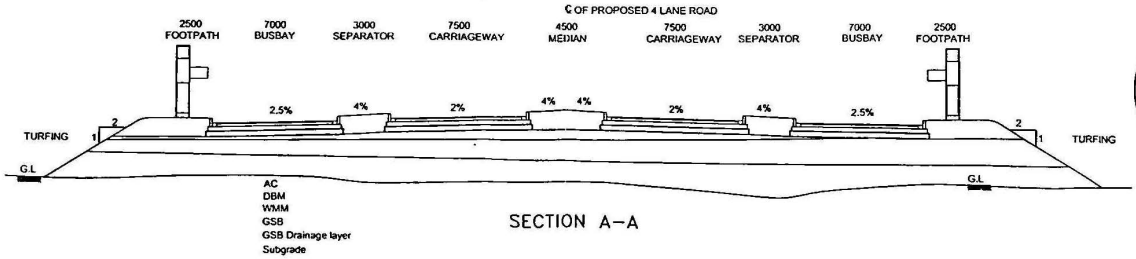
A fully functional material testing laboratory facility shall be provided by the Concessionaire for testing of various materials, mixes and executed works related to road construction and maintenance activities. The trained technicians and helpers, etc shall also be provided by the Concessionaire for the envisaged tests involved on the Project. The laboratory shall be fully equipped and functional including provision of two numbers vehicles attached to it. The cost of running and maintaining the laboratory including running and maintenance of the vehicles attached to the laboratory and driver's salary, fuel etc., complete shall be borne by the Concessionaire.







TYPICAL LAYOUT FOR BUS BAY



SECTION A–A

Fig C1

Client: NATIONAL HIGHWAYS AUTHORITY OF INDIA

Consultant: WILBUR SMITH ASSOCIATES, INC. JV WITH WILBUR SMITH ASSOCIATES PRIVATE LIMITED

Project: FEASIBILITY STUDY AND DPR FOR FOUR / SIX LANING OF NAGAPATNAM - THANJAVUR - TRICHY SECTION OF NH-67 IN THE STATE OF TAMILNADU PACKAGE - NHDP-III/DL4/17

Drawing Title: TYPICAL DETAILS OF BUSBAY

Schedule D

SPECIFICATIONS & STANDARDS

1. General

The Project/Project Facilities under this contract shall conform to the minimum design requirements set out in this Schedule. National Highway Authority of India (NHAI) has Prepared Feasibility Report. The concessionaire shall carryout its own investigation and design.

1.1. Alternate acceptable cross section types given in the Schedule-B if any, shall also be accepted. The finished top level of the road (Formation level) shall not be reduced/lowered than that provided in alignment plan and profile enclosed to Schedule 'B' unless, there are some apparent errors and the Concessionaire is able to demonstrate sound and durable design by lowering the formation levels

1.2. Alternative design for structures i.e. bridges, culverts, underpasses, overpasses and retaining walls can be adopted by the Concessionaire in accordance with Design Requirements subject to review of the same by IC and NHAI.

At least 2 weeks prior to commencement of the design work, the Concessionaire shall finalise a quality assurance plan for the design work and for preparation of working drawings.

2. Codes and Standards

2.1. The codes and standards applicable for the design of the Project and Project Facilities are :

i) Indian Road Congress (IRC) Codes and Standards; and

ii) Ministry of Road Transport and Highways (MORTH) Specifications

Both as applicable to National Highways and shall include policy circulars, guidelines and special publications, issued in respect thereof by IRC or MORTH, as the case may be, from time to time and shall incorporate all amendments and/or modifications to such codes and standards which are available to public 30 days before the Proposal Due Date unless otherwise specified in this Schedule.

The terms 'Ministry of Surface Transport' and 'Ministry of Road Transport and Highways' shall be considered as synonymous to each other.

A list of IRC/MORTH codes is provided in Appendix D-1, any revision of the codes given therein 30 days prior to date of submission shall be made applicable.

2.2. Where the aforesaid codes, standards and specifications are silent on any aspect, the following standards in order of preference shall be adopted in consultation with the IC, unless otherwise specified in this Schedule :

a). Bureau of Indian Standards (BIS)

b). American Association of State Highway and Transport officials (AASHTO)

c). Geometric Design Standards for Ontario Highways

d). American Society of Testing Materials (ASTM)

e). British Standards (BS)

N.H.A.I., NEW DELHI

f). Suitable specification/standard devised by the IC

g). Any other standard proposed by the Concessionaire

2.3. All items of building works shall conform to Central Public Works Department (CPWD) specifications for Class 1 building works and standards given in the National Building Code (NBC). To the extent specific provisions for building works are provided in IRC/MORTH specifications, the same shall prevail over the CPWD/NBC provisions. For this purpose, building works shall be deemed to include road furniture, roadside facilities, landscape elements and/or any other works incidental to the building works.

2.4. The Geometric Design Standards for the Project/Project Facilities shall be as per IRC: 73 code as applicable to the National Highways; the important geometric design requirements are appended as Appendix D-2. Where IRC Standards are silent Geometric Design Standards for Ontario Highways shall be adopted. These should be adhered to and the geometric design standards are the minimum requirements to be maintained for the Project Highway..

2.5. The designed parameters for horizontal and vertical alignments shown in the alignment plan and profile are the minimum requirements to be maintained for the Project Highway The concessionaire may adopt better standards enhancing the requirements of safety and mobility .

3. Materials and Specification

3.1. All materials and specifications shall be consistent with IRC/MORTH specifications. Where these are silent, the standards in the same order of preference as in Clause 2.2 shall be used.

3.2. For items other than road and bridge works, where tailor made specifications are not available in the PR, the same shall be finalised in consultation with the Independent Consultant.

3.3. Preparation of schemes for highway development, restriction on building lines, control lines, control of access, prevention of unauthorised occupation of land and removal of encroachment shall be as per IRC: SP: 15.

3.4. Modified Bitumen conforming to the requirement set forth in IRC-SP:53 shall be used bituminous surfacing layers on main carriageway including shoulders and service road.

3.5. Flyash shall be used as fill material in embankment, if available within the radius of 100 km from the project road, in accordance with IRC:SP:58 – 2001 and NHAI Circular No. 11013/1/2000/GM(Env.)/549 dated 13.02.2004 appended at Appendix D-3.

4. Embankment Design

4.1. Cut and fill slopes shall be appropriate to the nature of the material and the height of embankment or depth of cut. The slopes shall be safe against failure.

4.2. Material used in the fill and its compaction requirements shall conform to IRC-36. Where these specifications are in variance with the MoRT&H specifications the latter shall govern and be followed.

5. Pavement Design

5.1. Pavement Design shall be based on the following parameters :

a) Traffic Forecast

b) Design Life : I) Flexible Pavement 15 years
II)Rigid Pavement 30 years

c). Flexible Pavement

i) New Carriageway

The flexible pavement for new carriageway (main as well as service roads) shall be designed as per the IRC method or the AASHTO method or any other international method. The composition and thickness of various layers of pavement shall not be less than those required as per IRC:37 for minimum design traffic of 50 MSA for main carriageway and 10 MSA for service roads. For the main carriageway, the concessionaire should however satisfy himself in this regard and should consider higher traffic (than minimum specified 50 MSA) for design purposes in case required as per projected traffic considering 15 year design life.

To ensure internal drainage of the pavement structure, the granular sub-base layer/filter layer functioning as drainage layer (GSB/WMM) shall extend to full width across the shoulders on the embankment to the side drain. The finished pavement profile for the total project length shall be designed so that the bottom level of the subgrade always remains above the Highest Flood Level (HFL) and in any case shall not be lower than as given in the alignment plan and profile. Modified bituminous binder conforming to IRC-SP:53 should be used in the wearing course.

ii. Strengthening of the existing carriageway :

Strengthening of the existing flexible pavement shall be done with a bituminous overlay designed in accordance with IRC:81 or procedures specified by the Asphalt Institute, USA or any other international method for minimum design traffic of 50 MSA. Requirement of strengthening of existing pavement as assessed by the design consultants are given in project report. The Concessionaire may adopt alternate methods of strengthening the pavement. However, the following minimum requirements of profile, both longitudinal and cross shall have to be achieved and provided.

Cross profile :	Camber of 2.5% minimum super elevation as per geometric design.
Longitudinal profile :	Vertical curves as per geometric design Straight length between two curves - minimum 30 m

Over the profile corrective course as per requirement, a minimum of 50 mm dense bituminous macadam and 50 mm thick bituminous concrete layer shall be provided.

iii. Paved shoulders:

The composition of Pavement Layers of the paved shoulders shall not be lower than the adjacent flexible pavement of the mainline project highway.

d). Rigid Pavement

i). Rigid pavement may be designed as per IRC, AASHTO or any other international code/ specification considering 30 year design life.

ii). To ensure internal drainage of the pavement structure, the granular sub-base layer/filter layer functioning as drainage layer (GSB/WMM) shall extend to full width across the shoulders on the embankment to the side drain. The finished pavement profile for the total project length shall be designed so that the bottom level of the sub grade always remains above the Highest Flood Level (HFL) and in any case shall not be lower than as defined in the PR.

iii). Paved shoulders :

The paved shoulders adjoining the rigid pavement may be either rigid or flexible. In case of shoulders of rigid pavement, composition of the paved shoulders shall not be lower than the adjacent main pavement. In case of shoulders of flexible pavement, the composition shall not be lower than those required for main carriageway.

6. Drainage System

6.1. An effective surface and sub-surface drainage system of pavement structure shall be designed as stipulated in IRC SP : 42.

6.2. An effective drainage system shall also be planned and designed for the drainage of medians, interchanges, intersections/junctions, underpasses, service roads, toll plazas, Wayside Amenities – Service Area, Truck Lay-bye areas, Bus Bays and other highway features including the area between main carriageway and service road ensuring that there shall be no pooling of water at any time on the project highway.

6.3. Storm water should be directed away from the bridge deck by providing kerb and gutter on the approaches for a minimum distance of 50 m beyond the bridge and carried by a chute to the roadside channel in order to avoid embankment erosion.

6.4. In rural stretches of the Project Highway, roadside channels (flat bottomed) shall intercept and remove surface run-off from the highway ROW and the adjacent areas and will be drained to the nearest available natural watercourse. These shall have adequate capacity for the design run-off and be located and shaped to avoid creating traffic hazard and erosion of soil.

6.5. Concrete lined / masonry drains under footpath in urban stretches where service roads have been provided, shall be located on both side of the Project Highway. The capacity of these drains shall be sufficient to carry surface run-off of drainage area of highway ROW.

6.6. Drainage channels and pipe shall be installed at crossings with service pipes and utilities ensuring that conflicts do not occur.

6.7. Drainage of highway pavements on a highway embankment and steep grade will require designed outlet by means of kerb and gutter and concrete chutes / spillways along the side slope of the embankment in order to prevent its erosion.

7. Structures : Culverts, Bridges, Underpasses, ROB's and retaining walls

The design standards and loading to be considered for culverts, bridges underpasses, overpasses and retaining walls shall be those laid down in the relevant IRC codes. Railways specifications shall be followed for ROB's if desired by Railways. Where the said codes are found wanting or silent, other codes in the same order of preference as in Clause 2.2 shall be used.

7.1. All new major structures shall be 4-lane. Any existing bridge including the ROB or culvert found to be structurally unsafe and/or deficient to carry the IRC design load (based on non-destructive testing including full scale load testing) shall be replaced or rehabilitated.

7.2. Special Design Requirements

a). NP4 type pipes shall be used for all pipe culverts that are required for reconstruction. In case of existing culverts of dia. 90cm and above and which are in sound condition functioning satisfactorily, be extended using NP4 class pipes of existing diameter. For all pipe culverts having pipe dia. less than 90 cm, these shall be replaced by pipes of 1.20 m dia. (NP4 class) under both the carriageways and/or extension of pipe culverts. Where minimum depth of pipe cover is not available, profile of the highway may be raised or the culverts embedded in concrete in consultation with and approved by the Independent Consultant. Minimum diameter of pipes for new/ reconstruction cross drainage structures shall be 1.2m.

b). Where an existing structure or culvert is twinned, the profiles of the new and existing structures and their approaches shall be same. Also suitable protection of the embankment between the structures in the median portion shall be provided either by extending the abutment wall or by providing a retaining wall extending up to the bridge parapet wall.

c). Bridge superstructure may be of Reinforced concrete, prestressed concrete or steel-concrete composite construction. Similarly, the substructure and foundations may also be concrete, steel or steel-concrete composite construction.

d). Bearings of all bridges shall be easily accessible for inspection and maintenance.

e). Existing expansion joints should be working at all times and shall be timely replaced without causing additional stresses for the structure.

f). The box girder superstructure's minimum clear depth inside the box shall be 1.75 m with suitable opening in the end cross girder for inspection within the box in the entire length. Structures with less number of joints shall be preferred.

g). Reinforced Earth / R.C.C. Retaining Wall type shall be library provided through urban areas for high fill/embankment with aesthetically pleasing appearance. Design life of reinforcing elements for earth retaining structures shall be 100 years minimum. Structure with viaduct shall be provided in urban sections for ensuring unhindered local cross movement of people and slow moving vehicular traffic besides providing easy access for them to come on project highway.

8. At-Grade Intersections

8.1. At-Grade Intersections shall be designed according to the IRC Special Publication 41 `Guidelines for the Design of At-Grade Intersections in Rural and Urban Areas' and the MoRT&H Type Designs for Intersections on National Highways, with modifications where required.

8.2. For the design of elements not covered in the said publications the AASHTO publication `A Policy on the Geometric Design of Highway and Streets' shall be followed.

9. Interchanges

9.1. Geometric design standards for elements of interchanges are given in **Appendix D-2**

9.2. For interchange elements where Geometric design standards are not covered in the said Appendix D-2, design Guidelines IRC-92 supplemented by relevant MoRT&H and the AASHTO publication `A Policy on the Geometric Design of Highway and Streets' shall be used.

10. Illumination

10.1. The average level of illumination at the location of major intersection/ junctions, toll plazas, wayside amenities-service areas, Truck Lay-bys shall be 20 lux with suitable high mast poles approved by Independent Consultant/NHAI.

10.2. The layout of the lighting system together with type of luminaries for different locations shall be determined in consultation with the Independent Consultant.

10.3. Arrangement of lighting installations shall be staggered except on curves.

10.4. The layout of lighting poles, their height and spacing shall be finalized in consultation with the Independent Consultant so that the minimum illumination level prescribed in the aforesaid clauses above can be achieved;

10.5. Overhead electrical power and telecommunication lines erected within the ROW by the Concessionaire shall be provided with adequate clearance so that safe use of the highway is not affected.

10.6. The following codes shall be followed while designing the lighting system on the Project Highway:

i) IS: 1944 (Parts 1 and 11) - 1970

ii) IS: 1944 (Part V) - 1981; and

iii) IS: 1944 (Part VI - 1981)

10.7 Vertical and horizontal clearances shall conform to IRC: 32(1969).

11. Highway Signs

11.1. All road signs shall be with retro-reflective sheet of high intensity grade conforming to Clause 801.3.2 of MoRT&H specifications. The retro reflective sheet with engineering grade shall NOT be used.

11.2. The road signs erected on the Project Highway shall conform to IRC : 67, Code of Practice for Road Signs.

11.3. For overhead signs the standards prescribed by MoRT&H shall be followed. Where these are silent, standards prescribed in the same order of preference as in Clause 2.2 shall be used.

11.4. The overhead signs shall be placed on a structurally sound gantry or cantilever structure made of tubular structure or steel structure. The final location shall be finalized in consultation with the Independent Consultant. These signs shall be of high intensity retro reflective sheeting conforming to Clause 801.3.2 of MoRT&H specifications. The height, lateral clearance and installation of the sign structures shall be as per the MoRT&H / IRC specifications;

11.5. On kerbed road sections the edges of the road signs shall be at least 600 mm away from the edge of the kerb, whereas on un-kerbed road sections the edge of the signs shall be at a distance of 2.5 m from the edge of the carriageway;

11.6. Design and location of route marker signs for National Highways shall be as per the IRC:2(1968). The design and placement of highway kilometre stones, the dimensions of stones, size, colour, arrangement of letter shall be as per IRC : 26(1967) and IRC : 8(180). The design, location and materials to be used for road delineators shall be as per IRC : 79(1981), the colour, configuration, size and location of size of traffic signs shall be as per IRC : 67(2001);

11.7. Road Delineators shall conform to the recommended practice as per IRC 79(1981)

12. Road Markings

12.1. Road markings shall be as per IRC:35. These markings shall be applied to road centre lines, edge lines, continuity line, stop lines, give-way lines, diagonal / chevron markings, zebra crossing and at parking areas by means of an approved self-propelled machine which has a satisfactory cut-off value capable of applying broken lines automatically;

12.2. Road markings shall be of hot applied thermoplastic materials with glass reflectorising beads as per relevant clauses of section 803 of MoRT&H specifications;

12.3. Synthetic enamel paints shall be used to display details of structure number, span arrangement etc on all culverts and bridges with required description as per MoRT&H guidelines.

13. Traffic Safety Measures

13.1. Pedestrian Guard Rail shall be designed to control and guide pedestrian road crossing movement safely at designated location.

13.2. Concrete Crash Barriers and/or Steel Beam Guardrails shall be installed mainly at major hazard locations. Concrete / steel Crash Barrier shall be provided at the outer edge of both the shoulders of the road. It will also generally be installed on sections of the road (a) where embankment height is more than 3 m, (b) bridge approaches, and (c) where the Project Road passes through large ponds. Concrete Crash Barriers shall be installed along the edge of the outside shoulder with an offset of 2.5m from the edge of the driving pavement.

13.3. Both Concrete Crash Barriers and/or Steel Beam Guardrails (W-shaped) installation shall have short transition flared section at the approach ends.

13.4. Metallic crash barriers shall be provided along the full length of the ramps (both sides) of Interchanges and at important At-Grade Intersections.

13.5. Highway Patrolling

The Concessionaire is required to provide round the clock route patrols to assist motorists. The patrol personnel should be adequately trained to the satisfaction of the Independent Consultant in traffic management, road safety and in primary First Aid. The purpose of these patrols is to:

i) Provide the users of the Project Highway with basic mechanical help for vehicles that break down on the National Highway Section, and protect other motorists from such vehicles

ii) Immediately identify traffic hazards of whatever nature, such as unauthorised parking,public transport vehicles obstructing traffic during passenger loading and unloading, debris, stray animals and the like. The Concessionaire shall take the necessary measures to remove such obstructions.

iii) Provide emergency management at accident scenes until such time as the appropriate authorities arrive,

iv) Assist the motorist , for the removal of damaged or mechanically impaired vehicles from the Project Highway,

v) Provide road user information and to further the image of the National Highway Section in a professional and friendly manner.

vi) Maintain daily records of assistance provided to motorists

vii) Observe, record and report suspect aspects of the highway, hazards and incidental damage caused by vehicles, floods, storms, or other random events, such that the highway maintenance records and data base are continuously improved.

13.6. Patrol vehicles

The Concessionaire will provide 4x4 drive Patrol vehicles as stipulated in the Contract. Each vehicle shall accommodate a minimum 3 persons including the driver. The Concessionaire will also make arrangements for standby vehicles.

13.7. Ambulances

The Concessionaire will provide ambulances having all facilities of emergency assistance required like stretcher to carry the patient, Emergency Medicines, oxygen etc.

13.8. Cranes

The Concessionaire will provide cranes of 15 MT capacity having all requisite arrangements of pulling and lifting of accidental/break down vehicles. Table D-1 presents the serviceability indicators, required maintenance level that shall be followed by Concessionaire as part of highway patrolling.

13.9. Traffic Blinker Signal with Liquid Electromagnetic Display (LED)

The road traffic signals, its configuration, size, location and other requirements shall be as per IRC: 93 - 1985 and IS: 7537 - 1974.

Blinker Signal shall be provided at all intersections with SH/MDR/ODR category roads in rural areas with non-conventional energy sources like solar energy. The general Specifications mentioned in DPR shall be followed for this purpose.

13.10. Road Studs

Nineteen degree (19°) tilted one-way reflective road studs with anchor and with 1x43 glass elements etc. complete shall be provided at 1 m c/c on pedestrian crossing with red reflective panel as per EN 1463 and BS873 part IV (1987). Road

studs shall also be provided at 9 m c/c on edge lanes, lane lines for a length of at least 130 m on the approaching side of the intersection with white reflective panels as per BS873 part IV (1987) replaced partly with BS EN 1463-1: 1998.

14. Landscaping

14.1. Planting along the highway shall follow a variety of schemes depending upon location requirement as per the IRC: SP21. The choice of trees to be planted shall also be made as per IRC: SP21 : "Manual of Landscaping". Eucalyptus (all species) is not recommended for planting. Local, indigenous species that grow in that area shall be planted.

14.2. On medians and island, planting of dust and gaseous substance-absorbing shrubs are recommended. To ensure survival from herbivorous animals, shrubs / plants containing latex shall only be planted.

14.3. The treatment of the highway embankment slopes shall be as per the recommendations of IRC:56, depending upon the soil type involved. Pitching works on the slopes shall be as per the MoRT&H Specifications.

14.4. No advertisement / hoarding shall be allowed within the ROW limits of the Project Highway.

14.5. Visibility of any signs, signals or any other devices erected for traffic control, traffic guidance and / or information shall not be obstructed by plantation.

15. Ancillary Facilities

15.1. Wayside Amenities – Service Area

a. Wayside Amenity – Service Area design details shall be as per project report.

b. All building works shall be designed to meet their functional requirements and shall be compatible with the regional architecture and microclimate. Locally available materials shall be given preference but not at the cost of quality. All brick and stone masonry works shall be of first class type and as per good practice. All steel works shall conform to section 6., Part VI of the NBC and section 1900 of MoRT&H specifications.

c. All the open spaces around the building(s) shall be landscaped. Boundary walls, fencing with barbed wires, controlled entry points and cattle-catches at all entry and exist points to the buildings shall be provided to protect them from intruders and animals.

d. The design of water storage (including overhead reservoir) and distribution systems, laying of mains and pipes, cleaning and disinfecting of water supply system shall be as per relevant clauses of section 1 Part IX of the NBC.

e. The design, layout and construction of sanitary sewer and sewage disposal system with all ancillary works such as connections, manholes and inspection chambers and septic tanks shall be as per relevant clauses of Section 2, Part IX of the NBC. Each septic tank shall have a soak pit of adequate size. The location of the septic tanks and subsurface absorption system shall be as per clause 12.15.1 of part III of NBC.

f. The design and location of all electrical installations, distribution system, wiring, fittings, accessories and lighting protection of buildings shall conform to the relevant clauses of Section 2, Part VIII of the NBC;

g. The internal road system have the same material specifications as that of the mainline road and width shall conform to Clause 4 of part III of NBC;

15.2. Truck Lay-by

a). The layout and facilities thereon will be designed considering site requirement so as to cater to the estimated parking demand. Layout or design shall be reviewed and accepted by the Independent Consultant. Parking shall be parallel to the road any the lay-bys shall be setback from the edge of the carriageway. The Lay-bys shall be landscaped with low-density plantation to provide shade.

b). The parking spaces shall have the similar specification as that of the main carriageway or be so paved by pre cast Cement Concrete Block M-40 grade concrete to withstand vehicle loads and forces due to frequent acceleration and deceleration of vehicles. Parking bay/lots shall have proper cross slope and drainage. They shall be marked with paints as per IRC : 35 to demarcate parking and circulation spaces. Illumination shall be provided as per IS : 1944, Park I and II).

c). The parking lay-bys shall have basic facilities, such as, drinking water kiosk, and toilet, proper waste disposal system, electricity, water etc as described elsewhere in this Schedule.

15.3. Bus Bays

Bus Bays shall be provided at location as shown in Schedule B. The typical design shall be followed for all locations. Generally, the bus bays shall provide safe entry and exit of buses from Project Highway and safe boarding and alighting of passengers. The shelter structure shall be structurally safe and functional so as to protect the waiting passengers adequately from sun, rain and wind. The Bus Bay area shall be provided with an effective drainage system.

15.4. Road Furniture

Road furniture such as traffic signs, kilometre posts, hectometre stones, ROW pillar etc on the Project Highway provided as per IRC Codes shall meet requirements of MoRT&H specifications, other codes in the same order of preference as in Clause 2.2 shall be used.

15.5. Roadside Facilities

15.5.1. Litter Bin

The litterbins shall be located at no more than 100 m intervals in the rest area and the truck parking lay-byes. The bus stops shall be provided with at least one litterbin. It shall be simple in shape and its colour and finish shall be conspicuous. Litterbin shall be post mounted and/or swivel type. The mounting and fixing components shall be robust. The bin shall have drainage holes for periodic flushing. It shall also be theft, vandal and fireproof. It shall be resistant to wear and tear and the material and design shall be such as to require minimal maintenance. The capacity shall be minimum 30 litres.

15.5.2. Public Toilets

Separate Public Toilets for men and ladies shall be located in Truck Lay-bys. The capacity of toilets shall be for minimum 25 users. Toilets shall be provided with septic tank and soak pit. "Sulabh Souchalaya" type toilet is also acceptable. Generally, the Public Toilets shall be simple in design and the area around the toilet block shall be paved with cement concrete tiles or any other suitable material and have cross slope so as to ensure speedy disposal of water.

15.5.3. Drinking Water Kiosk

Piped water supply shall be provided to the Wayside Amenity – Service Area. Tube wells shall be provided in Truck Lay-bys. The design of the water kiosk shall be such as to require minimal maintenance. Area around the kiosk shall be paved with cement concrete tiles or any other suitable material and sloped away so as to ensure speed disposal of water. The water supplied shall conform to IS: 1050 for quality of potable water. The location of Drinking Water Kiosk shall be finalized in consultation with the Independent Consultant.

15.6. TOLL PLAZAS

'Open System' of toll collection shall be provided on the Project Highway with collection of user fee from vehicles only at the toll plaza. There shall be a total of minimum 8 (Eight) lanes having a semi-automatic system of toll collection comprising equipments for registering of vehicle classification, ticket issuing, data processing and power supply. One toll lane in each direction shall be provided for traffic not required to pay fees. Appropriate technology shall be used in this regard so that not more than 6 vehicles/Lane queue up during the peak hours

The conceptual design for Toll plaza is shown herewith as Fig. D-1 after which needs to be suitable modified for the required member of lanes to be provided so that during peak traffic hours, not more than 6 vehicles per lane should queue up at any time during the concession period. The pavement type to be provided at the location of each Toll Plaza must be of 'RIGID' type including the flares on either side up to the distance where joint with bituminous pavement having normal cross-section is formed.

15.7. Utility Ducts

Two (2) Numbers of Utility ducts shall be provided at an interval of 500m in urban sections and 2000m in rural sections for cross connection. These ducts shall be made of NP4 pipes of minimum 300mm diameter and shall be provided below the ground level. The above mentioned size of the pipe is bare minimum. It shall be increased if necessary in consultation with respective service departments and Independent Consultant. Location and level of the cross utility ducts shall be finalized in consultation with the Independent Consultant and NHAI.

APPENDIX-D1

List of IRC Codes / Standards / Acts for Road/Bridge Works

IRC:	2 -1968	Route Marker Signs for National Highways (First Revision)
IRC:	3 -1983	Dimensions and weight of Road Design vehicles. (First Revision)
IRC:	5 -1998	Standard Specification & Code of Practice for Road Bridges, Section I – General Features of Design (7th Revision)
IRC:	6 -2000	Standard Specifications & Code of Practice for Road Bridges, Section II – Loads and Stresses (Fourth Revision)
IRC:	7 -1971	Recommended Practice for Numbering Bridges and Culverts (First Revision)
IRC:	8 -1980	Type Designs for Highway Kilometre Stones (Second Revision)
IRC:	9 -1972	Traffic Census on non urban roads (First Revision)
IRC:	10 -1961	Recommended Practice for Borrowpits for Road Embankments Constructed by Manual Operation
IRC:	11 -1962	Recommended practice for the design and layout of cycle tracks
IRC:	12 -1983	Recommended Practice for Location and Layout of Roadside Motor-Fuel Filling and Layout of Roadside Motor-Fuel Filling and Motor-Fuel Filling-cum-Service Stations (Second Revision)
IRC:	14 -1977	Recommended Practice for 2cm Thick Bitumen and Tar Carpets (Second Revision)
IRC:	15 -2002	Standard Specifications & Code of Practice for Construction of Concrete Roads (Third Revision)
IRC:	16 -1989	Specification for Priming of Base Course with Bituminous Primers (First Revision)
IRC:	17 -1965	Tentative Specification for Single Coat Bituminous Surface Dressing
IRC:	18 -2000	Design Criteria for Prestressed Concrete Road Bridges (Post-Tensioned Concrete) (Third Revision)
IRC:	19 -1977	Standard Specification and Code of Practice for Water Bound Macadam(Second Revision)
IRC:	20 -1966	Recommended Practice for Bituminous Penetration Macadam (Full Grout)
IRC:	21 -2000	Standard Specifications and Code of Practice for Road Bridges. Section-III Cement Concrete (Plain and reinforced) (Third revision)
IRC:	22 -1986	Standard Specifications and Code of Practice for Road Bridges. Section-VI Composite Construction (First Revision).
IRC:	23 -1966	Tentative Specification for Two Coat Bituminous Surface Dressing
IRC:	24 -2001	Standard Specifications and Code of Practice for Road Bridges. Section-V Steel Road Bridges (First Revision)

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List of IRC Codes / Standards / Acts for Road/Bridge Works

IRC:	25 -1967	Type Designs for Boundary Stones
IRC:	26 -1967	Type Design for 200-Metre Stones
IRC:	27 -1967	Tentative Specifications for Bituminous Macadam (Base & Binder Course)
IRC:	28 -1967	Tentative specification for the construction of stabilised soil roads with soft aggregates uin areas of moderate and high rainfall.
IRC:	29 -1988	Specification for Bituminous Concrete (Asphaltic Concrete) for Road Pavement (First Revision)
IRC:	30 -1968	Standard Letters and Numerals of Different Heights for Use on Highway Signs
IRC:	31 -1969	Route Marker Signs for State routes.
IRC:	32 -1969	Standard for Vertical and Horizontal Clearances of Overhead Electric Power and Telecommunication Lines as Related to Roads
IRC:	33 -1969	Standard procedure for evaluation and condition surveys of stabilised soil roads.
IRC:	34 -1970	Recommendations for road construction in waterlogged area.
IRC:	35 -1997	Code of Practice for Road Markings (with Paints) (First Revision)
IRC:	36 -1970	Recommended Practice for Construction of Earth Embankments for Road Works
IRC:	37 -2001	Guidelines for the Design of Flexible Pavements (Second Revision)
IRC:	38 -1988	Guidelines for Design of Horizontal Curves for Highways and Design Tables (First Revision)
IRC:	39 -1986	Standards for Road - Rail level crossings (First Revision)
IRC:	40 -2002	Standard Specifications and Code of Practice for Road Bridges, Section IV - Brick, Stone and Block Masonry (Second Revision)
IRC:	41 -1997	Type designs for check barriers (First Revision)
IRC:	42 -1972	Proforma for record of test values of locally available pavement construction materials.
IRC:	43 -1972	Recommended practice for tools equipment and appliances for concrete pavement construction.
IRC:	44 -1976	Tentative guidelines for cement concrete mix design for pavements (for non air entrained and continuously graded concrete) First Revision.
IRC:	45 -1972	Recommendations for Estimating the Resistance of Soil Below the Maximum Scour Level in the Design of Well Foundations of Bridges
IRC:	46 -1972	A policy on road side advertisements (First Revision)
IRC:	47 -1972	Tentative specifications for built up spray grout.

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List of IRC Codes / Standards / Acts for Road/Bridge Works

IRC:	48 -1972	Tentative Specification for Bituminous Surface Dressing Using Pre-coated Aggregates
IRC:	49 -1973	Recommended Practice for the Pulverization of Black Cotton Soils for Lime Stabilisation
IRC:	50 -1973	Recommended Design Criteria for the Use of Cement-Modified Soil in Road Construction
IRC:	51 -1992	Guidelines for the use of soil lime mixes in road construction (First Revision)
IRC:	52 -2001	Recommendation about the alignment survey and geometric design of hill roads. (Second Revision)
IRC:	53 -1982	Road accident forms A-1 (First Revision)
IRC:	54 -1974	Vertical Clearances at Underpasses for Vehicular Traffic.
IRC:	55 -1974	Recommended practice for sand bitumen base courses.
IRC:	56 -1974	Recommended Practice for Treatment of Embankment Slopes for Erosion Control
IRC:	57 -1974	Recommended Practice for Sealing of Joints in Concrete Pavements
IRC:	58 -2002	Guidelines for the design of plain jointed Rigid pavements for highways (Second Revision)
IRC:	59 -1976	Tentative Guidelines for the design of gap graded cement concrete mixes for road pavements.
IRC:	60 -1976	Tentative guidelines for the use of lime fly ash concrete as pavement base or sub base.
IRC:	61 -1976	Tentative Guidelines for the construction of Cement Concrete Pavements in Hot Weather
IRC:	62 -1976	Guidelines for control of Access on Highways
IRC:	63 -1976	Tentative Guidelines for the Use of Low Grade Aggregates and Soil Aggregate Mixtures in Road Pavement Construction
IRC:	64 -1990	Guidelines for Capacity of Roads in Rural Areas (First Revision)
IRC:	65 -1976	Recommended practice for traffic rotaries.
IRC:	66 -1976	Recommended Practice for Sight Distance on Rural Highways
IRC:	67 -2001	Code of Practice for Road Signs (First Revision)
IRC:	68 -1976	Tentative Guidelines on cement fly ash concrete for rigid pavement construction.
IRC:	69 -1977	Space Standards for Roads in Urban Areas
IRC:	70 -1977	Guidelines on regulations and control of mixed traffic in urban areas.

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List of IRC Codes / Standards / Acts for Road/Bridge Works

IRC:	71 -1977	Recommended practice for preparation of notations.
IRC:	72 -1978	Recommended Practice for Use and Upkeep of Equipment, Tools and Appliances for Bituminous Pavement Construction
IRC:	73 -1980	Geometric Design Standards for Rural (Non-Urban) Highways
IRC:	74 -1979	Tentative Guidelines for lean cement concrete and lean cement flyash concrete as a pavement base or sub base.
IRC:	75 -1979	Guidelines for the Design of High Embankments
IRC:	76 -1979	Tentative Guidelines for strucural strength evaluation of Rigid airfield pavements.
IRC:	77 -1979	Tentative Guidelines for repair of concrete pavements using synthetic resins.
IRC:	78 -2000	Standard Specifications and Code of Practice for Road Bridges. Section-VII Foundations & Sub-structure (Second Revision).
IRC:	79 -1981	Recommended Practice for Road Delineators
IRC:	80 -1981	Type Designs for Pick-up Bus Stops on Rural (i.e., Non-Urban) Highways
IRC:	81 -1997	Tentative Guidelines for Strengthening of Flexible Road Pavement Using Benkelman Beam Deflection Technique (First Revision)
IRC:	82 -1982	Code Practice for Maintenance of Bituminous Surface of Highways
IRC:	83 -1999	Standard Specifications and Code of Practice for Road Bridges. Section-IX Bearings, Part-I: Metallic Bearings.
IRC:	83 -1987	Standard Specifications and Code of Practice for Road Bridges, (Part-II) Section-IX Bearings, Part-II : Electrometric Bearings
IRC:	83 -2002	Standard Specifications and Code of Practice for Road Bridges, (Part-II) Section-IX Bearings, Part-III :POT POT-CUM-PTFE, PIN AND METALLIC GUIDE BEARINGS
IRC:	84 -1983	Code of Practice for Curing of Cement Concrete Pavement
IRC:	85 -1983	Recommended practice for accelerated strength testing and evaluation of concrete for Road and Airfield Constructions.
IRC:	86 -1983	Geometric Design Standards for Urban Roads in Plains
IRC:	87 -1984	Guidelines for the design and erection of falsework for road bridges.
IRC:	88 -1984	Recommended practice for lime flyash stabilised soil base/ sub base in pavement construction.
IRC:	89 -1997	Guidelines for Design & Construction of River Training & Control Works for Road Bridges (First Revision)
IRC:	90 -1985	Guidelines of Selection, Operation and Maintenance of Bituminous Hot Mix Plant

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List of IRC Codes / Standards / Acts for Road/Bridge Works

IRC:	91 -1985	Tentative guidelines for construction of cement concrete pavement in cold weather.
IRC:	92 -1985	Guidelines for the Design of Interchanges in Urban Areas
IRC:	93 -1985	Guidelines on Design and Installation of Road Traffic Signals
IRC:	94 -1986	Specification for Dense Bituminous Macadam
IRC:	95 -1987	Specifications for Semi dense Bituminous concrete
IRC:	96 -1987	Tentative Specifications for two coat surface dressing using cationic bitumen emulsion.
IRC:	97 -1987	Tentative Specifications for 20 mm thick pre-mix carpet using cationic bitumen emulsion.
IRC:	98 -1997	Guidelines on Accommodation of Underground Utility Services Along and Across Roads in Urban Area (First Revision)
IRC:	99 -1988	Tentative guidelines on the provisions of sped breakers for control of vehicular speeds on minor roads.
IRC:	100 -1988	Tentative Specifications for single coat surface dressing using cationic bitumen emulsion.
IRC:	101 -1988	Guidelines for design of continuously reinforced concrete pavement with elastic joints.
IRC:	102 -1988	Traffic studies for planning bypasses around towns.
IRC:	103 -1988	Guidelines for Pedestrian Facilities
IRC:	104 -1988	Guidelines for Environmental impact assessment of Highway projects.
IRC:	105 -1988	Tentative Specifications for Bituminous concrete (Asphaltic concrete) for airfield pavements.
IRC:	106 -1990	Guidelines for Capacity of Urban Roads in Plain Areas
IRC:	107 -1992	Tentative Specifications for Bitumen Mastic Wearing Courses
IRC:	108 -1996	Guidelines for Traffic Prediction on Rural Highways
IRC:	109 -1997	Guidelines for Wet Mix Macadam

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List of IRC Codes / Standards / Acts for Road/Bridge Works

IRC:SP:	4 -1966	Bridge Loading Round the World
IRC:SP:	11 -1988	Handbook of Quality Control for Construction of Roads and Runways (Second Revision)
IRC:SP:	13 -2004	Guidelines for the Design of Small Bridges and Culverts.
IRC:SP:	14 -1973	A Manual for the Application of the Critical Path Method to Highway Project in India
IRC:SP:	15 -1996	Ribbon Development Along Highways and its Prevention
IRC:SP:	16 -2004	Guidelines for surface evenness of Highways Pavements (First Revision)
IRC:SP:	17 -1977	Recommendations About Overlays on Cement Concrete Pavements
IRC:SP:	18 -1978	Manual for Highway Bridge Maintenance Inspection.
IRC:SP:	19 -2001	Manual for Survey, Investigation and Preparation of Road Projects (First Revision)
IRC:SP:	20 -2002	Rural Roads Mannual.
IRC:SP:	21 -1979	Landscaping of Road
IRC:SP:	22 -1980	Recommendations for the Sizes for each Type of Road Making Machinery to Cater to the General Demand of Road Works
IRC:SP:	23 -1983	Vertical Curves for Highways
IRC:SP:	24 -1984	Guidelines on the Choice and Planning of Appropriate Technology in Road Construction
IRC:SP:	25 -1984	Gopi and his Road Roller-Guidelines on Maintenance of Road Roller
IRC:SP:	26 -1984	Report Containing Recommendations of IRC Regional Workshops on Rural Road Development (with Supplementary Notes)
IRC:SP:	27 -1984	Report Containing Recommendations of IRC Regional Workshops on Highway Safety
IRC:SP:	28 -1995	Road Transport and Energy (First Revision)
IRC:SP:	29 -1994	Directory of Indgenous Manufacturers of Road/Bridge Construction Machiney & Important Bridge Components (First Revision)
IRC:SP:	30 -1993	Manual on Economic Evaluation of Highway Project in India (First Revision)
IRC:SP:	31 -1992	New Traffic Signs
IRC:SP:	32 -1988	Road Safety for Children (5-12 Years Old)
IRC:SP:	33 -1989	Guidelines on Supplemental Measures for Design, Detailing & Durability of Important Bridge Structures.
IRC:SP:	34 -1989	General Guidelines About the Equipmentfor
IRC:SP:	35 -1990	Inspection and Maintenance of Bridge.
IRC:SP:	36 -1991	Guidelines on Format for IRC Standards
IRC:SP:	37 -1991	Guidelines for Evaluation of Load Carrying Capacity of Bridges
IRC:SP:	38 -1992	Manual for Road Investment Decision Model (with Floppy Disk)
IRC:SP:	39 -1992	Guidelines on Bulk Bitumen Transportation & Storage Equipment
IRC:SP:	40 -1993	Guidelines on techniques for strengthening and rehabilitation of bridges.
IRC:SP:	41 -1994	Guidelines on Design of At-Grade Intersections in Rural & Urban Areas
IRC:SP:	42 -1994	Guidelines on Road Drainage
IRC:SP:	44 -1994	Highway Safety Code
IRC:SP:	45 -1996	Time Series Data on Road Transport Passenger and Freight Movement (1951-1991)
IRC:SP:	46 -1997	Steel Fibre Reinforced Concrete For Pavements

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IRC:SP: 47 -1998 Guidelines on Quality System for Road Bridges (Plain, Reinforced, Prestressed and Composite Concrete).
IRC:SP: 48 -1998 Hill Road Manual
IRC:SP: 49 -1988 Guidelines for the Use of Dry Lean Concrete as Sub-base for Rigid Pavement
IRC:SP: 50 -1999 Guidelines on Urban Drainage
IRC:SP: 51 -1999 Guidelines for Load Testing of Bridges
IRC:SP: 52 -1999 Bridge Inspector's Reference Manual
IRC:SP: 53 -2002 Guidelines on Use of Polymer and rubber Modified Bitumen in Road Construction (First Revision)
IRC:SP: 54 -1999 Project Preparation Manual for Bridges
IRC:SP: 55 -2001 Guidelines for Safety in Construction Zones
IRC:SP: 56 -2000 Guidelines for Steel Pedestrian Bridges
IRC:SP: 57 -2001 Guidelines for Quality Systems for Raod Construction
IRC:SP: 58 -2001 Guidelines for Use of Flyash in Road Embankments
IRC:SP: 59 -2002 Guidelines for Use of Geotextiles in Road Pavements and Associated Works
IRC:SP: 60 -2002 An Approach Document for Assessment of Remaining Life of Concrete Bridges
IRC: Special Report II, 1992

III Ministry of Surface Transport Publications

Most Manual for Maintenance of Roads, 1983

MORT&H Pocketbook for Bridge Engineers, 2000 (First Revision)

MORT&H Pocketbook for Highway Engineers, 2002 (Second Revision)

MOST Handbook on Road Construction Machinery, 1985

MORT&H Specifications for Road and Bridge Works, 2001 (Fourth Revision)

MOST Standard Plans for 3.0 m Span Reinforced Cement Concrete Solid Slab Superstructure with and without Footpaths for Highways, 1991

MOST Standard Plans for Highways Bridges R.C.C. T-Beam & Slab Superstructure - Span from 10 m to 24 m with 12 m width, 1991

MOST Standard Plans for Highway Bridges PSC Girder and RC Slab Composite Superstructure for 30 m Span with and without Footpaths, 35 m Span with Footpaths and 40 m Span without Footpaths, 1991
MOST Standard Drawings for Road Bridges - R.C.C. Solid Slab Superstructure (15° & 30° SKEW Span 4.0 m to 10.0 m (with and without Foothpaths), 1992

MOST Type Designs for Intersections on National Highways, 1992

MOST Standard Bidding Document Procurement of Civil Works, Partl: Complete Bidding Document, Part II: Forms

MOST Computer Aided Design System for High Embankment Problems, 1993

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List of IRC Codes / Standards / Acts for Road/Bridge Works

MORT&H Standard Data Book for Analysis of Rates, 2003 (First Revision)

MOST Addendum to Ministry's Technical Circulars and Directives on National Highways and Centrally Sposored Road & Bridge Projects (Aug. 88 to Dec. 92), 1993

MOST Standard Drawing for Road Bridges R.C.C. Solid Slab Superstructure (22.5* SKEW) R.E.Span 4M to 10M (with and without Footpath), 1996

MOST Addendum to Ministry's Technical Circulars and Directives on National Highways and Centrally Sposored Road & Bridge Projects (Jan. 93 to Dec. 94), 1996

Standard Plan for Highway Bridges - Prestressed Concrete Beam & RCC Slab Type Superstructure - Volume -II

MOST Addendum to Technical Circulars & Directives on National Highways & Centrally Sponsored Road & Bridge Works Projects (Jan. 1995 to Dec. 1997)

Model Concession Agreement for Small Road Projects

MOST Standard Plans for Single, Double and Triple Cell Box Culverts with and without Earth Cushion

Manual for Safety in Road Design

MORT&H Report of the Committee on Norms for Maintenance of Roads in India, 2001

MORT&H Road Development Plan - Vision : 2021

MORT&H Manual for Construction and Supervision of Bituminous Works, 2001

BIS PUBLICATIONS

IS: 7537-1974	Road Traffic Signals
IS 10500-1991	Drinking Water
IS: 1944 (Part-I & II) 1970	Code of Practice for lighting of Public thoroughfare : Parts Land 2 For Main and secondary roads (Group-A and B) (First revision) (Amendments No. 1 and 2) Parts – I and 2 in one volume) (Amendments-2).
IS: 1944 (Part-V) 1981	Code of Practice for Lighting of Public Thoroughfares : Parts 5 Lighting for Grade separated junctions, Bridges and Elevated roads (Group – D).
IS: 1944 (Part-VI) 1981	Code of Practice for lighting of Public thoroughfare : Part-6 Lighting for Towns and city centres and areas civic Importance (Group-E).
IS: 10748 – 1995	Hot rolled steel for welded tubes and pipes (First Revision)
NBC	National Building Code
Part-III, NBC:	Development Control rules and general building requirements.
Part-IV, NBC:	Fire Protection

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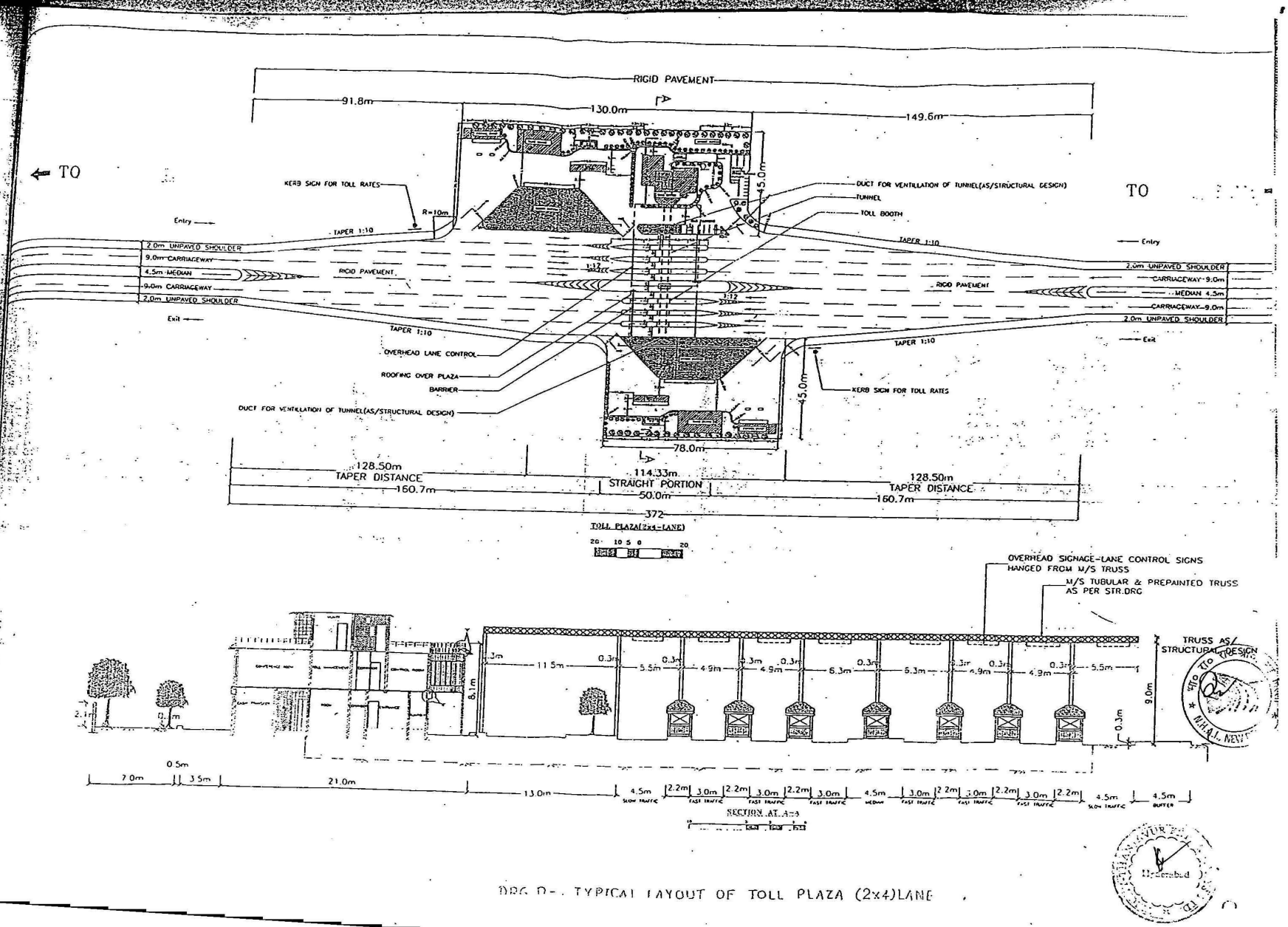
Part-VI, NBC:	Structural Design
Part-VIII, NBC:	Building Services
Part-IX, NBC:	Plumbing Services
	Generic Requirements Permanently lubricated HDPE Telecom Ducts
No. G/CDS-08/01. DEC'99 TEC-DoT	For use as underground optical fibre cable conduits.

Appendix D-2

GEOMETRIC PARAMETERS AND STANDARDS

Sl. No.	Particulars	Ref code	Unit	Value	Remarks
1	Design Speed	IRC:73-1980			
	(a) Plain areas		Km/hr	100/80	Ruling/Minimum
	(b) Rolling		"	80/65	"
	(c) Hilly areas	IRC:52-1981	"	50/40	"
2	Cross sectional element	IRC:73:1980			
	(a) Carriageway		m	7.00	Each direction
	(b) Shoulder				"
	(i) Paved		m	1.50	"
	(ii) Unpaved		m	Min 2.00	"
	(c) Marginal Strip		m	0.25	Each direction
	(d) Median(raised)				
	(i) Urban area		m	4.50	Each direction
	(ii) Rural area		m	1.50	Each direction
	(e) Service road carriageway		m	5.5/ 7.0	Each direction
	(f) Footpath cum drain (Urban areas)		m	1.5	Each direction
	f) Utility line strip		m	1.25	Each direction
3.	**Cross fall**				
	(i) Carriageway		%	2.5	
	(ii) Paved shoulder		%	2.5	
	(iii) unpaved		%	3.5	
4.	**Embankment Slope**		**Ratio**	**2H:1V <3m ht.** 3H:1V for ht. between 3 to 6m	**For more than 6m height the slope is to be designed**

Sl. No.	Particulars	Ref code	Unit	Value	Remarks
5.	**Maximum Super elevation** (i) Plain (ii) Rolling (iii) Hilly		 % % %	 5 6 7	
6.	**Gradient** (i) Plain (ii) Rolling (iii) Hilly		 % % %	 3.3 3.3 5	 Ruling Gradient " "
7.	**Coefficient of Lateral Friction**			0.15 (Max.)	**AASHTO practice will be adopted for detailing**
8.	**Minimum Horizontal curve radius** (i) Plain area (ii) Rolling (iii) Hilly		 m m m	 360/230 230/155 80/50	**Ruling/absolute minimum**
9.	**Stopping sight distance**		M M M	180 120 60	For 100 kmph for 80 kmph for 50 kmph
10.	**Minimum length of vertical curve**		M M M	60 50 30	For 100 kmph for 80 kmph for 50 kmph
11.	**Interchanges**				
12.	Interchange Ramp				
	a) Design Speed	Km/hr	65		
	b) Carriageway width				
	i) Single Lane	M	5.5		
	ii) Double Lane	M	7.5		
	c) Shoulder Paved				
	i) Inner (Single Lane)	M	1.5		
	ii) Outer	M	1.5		
	d) Minimum Radius	M	155		
	e) Maximum Super elevation	%	5		



DRG D-. TYPICAL LAYOUT OF TOLL PLAZA (2x4)LANE

APPENDIX-D3

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय)
National Highways Authority of India
(Ministry of Road Transport & Highways)
G-5 & 6, Sector-10, Dwarka, New Delhi-110075

Phone : 91-11-25074100/2574200
Fax : 91-11-25093507/25093514
Extn. : 2223/2318/2468/2553

No.11013/1/2000/GM(Env.)/549

Dated : 13.2.20042004

CIRCULAR

In continuation to the Office Circular No.11013/1/2000/GM(Env.)/4105 dated 30.12.2002, this is to inform to all concerned that final Amendment Notification has been published by the Ministry of Environment & Forests, on the use of flyash, vide No.S.O.979(E) dated 27th August, 2003. The relevant clauses of the amendment notification pertaining to the Highway Sector, are as under:

1. In the said notification [S.O. 763 (E) dated 14th September 1999], in the preamble, for the words "fifty kilometers", the words "one hundred kilometers" shall be substituted.

2. In the said notification, in paragraph 1, -

   a. in sub-paragraph (1), for the words "fifty kilometers", the words "one hundred kilometers" shall be substituted;

   g. after sub-paragraph (4), the following sub-paragraphs shall be inserted, namely:-

   "(5) No agency, person or organization shall, within a radius of 100 kilometers of a thermal power plant undertake construction or approve design for construction of roads or flyover embankments in contravention of the guidelines/specifications issued by the Indian Road Congress (IRC) as contained in IRC specification No.SP:58 of 2001. Any deviation from this direction can only be agreed to on technical reasons if the same is approved by Chief Engineer (Design) or Engineer-in-Chief of the concerned agency or organization or on production of a certificate of "Pond ash not available" from the thermal power plant(s) (TPPs) located within 100 kilometres of the site of construction. This certificate shall be provided by the TPP within two working days from the date of making a request for ash.

   Soil required for top or side covers of embankments of roads or flyovers shall be excavated from the embankment site and if it is not possible to do so, only the minimum quantity of soil required for the purpose shall be excavated from soil borrow area. In either case, the topsoil should be kept or stored separately. Voids created due to soil borrow area shall be filled up with ash with proper compaction and covered with topsoil kept separately as above. This would be done as an integral part of embankment project within the time schedule of the project.

N.H.A.I. NEW DELHI

Hyderabad

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No agency, person or organization shall within a radius of 100kilometres of a coal or lignite based thermal power plant allow reclamation and compaction of low-lying areas with soil. Only pond ash shall be used for compaction. They shall also ensure that such reclamation and compaction is done in accordance with the bye-laws, regulations and specifications laid down by the authorities mentioned in sub-paragraph (3) of paragraph 3".

The updated notification is enclosed herewith for your ready reference.

The notifications referred above, and other related notifications may be accessed on the MOEF website **http://envfor.nic.in**; at the web page http://envfor.nic.in/legis/legis.html.

12/

(V.K.SHARMA)
General Manager(Env.)

Encl: Copy of Notification

To

All Members/CGMs/GMs/PDs
PS to Chairman

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158(IV)
38

construction agencies either undertaking the construction or approving the design or both to ensure compliance of the provisions of sub-paragraph (1A) and to submit such returns as may be called for and compliance reports to the State Government or Union territory Administration";

(2) The authority for ensuring the use of specified quantity of ash as per sub-paragraph (1) shall be the concerned Regional Officer of the State Pollution Control Board or the Pollution Control Committee, as the case may be.

(2A) The concerned State Government shall be the enforcing and monitoring authority for ensuring compliance of the provisions of sub- paragraph (IA)

(3) In case of non-availability of ash from thermal power plant in sufficient quantities as certified by the said power plant, the stipulation *under sub-paragraph (1)* shall be suitably modified (waived/ relaxed) by the concerned State/Union Territory Government.

(3A) A decision on the application for manufacture of fly ash bricks, block, and tiles and similar other fly ash based products shall be taken within thirty days from the date of receipt of the application by the competent authority. A decision on consent to establish the brick kiln shall be taken by the Pollution Control Board or the Pollution Control Committee, as the case may be, within a period of thirty days from the date of receipt of application by it.

(3B) In case of non-compliance of the provisions of sub-paragraph (1) of paragraph 1, the competent authority, in addition to cancellation of consent order issued to establish the brick kiln, shall move the district administration for cancellation of the mining lease.

(3C) All authorities sanctioning or renewing any land, soil or clay mining lease shall not grant such lease or extension of lease or renewal to clay brick, block or tile manufacturing unit within a radius of one hundred kilometres of the coal or lignite based thermal power plant in cases where the manufacturer does not mix a minimum of 25 per cent by weight of fly ash or pond ash in the manufacture of bricks or blocks or tiles. The cancellation of mining lease shall be decided by the district administration after giving the holder of such lease an opportunity of being heard. To enable the competent authority to verify the actual use of ash, the thermal power plant shall maintain month-wise records of ash made available to each brick kiln.

(3 D) It shall be sufficient compliance of this notification if within twelve months from the date of issue of this notification, manufacturers of clay bricks, blocks and tiles located within a radius of 50 to 100 kilometres of a coal or lignite based thermal power plant comply with the provisions of sub-paragraphs (1) and (2)

(4) Each coal or lignite based thermal power plant shall constitute a dispute settlement committee which shall include the General Manager of the thermal power plant and a representative of All India Brick and Tile Manufacture's Federation (AIBTMF) *or a representative of local brick kiln owners association, federation, group.* Such a committee shall ensure unhindered loading and transport of ash without any undue loss of time. Any unresolved dispute shall be dealt with by a State/Union Territory level committee to be set up by State/Union Territory Government comprising Member Secretary of the State Pollution Control Board/Pollution Control Committee, representatives of Ministry of Power in the State/Union Territory Government and a representative of AIBTMF.

(5) No agency, person or organization shall, within a radius of 100 kilometres of a thermal power plant undertake construction or approve design for construction of roads or flyover embankments in contravention of the guidelines/ specifications issued by the Indian Road Congress (IRC) as contained in IRC specification No. SP: 58 of 2001. Any deviation from this direction can only be agreed to on technical reasons if the same is approved by Chief Engineer (Design) or Engineer-in-Chief of the concerned agency or organization or on production of a certificate of "Pond ash not available" from the thermal power plant(s) (TPPs) located within 100 kilometres of the site of construction. This certificate shall be provided by the TPP within two working days from the date of making a request for ash.

(6) Soil required for top or side covers of embankments of roads or flyovers shall be excavated from the embankment site and if it is not possible to do so, only the minimum quantity of soil required for the purpose shall be excavated from soil borrow area. In either case, the topsoil should be kept or stored separately. Voids created due to soil borrow area shall be filled up with ash with proper compaction and covered with topsoil kept separately as above. This would be done as an integral part of embankment project within the time schedule of the project.

(7) No agency, person or organization shall within a radius of 100 kilometres of a coal or lignite based thermal power plant allow reclamation and compaction of low-lying areas with soil. Only pond ash shall be used for compaction. They shall also ensure that such reclamation and compaction is done in accordance with

N.H.A.I. N

the bye-laws, regulations and specifications laid down by the authorities mentioned in sub- paragraph (3) of paragraph 3.

2. ***Responsibilities of Thermal Power Plants.***

Every coal or lignite based thermal power plant shall take the following steps to ensure the utilisation of ash generated by it, namely: -

(1) Every coal or lignite based thermal power plant shall make available ash, for at least ten years from the date of publication of this notification, without any payment or any other consideration, for the purpose of manufacturing ash-based products such as cement, concrete blocks, bricks, panels ***or a combination thereof*** or any other material or for construction of roads, embankments, dams, dykes or for any other construction activity. ***The thermal power plants have to ensure availability of fair quantity of ash to each user including brick kilns.***

(2) Every coal or lignite based thermal power plant commissioned subject to environmental clearance conditions stipulating the submission of an action plan for full utilisation of fly ash shall, within a period of nine years from the publication of this notification, phase out the dumping and disposal of fly ash on land in accordance with the plan. Such an action plan shall provide for thirty per cent of the fly ash utilisation, within three years from the publication of this notification with further increase in utilisation by atleast ten per cent points every year progressively for the next six years to enable utilisation of the entire fly ash generated in the power plant atleast by the end of ninth year. Progress in this regard shall be reviewed after five years.

2A. Utilization of fly ash for reclamation of sea.

Subject to the rules made under the Environment (Protection) Act, 1986, (29 of 1986) reclamation of sea shall be a permissible method of utilization of fly ash.

(3) Every coal or lignite based thermal power plant not covered by para (2) above shall, within a period of fifteen years from the date of publication of this notification, phase out the utilisation of fly ash in accordance with an action plan to be drawn up by the power plants. Such action plan shall provide for twenty per cent of fly ash utilisation within three years from the date of publication of this notification, with further increase in utilisation every year progressively for the next twelve years to enable utilisation of the entire fly ash generated in the power plant.

(4) All action plans prepared by coal or lignite based thermal power plants in accordance with sub-para (2) and (3) of para 2 of this notification, shall be submitted to the Central Pollution Control

Board/Committee and concerned, State Pollution Control Board/Committee and concerned regional office of the Ministry of Environment and Forests within a period of six months from the date of publication of this notification.

(5) The Central and State Government Agencies, the State Electricity Boards, the National Thermal Power Corporation and the management of the thermal power plants shall facilitate in making available land, electricity and water for manufacturing activities and provide access to the ash lifting area for promoting and setting up of ash-based production units in the proximity of the area where ash is generated by the power plant.

(6) Annual implementation report providing information about the compliance of provisions in this notification shall be submitted by the 30th day of April every year to the Central Pollution Control Board, concerned State Pollution Control Board/Committee and the concerned Regional Office of the Ministry of Environment and Forests by the coal or lignite based thermal power plants.

3. Specifications for use of ash-based products.-

(1) Manufacture of ash-based products such as cement, concrete blocks, bricks, panels or any other material or the use of ash in construction activity such as in road laying, embankments or use as landfill to reclaim low lying areas including back filling in abandoned mines or pitheads or for any other use shall be carried out in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Bureau of Mines, Indian Road Congress, Central Building Research institute, Roorkee, Central Road Research Institute, New Delhi, Building Materials and Technology Promotion Council, New Delhi, Central Public Works Department, State Public Works Departments and other Central and State Government agencies.

(2) The Central Public Works Department, Public Works Departments in the State/Union Territory Governments, Development Authorities, Housing Boards, National Highway Authority of India and other construction agencies including those in the private sector shall also prescribe the use of ash and ash-based products in their respective schedules of specifications and construction applications, including appropriate standards and codes of practice, within a period of four months from the publication of this notification.

(2A) All agencies including the Central Public Works Department and State Government agencies concerned with utilization of fly ash for construction purposes shall, within three months from the 1st day of September, 2003 make provisions for the use of fly ash and fly ash based bricks, blocks or tiles or aggregates of them in the schedule of approved materials and rates.

THE GAZETTE OF INDIA

EXTRAORDINARY

PART II -- Section 3 -- Sub-section (ii)

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 14th September, 1999

[incorporating amendments made vide S.O. 979 (E) dated 27th August 2003]

S.0.763(E).- Whereas a draft notification containing certain directions was published, as required by subrule (3) of rule 5 of the Environment (Protection) Rules, 1986 under the notification of the Government of India in the Ministry of Environment and Forests number S.O. 453(E) dated 22nd May, 1998 inviting objections and suggestions from all persons likely to be affected thereby, before the expiry of the period of sixty days from the date on which the copies of the Gazette of India containing the said notification are made available to the public;

And, whereas, copies of the said Gazette were made available to the public on the same date;

And, whereas, the objections and suggestions received from the public in respect of the said draft notification have been duly considered by the Central Government;

Where as it is necessary to protect the environment, conserve top soil and prevent the dumping and disposal of fly ash discharged from coal or lignite based thermal power plants on land;

And, whereas, there is a need for restricting the excavation of top soil for manufacture of bricks and promoting the utilisation of fly ash in the manufacture of building materials and in construction activity within a specified radius of ***one hundred kilometres*** from coal or lignite based thermal power plants;

And, Whereas, the Hon'ble High Court of Judicature, Delhi vide its order dated 25th August, 1999 in CWP No. 2145/99 Centre for Public Interest Litigation, Delhi v/s Union of India directed that the Central Government to publish the final notification in respect of fly ash on or before 26th October, 1999;

Now, therefore, in exercise of the powers conferred by sub-section (1), read with clause (v) of sub-section (2) of section 3 and section 5 of the Environment (Protection) Act, 1986 (29 of 1986); and in pursuance of the orders of the Hon'ble High Court, Delhi stated above, the Central Government

hereby issues the following directions which shall come into force on the date of the publication of this notification, namely:-

1. **Use of fly ash, bottom ash or pond ash in the manufacture of bricks and other construction activities.-**

(1) No person shall within a radius of ***one hundred kilometres*** from coal or lignite based thermal power plants, manufacture clay bricks or tiles or blocks for use in construction activities without mixing at least 25 per cent of ash (fly ash, bottom ash or pond ash) with soil on weight to weight basis. '

"(1A) Every construction agency engaged in the construction of buildings within a radius of fifty to one hundred kilometres from a coal or lignite based thermal power plant shall use fly ash bricks or blocks or tiles or clay fly ash bricks or cement fly ash bricks or blocks or similar products or a combination or aggregate of them in such construction as per the following minimum percentage (by volume) of the total bricks, blocks and tiles, as the case may be, used in each construction project, namely:-

(i) 25 per cent by 31st August 2004;

(ii) 50 per cent by 31st August 2005;

(iii) 75 per cent by 31st August, 2006; and

(iv) 100 per cent by 31st August 2007.

In respect of construction of buildings within a radius of 50 kilometres from a coal or lignite based thermal power plant the following minimum per centage (by volume) of use of bricks, blocks and tiles shall apply: -

(i) 50 per cent by 31st August 2004;

(ii) 100 per cent by 31st August 2005.

(1B) The provisions of sub-paragraph (1A) shall be applicable to all construction agencies such as Housing Boards and those in the private sector builders of apartments, hotels, resorts and cottages and the like. It shall be the responsibility of the

(2B) All agencies undertaking construction of roads or fly over bridges including Ministry of Road Transport and Highways (MORTH), National Highways Authority of India (NHAI), Central Public Works Department (CPWD), State Public Works Departments and other State Government Agencies, shall, within three months from the 1st day of September, 2003 -

a. make provisions in their tender documents, schedules of approved materials and rates as well as technical documents, including those relating to soil borrow area or pit as per sub-paragraph (7) of paragraph 1; and

b. make necessary specifications/guidelines for road orfly over embankments that are not covered by the specifications laid down by the Indian Road Congress (IRC)

(3) All local authorities shall specify in their respective building bye-laws and regulations the use of ash and ash-based products and construction techniques in building materials, roads, embankments or for any other use within a period of four months from the date of publication of this notification.

[F. No. 16-2/95-HSMD]

V RAJAGOPALAN, Jt.. Secy.

[For the amendment (S.O. 979 (E)] - [F.No.16-2/95-HSMD]
(Dr. V. Rajagopalan)

Joint Secretary to the Govt. of India

SCHEDULE E

APPLICABLE PERMITS

(to be obtained before/ on financial closure)

1. **Ministry of Finance / RBI**

   i) Approval for foreign investment and foreign loans, if required
   ii) Approval for import of equipment and machinery for construction and operation, if required
   iii) Exemption of Excise duty on construction material, if required.

2. **Department of Telecommunication**

   i) Permission / clearance for setting up of wireless system, if required
   ii) Clearance / permission for the use of optical fibre cables of DOT, if required

3. **State Government Permits**

Quarrying Permits:

- Permits for extraction of boulder from quarry from Additional District Magistrate (ADM) Mines
- Permit for installation of crusher from village Panchayat and State/Central Pollution Control Board
- License for explosives from the office of Explosive controller
- Explosive license for storing diesel

Electricity:

- Permission required from State Electricity Board (SEB) for installation of Diesel Generator (DG)
- Permission for electrical connection, if power source is available

Water:

- If water has to be taken from river/ reservoir, permission to be obtained from State Irrigation Department

Batching Plant:

- License from inspection of factories
- NOC consent from pollution department

Asphalt Plant:

- Clearance required from village panchayats & State/Central Pollution Control Board

Borrow Earth:

- Permission from irrigation department if land taken from irrigation land
- Permission required from village panchayat and ADM mines for Government & private land
- Permission from Local Municipalities and Development Authorities.

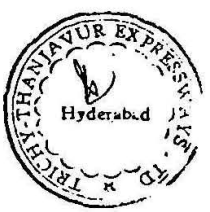
Cutting of trees and other environment clearances:

- Permission from Forest Department and other applicable agencies.

Sewage Lines and Water Mains:

- Permission from Local Municipalities and Development Authorities.





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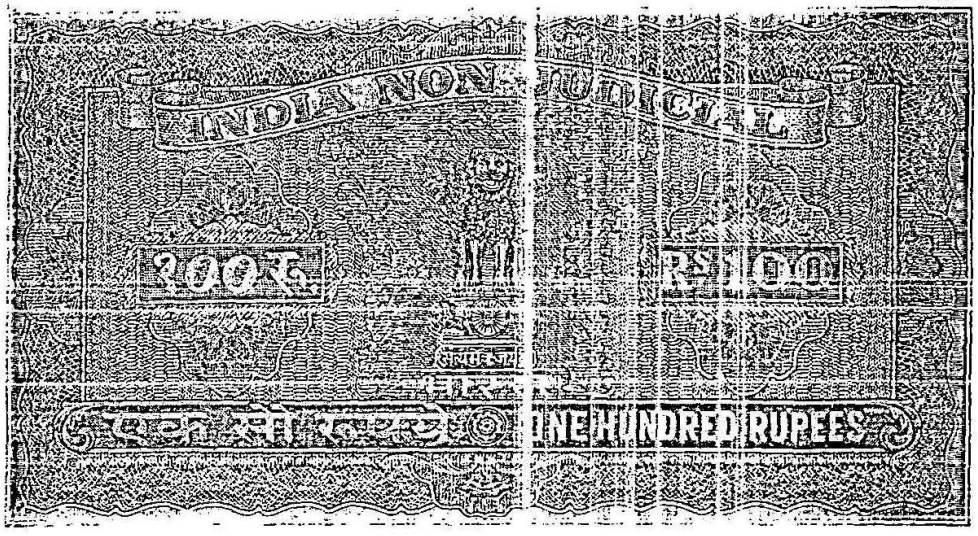

INDIA NON JUDICIAL

१००रु. Rs 100

एक सौ रुपये ONE HUNDRED RUPEES

39AA 680384

S. No. 36349 Dt. 03/3/2006 Rs. 100/-
Sold To Trivedi
S/o./W/o /D/o B. N. Trivedi
To Whom Madhucon Projects Ltd

K. RAMA CHANDRAVATHI
STAMP VENDOR (L.No. 27/99 R.L.No. 20/2005)
6-3-387, Beside Banjara Durbar Hotel, Panjagutta,
HYDERABAD - 500 082 Phone. No: 23351799

BANK GUARANTEE FOR PERFORMANCE SECURITY

From: *United Bank of India, 4-3-331, Bank Street, Koti, Hyderabad – 500 195*

To: Chairman,
National Highway Authority of India,
G – 5 & 6, Sector - 10,
Dwarka, New Delhi – 110 075

HYD/KG/01/06-07 dt 7/4/06

A. "NHAI vide Letter No. ***NHAI/BOT-I/11019/35/2005/316*** dated ***28/02/2006*** issued Letter of Acceptance (LOA) to ***M/s. Madhucon Projects Limited, Madhucon House, Plot No.1129/A, Road No.36, Jubilee Hills, Hyderabad-500 033*** (the "Consortium") for ***Design, Construction, Development, Finance, Improvement, Operation and Maintenance of Existing 2-Lane Road to 4-Lane Dual Carriageway from Km 80 to Km 135.750 of NH – 67 (Thanjavur - Trichy Section) in the State of Tamil Nadu on Build, Operate and Transfer (BOT) Basis*** (the "Project"). ***M/s.Madhucon Projects Limited*** has confirmed their acceptance to the said LOA of NHAI vide their Letter ***No.MPL/ND/NHAI/2006/178*** dated ***09/03/2006. M/s.Madhucon Projects Limited*** has promoted and incorporated a Special Purpose Vehicle in the form of a limited liability company ***Trichy – Thanjavur Expressways Limited*** (the "Concessionaire") to enter into the Concession Agreement for undertaking, inter alia, the Project and to perform and discharge all its obligations thereunder

B. The Concessionaire is required to give ("NHAI") a guarantee by a recognized bank based in India in the sum of ***Rs.5,60,00,000/- only (Indian Rupees Five Crores Sixty Lakhs only)*** as security for compliance with its obligations under the Concession Agreement during the Construction Period.

Contd..2..

यूनाइटेड बैंक ऑफ इंडिया/UNITED BANK OF INDIA
हैदराबाद शाखा/HYDERABAD BRANCH

सहायक प्रबन्धक/उप प्रबन्धक
Asst. Manager/Dy. Manager
CH. HARI BABU
Sl. No. 9033

मुख्य प्रबन्धक
Chief Manager

TRICHY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

HYD/ICA/01/06-07 dt 7/4/06

C. The Guarantor has agreed to give NHAI the abovementioned guarantee on the terms set out herein.

GUARANTEE

1. We, *United Bank of India* with its registered office at *16, Hemanta Basu Sarani, Kolkata – 700 001* and one of our branches at *4-3-331, Bank Street, Koti, Hyderabad – 500 195* (the **"Guarantor"**), unconditionally guarantee to pay NHAI upon first written demand and without any deduction any sum claimed by NHAI upto a maximum of *Rs.5,60,00,000/- only (Indian Rupees Five Crores Sixty Lakhs only)* (the **"Guaranteed Sum"**) subject to the conditions set out below.

2. The Guarantor unconditionally and irrevocably promises to pay on demand the Guaranteed Sum, without protest or demur whatsoever upon the receipt of a written demand from NHAI, which shall be final and conclusive as against the Guarantor requiring the Guarantor to make the payment to NHAI.

3. The Guarantor waives any requirement that NHAI demand any debt or payment from the Concessionaire before presenting it with a demand under this Guarantee.

4. NHAI shall notify the Guarantor of its demand for payment of the Guaranteed Sum without any deduction of whatsoever nature and without reference to any claim or counter claim or set off, in accordance with the Concession Agreement.

   Such notification by NHAI shall be conclusive and binding on the Guarantor.

5. Upon encashment and appropriation of the whole or any portion of the Guaranteed Sum by NHAI in accordance with the Concession Agreement, the Guarantor shall be obliged to replenish the existing Guarantee or provide fresh guarantee of the Guaranteed Sum and the Concessionaire is deemed to have made the request for such fresh guarantee upon the execution and furnishing of this Guarantee in the first instance.

6. No underlying dispute as between NHAI and the Concessionaire nor any pending application for interim relief or arbitration proceedings or other legal proceedings shall constitute any ground for prevention, delay or obstruction for making payment to NHAI by the Guarantor and the existence of any disputes or differences or claims in arbitration or otherwise shall not constitute any ground for non-payment on this Guarantee.

7. This guarantee is valid and effective from its date. This guarantee and the Guarantor's obligations under it will terminate on the Commercial Operations Date of the Project as advised to the Guarantor in writing by NHAI. However the Guarantee shall be released earlier by NHAI to the Concessionaire, upon contribution of the Equity (excluding) Equity Support, if any by the Shareholders of the Concessionaire to the extent of 100% and upon the Concessionaire having expended on the Project and paid out an aggregate sum of not less than 20% of the Total Project cost as certified by the Statutory Auditors of the Concessionaire but provided the Concessionaire is not in breach of this Agreement or the Concession Agreement.

8. The Guarantor agrees that its obligation to pay any demand made by NHAI before the termination of this Guarantee will continue until the amount demanded has been paid in full.

9. This Guarantee shall be valid and effective upto *05/04/2007* for enabling NHAI to lodge a claim for payment under the Guarantee till the date of expiry of the term of the Guarantee. The Guarantor shall be obligated to make payment upon the Guarantee forthwith on demand, if the claim is lodged within the claim validity period and the obligation to pay is subject to normal limitation for payment of claims upon a guarantee. Time is of essence for payment and in the event of failure to make payment, Guarantor shall be obligated to pay compound interest at 2% above the prime lending rate of the Guarantor institution, compounding quarterly in the event of the Guarantor's failure to make payment upon the Guarantee for any reason whatsoever. Payment of interest as provided is no excuse for delayed payment or nonpayment of the Guaranteed Sum.

यूनाइटेड बैंक ऑफ इंडिया/UNITED BANK OF INDIA
हैदराबाद शाखा/HYDERABAD BRANCH

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HYD/ICE/01/06-07 dt 7/4/06

10. No change in the constitution of the Concessionaire or of the Guarantor shall be a ground for release of the Guarantee and no variation in the concession agreement made post selection of the bidder, or post making of the bid, shall constitute a variation, which would, subject to the terms and conditions of this agreement, discharge the Guarantor. The Guarantor shall notwithstanding such change, be bound to make payment upon the Guarantee on demand.

11 The Guarantor agrees that no change, addition to or other modifications to the terms of the Concession Agreement or to any documents which have or may be made between NHAI and the Concessionaire will in any way release it from any liability under this Guarantee and that it waives any requirement for notice of any such change, addition or modification.

12. The Guarantor agrees that it will not assign its obligations under this Guarantee without the prior written consent of NHAI. NHAI will not unreasonably withhold its consent if the proposed assignee is of at least equal financial standing to the Guarantor and the assignee assumes in writing the obligations of the Guarantor under this Guarantee at the same time or before the assignment.

13. All correspondence should be addressed and delivered to General Manager (BOT) IA, National Highways Authority of India, G 5 & 6, Sector – 10, Dwarka, New Delhi – 110 075. Telefax No. 011 – 2509 3524.

14. This Guarantee binds the Guarantor, its successors and permitted assigns.

NOTWITHSTANDING ANYTHING CONTAINED HEREIN:

a. Our liability under this Bank Guarantee shall not exceed and is restricted to ***Rs.5,60,00,000/- only (Indian Rupees Five Crores Sixty Lakhs only).***

b. This Bank Guarantee shall be remain in force upto and including valid upto ***05/04/2007.***

c. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before ***05/04/2007.***

d. Unless a demand/ claim under this guarantee is served upon us in writing before the expiry of the validity period of this Guarantee i.e. on or before ***05/04/2007*** rights under this guarantee shall stand automatically forfeited and shall be relieved and discharged from all liabilities mentioned herein above.

यूनाइटेड बैंक ऑफ इंडिया/UNITED BANK OF INDIA
हैदराबाद शाखा/HYDERABAD BRANCH

SEAL OF [THE BANK] .....

NAME OF [THE BANK] ..... सहायक प्रबंधक/वरि. प्रबंधक Asst. Manager/Dy. Manager — मुख्य प्रबंधक Chief Manager

SIGNATURE .....

CH. HARI BABU
Sl. No. 9033

NAME .....

TITLE .....

CODE NO. .....

DATE .....

PHONE NO .....

FAX NO .....

THANJAVUR EXPRESS... Hyderabad

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

ONE HUNDRED RUPEES

₹. 100

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

आन्ध्र प्रदेश ANDHRA PRADESH

147861

K. RAMA CHANDRAVATHI
STAMP VENDOR (LNO; 27/99 RLNo. 20/2005)
6-3-387, Beside Banjara Durbar Hotel, Panjagutta,
HYDERABAD - 500 082 Phone. No: 23351799

I LC/3/06-07

BANK GUARANTEE FOR PERFORMANCE SECURITY

From: *United Bank of India, 4-3-331, Bank Street, Koti, Hyderabad – 500 195*

To: Chairman,
National Highway Authority of India,
G – 5 & 6, Sector - 10,
Dwarka, New Delhi – 110 075

A. "NHAI vide Letter No. *NHAI/BOT-I/11019/35/2005/316* dated *28/02/2006* issued Letter of Acceptance (LOA) to *M/s. Madhucon Projects Limited, Madhucon House, Plot No.1129/A, Road No.36, Jubilee Hills, Hyderabad-500 033* (the "Consortium") for *Design, Construction, Development, Finance, Improvement, Operation and Maintenance of Existing 2-Lane Road to 4-Lane Dual Carriageway from Km 80 to Km 135.750 of NH – 67 (Thanjavur - Trichy Section) in the State of Tamil Nadu on Build, Operate and Transfer (BOT) Basis* (the "Project"). *M/s.Madhucon Projects Limited* has confirmed their acceptance to the said LOA of NHAI vide their Letter *No.MPL/ND/NHAI/2006/178* dated *09/03/2006. M/s.Madhucon Projects Limited* has promoted and incorporated a Special Purpose Vehicle in the form of a limited liability company *Trichy – Thanjavur Expressways Limited* (the "Concessionaire") to enter into the Concession Agreement for undertaking, inter alia, the Project and to perform and discharge all its obligations thereunder

B. The Concessionaire is required to give ("NHAI") a guarantee by a recognized bank बैंक ऑफ इंडिया/UNITED BANK OF INDIA in the sum of *Rs.8,40,00,000/- only (Indian Rupees Eight Crores Forty* हैदराबाद शाखा/HYDERABAD BRANCH *only)* as security for compliance with its obligations under the Concession Agreement during the Construction Period.

Contd..2..

प्रबंधक/उप प्रबंधक
Manager/Dy. Manager

मुख्य प्रबंधक
Chief Manager H.L. SAHA
Sl. No. 4837

TRICHY-THANJAVUR EXPRESSWAYS LTD.
Hyderabad

ILG/3/06-07

C. The Guarantor has agreed to give NHAI the abovementioned guarantee on the terms set out herein.

GUARANTEE

1. We, ***United Bank of India*** with its registered office at ***11, Hemanta Basu Sarani, Kolkata – 700 001*** and one of our branches at ***4-3-331, Bank Street, Koti, Hyderabad – 500 195*** (the **"Guarantor"**), unconditionally guarantee to pay NHAI upon first written demand and without any deduction any sum claimed by NHAI upto a maximum of ***Rs.8,40,00,000/- only (Indian Rupees Eight Crores Forty Lakhs only)*** (the **"Guaranteed Sum"**) subject to the conditions set out below.

2. The Guarantor unconditionally and irrevocably promises to pay on demand the Guaranteed Sum, without protest or demur whatsoever upon the receipt of a written demand from NHAI, which shall be final and conclusive as against the Guarantor requiring the Guarantor to make the payment to NHAI.

3. The Guarantor waives any requirement that NHAI demand any debt or payment from the Concessionaire before presenting it with a demand under this Guarantee.

4. NHAI shall notify the Guarantor of its demand for payment of the Guaranteed Sum without any deduction of whatsoever nature and without reference to any claim or counter claim or set off, in accordance with the Concession Agreement.

   Such notification by NHAI shall be conclusive and binding on the Guarantor.

5. Upon encashment and appropriation of the whole or any portion of the Guaranteed Sum by NHAI in accordance with the Concession Agreement, the Guarantor shall be obliged to replenish the existing Guarantee or provide fresh guarantee of the Guaranteed Sum and the Concessionaire is deemed to have made the request for such fresh guarantee upon the execution and furnishing of this Guarantee in the first instance.

6. No underlying dispute as between NHAI and the Concessionaire nor any pending application for interim relief or arbitration proceedings or other legal proceedings shall constitute any ground for prevention, delay or obstruction for making payment to NHAI by the Guarantor and the existence of any disputes or differences or claims in arbitration or otherwise shall not constitute any ground for non-payment on this Guarantee.

7. This guarantee is valid and effective from its date. This guarantee and the Guarantor's obligations under it will terminate on the Commercial Operations Date of the Project as advised to the Guarantor in writing by NHAI. However the Guarantee shall be released earlier by NHAI to the Concessionaire, upon contribution of the Equity (excluding) Equity Support, if any by the Shareholders of the Concessionaire to the extent of 100% and upon the Concessionaire having expended on the Project and paid out an aggregate sum of not less than 20% of the Total Project cost as certified by the Statutory Auditors of the Concessionaire but provided the Concessionaire is not in breach of this Agreement or the Concession Agreement.

8. The Guarantor agrees that its obligation to pay any demand made by NHAI before the termination of this Guarantee will continue until the amount demanded has been paid in full.

9. This Guarantee shall be valid and effective upto ***05/04/2007*** for enabling NHAI to lodge a claim for payment under the Guarantee till the date of expiry of the term of the Guarantee. The Guarantor shall be obligated to make payment upon the Guarantee forthwith on demand, if the claim is lodged within the claim validity period and the obligation to pay is subject to normal limitation for payment of claims upon a guarantee. Time is of essence for payment and in the event of failure to make payment, Guarantor shall be obligated to pay compound interest at 2% above the prime lending rate of the Guarantor institution, compounding quarterly in the event of the Guarantor's failure to make payment upon the Guarantee for any reason whatsoever. Payment of interest as provided is no excuse for delayed payment or nonpayment of the Guaranteed Sum.

UNITED BANK OF INDIA
HYDERABAD BRANCH

Contd..3..

10. No change in the constitution of the Concessionaire or of the Guarantor shall be a ground for release of the Guarantee and no variation in the concession agreement made post selection of the bidder, or post making of the bid, shall constitute a variation, which would, subject to the terms and conditions of this agreement, discharge the Guarantor. The Guarantor shall notwithstanding such change, be bound to make payment upon the Guarantee on demand.

11. The Guarantor agrees that no change, addition to or other modifications to the terms of the Concession Agreement or to any documents which have or may be made between NHAI and the Concessionaire will in any way release it from any liability under this Guarantee and that it waives any requirement for notice of any such change, addition or modification.

12. The Guarantor agrees that it will not assign its obligations under this Guarantee without the prior written consent of NHAI. NHAI will not unreasonably withhold its consent if the proposed assignee is of at least equal financial standing to the Guarantor and the assignee assumes in writing the obligations of the Guarantor under this Guarantee at the same time or before the assignment

13. All correspondence should be addressed and delivered to General Manager (BOT) IA, National Highways Authority of India, G 5 & 6, Sector – 10, Dwarka, New Delhi – 110 075. Telefax No. 011 – 2509 3524.

14. This Guarantee binds the Guarantor, its successors and permitted assigns.

SEAL OF [THE BANK] .....

NAME OF [THE BANK] .....

SIGNATURE ..... यूनाइटेड बैंक ऑफ इंडिया/UNITED BANK OF INDIA हैदराबाद. शाखा/HYDERABAD BRANCH

NAME .....

TITLE ..... सहायक प्रबन्धक/उप प्रबन्धक Asst. Manager/Dy. Manager मुख्य प्रबन्धक Chief Manager

CODE NO. ..... KANJANEYULU Sl.No.7100

DATE ...17/04/2006.....

PHONE NO .....

FAX NO .....

THANJAVUR EXPRESSWAY LTD. Hyderabad

SCHEDULE G

SCHEDULE OF USER FEE

TO BE PUBLISHED IN THE GAZETTE OF INDIA EXTRAORDINARY
PART – II – SECTION 3 SUB SECTION (ii)
GOVERNMENT OF INDIA
MINISTRY OF SHIPPING, ROAD TRANSPORT & HIGHWAYS
DEPARTMENT OF ROAD TRANSPORT AND HIGHWAYS
NEW DELHI the ....., 200....

Whereas, by the notification of the Government of India in the Ministry of Shipping, Road Transport & Highways (MoSRT&H), number ..... dated ..... issued under Section 11 of the National Highways Authority of the India Act, 1988 (68 of 1988), the Central Government has entrusted the section from Km 80.000 to 135.750 of the National Highway number 67 in the State of Tamil Nadu to the National Highways Authority of India (herein after referred to as the "Authority")';

AND, WHEREAS, the Authority has entered into an agreement with Trichy-Thanjavur Expressways Limited (herein after referred to as the "Concessionaire") for the development of the Thanjavur-Trichy stretch from Km 80.000 to Km 135.750 which forms part of the said section of the said National Highway;

AND, WHEREAS, the Central Government has entered into an agreement with the Authority for the development of the said section of the said National Highway and to issue a Fee Notification to levy and collect the Fees from the said National Highway in terms of the aforesaid agreement entered into between the Authority and the said Concessionaire;

NOW, THEREFORE, in exercise of powers conferred by section 8A of the National Highways Act, 1956 (48 of 1956), read with rule 3 of the National Highways (Collection of Fees by any person for the use of section of National Highways/permanent bridge/temporary bridge on National Highway) Rules, 1997, the Central Government, having regard to the expenditure involved in building, maintenance, management and operation of the said section of the said National Highway No....., interest on the capital invested, reasonable return, the volume of traffic and the period of such agreement entered into between the Authority and the Concessionaire, hereby notifies that there shall be levied and collected Fees on mechanical vehicles for the use of the said section starting from Km 80.000 to Km

THANJAVUR EXPRESSWAYS LTD. TRICHY Hyderabad

135.750 of the National Highway number 67in the State of Tamil Nadu at the rate specified in the Schedule below, and authorizes the said Concessionaire to collect and retain the said Fees on and from the date of commercial operation or publication of this notification in the Official Gazette whichever is later and till the termination date as mentioned in the Agreement.

Definitions, - In the notification, unless the context otherwise requires, -

(i) "Actual Fees" means the Fees actually charged on the road users for using Km 80.000 to Km 135.750 of the Project Highway based on the length of the Project Highway and the base Fee given in the schedule to this notification. In case of two Toll Plazas each Toll Plaza would levy Fee for half of the length of the Project Highway.

(ii) "date of commercial operation or COD" means the date on which the commercial operations of the said section of the National Highway number 67 in the State of Tamil Nadu begins, which shall be the date on which the Independent Consultant has issued the Completion Certificate or the Provisional Certificate upon completion of the said section of the said National Highway in accordance with the provisions of the Agreement entered into between the Authority and the Concessionaire;

(iii) "Termination Date" means the date on which the said Agreement entered into between the Authority and the Concessionaire expires pursuant to the provisions of the said Agreement or is terminated by Termination Notice;

(iv) "Local Traffic" means the following type of traffic

(a) Car/ jeep / vans – It has 2 category of traffic, viz

- Category I means and includes local users falling into any of the following categories

(1) Residents of villages/towns/cities whose boundary falls within a radius of 10 Km of the fee collection booths (toll plaza).

(2) Establishments /Industrial units located within a radius of 10 Km of the fee collection booths (toll plaza).

(3) Employees of Establishments /Industrial units located or which have their office, within a radius of 10 Km of the fee collection booths (toll plaza); and

(4) Self employed persons/ businessmen having a place of work within a radius of 10 Km of the fee collection booth (toll plaza).

➢ Category II means and includes local users falling into any of the following categories

(1) Residents of villages/towns/cities whose boundary falls within a radius of more than 10 Km but upto 20 Km of the fee collection booths (toll plaza).

(2) Establishments /Industrial units located within a radius of more than 10 Km but upto 20 Km of the fee collection booths (toll plaza).

(3) Employees of Establishments /Industrial units located or which have their office, within a radius of more than 10 Km but upto 20 Km of the fee collection booths (toll plaza); and

(4) Self employed persons/ businessmen having a place of work within a radius of more than 10 Km but upto 20 Km of the fee collection booth (toll plaza).

The discounted fee for the above two categories shall be as under:

Category I: Monthly pass of Rs 150.00

Category II: Monthly pass of Rs 300.00

(b) Deleted

(c) LCV/Trucks (Local Transport Operators):

Concessional Fee shall be from Local Transport Operators on production of proof for plying within 20 Km i.e. goods challan for origin and destination clearly specifying the return details of the vehicle. The Fee for such transport shall be Rs 25 (Rupees twenty five) for trucks for each entry and Rs 15 (Rupees fifteen) for LCV for each entry

(v) Words and expressions used in this notification but not defined but defined in the Agreement entered into between the Authority and the Concessionaire in respect of section from Km 80.000 to Km 135.750 of the National Highway number 67 in the States of Tamil Nadu shall have the same meaning as assigned to them respectively in the said Agreement.

SCHEDULE

Rates of base Fees to be recovered from the users of the National Highway number 67 from Km 80.000 to Km 135.750 in the State of Tamil Nadu, applicable as on 1st July, 1997.

The Fee shall be collected at one plaza

S. No.	Category of Vehicle	Capping Rate of base Fees per vehicle per one way trip at June 1997 (in rupees per km.)	Current Rate per vehicle per one way trip (In rupees per km) based on Annual Yearly Average WPI for the Year 2004-05. (WPI for 2004-05 = 187.3)
(1)	(2)	(3)	(4)
1.	A car, passenger van or jeep	0.40	0.570
2.	Light Commercial Vehicle (LCV)	0.70	0.998
3.	Bus, Truck	1.40	1.996
4.	MAV (>2 Axle)*	2.25	3.207

* It shall include Earth Moving Equipment and Heavy Constriction Machinery.

Notes:

1. Actual amount of fee to be charged for a particular year (from 1st September of a year to 31st August of the following year) will be computed as under:

2. The aforesaid Fee will be revised once in every year. The revised Fee shall be computed ("Computed Fee") as follows:-

$$\text{Base Fee} \times \frac{\text{WPI-B}}{\text{WPI-A}} \times \text{....Km for one way journey}$$

Where

- WPI-B = is the Average Wholesale Price Index available for the year ending March 31st preceding the Fee revision date.
- WPI-A = is the Wholesale Price Index on June 1997 i.e (131.4%)

WPI means Wholesale Price Index as released by the Office of the Economic Advisor, Ministry of Commerce and Industry, Government of India or any other index replacing the same.

3. When the same vehicle has to cross the said stretch of the National Highway more than once in a day, the user shall have the option to pay the Fee for multiple trips at 1.5 times the rates as given in the Schedule above while crossing the Toll Plaza in the first trip itself. If the vehicle has to use the said stretch continuously and frequently for entire month, the vehicle owner can have a monthly pass on payment of charges equal to thirty (30) times rate applicable for single trip as applicable to it as specified in the aforesaid Schedule.

   For the purpose of this notification "day" shall be counted as continuous period of twenty-four hours.

4. The actual Fees to be charged shall be rounded off to the nearest rupee.

5. The following type of vehicles shall be exempted from the fee specified above in the Schedule, namely: -
   Exempted Vehicles" means Vehicles having "VIP" symbols or officially belonging to;
   a. President of India
   b. Vice-President of India
   c. Governor of a State and Lt. Governor of a Union Territory;
   d. A Foreign dignitary on State visit to India, and
   e. A Foreign Diplomat stationed in India using cars with "CD"/ "CC" symbols
   f. Chairman of Rajya Sabha or Speaker of Lok Sabha or Chairman of a State Legislative Council or Speaker of a State Legislative Assembly or a Minister for the Union or State or Leader of Opposition in Lok Sabha or Rajya Sabha or State Legislatures having the Status of Cabinet Minister if he is sitting in the vehicle; Or
   g. Members of Parliament in the entire country or a Member of Legislative Assembly of a State or a Member of Legislative Council of a State, in the respective State if he produces his Identity Card issued by the Parliament or concerned Legislature of a State as the case may be.

h. Belonging to winner of Gallantry awards such as Param Vir Chakra, Ashok Chakra, Maha Vir Chakra, Kirti Chakra, Vir Chakra and Shaurya Chakra, if such awardee produces his photo Identity Card duly authenticated by the Competent Authority for such award

i. Defence vehicles, police vehicles, fire fighting vehicles, ambulances, funeral vans, Post and Telegraph Department's vehicles, central and state Government vehicles on duty.

j. Different class of Defense Personnel and vehicle carrying cargo meant for them in accordance with Indian Tolls (Army and Air Force) Act, 1901, Rules including any amendments thereto.

6. The rates of Fees, the Categories of vehicles exempted from payment of Fee and the name, address and telephone number of Concessionaire to whom complaints, if any, should be addressed, shall be conspicuously and prominently displayed 500 meters ahead of the toll booths, 100 meters ahead of the toll booths and at the toll booths also, the height of the display boards and size of letters being such that it is easy for drivers to read the display boards and they shall be legibly written or printed in English, Hindi and the regional language of the area in which the stretch is situated.

7. The Concessionaire shall nominate an officer as in-charge of fee collection. The Concessionaire and also the said officer shall be responsible to ensure that Fees are collected at not more than the agreed rates and the Fee collected is smooth without causing undue hardship to the road users and for all matters connected therewith.

8. Concessionaire shall not collect any Fees from Local Traffic in excess of the discounted rates mentioned this Schedule G. Provided however, that if a separate service lane is opened for free use by local traffic, the Concessionaire shall levy and collect Fee from such local traffic, if they use the four lane highway.

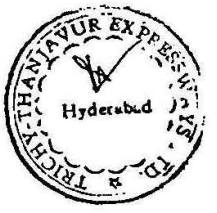
9. The Fee schedules mentioned in serial numbers 8 are applicable for the time being and will undergo change as and when announced by NHAI as per the policy applicable at that time.

10. As and when a service lane is constructed, the Concessionaire shall not collect any fee from the users of such lane(s)

11. The Concessionaire shall publish substance of this notification and the scheme of discount to frequent and local users, as provided in the Concession Agreement, in two local newspapers (one of which shall be in vernacular language), which shall also state the date of commercial operation as per the provision of this notification, at least ten days prior to the date of commercial operation. Such substance shall also be repeated, ten days prior to giving effect to revised Fees as per this notification.

13. The actual Fees to be charged to users shall be computed by the Concessionaire and sent to Authority for validation as soon as possible after 31st March in every year, but at least forty-five days before the rate increase is to be effective. Authority shall provide any comments or request clarifications as soon as possible upon receipt of the Fee revision proposal but not later than fifteen days of receipt of the Fee revision proposal. If the Authority does not offer comments or seek clarification during this period the revised Fee, as proposed by the Concessionaire, shall be deemed to have been confirmed by the Authority.





Schedule H

I. PROJECT COMPLETION SCHEDULE

S.No.	Activities	Completion Period (from the Appointed Date)
1.	Completion of project road from Km 80.00 to km 135.750 of NH – 67.	2.5 years

II. SITE HANDING OVER SCHEDULE

The site shall be handed over as below from the date of signing the Concession Agreement:

Stretch	Length	Remarks
Existing ROW	Km 80.000 to km 135.750	Within One month
Additional Land wherever required for the Project Highway including Land for Base Camp	-	Within 12 months

Note: The above Handing over Schedule is subject to accomplishment of all obligations of the Concessionaire as mentioned in the Request for Proposal (RFP) Document.

Design, Engineering, Finance, Construction, Operation and maintenance of Thanjavur - Tirchy section from Km. 80.000 to Km. 135.750 of NH-67 under NHDP phase IIIA on Build, Operate and Transfer (BOT) Basis.

(Package No. : NHDP-III/ BOT/ TN/ 03)

PROJECT MILESTONES

Sl. No	Project Milestone ↓	Construction Month →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Pre Construction Activity	Date of Signing of Concession Agreement																														
1	Achievement of Financial Closure																															
2	Project Design																															
3	Handing over the site to the Concessionaire																															
4	Mobilization at site by Concessionaire																															
5	Shifting of Utilities including Tree Cutting																															
	Construction Activity																															
6	Bridges and CD Structure																															
7	ROBs & Grade Separator																															
8	New Carriageway																															
9	Existing Carriageway																															
10	Toll plaza and Administrative Blocks																															
11	safety Features																															
12	C.O.D.	(2 years) May 2008																														

S.V. PATWARDHAN
Managing Director
Madhucon Projects Ltd.

SCHEDULE I

DRAWINGS

1. The project highway drawings, as defined in clause 1.1, Definitions, Article 1, Definition and Interpretation, Chapter I-Preliminary, of the Concession Agreement shall consist:

   A. Working drawings of all the components/elements of the project as determined by Independent Consultant/NHAI, and

   B. As-built drawings for the project highway components/elements as determined by Independent Consultant/NHAI. As-built drawings shall be duly certified by Independent Consultant

2. A broad list of the drawings of the various components/elements of the project highway and project facilities required to be submitted by the Concessionaire is given below:

   a) Drawings of horizontal alignment, vertical profile and cross sections
   b) Drawings of cross drainage works
   c) Drawings of interchanges, major intersections and grade separators
   d) Drawings of toll plaza layout, toll collection systems and roadway near toll plaza
   e) Drawings of Control Centre
   f) Drawings of bus-bay and bus shelters with furniture and drainage system
   g) Drawing of a truck parking lay by with furniture and drainage system
   h) Drawings of road furniture items including traffic signage, markings, safety barriers, etc.
   i) Drawings of traffic diversion plans and traffic control measures
   j) Drawings of road drainage measures
   k) Drawings of typical details slope protection measures
   l) Drawings of landscaping and horticulture
   m) Drawings of pedestrian crossings
   n) Drawings of street lighting
   o) Layout/Configuration of HTMS
   p) General arrangement of Base camp and Administrative Block

Schedule J

TESTS TO BE CONDUCTED

1. All materials to be used , all methods adopted and all works performed shall be strictly in accordance with MOSRT&H's Specifications for road and bridge works. For this purpose the responsibility of the contractor in section 900 shall be taken up by the Concessionaire and the responsibility of the engineer shall be taken up by the IC/NHAI.

2. The Concessionaire shall carry out quality control tests on the materials and works at the frequency stipulated in Section 900 of MOSRT&H's Specifications for road and bridge works. For the convenience of the Concessionaire particulars of the Tests to be conducted for various items are shown in Appendix-I. Appendix also covers the particulars of the tests for items not covered under Section 900 of MOSRT&H's Specifications for road and bridge works. In the absence of clear indications about the methods and/or frequency of tests for any item in Section 900 of MOSRT&H's Specifications for road and bridge works or Appendix-I, the instruction of IC/NHAI shall be followed.

3. The Concessionaire shall carry out all necessary tests on materials and works independently and keep their records for reference. The Concessionaire shall prepare a quality Audit Manual in consultation with IC to ensure better quality of work. Following circulars of MOSRT&H and IRC Codes may also be referred.

    a. IRC:SP-11 "Handbook of Quality Control for Construction of Roads and Runways"
    b. IRC:SP-47 "Guidelines on Quality Systems for Road Bridges (Plain, Reinforced, Pre-stressed and Composite Concrete)"
    c. IRC:SP-51 "Guidelines for Load Testing of Bridges"
    d. IRC:SP-57 "Guideline for Quality Systems for Road Constructions"
    e. MOSRT&H Circular No RW/NH-34059/1/96-S&R dated 30/11/2000 "Revised Interim Specifications for Expansion Joints"

4. Above stipulated requirements for tests and quality control are minimum. The Concessionaire shall conduct all possible tests to ensure quality construction.
5. IC, at his discretion and consistent with sound engineering practice, shall carry out any non-destructive tests on pavement , structures and any other component to ascertain the soundness of work.





APPENDIX-I

TESTS TO BE CONDUCTED

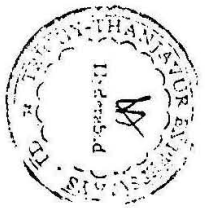
Sl. No.	Item	Test	Testing Procedure
1.0	**Earthwork for embankment, subgrade construction and cut formation**		
1.1	Embankment and subgrade borrow materials	Quality Audit of the following tests performed during construction for soil type, density, moisture content and CBR as required by Ministry of Surface Transport specifications for Road and Bridge works • Moisture Content test as per IS : 2720 (Part 2) • Sand Content Test according to IS : 2720 (Part 4) • Plasticity Characteristics of soils according to IS : 2720 (Part 5) • Moisture Content-Dry Density relationship using heavy compaction according to IS: 2720 Part 8. • Determination of total soluble sulphate content as per IS : 2720 Part 37 • IS : 2720 (Part 40): Determination of Free Swelling Index of solutions	As per relevant parts of IS - 2720
1.2	Compaction	Quality Audit of the following Tests performed during construction as required by MORT&H specifications for Road and Bridge works. • Compaction density and • Determination of dry density of soils in place according to IS-2720, Part 28 by the Sand Replacement Method	As per IS-2720, Part 28

2.0 Pavement Structure			
2.1	Granular Sub base and base courses	Quality Audit of quality control tests on soils, aggregate and moisture content - density tests and CBR tests as required by MORT&H specifications for Road and Bridge works. • Plasticity Characteristics of soils according to IS : 2720 Part 5 • Dry density of soils in place according to IS : 2720 Part 28 • Determination of total soluble sulphate, content as per IS : 2720 Part 37 • CBR test as per IS : 2720, Part 16 • Dry density-moisture content relationship as per IS: 2720 Part 8 • Aggregate grading as per Job Mix Formula • Aggregate Impact value as per IS: 2386 (Part 4) or IS : 5640 • Particle size and shape as per IS : 2386 (Part I)	As per relevant parts of IS – 2720, IS 2386 and IS 5640
2.2	Bituminous base and wearing courses	Quality Audit of quality control tests on aggregates and bitumen and on bituminous mixes as laid down in clause 903.4 of MORT&H specifications for Road and Bridge works. • Aggregate Impact Value as per IS2386 (Part 4) • Particle size and shape as per IS : 2386 (Part I) • Stripping value test as per AASHTO T182 • Water absorption as per IS : 2386 (Part 3) • Soundness Test as per IS : 2386 Part 5 • Marshall stability test as per ASTM D-1559	As specified in the codes IS 2386, parts 1,3,4 and 5, AASHTO T182 and ASTM D-1559
2.3	Cement concrete Pavement	Quality audit of sampling and testing of cubes and beams for strength of concrete and quality control tests on aggregates • Aggregate Impact Value as per IS : 2386 (Part 4) • Soundness Test as per IS: 2386 (Part 5) • Alkali Aggregate Reactivity IS : 2386 (Part 7)	As per relevant parts of IS 2386, IS 516 and IS1199

		• Strength of Concrete (Tests on Cubes and beams) as per IS : 516 • Workability of fresh Concrete - Slump Test IS : 1199	
2.4	Riding Quality of Surface	Checking International Roughness index of the finished pavement surface for compliance with the requirement stated in clause 2.5.7 of Schedule D.	Roughness measurement by bump integrator (Annexure A) or an equivalent device approved by NHAI/IC
3.0	**Bridges**		
3.1	Cement, aggregate, reinforcement pre-stressing steel and Concrete	Tests and Standards of Acceptance as per MORT&H Specifications of Tests performed during construction	The Auditing shall be carried out in accordance with the IRC special publication on Quality Assurance
3.2	Superstructure	Static load testing of any one span of the structure for carrying design load as per IRC SP 37-1991	Test shall be carried out in accordance with Annexure B
3.3	Bearings	Checking and verification of the bearings to ascertain proper functioning as per MORT&H Specifications.	The inspection shall be carried out in accordance with requirement laid in MORT&H specifications for Road and Bridge works and shall meet the prescribed criteria.
3.4	Expansion Joints	Checking and verification of the Expansion joints to ascertain proper functioning as per MORT&H Specifications	The inspection shall be carried out in accordance with requirement laid in MORT&H specifications for Road and Bridge works and shall meet the prescribed criteria.
3.5	Foundation & Substructure	Checking and verification of the Foundation settlement and rotation	The settlement of foundation for superstructure load at completion shall be measured with reference to a fixed datum. (For this purpose, the records of measurements taken before the superstructure concreting should also be available.)
4.0	Highway Lighting System	Level of illumination	The illumination level shall be measured with luxmeter following the method as specified in its manual (Annexure C).

5.0	Traffic Signals	Test in accordance with the relevant clauses of IRC:93 and IS 7537	Meet the prescribed criteria in IRC 93 and IS 7537
6.0	Toll System Operations	1. Certified report of Factory Acceptance test (FAT) 2. Post installation site test to conform to the functionability and specifications of the contract	Real time test for individual functionality of each component which should conform both specifications / codes stipulated in the country of manufacture. It should include manual operations in case of no power.
7.0	Rest Area Operations	Test in accordance with the functioning of facilities built in RAO	Standard building safety procedures as presented by NBC
8.0	Emergency Telephone System	Independent Systems to be developed to operate on the Project site	Real time test to be carried out to conform to the designed system.
9.0	Traffic Signage and Pavement Marking	Tests in accordance with ASTM standard E:810 relevant clauses of section 800 of MORT&H specifications for Road and Bridge works published by IRC 1997	To follow ASTM Standard E:810 as per section 800 of MORT&H specifications for Road and Bridge Works published by IRC 1997





1 Schedule for Tests

1.1 The Concessionaire shall, not later than 30 (thirty) days prior to the likely completion of [Four-Lanning], notify the Independent Consultant and NHAI of its intent to subject the Project Highway to Tests, and not later than 10 (ten) days prior to the actual date of Tests, furnish to the Independent Consultant and NHAI a detailed inventory and particulars of all works and equipment forming part of [Four-Lanning].

1.2 The Concessionaire shall notify the Independent Consultant of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Independent Consultant shall, in consultation with the Concessionaire, determine the date and time for each Test and notify the same to NHAI who may designate its representative to witness the Tests. The Independent Consultant shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 16 and this Schedule-J.

2 Tests

2.1 **Visual and physical Tests:** The Independent Consultant shall conduct a visual and physical check of [Four-Lanning] to determine that all works and equipment forming part thereof conform to the provisions of this Agreement.

2.2 **Test Drive:** The Independent Consultant shall take test drive of the Project Highway by a Car and a fully loaded Truck to determine that the quality of service conforms to the provisions of this Agreement.

2.3 **Riding quality Test:** Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator as mentioned at annexure A of this Schedule.

2.4 **Pavement Composition Test:** The thickness and composition of the pavement structure shall be checked on a sample basis by digging pits to determine conformity of such pavement structure with Specifications and Standards. The sample shall consist of one pit in each direction of travel to be chosen at random in each stretch of 5 (five) kilometers of the Project Highway. The first pit for the sample shall be selected by the Independent Consultant through an open draw of lots

and every fifth kilometer from such first pit shall form part of the sample for this pavement quality Test.

2.5 **Cross-section Test:** The cross-sections of the Project Highway shall be checked on a sample basis through physical measurements of their dimensions for determining the conformity thereof with Specifications and Standards. For the road portion, the sample shall consist of one spot to be selected at random in each stretch of 1 (one) kilometer of the Project Highway. The first spot shall form part of the sample shall be selected bye the Independent Consultant through an open draw of lots and the spots located at every one kilometer from such first spot shall form part of the sample. For the bridge portion, one spot shall be selected at random by the Independent Consultant in each span of the bridge.

2.6 **Structural Test for bridges:** All major and minor bridges constructed by the Concessionaire shall be subjected to the Rebound Hammer and Ultrasonic Pulse Velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17; 1996 of the IRC Highway Research Board on Non-destructive Testing Techniques, at two spots in every span, to be chosen random by the Independent Consultant.

2.7 **Environmental audit:** The Independent Consultant shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.

2.8 **Safety Review:** Safety audit of the Project Highway shall have been undertaken by the Safety Consultant as set forth in Schedule-L and on the basis of such audit, the Independent Consultant shall determine conformity of the Project Highway with the provisions of this Agreement.

3 **Completion/Provisional Certificate**

Upon successful completion of Tests, the Independent Consultant shall issue the Completion Certificate or the Provisional Certificate, as the case may be, in accordance with the provisions of Article 16.4.

Annexure-A

TEST PROCEDURE FOR MEASURING ROUGHNESS INDEX OF THE RIDING SURFACE OF A FLEXIBLE PAVEMENT

EQUIPMENT – Bump Integrator Fitted in a Vehicle

Test Procedure:

The following test procedure shall be adopted for the test

1) Check that the installation and operation of the equipment is in order and meets the requirements prescribed in its operational manual. The tyre pressure of wheels should be as prescribed.

2) The instrument shall be calibrated prior to its use for measurement as prescribed in its operational manual.

3) The operators shall familiarise themselves with the Bump Integrator & other equipment associated with its operation using its Test Mode before commencing a survey.

4) Generally a speed varying between 30 km./hour-40 Km/hour shall be maintained during measurements. The readings shall be taken for each carriageway independently.

5) The equipment shall run on a lane in both the directions once and the average of two values taken for its roughness index.

6) Pavement unevenness/roughness of 2/3 lane carriageway shall be obtained from the average of the values of the 2/3 lanes recorded.

7) The roughness index value is obtained by using the internationally accepted software associated with the equipment from the measured Bumps.

8) All data shall be properly recorded with appropriate referencing and stored in a prescribed manner as in the operational manual.

9) The roughness measurements shall be properly calibrated using the procedure recommended in the World Bank Technical Publication No. 46.

Annexure-B

LOAD TESTING OF A BRIDGE SUPERSTRUCTURE

The load test shall be carried out to check and establish the serviceability and working strength of the superstructure.

1.0 Test Load

The "Test Load" is the equivalent static load equal to the impacted working design Live Load (applied in addition to all dead loads) placed for maximum effect (bending moment, shear, deflection, etc. as the case may be) and applied either through an appropriate test loading truck or through loading platforms resting on tyre-contact area plates simulating the actual areas of wheels.

2.0 Load Application and Testing Procedure

I. Fix deflection gauges (supported on unyielding supports) under the superstructure, just touching its soffit, at the pre-marked critical 'points'.

II. Apply the test load in five equal increments (including the weight of platforms of trucks in the first increment), allowing about two hours in between completion of one load increment and commencement of the next. About an hour after completing a load increment, note the deflections and any crack patterns together with maximum crack widths.

III. After measuring the deflections, etc, one hour after applying the fifth increment, i.e. the final load increment, keep the test load maintained for about 24 hours and again measure the deflections and crack widths (if any)

IV. Remove the test load in five equal decrements, allowing about two hours in-between completion of one load decrement and commencement of the next. Note the deflections and crack widths (if any) at the end of each load decrement.

V. Note the deflection and crack widths (if any_ 24 hours after removal of the test load in order to see whether the recovery is complete or there is any residual deflection, etc.

3.0 Acceptance Criteria

I. Increase and decrease in deflections at a point shall follow a linear relation, with actual deflections not exceeding the theoretically estimated ones by more than 10%;

II. The maximum crack width in reinforced concrete shall not exceed 0.25 mm to 0.30 mm (but no cracks in case of prestressed concrete);

III. The deflections at the end of the 24 hours of maintaining the test load shall not exceed the corresponding values at the start of this 24 hour period by 5% and

IV. The residual deflection at any point 24 hours after complete unloading shall not exceed 10% of the maximum observed deflection at that point (i.e. recovery: 90% or more);

4.0 Observation

The cracks in reinforced concrete shall close upon removal of test load but may not completely disappear.

Annexure-C

Testing Procedure for Illumination intensity by Luxmeter

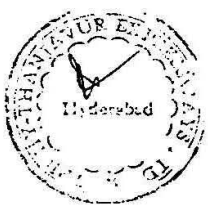
Instrument	:	Luxmeter (make of renowned company)
Basis	:	Comparison with a calibrated Luxmeter through a standard lamp by renowned Photometric Lab.

Test Procedure:

Following steps shall be taken for the test

- Calibration of the luxmeter.
- Put off the lights to be tested.
- Take calibrated luxmeter reading.
- Put on the lights in the area to be tested
- Observe the luxmeter reading
- Difference (positive or negative) in addition with standard light luminance level will give the actual luminance of existing lighting system.

Note: The testing procedure shall be as per the Manual of the Luxmeter used.





SCHEDULE - K

COMPLETION CERTIFICATE

(In case the Completion Certificate is being issued without the Provisional Certificate already being issued.)

I/We, (Name of Independent Consultant) acting as Independent Consultant on the Project "Design, Construction, Development, Finance, Operation and Maintenance of Km 80.000 to Km 135.750, of section of NH 67 in the State of Tamil Nadu, India on BOT basis" through the Concessionaire, **Trichy-Thanjavur Expressways Limited** hereby issue this Completion Certificate in-terms of sub-clause 16.4 of Concession Agreement since the said Project has been completed and successfully tested as per Schedule 'J' as stipulated in the said Concession Agreement and is ready for commissioning of traffic commercially as provided in the Concession Agreement dated (Date of Agreement) between the said Concessionaire and the NHAI. The date of issue of this Completion Certificate shall be the COD, as defined in the said Concession Agreement.

Dated _____

(Date of Issue)

Team Leader

Authorised Representative of the Independent Consultant

(In case the Completion Certificate is being issued with the Provisional Certificate already issued)

I/We, (Name of Independent Consultant) acting as Independent Consultant on the Project "Design, Construction, Development, Finance, Operation and Maintenance of Km 80.000 to Km 135.750, of section of NH 67 in the State of Tamil Nadu, India on BOT basis" through the Concessionaire, **Trichy-Thanjavur Expressways Limited** hereby issue this Completion Certificate in-terms of sub-clause 16.4 of Concession Agreement since the said Project has been completed and successfully tested as per Schedule 'J' as stipulated in the said Concession Agreement and all the Punch List items as mentioned in the Provisional Completion Certificate issued on .....completed as provided in the Concession Agreement dated (Date of Agreement) between the said Concessionaire and the NHAI.

Dated _____

(Date of Issue)

Team Leader

Authorised Representative of the Independent Consultant

SCHEDULE – K_1

PROVISIONAL COMPLETION CERTIFICATE

Provisional Completion Certificate

I/We (Name of Independent Consultant) acting as Independent Consultant on the Project, "Design, Construction, Development, Finance, Operation and Maintenance of Km 80.000 to Km 135.750, of section of NH 67 in the State of Tamil Nadu, India on BOT basis" through the Concessionaire, **Trichy-Thanjavur Expressways Limited** hereby issue this Provisional Certificate of Completion in-terms of sub-clause 16.5 of Concession Agreement dated (Date of Agreement), between the said Concessionaire and the NHAI, on the request of the said Concessionaire subject to the appended Punch List containing a list of outstanding items since the tests stipulated in Schedule 'J' have been successfully carried-out and all parts of Project Highway can be legally, safely and reliably placed in commercial operations though certain works and things forming part thereof are not yet complete as indicated in the said Punch List. All the items of the said Punch List shall be completed by the said Concessionaire with in 120 (one hundred and twenty) days of the date of issue of this Provisional Certificate of Completion. The date of issue of this Provisional Completion Certificate shall be the COD, as defined in the said Concession Agreement.

Dated _____

(Date of issue)

Team Leader

Authorised Representative of the Independent Consultant

Schedule-L

OPERATION & MAINTENANCE (O&M)

1 General

a. The Concessionaire shall comply with the O&M Requirements set out in this Schedule. In doing so, the Concessionaire shall ensure that the Project Highway and Facilities are maintained to the standards and specifications and shall also meet the other requirements, if any, set out in the Agreement.

b. During the Implementation Period, the Concessionaire shall take appropriate measures to operate and maintain the existing highway and ensure that minimum 2 lanes remain open for uninterrupted, smooth and safe traffic flow at all times.

c. The Concession Agreement stipulates that the project highway shall be constructed operated and maintained during the Concession Period by Concessionaire and thereafter transferred to NHAI. This schedule elaborates the operation and maintenance requirements of the concession and is to be read together with the Concession Agreement for this purpose. For clarification of doubt, the period during which the Concessionaire shall comply with O&M requirements covers the entire Concession Period including the Construction period. Particularly, during the construction period, the Concessionaire is required to operate and maintain the existing two lanes as provided in the Concession Agreement and this Schedule.

2 O & M Requirements

2.1 In the design, planning and implementation of all works and functions associated with the operation and maintenance of the Project facilities, the Concessionaire shall take all such actions and do all such things (including without limitation, organizing itself, adopting measures and standards, executing procedures including inspection procedures, highway patrols, and engaging contractors, if any, agents and employees) in such manner, as will:

(i) Ensure the safety of personnel deployed on and users of the Project Facilities or part thereof:

(ii) Keep the Project Facilities from undue deterioration and wear;

(iii) Permit unimpaired performance of statutory duties and functions of any party in relation to the Project;

2.2 During the concession period, the concessionaire shall ensure that

(i) The Project Facilities are kept free from undue deterioration and undue wear;

(ii) applicable and adequate safety measures are taken;

(iii) minimum delay is caused to users of the Project Facilities

(iv) adverse effects on the environment and to the owners and occupiers of property and/or land in the vicinity of the Project Facilities, due to any of its actions, is minimized;

(v) Any situation which has arisen or likely to arise on account of any accident or other emergency is responded to as quickly as possible and its adverse effects controlled/minimized;

(vi) disturbance or damage or destruction to property of third party by operations of the Project Facilities is controlled/minimized;

(vii) Elected members of the public are treated with due courtesy and consideration by its employees/agents;

(viii) Users are provided with adequate information and forewarned of any event or any other matter affecting the Project Facilities to enable them to control/ minimize any adverse consequences by such event or matter;

(ix) Registers to be maintained to record grievances or appreciations of members of public in relation to the operation and maintenance of project/project facilities.

(x) Traffic data and data relating to the operation and maintenance of the Project Highway and its Facilities and events on the Project Highway are collected and disseminated such that the MORT&H and other persons or bodies with statutory duties or functions in relation to the Project Highway or adjoining roads are able to perform those duties and functions efficiently;

(xi) All materials used in the maintenance, repair and replacement of any of the Project Facilities shall meet the Design Requirements/standards.

(xii) The personnel assigned by the Concessionaire have the requisite qualifications and experience and are given the training necessary to enable the Concessionaire meet the O&M Requirements.

3 Operation and Maintenance Manual and O&M Plans

3.1 This will be made for three stages as described in sub paras below:

a) Prior to the commencement of any construction activity, the Concessionaire, in consultation with the Independent Consultant, shall finalize the O&M Plan for Implementation Period.

b) Prior to making application for the Completion certificate for the Project the Concessionaire shall finalize in consultation with the Independent Consultant:

(i) the O&M Manual

(ii) the O&M Plan for the first year of operations.

Hyderabad

c) Six weeks prior to the anniversary of Commercial Operation Date of Project (COD)* each year, the Concessionaire shall submit an annual O&M Plan for the next year of operations.

d) The O&M Manual prepared by the Concessionaire shall set out the operations and maintenance standards and details of the operations and maintenance activities to be undertaken during the Concession Period, so that the Project Facilities shall at all times conform to the Design Requirements/ specifications.

e) The Manual shall include without limitation the following aspects:

(i) Organization structure with responsibilities of key personnel;

(ii) Traffic Management Plan including the Corridor Control Plan;

(iii) Safety Management Programme including the Emergency Response Protocol;

(iv) Inspection Procedures;

(v) Maintenance Intervention Levels;

(vi) Asset Management Project Deliverables and Tolerance Criteria;

(vii) Environment Management Plan;

(viii) Maintenance Programme;

(ix) Management information system;

(x) Report Formats.

f) The said Operation and Maintenance Manual shall have two separate sections namely.

6) Section I Operations; and

6) Section II, Maintenance

3.2 Operations Part of O&M Manual

It shall prescribe procedures and systems for activities including but not be limited to the following for the regular and emergency operations of the Project Highway and facilities thereon.

- Permitting smooth and uninterrupted flow of traffic during normal operating conditions.
- Functioning of the Toll System including charging and collecting the fees from the road user in accordance with the Concession Agreement.
- Functioning of the Patrolling System
- Functioning of rescue and medical and aid services
  - Ambulance
  - Fire Brigade

- Tow away trucks and cranes

- Functioning of the Project Facilities
  - Administrative, Operation and Maintenance camp
  - Pickup bus stops
  - Parking Laybys & Rest Areas
  - Electrical Services at Laybys, bus stops and rest area
  - Potable water supply system including supply of drinking water at truck parking laybyes, rest areas etc.
  - Public toilets and other sanitary facilities
  - Solid wastes disposal system including those from litterbins

3.3 Maintenance Part of O& M Manual

3.3.1 This section of the operation and maintenance manual, shall include the activities described here-in-under amongst other activities required for the regular and preventive maintenance of the equipment during the operations period, so that the project Highway is maintained in a manner that at all times it complies with the specifications and standards and at the time of divestment of Right and Interests by the Concessionaire in terms of Article XXXIII of the Concession Agreement it is sound, durable and in functional condition.

3.3.2 The concessionaire shall maintain the Project Highway in traffic-worthy condition and the Project's Ancillary Facilities in usable condition throughout the Concession Period or any extension thereof in terms of the Concession Agreement through regular maintenance and preventive maintenance of the various items and elements of the Project Highway.

3.3.3 The concessionaire shall maintain the existing 2 lanes of the Project Highway during construction of new lanes in such a manner that the unevenness index of the pavement does not exceed 3,000 mm per km, or the present roughness value of the existing pavement, whichever is lesser.

3.3.4 The following publications can be referred for preparation of the said section II of "Maintenance Manual"

- MOST manual for maintenance of roads
- IRC:SP-35, guidelines for Inspection and Maintenance of Bridges
- The manufacturer's Maintenance Manual(s) of the equipment including that of the Toll Collection system to be used in the Project Highway Operations shall form part of the said O&M Manual
- Any other appropriate documents

3.3.5 Routine Maintenance

In order to ensure smooth and uninterrupted flow of traffic during normal operating conditions for all 24 hours of a day, routine maintenance of the Project Facilities shall include but not be limited to:

(i) prompt repairs of Toll Plaza, concrete joints, drains, lane marking, signage; patching, raised berms, drain cleaning, repairing of signs, road marking, carrying out repairs to pavement crack by sealing; barricades, railing etc.

(ii) replacement of equipment/consumables, horticultural maintenance and repairs to equipment, pavements, elevated highway, overpasses, bridges, structures and other civil works which are part of the Project/Project Facilities;

(iii) maintenance of the approach roads to overpasses and drainages within the Project Site in accordance with Good Industry Practice;

(iv) Keeping the Project Site/Project Facilities in a clean, tidy and orderly condition free of litter and debris and taking all practical measures to prevent damage to the Project Facilities or any other property on or near the Project Site. Removing and disposing of in accordance with all Applicable Laws and Applicable Permits, all rubbish, debris, etc. including any and all equipments, supplies, materials and wastes brought or produced by the Concessionaire/Contractor on the Project Site;

(v) undertaking maintenance works in accordance with the O & M Plan and O&M Manual;

(vi) preventing, with the assistance of concerned law enforcement agencies where necessary, any unauthorized entry to and exit from including any encroachments on the ROW / Project Site;

(vii) taking all reasonable measures for the safety of all the workmen, material, supplies and equipment brought to the Project Site. Explosives, if any, shall be stored, transported and disposed of by the Concessionaire in accordance with Applicable Laws/Applicable Permits.

(viii) maintenance of road furniture like KM post, Hectometer stones, ROW pillar etc. and attending to repairs to various parts of the road furniture and connected services as and when necessary, and replacement of irreparable items of work in responsible period. At the end of the Concession Period, all road furniture shall be handed over to Independent Engineer in neat, tidy and in usable and working order.

(ix) for routine maintenance works, the Concessionaire shall generally follow the operational and performance criteria specified in the respective IRC/MORT&H standards and specifications for each of the performance indictors covered under pavement condition survey, roughness and BBD deflections. Where such criteria are not specified in the standards, the Concessionaire, for the purpose of routine maintenance shall set forth such criteria as to conform to good international standards and Good Industry Practice for sound pavement maintenance practices in consultation with the Independent Consultant.

(x) all traffic signs and markings shall always be kept clear visible and in correct

alignment and position.

(xi) repairs will be attended to elements of landscape as and when necessary and irreparable items replaced.

3.3.6 Preventive Maintenance

(i) The Concessionaire shall regularly carry out the necessary preventive maintenance activities for the Project Facilities to ensure adherence to the Design Requirements and specifications throughout the Concession Period.

(ii) Preventive Maintenance shall include the activities related to each element and the system as a whole of the Project Highway to ensure that during the Concession Period and at its end is in sound, durable and functional condition

3.3.7 Periodic Maintenance

(i) Carriageway

a) This activity shall be carried out as required and at least once every 5th year (from COD) and in the last year of concession period. Road marking as specified and other road side features shall be restored to meet the relevant standards to the satisfaction of the Independent Consultant.

b) The periodic maintenance activities shall also include profile corrective course of overlaid with the periodic renewal of the wearing course of the road pavement. The same shall be undertaken on all roads and pavements in the Project facilities including on the truck lay-bays bus-bays and way side Amenities – Service Area. The concessionaire may adopt cost effective treatment like Asphalt concrete, recycling, stone mastic, micro seal etc.

c) The paved shoulders shall also be treated in similar manner as applicable to the Mainline traffic lanes.

d) The periodic renewal shall result in improvement of the riding quality, meeting road roughness value at least as at the time of COD.

e) The separator islands shall be restored to the design cross section.

f) Road marking as specified and other roadside features wherever required shall be restored to meet the relevant standard specified.

g) Any other repairs needed to the project will be attended to

(ii) Crash Barriers & Pedestrian Guard Details

a) The crash barriers should require minimum maintenance except in case of damage due to impact.

b) Concrete Posts and Steel Beam crash barriers will require repairs or replacement from low to medium impact damage caused by vehicles. Periodic painting will also be required.

(iii) Maintenance of Buildings

a) The Concessionaire shall carry out regular and periodic inspection/ maintenance of all buildings related to the 'Project'. This shall include cleaning, repairs and

maintenance of various parts of the building, services and facilities in a wholesome and hygienic condition at all time. This will involve replacement of irreparable items of work, cleaning & disinfecting of the water supply systems, inspection and maintenance of drainage/sanitation systems and Illumination and electrical installations, landscaping, painting and shall be as per relevant clauses of NBC. Maintenance of pavement of parking lot with Road Marking shall be carried out.

b) Maintenance of all furniture, furnishing items and equipment shall include periodic servicing, checking, replacement attending to all necessary repairs, replenishment of the consumables and other incidentals. Laboratory shall be maintained and operated efficiently to carry out requisite Tests till end of the concession period.

3.3.8 Special Repairs

Damages occurring due to natural calamities like heavy floods, sand storms, hurricanes, cyclones, earthquakes to any element or system of the Project Highway shall be rectified and the system restored to function as per programme prepared in consultation with Independent Consultant. All such activities shall fall under the Maintenance and shall form a part of the said Maintenance Manual

3.3.9 Minimum Maintenance Requirements

3.3.9.1 Major Breaches in the Roadway

Major breaches in the roadway of any type endanger safety of traffic and cause obstruction in movement of vehicles. These breaches shall be repaired urgently. Steps as mentioned in O&M manual shall be followed by the Concessionaire for repairing the breaches.

The concessionaire shall ensure speedy restoration of traffic and take immediate action to repair the damages as permanent measures for the Project Highway. The restoration of traffic shall be made within 24 hours of its occurrence. The permanent measures shall be completed within a period one week.

3.3.9.2 Minor cuts, ruts or blockage

Minor cuts, ruts and damages on Project Highway which do not completely obstruct the traffic but endanger the safety of traffic, shall be attended to on an urgent basis. For this purpose any cut which is in width more than 1 m shall be repaired within 24 hrs. Any minor blockage, which partially obstructs the traffic and endangers safety, shall be removed by the concessionaire immediately.

3.4 Maintenance Standards

3.4.1 During Implementation Period

During Implementation Period, the Concessionaire shall maintain the existing 2 lane highway in traffic worthy condition as per the Intervention levels 1 and 2 provided in

Table L-1;

Table L-1
Intervention Levels
(Existing 4-Lane Highway during Implementation Period)

Sl. No.	Service Factor	Level 1 (Desirable)	Level 2 (Acceptable)
1.	Roughness by Bump Integrator (max. permissibility)	2500mm/Km (Allowable Tolerance: +5%)	3000mm/Km
2.	Potholes /km (max)		
	i) upto 75mm deep	Nil	5 Nos. of size < 5 sq.m
	ii) more than 75mm deep	Nil	Nil
3.	Percent Cracking	Nil	No Unsealed cracks > 6mm wide on 95% Project Highway.
4.	Rut Depth not exceeding 10mm	Length not more than 10% of the Project Highway	Length upto 20% of Project Highway
5.	User Information	All road signs, Km post and road marking in good condition.	All road signs, Km post and road marking in good condition
6.	Percentage Defective bridge Deck area and bump at approach	Nil	Nil
7.	Drainage (including shoulders)	No visible water pool within the ROW	No visible water pool within the ROW.
8.	Pavement Marking	Full reflectivity in wet conditions	The adequate wet reflectivity should exist.

3.4.2 During Operation Period

3.4.2.1 During Operations Period, all the road works and pavements contained in the Project Facilities (including those in the ancillary facilities) shall be maintained in traffic-worthy condition as per the intervention levels 1 & 2 as provided in the Table L– 2 through the various maintenance activities.



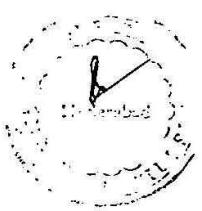


Table L-2 (Intervention Levels-Operations Period)

Sl.No.	Service Factor	Level 1 (Desirable)	Level 2 (Acceptable)
1.	Roughness by Bump Integrator (max. permissibility)	2000mm/Km (Allowable Tolerance: +5%)	3000mm/Km
2.	Potholes /km (max)		
	i) less than 75mm deep	Nil	2 Nos. of size < 5 sq.m
	ii) more than 75mm deep	Nil	Nil
3.	Percent Cracking	Nil	No Unsealed cracks > 6mm wide on 95% Project Highway.
4.	Rut Depth not exceeding 10mm	Length not more than 5% of the Project Highway	Upto 10% of length of Project Highway
5.	User Information	All road signs, Km post and road marking in good condition in 3 language formula.	All road signs, Km post and road marking in good condition in 3 language formula
6.	Percentage Defective bridge Deck area and bump at approach	Nil	Nil
7.	Camber		
	i) Mainline	(+ or -) 0.05% variation from the Camber as per Design Requirements	(+ or -) 0.15% variation from the Camber as per Design Requirements
8.	Drainage (including shoulders)	No visible water pool within the Project Highway	No visible water pool within the charge of concessionaire
9.	Characteristic Deflection as per IRC: 81-1997	Upto 0.50mm	Upto 0.80mm
10.	Pavement Marking	Full reflectivity in wet conditions	Adequate wet reflectivity.

3.4.2.2 The road roughness value shall be measured at least twice in a year by a properly calibrated Bump Integrator device before the monsoon and soon after the monsoon preferably in the months of April and October of every year. The Concessionaire shall ensure that at no point during the Operations Period the roughness in the road surface shall fall below than the prescribed acceptable roughness values given in Table L -2.

3.4.2.3 The structural condition of the flexible pavement of the Project Highway shall be assessed every year by taking Benkelman Beam Deflections and working out characteristic deflections of homogeneous sections of the Project Highway as per IRC-81. In the case of cement concrete pavement, joints shall be thoroughly inspected every year and the loss of sealing compounds made good.

3.4.2.4 Bridges and Other Structures: The Concessionaire shall maintain and carry out required repairs of the various elements of the structures in accordance with IRC-SP-35: 1990 "Guidelines for the inspection and Maintenance of Bridges in consultation with Independent Consultant.

3.4.2.5 Pavement

Pavement Distress

Maintenance procedure for correcting distress in bituminous pavement shall include patching, crack sealing, surface treatment and pot hole filling.

Cracking

Cracking of bituminous pavements shall include all types of cracks such as hairline, alligator, longitudinal, transverse, shrinkage, reflective and edge cracking, linear and slippage etc. The minimum requirement and criteria for crack sealing shall be as under.

i) If the width of the cracks is less than 3 mm and resulting into settlement of pavement upto 10 mm in depth and exceeding in are more than 1 sqm at a place, such cracking shall be sealed by fog sealing in accordance with the MORT&H Specification 2004-3.

ii) If the width of cracks is more than 3 mm and causing settlement of the pavement upto 10 mm and the area of cracked surface exceeds 0.5 sq.m at a place, such cracked surface shall be repaired by slurry sealing in accordance with MORT&H Specification.516.

iii) If the cracked portion has settled more than 10 mm and its area exceeds 0.5 sqm, such areas shall be repaired by patching as per MOST Specification 3004. In case of alligator cracks, the permanent repair by full depth patching, shall be carried out. The slippage cracks shall be repaired by removing the affected bituminous layer and replacing it with surface patch. In edge cracking, if shoulders are not providing adequate lateral support. the shoulder shall be reconstructed with good quality material.

Rutting

If the depth of rut exceeds 10 mm with a length of 10 m at a place in the wheel track of pavement surface, the same shall be repaired by full depth patching.

Corrugations and Shoving

If corrugations and shoving in the pavement area exceeds 1 sq.m at a place and depth/height of corrugation/shoving exceed 10 mm, the same shall be treated by full

depth patching.

Settlement of Grade Depressions

If the settlements and grade depressions exceed 1 sqm in area and their depth is within 10 mm, such defects shall be treated by skin/full depth patching .

Upheaval or swell

If upheaval or swell exceeds 0.5 sq.m in area and its height is more than 10 mm such defects shall be treated.

Raveling

If the raveling of bituminous pavement exceeds 1 sq.m in area, slurry seal treatment shall be applied in accordance with the MOST Specification.

Pot holes

If the bowl shaped pot hole in the pavement exceeds 0.5 sqm in area and 10 mm in depth irrespective of the numbers existing on the pavement shall be repaired by patching/pothole filling in accordance with MOST Specification 3004-1.

Skid Hazards

Skid hazards irrespective of size, shall be corrected by improving the surface drainage and skid resistance including cleaning the surface of contamination, surface treatments or milling or resurfacing.

Bleeding or Flushing

Bleeding or flushing of the pavement irrespective of the area shall be repaired by application of hot sand.

Longitudinal/ Transverse streaking

If the longitudinal and transverse streaking appears on the pavement surface in area exceeding 5 sqm, the same shall be treated by application of new surface treatment or by a second treatment over the streak surface.

If any defects other than those mentioned above occur on the pavement of the project highway, the same shall be rectified/corrected by the concessionaire as per directions laid out in IRC:82-1982 or based on sound engineering practice.

Periodic Maintenance of Pavement

The concessionaire shall set forth in the Operations and maintenance Manual the detailed procedures to be followed under each of these activities, and also choose the operational and performance criteria from the IRC/MOST standards and specifications for each of the performance indicators covered under pavement condition survey, roughness and BBD deflection. Where such criteria is not specified in the standards, the concessionaire, for the purpose of routine maintenance shall set forth such criteria so as to conform to international standards or sound pavement maintenance practices in consultation with the independent consultant for using them as criteria.

Pavement Riding Quality

The riding quality of the pavement shall be ensured by satisfying the minimum requirements given herein under:

i) Surface roughness of the project highway on completion of construction shall not exceed 2000 mm/km as measured by the 5th wheel Bump Integrator .

ii) Surface roughness shall not exceed 3000 mm/km and 1000 mm in any 200 m length during the service life of the pavement at any time. A renewal coat of 25 mm of bituminous concrete shall be laid after initial construction whenever the roughness value reaches 3000 mm/km to bring it to less than 2000 mm/km.

Structural condition of the Pavement

i. The structural condition of the flexible pavement of the Project Highway shall be assessed every year by taking Benkelman Beam Deflections and working out characteristic deflections of homogenous sections of the project Highway as per IRC-81-1997. Wherever the characteristic deflection exceeds 0.8 mm a bituminous overlay shall be provided appropriately designed according to IRC:81-1997 or its latest versions or amendments to it. The characteristic deflection at the end of concession period shall not exceed 0.5 mm.

ii. In case of cement concrete pavement, joints shall be thoroughly inspected every year and the loss of sealing compounds made good.

3.4.2.6 Shoulders

If the shoulders are deformed or scoured and are lower than 25 mm from the adjacent carriageway, these shall be corrected by excavation, filling, dressing and compacting a material matching the existing material and it shall conform to the relevant MORT&H Specification requirement.

For maintenance it shall be ensured that no earth is borrowed from roadside land. All borrowing operation shall be as per I RC: 1 0-1961.

3.4.2.7 Damaged Culverts/Bridges

The treatment for the damaged culverts/bridges shall be assessed at site after ascertaining the damaged portion as per site exigencies. The repair shall be carried out expeditiously.

3.4.2.8 Drainage/Side Drains

Routine maintenance under this category shall cover pipe drainage system, slot drains, porous drains, gullies, catch-pits, open grills, ditches, side drains and median drainage etc.

If the side drains/median drains where provided, and other drainage structures have been silted up in such a manner that it is causing obstruction in flow of water, the same shall be cleared of regularly in order to keep the drains free from obstructions all the time.

If the drainage system of project Highway is covered and damaged, it obstructs the flow of water causing damage to the road pavement. Such damaged structures shall be reconstructed to required shape, size and proper slope.

3.4.2.9 Cross Drainage Works

Where the bed of a culvert gets silted up and causes obstruction in flow of water, the de-silting operation shall be done regularly. The scouring of piers and abutment of bridges and culverts shall be observed carefully particularly before and after rainy season and suitable remedial measures as deemed fit looking to site conditions shall be taken.

If any settlement cracks are appearing in substructure and superstructure of the CD works beyond permissible limits, the same shall be carefully observed and suitable remedial measures as per sound engineering practice taken.

3.4.2.10 Landscaping

Trees shall be maintained as per the guidelines in IRC : SP : 21 -1979 and no indiscriminate felling of trees shall be resorted. The felling of trees shall be undertaken in consultation with the Independent Consultant and after obtaining due permission as applicable.

Maintenance operations include numbering and maintaining a register of all road side trees within the Right of way (ROW).
The routine maintenance such as trimming and shaping shall cover hedges and trees within the control of concessionaire, which affect the performance of the Project Highway.

- Cutting or clearance to safeguard visibility at road bends, accesses and signs shall be carried out in such a way as to avoid permanent damage to hedges and trees. Trees overhanging carriageways shall be trimmed to provide a minimum headroom of 5.5 meters at all times; Headges shall be kept timed not to overhang carriageways.
- Turfing hall be mown as to achieve a visual pattern in harmony with adjacent areas. Mowing shall be done regularly not to allow the height of turfing grass reach 150 mm.
- The O&M Manual shall include a maintenance and management plan for trees, shrubs, turfing and hedges to sustain their development in a manner pleasing in appearance.

3.4.2.11 Maintenance of Traffic Signals

The traffic signals shall be maintained at all times as per clause 18 of IRC:93-1985 and shall be periodically inspected, maintained and repaired so as to be in satisfactory working condition all the time.

3.4.2.12 Lighting of Facilities

(i) Maintenance of all lighting installations and related appurtenances shall be as per relevant clauses of IS:1944 (Part I-V) .

(ii) Lighting wherever provided shall be maintained by the Concessionaire in a condition nearly similar to original condition.

(iii) The faults shall be repaired instantly and lighting restored and missing and damaged items shall be replaced instantly.

(iv) Cleaning shall be done at regular intervals to be mentioned in the Maintenance Manual to ensure that lighting is not below the specified standard.

(v) All installations shall be safeguarded against weathering and ageing effect by repainting and other preventive measures.

(vi) The servicing of stand-by power generation units shall be carried out in accordance with the manufacturer's instructions.

3.4.2.13 Highway Signs and Road Markings

(i) Traffic signs shall be kept clean to maintain their visibility and reflectivity unempirical due to dust etc. Any damage to traffic signs which reduces or threatens to reduce full and clear visibility shall be rectified within twenty four (24) hours of its occurrence. If they are used as base for posters, the posters shall be removed and the signs shall be cleaned within 24 hours. Signs shall be washed using detergent solution followed by clean water.

(ii) Any part of traffic signs damaged due to weathering, corrosion, vandalism or any other cause shall be replaced by the Concessionaire as early as possible and in any case within seven days.

(iii) Any mandatory sign including those for traffic safety, damaged beyond repair shall be replaced within 2 days and all other signs replaced within 3 days.

(iv) Appropriate devices for measuring the luminosity and reflectivity shall be used to check visibility and reflectivity of signs, delineators and markings. These shall be replaced by similar material if the reduction in the level of these two requirements falls below 50% of the original level.

(v) Line marking with thermo-plastic paint on toll road shall be carried out soon after any overlay/renewal coat is provided and in situation when adequate reflectivity is lost under poor weather condition adequate wet reflectivity should be ensured.

(vi) Raised Pavement marker 3M-Series 290 or equivalent using micro prismatic Lens technology (confirming to ASTMD 4280 Type H) shall be provided on the centre line of each carriageway enhancing road safety.

3.4.2.14 Maintenance of Control Centre

(i) There shall be periodic inspection and maintenance of the Control Centres. This shall include attending to repairs and maintenance (both regular and periodic) to various parts of the building and connected services and facilities as and when necessary, and replacement of irreparable items of work.

Clearing & disinfecting of the water supply system, inspection and maintenance of drainage/sanitation system and electrical installations shall be as per relevant clauses of NBC.

(ii) Maintenance of Emergency Telephone system including its equipment shall include periodic servicing, checking of the system; replacement of components, attending to all necessary repairs and other incidentals to keep the system in working condition.

(iii) All the vehicles shall be maintained in smooth running condition at all times. In the event of any vehicle being of the road for maintenance or on account of breakdown, substitute vehicle shall be provided immediately.

(iv) At the end of the Concession period or the extended period thereof, Control Centre together with all equipment in working order shall be handed over to NHAI.

3.4.2.15 Maintenance of Buildings

(i) Maintenance of buildings shall include routine maintenance and attending to repairs to various parts of the building and connected services as and when necessary, and replacement of irreparable items of the work, cleaning & disinfections of the water supply systems, inspection and maintenance of drainage/sanitation systems and electrical installations shall be as per relevant clauses of NBC.

(ii) All the end of the concession period or the extended period thereof, all buildings shall be in usable condition and handed over to NHAI.

3.4.2.16 Maintenance of Facilities for Road Users

The concessionaire shall ensure that all the facilities provided for Road Users of all categories are kept in a neat, hygienic and tidy condition. Special attention shall be given in preparation of food items so that they are cooked with unadulterated ingredients in a hygienic manner.

4. Traffic Management and Lane Closure

4.1 Traffic Management

4.1.1 General

Traffic Management shall be undertaken during scheduled and unscheduled construction work and maintenance activities and also during any Emergency. Traffic Management during Emergency shall be undertaken in consultation with the Independent Engineer. The extent of the traffic management shall be assessed as per the site conditions.

4.1.2 Traffic management during construction, operation and maintenance of the project highway is important activity the Concessionaire has to attend to ensure safety of the road users as well as the construction workers simultaneously throughout the

concession period. It is an usual activity to carryout various types of construction works at different stages ant at different periods as per site requirement. Also, it is a vital activity during unforeseen and/or emergency situations arising on account of natural causes or accidents or administrative reasons.

4.1.3 Traffic Management is required during planned scheduled construction and maintenance activities. However, traffic management will also be called for during unscheduled activities such as:

i) Emergency situation arising on account of

a) Force Majeure;

b) Accident/Incident on the Project Highway

ii) Special repairs required on account of failure of an element of the Project Highway and

iii) Default of the concessionaire with respect to an operational activity on the project highway

4.1.4 The basic principles to be followed for traffic management and lane closure in this project highway shall be as follows:

(i) Work programme schedule shall be prepared such that diversion roads for the main traffic are minimized, and the existing two lane carriageway is utilized to the maximum extent possible.

(ii) Measures shall be taken that the traffic is guided from closed lane into the operating lane without its conflict with the traffic from the opposite direction.

(iii) The activity of renewal of pavement surface and/or strengthening of the pavement structure shall not be taken up in a continuous length of more than 2 kilometers at a time to avoid long detour of the traffic.

(iv) The traffic diversion and road where provided shall be appropriately designed for the traffic plying on the highway. It shall also be properly maintained during its operation period.

(v) During traffic detour involving traffic diversion adequate safety measures as per safety standards shall be followed.

(vi) Proper and adequate information about the maintenance activity shall be notified to the Road Users in advance and displayed at the work site during the Operation Period.

(vii) Traffic Management plan and programme for planned scheduled construction and/or maintenance activity shall be prepared in advance of that activity keeping mentioned above and got approved by the independent Consultant/NHAI as the case may be.

(viii) In case of un-scheduled activities mentioned above, an emergency traffic management for the affected reach of the highway shall be prepared and implemented in consultation with the independent Consultant Immediately. This

emergency traffic management plan shall take into account the various requirements spelt out in the Concession Agreement as well as in this schedule.

4.2 The Concessionaire shall provide, erect, maintain, cover, uncover and remove traffic signs as required in respect of works on the Project Site. Adequate safety during night time shall be ensured by providing mobile emergency lighting units with illuminated warning signs at important locations finalized in consultation with the Independent Consultant.

4.3 Traffic Management Plan

4.3.1 Before the commencement of construction activity, an overall traffic management plan and programme for a planned scheduled construction and/or operations and maintenance activity of the existing highway shall be prepared in consultation with the Independent Consultant. The plan shall be based on the following operational parameters:

(i) The existing 2 lane carriageway shall be utilized to the maximum extent possible;

(ii) At major intersections all traffic turning movements will be allowed at most of the times

(iii) Lane closure adopted for diverting the main traffic during Construction Works shall be governed by the approved programme of construction.

(iv) Existing traffic may be bifurcated to a one carriageway for going and another for coming;

(v) Construction of service roads including construction of culverts etc. could be taken up early to help traffic movement during construction of facility.

(vi) Traffic speed through the construction zone shall be reduced by providing well designed speed breakers and warning signs.

(vii) For the safety of construction workers as well as the traffic, a physical separation of 1.5 m between work area and the highway traffic shall be maintained.

(viii) All construction traffic shall enter and exit the construction site at designated and manually controlled entrances;

(ix) All short and long term temporary road detours (diversions) shall be proposed for approval Independent Consultant;

(x) Adequate advance warning and information signs shall be incorporated in the traffic management plan in accordance with IRC/MORT&H standards and specifications.

4.3.2 Traffic management and lane closure requirements during various situations arising on the project highway needing traffic management details below:

4.3.2.1 Rural Sections

i) The widening of the existing 2 lane carriageway shall be as far as possible

eccentric to develop four lane divided carriageway facility. A new 2 lane carriageway separated from the existing carriageway with a 5.0 m central median will be constructed in the first instance before taking up works on existing 2 lane carriageway.

ii) The construction sequence in this case will be as under

a) 2 new lanes will be constructed initially. There will be no conflict area for the main traffic using the existing two lanes during this construction phase. It shall be ensured that the construction traffic does not conflict with the main traffic in this phase.

b) On completion of the 2 new lanes in sufficiently long sections, the total traffic will be diverted on it and the works on existing 2 lanes will be taken up

4.3.2.2 Central widening –urban/built up sections

i) In built up areas widening of the existing 2 lane carriageway shall be concentric to make it a 4 lane divided carriageway facility. The divider will be generally 3 m wide median. In addition 5.5 m wide service road will be provided on either side on the 4 lane carriageway.

ii) The construction in such cases shall be taken up in about 2 km stretch and the sequence in this case will be as under:

a) Service roads and side drains, side berms will be constructed initially. Also required widening including paved shoulders upto granular base layer on the side other than service road will be taken up and 1st surface dressing provided over the WMM top layers.

b) On completion of the service roads on both sides and the widening portions upto surface dressing stage the main traffic will be diverted on them direction wise with light traffic on service road and main heavy traffic on widened portion of existing road after diversion of traffic from existing work on medina will be taken up. Once median work is completed the existing widened carriageway with paved shoulders shall be provided with DBM &BC on one side and in the mean time traffic maintained on available width.

4.3.2.3 Operation and Maintenance Stage

This stage is obtaining during the entire period of operation on the Project Highway in the concession period. Various important activities to be carried out during this stage are:

i) Localized repairs in short lengths less than 500 m on account of pot holes, cracks subsidence in isolated sports or in scattered areas.

ii) Renewal/strengthening course to be provided on as required basis (once 5 year).

iii) Wearing course required on account of the IRI values higher than the prescribed criteria obtained during regular testing as per Concession Agreement requirement

iv) Strengthening course required on account of the BBD values in excess of the prescribed criteria obtained during regular testing as per the Concession Agreement requirement;

v) Regular periodic maintenance of shoulders, median, separator islands, embankment slopes, plantations, road furniture etc.

4.3.3 Lane Closure

(i) Lane closure is a vital activity during construction and/or maintenance in the Concession Period that the Concessionaire shall carryout in an organized, planned and disciplined manner.

(ii) Lane closure involves traffic management in the affected reach of the highway and is always a time bound activity and the Operation and Maintenance Manual has to incorporates it accordingly. In case where the concessionaire for the delay in reopening the closed lane to the traffic in terms of the Concession Agreement.

(iii) The basic principles to be followed in preparation of a planned lane closure shall be as follows:

a) The activity of renewal of pavement surface and/or strengthening of the pavement structure shall be taken up in a manner so that 2 lane are always available to the traffic.

b) The activity of renewal or strengthening shall not be carried out in a continuous length of more than 2 km in rural section and 1 km in Urban section so that the closure of a lane is not more than 2 days and 1 day in Rural and Urban section respectively.

c) Lane closure adopted for diverting the main traffic on account of the traffic management during construction works of the Project Highway shall be governed by the approved programme of Construction.

d) Lane closure in short length less than or equal to 500 m from carrying out a routine maintenance activity defined in item 2 of this schedule shall not be more than for continuous period of 1 day.

5.0 Corridor Control Plans

a. Regular 24 hours patrol/surveillance of the ROW in respect of the Project/Project Facilities shall be required to monitor, report and take actions against activities, such as, encroachments, unauthorized construction of road or entrance connections, structures, interference with drainage system etc, within 150 m of the highway corridor.

b. Surveillance shall also include traffic operation and management of accidents/ other incidents

c. The Corridor Control Plan shall be developed in consultation with local administrative authorities and the Independent Consultant and shall form a part of the O&M Manual.

6.0 Inspections & Frequency

The Concessionaire shall plan inspection programme for the Project Facilities for its smooth operations as follows:

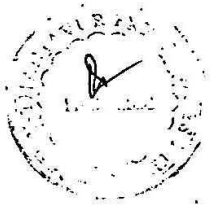
6.1 Visual Inspection

Visual Inspections are broad general inspections carried out frequently by highway/ bridge maintenance engineers having adequate knowledge of road structures. The purpose of visual inspection is to report the obstacles to traffic and fairly obvious deficiencies, which could lead to accidents or maintenance problems. Such inspections should be frequent. The visual inspection may be carried out by visual assessment with careful observation of the specific object/item of the Project Facilities for identification and for quantification of the deficiencies or damages of the Project Facilities.

6.2 Close Inspection

Close inspections may be visual and/or by standard instrumental aids for assessment of defects / deficiencies of Project Highway with careful observation of specific element(s). The close inspection is more intensive and would require detailed examination of element of the Project Highway. It should cover all the aspects of the specific element of Project Highway against a checklist. The frequency of close inspections would depend upon the type of defect or damage to Project Highway. This inspection is to be carried out by the Highway/Bridge Engineer having good knowledge of road structures with theoretical background to analyze the nature, and extent of defects/deficiencies, suggest suitable remedial measures to rectify/remedy them and quantify repair work.





6.3 Thorough Inspection

A thorough inspection is comprehensive and detailed for assessment of defects/deficiencies of the Project Highway by visual inspection or with aid of standard equipment and non-destructive testing where necessary. Such an inspection is to be carried out on the basis of comprehensive checklist of items related to the materials, condition and situation of the structure etc. The checklist is to be prepared meticulously well in advance of this kind of inspection. The thorough inspection should be undertaken during the critical weather condition, which is generally rainy season in India. During rainy season the Road /bridge structures are under severe condition thereby the damage and deficiencies of the Project Highway are more pronounced. The inspection carried out during the said period offer to the Client critical evaluation of the performance of the structure. The thorough inspections would be of critical importance for bridges, culverts and drainage structures, as well as road pavements during adverse weather condition of monsoon period.

6.3 Frequency of Inspections

The type of inspection and related frequency of various items of Project Highway and its facilities have been indicated in the Table 1- 3 below. The -frequency of inspection can be suitably revised in consultation with the Independent Consultant if the situation so warrants. The objective and minimum frequency of inspections under normal circumstances shall be as under. If the exigencies arise, the interval of inspection shall be reduced.

7. Reporting Requirements

The reporting and information that generally need to be provided by the Concessionaire are given below. The requirements given below are indicative of the type of information to be provided. The format of such reports, recording requirements, software standards and number of copies required would be finalized in consultation with the Independent Consultant. All reports and records shall be in the English language.

7.1 Inspection Reports and Remedial Measures

The periodicity of inspections for maintenance activities by the Concessionaire shall be set out in the O&M Manual and regular reports on the same shall be, sent to the Independent Consultant. Where required, the Concessionaire shall carry out any maintenance, repair or rehabilitation works found necessary as a result of such inspections

Table L-3
Objective and Frequency of Inspection

Object	Item	Daily	Monthly	Quarterly	Before and after rainy season
Riding Surface	Pavement	♦	#		•
	Expansion joints	♦	#		•
Median	Kerb	♦	#		•
Side Slopes	Shape	♦		#	•
	Turfing		♦		•
	Pitching Masonry		♦		•
	Retaining Wall		#		•
Drainage	Side drain	♣	#		
	Gullies and catch pits	♣	#		
Bridges	a) Superstructure			#	•
	b) Substructure			#	•
	c) Head wing walls and aprons			#	•
	d) Painting				•
	e) Hand rail		#	•	
Culverts					•
Safety Barrier		♣		#	•
Traffic operation facilities	Signs		•		•
	Marking	♣	#	#	•
	Delineator	♣	#	#	•
	Lighting	♣		#	•
Other facilities	Vegetation / landscaping/toll plaza/wayside amenities	♣	#	•	
Traffic Conditions		♣	•	#	
Encroachments		♣	•		

♦ Visual inspection
\# Close inspection
• Thorough inspection
♣ Visual inspection during rainy season only

7.2 Monthly O&M Report

During the Concession Period, within 5 days of the end of each calendar month or part thereof, the Concessionaire shall provide to the Client a monthly report (Monthly O&M Report) which shall contain the following minimum information:

a) Inspections undertaken by the Concessionaire during the month and action taken proposed thereafter;

b) Details *of* all reports submitted to the Independent Consultant during the month

c) O&M inspection compliance report

d) Maintenance activities undertaken during the month ended,

e) Details *of* any Emergency and action taken

The *format of* the O&M Report would be finalized in consultation with the Independent Consultant.

8.0 Inventory

(i) The Concessionaire shall maintain an inventory of all items comprised in the Project Facilities (the "inventory"), in a format to be developed in consultation with the Independent Consultant.

(ii) Throughout the Concession Period the Concessionaire shall keep the Inventory updated to take account of works carried out on and other changes made to the Project Facilities.

(iii) A Copy of the Inventory shall be submitted by the Concessionaire to the Independent Consultant within thirty (30) days of receipt of a request for the same.

9.0 Abnormal Load Routing

(i) The Concessionaire shall take all reasonable steps to facilitate the transit of Abnormal Indivisible Loads along the Project Facilities.

(ii) The Concessionaire shall develop a procedure for handling Abnormal Indivisible Loads in consultation with local authorities and the Independent Engineer.

10.0 Equipment Belonging to Third Parties

The concessionaire shall be responsible for the installation, operation, maintenance and removal of any equipment belonging to third parties.

11.0 Limit of Maintenance

The concessionaire shall maintain the Project Highway, Project area, Project Assets. Ancillary Facilities on the Project Highway in working and orderly condition at all times during the Concession Period or any extension thereof.

12.0 Divestment

The Concessionaire shall take action(s), in terms of Article XXXIV. Defects Liability Chapter-VIII, Miscellaneous, of the Concession Agreement prior to proceeding with Transfer of the Project Highway, Facilities and Assets thereon to NHAI.

The concessionaire shall obtain transfer certificate, appended to this schedule, from the independent consultant, who shall issue it after satisfying itself that the project highway and facilities and assets thereon have been constructed, operated and maintained in terms of the Concession Agreement during the Concession Period and meet the divestment requirements as per Concession Agreement for the issue of Vesting Certificate (Schedule) by NHAI.

The Concessionaire shall take action(s), in terms of Article XXXIV. Defects Liability Chapter-VIII, Miscellaneous, of the Concession Agreement prior to proceeding with Transfer of the Project Highway, Facilities and Assets thereon to NHAI.

The concessionaire shall obtain transfer certificate, appended to this schedule, from the independent consultant, who shall issue it after satisfying itself that the project highway and facilities and assets thereon have been constructed, operated and maintained in terms of the Concession Agreement during the Concession Period and meet the divestment requirements as per Concession Agreement for the issue of Vesting Certificate (Schedule) by NHAI.

Transfer Certificate

I/we _____ (name of the independent consultant) issue this certificate, designated Transfer Certificate for _____(Name of the Project) in _____(Name of the State), India on Build Operate and Transfer (BOT) basis by the Concessionaire _____ (Name of the Concessionaire) on Build, Operate and Transfer (BOT) basis as per the Concession Agreement between the National Highways Authority of India (NHAI) and the said Concessionaire, being satisfied that the Project Highway has been constructed, operated and maintained during the Concession Period is in sound, durable and operational condition on completion of the said concession period, and is in a fit condition for transfer by the said Concessionaire to NHAI or its nominee. The transfer of the said project highway together with facilities thereon shall be effected on the strength of this certificate.

Place of Issue _____

Date of Issue _____

(Independent Consultant)

Equivalent Rating Conditions

Category	Status	Rating
Very Good Construction	On completion as per specification and Standards	9
Good Condition	No repairs needed	8
Generally good condition	Potential exists for minor maintenance	7
Fair condition	Potential exists for major rehabilitation	6
Generally fair condition	Potential exists for minor rehabilitation	5
Marginal condition	Potential exists for major rehabilitation	4
Poor Condition	Repair or rehabilitation required immediately	3
Critical condition	Need for repair or rehabilitation is urgent. Facility should be closed until the indicated repair is complete	2
Very critical condition	Facility is closed. Study should determine the feasibility for repair.	1
Unserviceable	Facility is closed and is beyond repair	0

Sufficiency Rating System

1. Load Performance
2. Safety Performance
3. Remaining Life

SCHEDULE M

MONTHLY FEE COLLECTION STATEMENT

1. Name of Work: "Strengthening of the existing carriageway from km 80.000 to km 135.750, on the Thanjavur-Trichy section of National Highway No.67 (NH-67) in the State of Tamil Nadu and widening thereof to 4 lanes and its Improvement, Operation and Maintenance through a concession on Build, Operate and Transfer (BOT) basis"
2. Date of commencement of fee collection: ..... (D/M/Y)
3. Report for month ending.....
4. Fee rates (in Rs.)

Vehicle Type	Fee rates on commencement	Rates during year before last year w.e.f. ..... (Date)	Rates during previous year applied w.e.f. ..... (Date)	Present rates applied w.e.f. ..... (Date)
Car, passenger van or jeep				
Light Commercial Vehicle				
Truck				
Bus				
Multi Axle Vehicle(>2 axle)*				

* It shall include Earth Moving Equipment and Heavy Constriction Machinery

5. Collection during month under report (Amount in Rs. Lacs)

Vehicle Type	Previous Month		Corresponding Month during Previous Year		Current Month	
	Nos.	Amount	Nos.	Amount	Nos.	Amount
Car, passenger van or jeep						
Light Commercial Vehicle						
Truck						
Bus						
Multi Axle Vehicle(>2 axle)*						
Gross Total						

* It shall include Earth Moving Equipment and Heavy Constriction Machinery

Note: Information at '4' and '5' to be provided separately for Through Tolled Traffic, Local Tolled Traffic and Total Tolled Traffic on the Project Highway.

SCHEDULE N

SELECTION CRITERIA FOR INDEPENDENT CONSULTANT

Selection of the Independent Consultant shall consist of the following steps :

1. Shortlisting of Consultants by the concessionaire and NHAI out of the list of consultant empanelled by NHAI.
2. Issue of Letter of Invitation (LoI) alongwith Terms of Reference (Schedule O) to shortlisted Consultants.
3. Evaluation of Technical Proposal and selection of technically qualified Consultants.
4. Evaluation of Financial Proposal of the Technically Qualified Consultants.
5. Negotiation and selection of Independent Consultant.

SELECTION COMMITTEE

A selection committee shall do the selection; NHAI shall nominate the members of this committee.

1. Short listing of consultants by NHAI

NHAI will provide the list of empanelled consultants to the concessionaire. The concessionaire will prepare a short list of 10 consultants and forward it to NHAI who will approve the short list as sent by the concessionaire as modified with the mutual consent of the concessionaire and NHAI.

2. Request for Proposal

The request for proposal shall be sent NHAI to the short listed firms. This shall include a LoI and the ToR besides information (Data Sheet) to the firms and the proposed form of contract. It shall contain the guidelines for the preparation of technical and financial proposals by the firms and submission.

The LoI shall state the intention of the NHAI to enter into a contract for the provision of consulting services and the date, time and address for submission of technical and financial proposals. ToR shall include the following details :

1. Project background

2. Objectives
3. Scope of services
4. Interaction with NHAI
5. Reporting requirement
6. Performance clause
7. Consultant's Proposal
8. Period of Services

3. Evaluation of Technical Proposal

The technical proposals received from short listed firms shall be evaluated for selection of five firms based on the following :

Evaluation Criteria for Technical Proposal

S.No.	Description	Marks
1	Specific experience of the firm related to the assignment	15
2	Adequacy of the proposed work plan and methodology in response to the ToR	15
3	Qualifications and competence of the key staff for the assignment	70
	Total	**100**

Sub criteria for qualification of key staff

General qualifications	30
Adequacy for the project	70
Total	**100**

4. Evaluation of Financial Proposal

Financial proposals of the three firms selected by the Concessionaire shall be opened and evaluated as under :

The financial score of the lowest bidder shall be 100 marks. The financial score for the remaining bidders shall be calculated in proportionate to the lowest bidder by the following formula :

Financial Score of 'X' = {100 X Bid price of lowest bidder} / {Bid price of 'X'}

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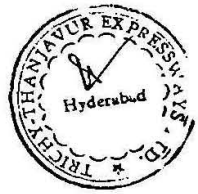
The weightage given to the technical proposal	:	80%
The weightage given to financial proposal	:	20%

Combined score of bidder 'X' = 0.20{Financial score of bidder 'X'} + 0.80{Technical score of bidder 'X'}

5. Negotiation and Selection of Independent Consultants

The combined score of technical and financial proposals shall be calculated and the firm scoring maximum marks shall be called for negotiations. After satisfactory agreement of all matters by both the parties, NHAI will appoint the said firm as Independent Consultant for the initial term of 48 months. In case of failure of negotiations, the firm with second highest score shall be called for negotiations. In case of failure of negotiations with the said second firm, the firm with the least score shall be called for negotiations.





SCHEDULE O

INDEPENDENT CONSULTANT'S SERVICES

LETTER OF INVITATION

Re: "Strengthening of the existing carriageway from km 80.000 to km 135.750, on the Thanjavur-Trichy section of National Highway No.67 (NH-67) in the State of Tamil Nadu and widening thereof to 4 lanes and its Improvement, Operation and Maintenance through a concession on on BOT basis.

M/s.:

1 INTRODUCTION

1.1 You are invited to submit a technical and financial proposal for consulting services required for the assignment named in the attached data sheet (referred to in sequential sub clause numbering herein under). Your proposal could form the basis for future negotiations and ultimately a contract between your firm and the NHAI.

1.2 A brief description of the assignment and its objectives are given in the data sheet.

1.3 The assignment shall be implemented in various stages such as Design, Construction supervision, and Operation and Maintenance and Divestment, if any.

1.4 To obtain first hand information on the assignment and on the local conditions, you are encouraged to pay a visit to the NHAI before submitting a proposal and attend a pre proposal conference as specified in the data sheet. You must inform yourself of local conditions and take them into account in preparing your proposal.

1.5 Please note that (i) the costs of preparing the proposal and negotiating for the contract, including a visit to site, are not reimbursable as a direct cost of assignment and (ii) NHAI is not bound to accept any of the proposals received by it.

1.6 An invitation to submit a proposal has been sent to the firms stated in the data sheet.

1.7 We wish to remind you that in order to avoid conflict of interest situations any firm associated with the Concessionaire of the Project Highway and its Design and/or Supervision Consultant and/or the Contractor(s) as Design Consultant and/or Construction Supervision Consultant is not eligible to participate in the bidding.

2 DOCUMENTS

2.1 To enable you to prepare a proposal, please use the attached documents listed in the data sheet.

2.2 Firms requiring a clarification of the documents must notify the NHAI, in writing, not later than thirty days before the proposal submission date. Any request for clarification in writing, by cable, telex or must be sent to the NHAI address indicated in the data sheet. NHAI will respond by cable or fax to such requests and copies of the response shall be sent to all the other invited firms.

2.3 At any time before the submission of the proposals, the NHAI, may for any reason, whether at its own initiative or in response to a clarification sought by an invited firm, modify the documents by amendment. The amendment shall be notified in writing or by cable, fax to all the invited firms and shall be binding on them. NHAI may at its discretion extend the deadline for the submission of the proposals.

3 PREPARATION OF PROPOSAL

3.1 You are requested to submit a technical and a financial proposal. Your proposal shall be written in the language specified in the data sheet.

Technical Proposal

3.2 You are expected to examine all terms and conditions included in the documents. Failure to provide all requested information will be at your own risk and may result in rejection of your proposal.

3.3 During preparation of the technical proposal you may give particular attention to the following :

i. If you consider that your firm does not have all the expertise for the assignment, you may form a joint venture with other firms but no the firms invited for this assignment, subject to restriction specified in the data sheet, to enable a full range of expertise to be presented.

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vi. Comments, if any, on the services and facilities to be provided by the client and indicated in the ToR.

3.5 The technical proposal must not include any financial information.

Financial Proposal

3.6 The financial proposal should list the cost associated with the assignment. These normally cover; remuneration for staff (in the field and at headquarters), accommodation (per diem or housing), transportation (for mobilisation and demobilisation) and equipment (vehicles, office equipment, furniture and supplies), printing of documents, etc. Your financial proposal should be prepared using, but not limited to, the formats attached in Appendix II.

3.7 The financial proposal must take into account the tax liability including service tax and cost of insurance specified in the data sheet.

4 SUBMISSION OF PROPOSAL

4.1 You must submit one original proposal and the number of copies indicated in the data sheet. Each copy of the Technical and Financial proposal shall be separately sealed and put in an outer envelope which shall bear the address and information indicated in the data sheet. The envelope must be clearly marked.

"DO NOT OPEN, EXCEPT IN PRESENCE OF THE EVALUATION COMMITTEE"

4.2 This outer envelope shall include two separate envelopes, one clearly marked "Technical Proposal" and one clearly marked "Financial Proposal" (both envelopes indicating original or copy as appropriate).

4.3 In the event of any discrepancy between the copies of the proposals, the original shall govern. The original and each copy of the technical and financial proposal must be prepared in and signed by the authorised representative of the firm in indelible ink. The letter of authorisation must be confirmed by a written power of attorney accompanying the proposals.

4.4 The proposals must contain no interlineations or over writing except as necessary to correct errors made by the firm themselves, such corrections must be written fresh and initialled by the person or persons signing the proposal.

ii. Sub contracting part of the assignment is considered desirable; a sub consultant may participate with more than one short listed firms subject to the limitation mentioned in the data sheet.

iii. The estimated man months for the assignment are stated in the data sheet for your information.

iv. The majority of the key professional staff proposed must be permanent staff of the firm, unless otherwise indicated in the data sheet.

v. No alternative to key professional staff may be proposed and only one Curriculum Vitae (CV) may be submitted for each position and

vi. A good working knowledge of the language specified in the data sheet is essential for key professional staff on this assignment. Reports must be in the language (s) specified in the data sheet.

3.4 Your technical proposal must provide the following information, using but not limited to the formats attached in the Appendix I.

i. A brief description of the firm's organisation and an outline of recent experience on assignments of a similar nature. The information which you shall provide on each assignment should indicate, *inter-alia*, the profiles of the staff provided, duration, contract amount and firm's involvement.

ii. Any comments or suggestions on the ToR and a description of the methodology (work plan) which the firm proposes to execute the services, illustrated with bar charts of activities.

iii. The composition of the proposed staff team, the tasks which shall be assigned to each and their timing;

iv. CVs recently signed in blue ink on each page by the proposed key professional staff or an authorised manager in the home office. Key information should include years with the firm and degree of responsibility held in various assignments during the last ten years;

v. Estimates of the total time effort (person x months) to be provided for the services, supported by bar chart diagrams showing the time proposed (person x months) for each professional staff and

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4.5 Your completed technical and financial proposal must be delivered on or before the time and date stated in the data sheet.

4.6 Your proposal shall be valid for the number of days stated in the data sheet from the date of its submission prescribed in the data sheet during which you must maintain available the professional staff proposed within this period for the assignment. NHAI will make its best effort to complete negotiations at the location stated in the data sheet.

5 PROPOSAL EVALUATION

5.1 A two-stage procedure shall be adopted in evaluating the proposals: (i) a technical evaluation, which shall be carried out prior to opening any financial proposal; (ii) a financial evaluation. Firms shall be ranked using a combined technical and financial score, as indicated below.

Technical Proposal

5.2 The Evaluation Committee appointed by the NHAI shall carry out its evaluation applying the evaluation criteria and point system specified in the data sheet. Each responsive proposal shall be attributed a technical score (St.)

Financial Proposal

5.3 The Evaluation Committee shall determine if the financial proposal is complete and without computational errors. The lowest financial proposal (Fm) shall be given a financial score (Sf) of 100 points. The financial score of the proposals shall be computed as follows: Sf = 100 x Fm//F (F-amount of financial proposal).

5.4 Proposals shall finally be ranked according to Total Score (ST) which will be combined technical (St) and financial (Sf) scores using the weights indicated in the data sheet.

$$ST = Wt*St + Wf*Sf$$

5.5 Any effort by the firm to influence the NHAI in its evaluation of proposal or award of contract may result in the rejection of the firm's proposal.

6 NEGOTIATIONS

6.1 Prior to the expiration period of validity of proposal, the NHAI shall notify the successful firm who submitted the highest scoring proposal in writing by registered letter, cable facsimile and invite it to negotiate the contract.

6.2 Negotiations normally take two to five days. The aim is to reach agreement on all points, and initial a draft contract by the conclusion of negotiations

6.3 Negotiations shall commence with a discussion of your technical proposal, the proposed methodology (work plan), staffing and any suggestions you may have made to improve the ToR. Agreement must then be reached on the final ToR, the staffing and bar charts, which shall indicate activities, staff, periods in the field and in the home office, staff months, logistics and reporting. Special attention shall be paid to optimise the required outputs from the firm within the available budget and to define clearly the inputs required from the NHAI to ensure satisfactory implementation of the assignment.

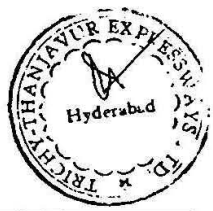
6.4 Changes agreed upon shall then be reflected in the financial proposal, using proposed unit rates (no negotiation of the unit rates, including the man months rates).

6.5 Having selected a firm, among other things, on the basis of an evaluation of proposed key professional staff, the NHAI expects to negotiate, a contract on the basis of the staff named in the proposal and, prior to contract negotiations, will require assurance that this staff shall be actually available. NHAI shall not consider substitutions during contract negotiations except in cases of unexpected delays in the starting date or incapacity of key professional staff for reasons of health.

6.6 The negotiations shall be concluded with a review of the draft form of Contract. NHAI and the firm will finalise the contract to conclude negotiations. If negotiations fail, the NHAI will invite the firm having obtained the second highest score to contract negotiations. In case of failure of negotiations with the second highest scoring firm, the firm with the least score shall be called for negotiations.

7 AWARD OF CONTRACT





7.1 The contract shall be awarded after successful negotiations with the successful firm. Upon successful completion, NHAI shall promptly inform the other firms that their proposals have not been retained.

7.2 The successful firm with whom the contract is signed is expected to commence the assignment on the date and at the location specified in the data sheet.

8 CONFIRMATION OF RECEIPT

8.1 We shall appreciate your informing us by telex/facsimile :

- Receipt of the LoI and
- Whether or not you will submit a proposal.

[Name]*
[Designation]*
[Department]*





DATA SHEET
(As Mentioned in LoI)

Sub clause No. in LoI

1.1 **The name of the Assignment is: Independent Consultancy services for "strengthening of the existing carriageway from km 80.000 to km 135.750, on the Thanjavur-Trichy section of National Highway No.67 (NH-67) in the State of Tamil Nadu and widening thereof to 4 lanes and its Improvement, Operation and Maintenance through a concession on BOT basis"**

1.2 **The description and the objectives of the Assignment are :** The Government of India (GoI) in the National Highways Authority of India (NHAI) has decided to undertake **"strengthening of the existing carriageway from km 80.000 to km 135.750, on the Thanjavur-Trichy section of National Highway No.67 (NH-67) in the State of Tamil Nadu and widening thereof to 4 lanes and its Improvement, Operation and Maintenance through a concession on on BOT basis"** including its operation and maintenance NHAI after due consultation with the Concessionaire intends to appoint an Independent Consultant (IC) to oversee the activities of the Concessionaire during Design, Construction, Operation and Maintenance of the Project Highway.

The objectives of the consultancy service are to:

i) Act principally on behalf of NHAI and lenders to review all activities associated with Design, Construction and O&M to ensure compliance of requirements of Concession Agreement with the Concessionaire in order to have a sound project.

ii) Report on the financial and technical aspects of the project, after visiting the site at least once a month.

iii) Assist the parties to the Concession Agreement in arriving at an amicable settlement in case of a dispute

1.4 **Pre-Proposal Conference shall be held at _____ hr on _____ 2004 at _____.**

1.6 **The invited firms are : ***

i)

ii)

iii)

2.1 **The Documents are:** (ToR, Contract, Appendices etc.)

i) ToR
ii) Form of Contract Agreement alongwith Appendices
iii) Appendix I - Formats for Technical Proposal
iv) Appendix II - Formats for Financial Proposal

2.2 **The address is :**

_____

_____

3.1 The Language of documents and correspondence will be English

3.3 Limitations to joint ventures or sub-contracts are: Joint Vènture between firms on the short list is not permitted.

(i) Limitations to joint ventures or sub-contracts are : Joint Venture between firms on the short list is not permitted.

(iii) It is estimated that about 113 **man** months of services of key personnel and 222 man months for supporting staff will be required. However, you should feel free to submit your proposal on the basis of the man-months which you consider to be necessary to undertake the assignment.

(iv) Majority of proposed key staff should be permanent employees of the firm:

(vi) All the personnel shall have working knowledge of English and all the reports shall be written in English.

3.7 Tax Liability, insurance:
As per clause _____ and _____ of Special Conditions of Contract.

4.1 **The number of copies of the proposals required :** 1 Nos.
The address and information are:

4.5 **The date and time of proposal submission are : ***

4.6 ***Validity period :*** *90 days*

Negotiations shall be held at New Delhi

5.2 **The points assigned to evaluation criteria are:**

	POINTS
(i) Relevant experience for the assignment	15
(ii) The quality of methodology and work plan proposed	15
(iii) The qualifications of the key staff proposed	70
TOTAL :	**100**

The points assigned to the evaluation sub-criteria for qualifications and competence of key staff are:

	POINTS
General Qualifications	30
Adequacy for the Project	70
TOTAL :	**100**

The technical proposal should score at least 75 points out of 100 to be considered responsive for financial evaluation.

5.4 The weight (Wt%) given to the Technical Proposal is 80 percent

The weight (Wt%) given to the Financial Proposal is 20 percent

7.2 Commencement of Assignment : The firm shall begin carrying out the services within one month of the date of effectiveness of the contract at locations as required for the project highway stated in ToR

Sincerely,

[Name]*

[Designation]*

Attachments :

i) ToR
ii) Form of Contract Agreement alongwith Appendices
iii) Appendix I - Formats for Technical Proposal
iv) Appendix II - Formats for Financial Proposal*

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INDEPENDENT CONSULTANTS' SERVICES
TERMS OF REFERENCE

1. PROJECT BACKGROUND

The Government of India, National Highways Authority of India (NHAI) has taken up strengthening of the existing carriageway from km 80.000 to km 135.750, on the Thanjavur-Trichy section of National Highway No.67 (NH-67) in the State of Tamil Nadu and widening thereof to 4 lanes and its Improvement, Operation and Maintenance through a concession on Build, Operate and Transfer (BOT) basis,

(1) NHAI will bear the cost of land to be acquired on the award of concerned Revenue Authority.

(2) The Concessionaire shall make necessary arrangements clearing the encumbrances along the Project corridor under the directions of the concerned agencies and officials at his own cost.

(3) The Concessionaire shall operate and maintain the Project Highway by itself, or through O&M Contractors including tolling contractor, if any, after carrying out improvements to comply with Standards and Specifications spelled out by the NHAI in the Concession Agreement.

(4) NHAI intends to appoint an Independent Consultant (IC) to oversee the activities of the Concessionaire during Design, Construction, Operation and Maintenance of the Project Highway.

2. OBJECTIVES

The objectives of consultancy service are to :

i) Act independently and on behalf of the NHAI to review all activities associated with Design, Construction and O&M to ensure compliance of requirements of Concession Agreement in order to have a sound project.

ii) Report to NHAI on the financial and technical aspects of the project, after visiting the site at least once a month.

iii) Assist the parties to the Concession Agreement in arriving at an amicable settlement of dispute.

iv) Act, if required on behalf of the lenders and fulfil various reporting requirements of the lenders.

3.0 SCOPE OF SERVICES

The Project Highway provides for strengthening of the existing carriageway from km 80.000 to km 135.750, on the Thanjavur-Trichy section of National Highway No.67

(NH-67) in the State of Tamil Nadu and widening thereof to 4 lanes and its Improvement, Operation and Maintenance through a concession on Build, Operate and Transfer (BOT) basis, India. The work also includes widening of the existing bridges and culverts and construction of new bridges and culverts for new carriageway, **including bypasses.** Further. Reconstruction of weak/narrow bridges/culverts are also involved. In this connection, ICs are advised to go through the Scope of Work of the Concessionaire engaged by NHAI for this Project. The Scope of Work for the Concessionaire is available at the Head Office of NHAI at Delhi for Inspection on all working days between 1000 hrs to 1700 hrs. Broadly the Project Highway shall include but not be limited to the following:

- Road works
- Fee Collection system including buildings and related structures, hardware and software
- *Communication systems*
- Administration and Maintenance Depots
- Rest Area and Fuel and Service facilities
- Rest areas
- Lighting system
- Interchanges
- Bridges
- Service Roads
- Lay byes, Bus bays
- Traffic safety, Landscaping, arboriculture and other Project facilities.
- Mediate to resolve the issues between NHAI and the Concessionaire
- Quality Assurance and Quality Control Tests

The Concession Agreement envisages the appointment of an Independent Consultant (IC) by NHAI. The IC shall be, in principle, responsible for review of Designs, Drawings, exercise Quality Assurance and Quality Control for the Concessionaire's activities regarding Construction, Operation and Maintenance of the Project Highway, Progress Monitoring, affirmation of all certifications done by the Concessionaire, Resolving the issues involved on the project between the Client and the Concessionaire, Reporting as per the requirements of the Concession Agreement and the Contract Agreement of the Independent Consultant, etc.

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The Independent Consultant shall supervise that all the requirements of the Concession Agreement and various schedules are met by the Concessionaire and in case of any discrepancy/ deviations, he shall inform NHAI and the Concessionaire. The responsibility of the IC during various stages of Design Review, Construction and Operation and Maintenance shall be as follows but not be limited to :

3.1 Design Responsibilities

i) Review the adequacy of the geotechnical and sub-soil investigations for road, bridge and other structures and building works, hydrological investigation and the topographical survey.

ii) Review the Design and working drawings prepared for the construction of various components of the highway, bridges / structures, analysis of rates, estimates, reports and other deliverables.

iii) Review the impact of widening proposal on the Archaeological structures, if any.

iv) Review the Project report prepared by the Concessionaire, with respect to the traffic, toll management, traffic management, etc.

v) Review the implementation schedule of Engineering, Design, Procurement and Construction of the Project submitted by the Concessionaire.

vi) Review the Planning and Design of way-side amenities, toll plazas, toll collection system, communication facilities, emergency relief arrangements, traffic operation and safety arrangements.

vii) Review all Project contracts including Detailed Engineering and Design Consultancy Contract, Construction Supervision Consultancy contract, any other EPC contract, O & M Contract and Tolling contract, made by the Concessionaire.

viii) Review the environmental management plan for the Project Highway during Construction and Operation and Maintenance phases.

ix) Review quality assurance and quality control provisions during the design, construction and maintenance stages.

x) Audit the safety of the Project Highway both during Construction and Operation and Maintenance stages.

xi) To mediate and assist in resolving disputes between NHAI and Concessionaire.

xii) Provide Management Information System to NHAI.

3.2 *Construction Stage*

3.2.1 The duties of the IC are to supervise the Construction works on a day-to-day basis and to approve the materials and workmanship of such works. During the construction phase, It should be made mandatory that, IC's key staff must be satisfied with the quality of Construction provided by the Concessionaire and undertake themselves the quality control tests for at least 25-30% of the Requests for Inspection (RFI) pertaining to each item of construction and close them. IC's Team Leader should at least close 5-10% of RFI as per such

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provisions of Inspection in the Concession Agreement. He/She shall have no authority to relieve the Concessionaire of any of their duties or to impose additional obligations. The IC shall administer the work contracts and ensure that the Contractual Clauses, whether related to quality or quantities of works, are respected. Request for Inspection (RFI) is a formal application from the Concessionaire (or EPC contractor) to Independent Consultant to examine all aspects of the works or activity pertaining to construction or development of the Project Highway. Submission of a RFI for construction activity must be made a minimum of 48 hours in advance of the time the Concessionaire (or EPC contractor) plans to begin work on the RFI activity.

3.2.2 Review and approve works programme.

3.2.3 Review the material testing results and Mix Designs and to order special tests of materials and/or completed works, and/or order removal and substitution of substandard materials and/or works as required.

3.2.4 Review quality assurance and quality control during Construction period.

3.2.5 Ensure that the Construction work is accomplished in accordance with the technical specifications.

3.2.6 Identify Construction delays and recommend to the NHAI the remedial measures to expedite the progress.

3.2.7 Review and certify the 'As Built' drawings for each component of the works prepared by the Concessionaire.

3.2.8 Review the safety measures provided for the traffic and Project workers.

3.2.9 Determine any extension of the Project Completion Schedule and the Concession period, to which the Concessionaire is entitled and shall notify the NHAI accordingly.

3.2.10 To mediate and assist in resolving disputes between NHAI and Concessionaire during Construction stage.

3.2.11 Assist the NHAI in arriving at any cost variation and its impact on Concession Agreement.

3.2.12 Evolve MIS and provide it to the NHAI

3.2.13 Issue Completion Certificate after checking the results of prescribed tests, with the approval of NHAI.

3.2.14 Issue Provisional Certificate duly appended with a list of outstanding items (Punch List, as defined in the Concession Agreement) established after joint inspection with the Concessionaire, if the Concessionaire requests for it, after approval of NHAI. .

3.2.15 In case of Change in scope, while calculating the cost implications to the Concessionaire of complying with such Change of Scope Notice, the rates shall be worked out by based on the concerned State PWD (NH) current schedule of rates based on MORTH data book. In case an item is not covered under the above-mentioned schedule of rates, the rate of such item shall be worked out by the Concessionaire on the basis of the prevailing market rate so far as found reasonable and competitive by the IC.

3.2.16 To direct the Concessionaire in all matters concerning construction safety and care of the works and if required, to request the concessionaire to provide any necessary lights, guard, fencing etc.

3.3 Operations and Maintenance Stage

The IC must ensure a high level of quality input by the Concessionaire on each of the activity of civil Works towards maintenance of the Project Assets. The IC shall be responsible for the quality of civil Works towards maintenance of Project Assets. At least 25%-30% of the works related to the maintenance shall be thoroughly tested by the IC for which the Concessionaire shall submit a Request for Inspection (RFI). Maintenance shall include cleaning, replacement of equipment/consumables, roadside facilities, horticultural maintenance and repairs to equipment, pavements, bridges, structures, HTMS and other civil works. Maintenance shall not include the extension of any existing pavements, bridges, structures and other civil works unless part of the Project Highway.

3.3.1 Review work plan and schedules of various operation and maintenance activities.

3.3.2 Review Operation and Maintenance manual prepared by the Concessionaire.

3.3.3 Review the performance of Operation and Maintenance (O & M) activities including equipment, service, traffic operation and safety, toll plazas and fees collection system, landscaping, environmental issues and way side amenities.

3.3.4 To mediate and assist in resolving disputes between NHAI and Concessionaire during O&M stage.

3.3.5 Initiate necessary action to undertake maintenance obligations of the Concessionaire at risk and cost of the Concessionaire in the event of his failure to carry out O&M.

3.3.6 Undertake audit of the traffic using the Project Highway at least once a month.

3.3.7 Review and inspect the Project Highway at least once a month during the O&M period and issue an Inspection Report of such inspections.

3.3.8 Review the accident record on the Project Highway and suggest remedial measures.

3.4 **Transfer/Termination**

Satisfy itself that the entire divestment requirement have been met by the Concessionaire.

3.5 All other activities as per provisions of the Concessionaire Agreement

4. INTERACTION WITH NHAI

The Independent Consultants shall interact with the NHAI on a regular basis. NHAI shall generally hold meetings every month to review the progress etc. during the phase of Design and Construction, and every second month during

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the Operation and maintenance stage. Within 30 days of the receipt of the Drawings, the Independent Consultant shall review the same and convey its comments/observations to the Concessionaire with particular reference to the conformity or otherwise with the specifications and standards setforth in the Agreement.

5. REPORTING REQUIREMENT

The Independent Consultants shall prepare and submit to the NHAI three copies and Concessionaire two copies each of the following reports.

(a) Design Review Phase

- Monthly Progress Report.

(b) Construction Phase

- Weekly Inspection Report covering all aspects such as Progress Monitoring, Quality Assurance (QA)/Quality Control (QC) etc.

(c) Operation and Maintenance Phase

- Monthly and Quarterly report on existing condition of facility including advise on all aspects of Operation And Maintenance, Toll Booths, Bridges or other Structures, Traffic Management & Safety, Telephone, Ambulance, etc.
- Monthly report on audit of the traffic using the Project Highway at least once a month.
- Monthly and quarterly reports for Lane Availability (Including non-availability)

(d) Various other reports as provided in the Concession Agreement such as Completion Report.

6. PERFORMANCE CLAUSE

Independent Consultants shall be expected to fully comply with all the provisions of the 'Terms of Reference', and shall be fully responsible for supervising that Designs, Construction and maintenance and operation of the facility takes place in accordance with the provisions of the Concession Agreement and other schedules. Any failure of the Independent Consultant in notifying to NHAI and the Concessionaire on non-compliance of the

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provisions of the Concession Agreement and other schedules by the Concessionaire, non-adherence to the provision of ToR and non-adherence to the time schedule prescribed under ToR shall amount to non-performance.

7. CONSULTANT'S PROPOSAL

7.1 List of key personnel to be fielded by the Consultants shall be as below :

i) Team Leader-cum-Senior Highway Engineer
ii) Senior Bridge/Structural Engineer
iii) Traffic & Transportation Expert
iv) Senior Pavement Specialist
v) Senior Quality/Material Expert
vi) Financial Expert
vii) Legal Expert
viii) Road Safety Expert

7.2 Broad job-description and minimum qualification for key personnel mentioned above is enclosed as Appendix A. However, higher marks shall be accorded to the Candidate with higher relevant qualification and experience. It is estimated that about 113 man-months of services of key personnel are required as detailed in Appendix B. However, the Consultant should feel free to submit their proposal on the basis of the man-months which they consider to be necessary to undertake the assignment. All the key personnel mentioned in para 7.1 above shall be evaluated at the time of evaluation of technical proposal. Consultants are advised in their own interest to frame the technical proposal in an objective manner as far as possible so that these could be properly assessed in respect of points to be given as part of evaluation criteria. The bio-data of the key personnel should be signed on every sheet by the personnel concerned and the last sheet of each bio-data should also be signed by the authorised signatory for the Consultant. The key personnel shall also certify at the end of their bio-data proforma that they have not accepted any other offer at the time of signing of the bio-data and as such shall be available to work with the Independent Consultant, if the project is awarded.

8. PERIOD OF SERVICES

8.1 The services of an Independent Consultant will be in phases as per Article XXII of the Concession Agreement.

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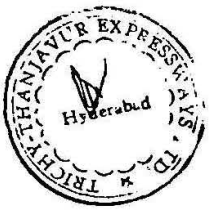
8.2 The appointment of the Independent Consultant shall initially be for a period of 48 months. Estimated Design and Construction schedule for completion of the project for commercial operation is 30 months. The proposed manpower deployment for this period shall be matching the activities to be performed during the said period. The time frame for services during Operation and Maintenance shall be for about 18 months from the date of commissioning of the facility.





Appendix A

MINIMUM QUALIFICATION OF KEY PERSONNEL

TEAM LEADER CUM SENIOR HIGHWAY ENGINEER

This is the senior most position, the nominated expert as the team leader shall be responsible for reviewing the entire project preparation and implementation activities of the Concessionaire. He shall check all the Designs prepared by the Concessionaire, ensure execution of works on site as per specification and standards, and continuously interact with the NHAI and the Concessionaire. He shall undertake project site visits and shall guide, supervise, coordinate and monitor the work of other experts in his team as well as those of the Concessionaire. The candidate should have a proven record of supervising, organising and managing of project preparation and construction of highway projects of large magnitudes, as defined below, financed by international lending agencies and others. Knowledge of project management shall be an added advantage.

This position requires a Senior Highway Engineer who shall be a graduate in Civil Engineering with higher qualifications and specialisation in highway engineering. He should have a minimum 20 years of experience of highway engineering including 10 years of experience in developing countries. He should have handled as Team Leader or similar capacity in at least one Project Preparation and Construction supervision work of major highway project of four laning/six-laning/expressway costing more than Rs. 1500 million (1997 cost) or of at least 50 km length. Alternatively, he should have handled as Deputy Team Leader or in similar capacity Project Preparation and Construction supervision of at least two projects of four laning/six laning/ expressway costing more than Rs. 900 million (1997 cost) each or of at least 30 km length.

SENIOR BRIDGE /STRUCTURAL ENGINEER

The Senior Bridge Engineer shall be responsible for checking the designs of bridges, ROBs, interchanges and any other structure to be constructed as part of the Project Highway. He shall also inspect the construction of structures and monitor bridge rehabilitation and repair works to be undertaken by the Concessionaire.

The position requires a graduate in Civil Engineering, with a Masters degree or equivalent in Structural/Bridge Engineering with minimum 15 years experience out of which at least 10 years on Design and Construction of bridges/interchanges/any other

structures including rehabilitation. He should have handled in the last 5 years one detailed engineering work for rehabilitation and/or upgrading of major highway or expressway. The candidate should have a thorough understanding and experience with international 'best practices', and of modern bridge construction technology. He should have designed independently, at least two major bridges (150 m or more in length).

TRAFFIC AND TRANSPORTATION EXPERT

Shall review and check the traffic analysis, projection, and assignment exercises to be carried out by the Concessionaire. He shall also review type and locations of traffic control (e.g. signal) and safety measures, design of intersections and interchanges, toll plaza layout, toll collection method and use facilities, scheme for traffic management during construction period. He shall also study and comment on safety audit report prepared by the Concessionaire.

The position requires a graduate in Civil Engineering with higher qualification in traffic engineering. The minimum period of professional experience is 15 years including at least 5 years on projects of similar nature, of which at least one should involve works of four laning/six-laning/expressway or similar project. The candidate should have enough knowledge on road safety aspects.

SENIOR PAVEMENT SPECIALIST

The expert shall be continuously interacting with the Concessionaire, to ensure life cycle cost effectiveness and viable design of pavement including appropriate rehabilitation / strengthening of the existing two lane pavement which is significantly distressed. He shall also be responsible for ensuring complete adherence to maintenance standards during Construction and Operation period. Thus, the position requires a pavement specialist with thorough knowledge and understanding of international 'best practices' in the field of Design, Construction and maintenance of flexible/rigid type of pavements including latest codal stipulations and specifications.

The candidate should be a graduate in Civil Engineering with higher qualification and specialisation in Pavement Design. He should have a minimum of 15 years of professional experience of pavement Design, Construction and its maintenance. The minimum experience of 15 years should include assignments of at least 3 years in developed countries or at least 3 years on major highway projects funded by international funding agencies in developing countries in Senior Expert capacity.

SENIOR QUALITY/MATERIAL EXPERT

The Quality/Material Expert shall review the test results of quarry and borrow area material to find out their strength characteristics and suitability for using them in pavement construction. He shall inspect the Concessionaire's field laboratories to ensure that they are adequately equipped and capable of performing all the specified testing requirements of the contract. He shall look into the quality assurance aspect of the construction works and supervise the setting-up of the various Concessionaire's rock crushers and bituminous mixing plants to ensure that the specified requirements for such equipments are fully met.

The position requires a graduate in Civil Engineering with a minimum of 15 years of professional engineering experience including 6 years in quality assurance programs in highway projects using modern technology.

FINANCIAL EXPERT

Over 8 to 10 years as a Financial Advisor particularly in the field of project financing. Advisory experience in the field of transportation project would be desirable.

LEGAL EXPERT

Lawyer with over 8 years experience in contracts and financial documentation related to project financing. Advisory experience in transportation would be desirable.

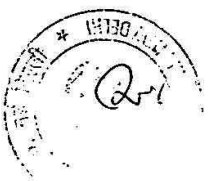
ROAD SAFETY EXPERT

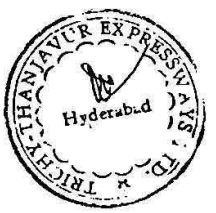
The position requires a graduate in Civil Engineering with a minimum of 15 years of construction experience. He should have been involved on at least one major highway construction project of size not less than 25% of the length of the Project Highway or 25 kilometres length (whichever is more) in the capacity of a Road Safety Expert.

Appendix B

MANMONTH INPUT FOR KEY PERSONNELAND SUPPORTING STAFF

Sl. No.	Key Personnel	Suggested Manmonths		
		Construction stage	O&M Stage	
1	Team Leader cum Senior highway Engineer	36	12	
2	Senior Bridge Engineer	12	1	
3	Traffic & Transportation Expert	6	3	
4	Senior Pavement Specialist	12	2	
5	Senior Quality/Material Expert	12	1	
6	Financial Expert	2	2	
7	Legal Expert	2	2	
8	Road Safety Expert	6	2	**TOTAL**
	Total	**88**	**25**	**113**





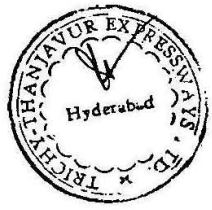
SCHEDULE O

APPENDIX I : FORMATS FOR TECHNICAL PROPOSAL

(as mentioned at para 2.1 of the data sheet)

Appendix I-1	Firm's references
Appendix I-2	Firm's comments and suggestions on the Terms of Reference and on data, services, and facilities to be provided by the NHAI.
Appendix I-3	Approach paper on methodology and work plan for performing the assignment.
Appendix I-4	Composition of the team and task(s) of each team member
Appendix I-5	Curriculum vitae of proposed professional staff.
Appendix I-6	Time schedule for deployment of professional personnel
Appendix I-7	Activity (works) schedule.





APPENDIX I-1 : FIRM'S REFERENCES

Relevant Services Carried Out in the Last Five Years
That Best Illustrate Qualifications

Using the format below, provide information on each reference assignment for which your *firm/entity, either individually as a corporate entity or as one of the major companies within an association,* was legally contracted.

<table>
<tr><td colspan="2">Assignment Name :</td><td>Country :</td></tr>
<tr><td colspan="2">Location within Country :</td><td>Professional Staff Provided by Your Firm:</td></tr>
<tr><td colspan="2">Name of Client :</td><td>No. of Staff :</td></tr>
<tr><td rowspan="2">Start Date
(Month/Year)</td><td rowspan="2">Completion
Date
(Month/Year)</td><td>No. of Staff-Months :</td></tr>
<tr><td>Approx. Value of Services (in Current INR)</td></tr>
<tr><td colspan="2">Name of Associated Consultants, if any:</td><td>No. of Months of Professional Staff.
Provided by Associated Consultants :</td></tr>
<tr><td colspan="3">Name of Senior Staff involved :</td></tr>
<tr><td colspan="3">Narrative Description of Project :</td></tr>
<tr><td colspan="3">Description of Actual Services Provided by Your Staff :</td></tr>
</table>

Firm's Name : _____

APPENDIX I-2 : COMMENTS AND SUGGESTIONS OF CONSULTANTS ON THE TERMS OF REFERENCE AND ON SERVICES AND FACILITIES TO BE PROVIDED BY THE NHAI

On the Terms of Reference :

1.

2.

3.

4.

....

On the services and facilities to be provided by the NHAI

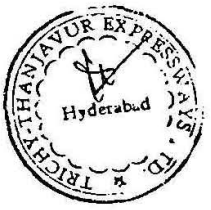
1.

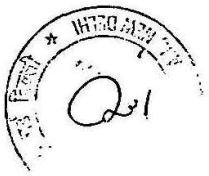
2.

3.

4.

....





APPENDIX I-3 : APPROACH PAPER ON METHODOLOGY AND WORK PLAN FOR PERFORMING THE ASSIGNMENT

APPENDIX I-4 : COMPOSITION OF THE TEAM PERSONNEL, AND TASK(S) OF EACH TEAM MEMBER

1. Technical/Managerial Staff

Sl. No.	Name	Position	Task
1			
2			
3			
4			
..			
..			

2. Support Staff

Sl. No.	Name	Position	Task
1			
2			
3			
4			
..			
..			





APPENDIX I-5 : FORMAT OF CURRICULUM VITAE (CV) FOR PROPOSED PROFESSIONAL STAFF

Proposed Position : .....

Name of Firm : .....

Name of Staff : .....

Profession : .....

Date of Birth : .....

Years with Firm/Entity : ..... Nationality : .....

Membership of Professional Societies : .....

Detailed Task Assigned : .....

Key Qualifications :

[Give an outline of staff member's experience and training most pertinent to tasks on assignment. Describe degree of responsibility held by staff member on relevant previous assignments and give dates and locations. Use about half a page.]

Education :

[Summarise college/university and other specialised education of staff member, giving their names, dates attended, and degrees obtained. Use about one quarter of a page.]

Employment Record :

[Starting with present position, list in reverse order every employment held. List all positions held by staff member since graduation, giving dates, name of employing organisations, titles of positions held, and locations of assignments. For experience in last ten years, also give types of activities performed and client references, where appropriate. Use about three-quarters of a page.]

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Languages :

[For English language indicate proficiency : excellent, good, fair, or poor; in speaking, reading, and writing]

Certification

1. **I have not accepted any other offer at the time of signing this CV and as such I shall be available to work with (Name of the firm).**

2. I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe qualifications and experience.

.....Date : .....

[Signature of staff member and authorised representative of the Firm] Day/Month/Year.

Note / Instruction: -

1. **The CVs should be signed on every sheet by the concerned key personnel.**

2. **Last sheet of CV should also be signed by the authorized signatory for the Independent Consultant.**

3. **All the Original Signatures shall be in Blue Ink.**

APPENDIX I-6 : TIME SCHEDULE FOR PROFESSIONAL PERSONNEL

A. Activity Schedule

Sl. No.	Name	Position	Monthwise Program (in form of Bar Chart) *[1st, 2nd, etc. are months from the start of assignment]*											
			1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th and subsequent months	Number of Months
1															Subtotal (1)
2															Subtotal (2)
3															Subtotal (3)
4															Subtotal (4)
-															-
-															-

APPENDIX I-7 : ACTIVITY (WORKS) SCHEDULE

A. Activity Schedule

		Monthwise Program (in form of Bar Chart) *[1st, 2nd, etc. are months from the start of assignment]*											
Sl. No.	Item of Activity (Works)	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1	.....												
2	.....												
3	.....												
4	.....												
-	.....												
-	.....												

B. Completion and Submission of Reports

S.No	Reports :	Programme : (Date)
1	Monthly reports (Design and Construction)	
2	Quarterly Reports	
3	Various others reports as provided in the Concession Agreement such as Completion Report	

SCHEDULE O

APPENDIX II : FORMATS FOR FINANCIAL PROPOSAL

(as mentioned in para 2.1 of Data Sheet)

Appendix II-1 Financial proposal submission form

Appendix II-2 Summary of costs

Appendix II-3 Breakdown of costs





APPENDIX II-1 : FINANCIAL PROPOSAL SUBMISSION FORM

FROM : (Name of Firm)

TO :
National Highways Authority of India
New Delhi (India)

Subject :

We, the undersigned, offer to provide the consulting services for the above in accordance with your Request for Proposal dated [Date], and our proposal (technical and financial proposals). Our attached financial proposal is for the sum of [Amount in words and figures]. This amount is exclusive of the local taxes which we have estimated at (Amount in Words and Figures).

Our financial proposal shall be binding upon us subject to the modifications resulting from contract negotiations, up to the expiration of the validity period of the proposal, i.e., [Date].

We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".

Commission and gratuities, if any, paid or to be paid by us to agents relating to this proposal and contract execution, if we are awarded the contract, are listed below :

Name and Address of Agents	Amount and Currency	Purpose of Commission or Gratuity
.....	.....	.....
.....	.....	.....

We understand you are not bound to accept any proposal you receive.

We remain,

Yours sincerely,

Authorised Signature :
Name and title of Signatory :

APPENDIX II-2 : SUMMARY OF COSTS

No.	Description	Amount
I	Remuneration for Professional Staff	
II	Supporting Staff	
III	Transportation	
IV	Duty Travel to Site	
V	Office Rent	
VI	Office Supplies, Utilities and Communication	
VII	Office Furniture and Equipment	
VIII	Reports and Document Printing	
	Subtotal :	
	Total Cost Net of Tax	
Taxes and Duties		
	TOTAL COSTS (Including Tax)	

APPENDIX II-3 : BREAKDOWN OF COSTS

REMUNERATION FOR STAFF

No.	Position	Name	Year 1			Year 2			Year 3			Year 4		
			Rate	SM	Amount	Rate	SM	Amount	Rate	SM	Amount	Rate	SM	Amount
	Professional Staff													
1.														
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														
	Sub - Total													
	Technical Support Staff													
1.		TBN												
2.		TBN												
3.		TBN												
4.		TBN												
5.		TBN												
6.		TBN												
7.		TBN												

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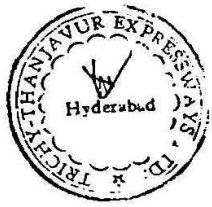
No.	Position	Name	Year 1			Year 2			Year 3			Year 4		
			Rate	SM	Amount	Rate	SM	Amount	Rate	SM	Amount	Rate	SM	Amount
8.		TBN												
9.		TBN												
10.		TBN												
	Sub-Total													
	TOTAL													

SM = Staff Month

TBN = To be Named





II. Support Staff

No.	Position	Name	Staff Months	Billing Rate ( )	Amount ( )
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
				Total :	

III Transportation (Reimbursable)

I. The vehicles provided by the firm shall include the cost for rental drivers, operation, maintenance, repairs, insurance, etc.

Purchases _____

Operation, maintenance, repairs _____

Total _____

IV Duty Travel to Site (Reimbursable)

Professional Staff

___ x _____ trips x ____ days @ _____

Transport __ x ____ trips @ _____

Total _____

V Office Rent (Reimbursable)

The rent cost include maintenance, cleaning, repairs,etc.

____ months x 200 sqm.x _____

Total _____

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VI Office Supplies, Utilities and Communication (Reimbursable)

No.	Item	Months	Monthly Rate	Amount in
1.	Office Supplies			
2.	Drafting Supplies			
3.	Computer Running Costs			
4.	Communication			

Total _____

VII. Office Furniture and Equipment (Reimbursable)

No.	Description (*)	Unit	Quantity	Rate (.)	Amount ( )
	Office Furniture (Purchase)				
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
	Office Equipment (Purchase)				
1					
2					
3					
4					
5					

No.	Description (*)	Unit	Quantity	Rate ( )	Amount ( )
6					
7					
8					
9					
10					
11					
12					
13					
14					
				Total	

VII. Reports and Document Printing

No.	Description*	No. of Volumes	No. of Copies per Volume	Rate per Copy ( )	Amount
1	Monthly reports (Design and Construction)				
2	Quarterly Reports				
3	Various others reports as provided in the Concession Agreement such as Completion Report				
				Total	

SCHEDULE P

TRAFFIC SAMPLING

NHAI through Independent Consultant shall have the right to undertake traffic sampling for the purpose of determination and/ or verification of the actual traffic on the Project Highway. This shall be done through Automatic Traffic Count -cum-classifier.

For the purpose of traffic sampling, the Concessionaire shall procure a portable type automatic traffic count-cum-classifier and provide it to the Independent Consultant. The traffic count -cum-classifier shall be light weight and portable with weather resistant casing. The system shall be capable of detecting and recording all types of vehicles plying on the Project Highway and of classifying any other vehicle category as per user needs. The vehicle classification shall be user selectable based on length of vehicle and number of axles. It would have the following main components:

Sensor - combination of piezo electric sensor and inductive loops. The sensor shall be portable as well as permanent so that either of these could be used as per the needs.

Electronic - the logic unit shall be micro processor based and programmable through a key board. It shall have legible electronic display with requisite number of entry ports and exit to communication system. The vehicle counting/classification interval shall be programmable from one minute to 1440 min. (24 hours). The system shall count and classify vehicle by each lane.

Data Collection - The system shall be capable of recording for later analysis on an individual vehicle basis time, date, speed, direction, lane, number of axles, axles spacing and site identification. The system should be able to record and store vehicle data for a period of at least two weeks.

Data Retrieval - The system shall have the capability of data retrieval through removable floppy diskette, data catridge, direct data transfer through a serial link to a portable computer and telemetory transmission via telephone link by modem.

Software - The system shall have software and manuals to analyse the data from output of vehicle count, classification speed and head-way. It should have capability of graphic/tabular representation of analysis data.

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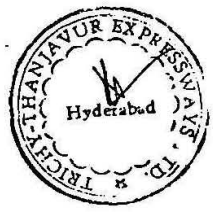
Before the use of portable automatic traffic counter cum classifier, it shall be validated and calibrated through sample counts to establish the reliability and acceptability of Automatic Traffic Counter-cum-Classifier both by Concessionaire and the Independent Consultant.

The sampling shall be done at intervals of 15 days by continuous 24 hrs counting for three days. If no abnormal trends are observed in three days counting at the frequency of 15 days, the frequency would be increased to 1 month after a period of one year. The sensor/loops shall be permanently installed to capture the traffic on all the approaching lanes, in accordance with the instructions of the supplier. They shall be located about 5 kms away from the toll plaza transitions taking care that no diversion of traffic is possible in between. The portable logic unit shall be plugged to these sensors whenever counting is to be done. Portable sensor can be utilised for traffic counting at any other location as per the need.

Apart from these periodical counts, the Independent Consultant shall have the right for traffic counting at a request from the NHAI. The traffic count as obtained from the samples shall be taken as actual traffic on the Project Highway at the locations of the counting.





Design. Engineering, Finance, Construction, Operation and maintenance of Thanjavur - Tirchy section from Km. 80.000 to Km. 135.750 of NH-67 under NHDP phase IIIA on Build, Operate and Transfer (BOT) Basis.

(Package No. : NHDP-III/ BOT/ TN/ 03)

PROJECT MILESTONES

Sl. No	Project Milestone ↓	Construction Month →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Pre Construction Activity	Date of Signing of Concession Agreement																														
1	Achievement of Financial Closure																															
2	Project Design																															
3	Handing over the site to the Concessionaire																															
4	Mobilization at site by Concessionaire																															
5	Shifting of Utilities including Tree Cutting																															
	Construction Activity																															
6	Bridges and CD Structure																															
7	ROBs & Grade Separator																															
8	New Carriageway																															
9	Existing Carriageway																															
10	Toll plaza and Administrative Blocks																															
11	safety Features																															
12	C.O.D		(2 years) May 2008																													

S.V. PATWARDHAN
Managing Director
Madhucon Projects Ltd.

SCHEDULE Q

DRAFT
ESCROW ACCOUNT AGREEMENT

Among

Trichy-Thanjavur Expressways Limited (THE CONCESSIONAIRE)

And

.....

As Lenders Representative

And

.....

As Escrow Agent

And

NHAI

(Subject to terms of the facility Agreement(s) between the Concessionaire and Senior Lenders. However, NHAI position in the cashflows shall not be changed)

THIS AGREEMENT (the "Agreement") is made on the ..... day of ..... 200... by and among:

Trichy-Thanjavur Expressways Limited a Concessionaire incorporated in India whose registered office is at Madhucon House, 8-2-272/82/A/1129/A, Road No. 36, Jubilee Hills, Hyderabad, India (the "Concessionaire");

and

..... and having its registered office at ....., as Senior Lenders Representative (the "Lenders Representative");

and

....., and having its registered office at ..... (the "Escrow Agent").

and

National Highways Authority of India (NHAI), Government of India, as Employer and Sub-ordinate Lender (the "NHAI").

WHEREAS:

- The Concessionaire is undertaking a project for "strengthening of the existing carriageway from km 80.000 to km 135.750, on the Thanjavur-Trichy section of National Highway No.67 (NH-67) in the State of Tamil Nadu and widening thereof to 4 lanes and its Improvement, Operation and Maintenance through a concession on BOT basis"

- The Concessionaire has entered into a Concession Agreement dated as of ..... 200... with NHAI (the "Concession Agreement") wherein NHAI has granted Concession to Concessionaire for the work referred to above, on BOT basis.

- The Concessionaire has entered into Financing Documents with Senior Lenders wherein Senior Lenders (the "Lenders") have agreed to lend and advance to the

TRICHY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

Concessionaire Rupee amounts aggregating ..... crores and foreign currency amounts aggregating US Dollars ..... in terms thereof;

- One of the terms of the Concession Agreement and the Financing Documents is that the Concessionaire is required to establish an Escrow Account, inter alia, on terms and conditions satisfactory to Senior Lenders.

NOW IN CONSIDERATION FOR THE PREMISES IT IS AGREED BY THE PARTIES AS FOLLOWS:-

1. Definitions and Construction

1.1 Definitions: Each capitalized term used herein and not otherwise defined shall have the definition assigned to such term in the Concession Agreement or the Substitution Agreement as the case may be

- "Account" means the Escrow Account to be opened by the Concessionaire in accordance with this Agreement;

- "Authorized Investment" means any authorized investments which Lenders Representative may, from time to time permit the Concessionaire to make in accordance with this Agreement;
- "Business Day" means any day on which banks are open for business in ..... or in relation to any notice or communication to be made under this Agreement, a day on which banks are open for business in the place of receipt of such notice or communication;

- "Concessionaire Account" shall mean any bank account of the Concessionaire, other than the Escrow Account.

- "Enforcement Notice" means any enforcement procedure commenced by the Lenders Representative under any of the Security Documents;

- "Escrow Account" means an Escrow Account established in terms of and under this Agreement;

- "Event of Default" means an event of default as defined and detailed in the Financing Documents;

THANJAVUR EXPRESSWAY LTD. TRICHY Hyderabad

- "INR" means the lawful currency of India;
- "Payment Date" means in relation to any Permitted Payment, the date(s) specified for such payment;
- "Permitted Payment" means the Payments Agreed to in this Agreement excluding payment to the Concessionaire Accounts as more particularly given in clause3.3.1;
- "Required Balance" means on any Date in relation to the Sub-Account of the Escrow Account, an amount in INR/Dollars which if proportionately built over the months, would be sufficient to meet Permitted Payment on the Payment Date(s).
- "Security Documents" means all or any of the Documents executed, delivered or furnished to secure the Financial Assistance under the Financing Documents including but not limited to the Deed of Hypothecation, Mortgage Deed, Equitable Mortgage, Deed of Guarantee, Pledge Agreement, Undertakings, Negative Lien and other incidental or supplemental documents related thereto.
- "Sub-Accounts" means the Sub-Accounts of the Escrow Account, into which the monies due in relation to Permitted Payment would be credited every month and paid out if due and if not due in a month then appropriated proportionately in such month and retained in the Sub Account and paid out therefrom on the Payment date.
- "Year" means each twelve month period ending on March 31.

1.2 Construction

In this Agreement:

- Unless the context otherwise requires, the singular includes the plural and vice versa;
- Headings and the use of bold typeface shall be ignored in its construction;

THANJAVUR-TRICHY EXPRESSWAY PVT. LTD. Hyderabad

- A reference to a Clause, or Schedule is, unless indicated to the contrary, a reference to a clause or schedule to this Agreement;

- References to this Agreement shall be construed as references also to any separate or independent stipulation or agreement contained in it;

- The words "other", "or otherwise" and "whatsoever" shall not be construed to be as any limitation upon the generality of any preceding words or matters specifically referred to;

- References to the word "includes" or "including" are to be construed without limitation;

- References to a person shall include such person's successors and permitted assignees or transferees;

- All references to agreements, documents or other instruments include (subject to all relevant approvals) a reference to that agreement, document or instrument as amended, supplemented, substituted, novated or assigned from time to time.

- The words "herein", "hereto" and "hereunder" refer to this Agreement as a whole and not to the particular Clause in which such word may be used;

- Words importing a particular gender include all genders;

- "person" includes any individual, partnership, firm, trust, body corporate, government, governmental body, authority, agency, unincorporated body of persons or association;

- any reference to a public organization shall be deemed to include a reference to any successor to such public organization or any organization or entity which has taken over the functions or responsibilities of such public organization;

- references to "Party" means a party to this Agreement and references to "Parties" shall be construed accordingly; and

- references to any law shall include references to such law as it may, after the date of this Agreement, from time to time, be amended, supplemented or re-enacted.

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- terms and expressions not expressly defined herein shall subscribe the meanings ascribed thereto in the Concession Agreement

2. THE ACCOUNTS

2.1 Acceptance of Appointment of Escrow Agent

(a) The Escrow Agent hereby agrees to act as such and to accept all payments and other amounts to be delivered to or held by the Escrow Agent pursuant to the terms of this Escrow Agreement. Escrow Agent shall hold and safeguard the Escrow Account during the term of this Escrow Agreement and shall treat the amount in the Escrow Account as monies deposited by Concessionaire / NHAI with the Escrow Agent, as agent for the benefit of the Lenders Representative, or its nominee, successors or assigns, in trust in accordance with the provisions of this Escrow Agreement. In performing its functions and duties under this Escrow Agreement, the Escrow Agent shall act as agent for the Lenders Representative.

The Concessionaire also hereby declares that all right, title and interest in and to the Escrow Account, the Authorised Investments and Permitted Payments made from the Escrow Accounts shall be vested in the Escrow Agent and held in trust for the Senior Lenders acting through Lender's Representative, NHAI and the Concessionaire in accordance with the terms of this Agreement and as their respective interests are provided for herein. Amounts deposited in the Escrow Account from time to time shall be held by the Escrow Agent in trust and received and applied as provided in and in accordance with the Agreement. No person other than the Lenders Representative, NHAI and the Concessionaire shall have any rights hereunder as the beneficiaries of or as third party beneficiaries under this Agreement.

(b) The rights of Concessionaire/NHAI in the monies held in Escrow Account are set forth in their entirety in this Escrow Agreement and Concessionaire/NHAI shall have no other rights against or to the monies in the Escrow Account.

2.2 Establishment of Escrow Account

At least thirty (30) days prior to seeking any disbursement (including issue of guarantees or all forms of Financial Assistance), the Concessionaire shall establish the Escrow Account with the Escrow Agent.

2.3 Maintenance of the Account

The Escrow Agent shall maintain the Escrow Account in accordance with the terms of this Agreement and its usual practices and applicable regulations and pay the maximum rate of interest payable to its customers on the balance in the said account from time to time.

2.4 Operating Procedures

The Escrow Agent and the Concessionaire shall agree (after consultation with the Lenders Representative) on the detailed mandates, terms and conditions and operating procedures for the Escrow Account but in the event of any inconsistency between this Agreement and such mandates, terms and conditions or procedures, this Agreement shall prevail.

3. Currency

3.1 The Escrow Account shall be established with the ..... Branch of the Escrow Agent. The Escrow Account shall be denominated in INR.

3.2 Deposits

3.2.1 The Concessionaire

(A) agrees, confirms and undertakes that it shall deposit and/or credit the Escrow Account with:

(i) all its receivables;

(ii) all proceeds received pursuant to any insurance claims; and

(iii) all monies received from any other sources in relation to and in respect of the Project.

(B) may make other deposits of the Concessionaire's other funds into the Escrow Accounts at any time. Provided however that the terms of this Agreement shall apply to such other funds deposited in the Escrow Account by the Concessionaire.

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The NHAI agrees, confirms and undertakes that it shall deposit and/or credit the Escrow Account with:

(i) all Fees collected by NHAI in exercise of its rights under Concession Agreement;

(ii) Revenue Shortfall Loan;

(iii) Grant, termination payments and other monies paid or disbursed in accordance with the provisions of the Concession Agreement and/or the Substitution Agreement..

3.2.2 The Escrow Agent shall ensure that all interest, if any, on the balances of the Escrow Accounts and interest on Authorized Investments made from the Escrow Accounts shall be credited to or deposited in the Escrow Account.

3.3 Withdrawals

3.3.1 The Escrow Agent shall withdraw amounts from the Escrow Accounts and appropriate in the following order every month as more particularly given in the Bank Proforma in Schedule I and deposit in the relevant Sub-Account for payments and if not due in a month then appropriate proportionately in such month and retain in the Sub-Account and pay out therefrom on the Payment Date(s):

(a) All taxes due and payable by the Concessionaire;

(b) All expenses in connection with and relevant to the Construction of Project Highway by way of payment to the EPC Contractor and such other persons as may be specified in the Financing Documents.

(c) O&M Expenses including Fees collection expenses incurred by the Concessionaire directly or through O&M Contractor and/or Tolling Contractor, if any, subject to the items and ceiling in respect thereof as set forth in the Financing Documents but not exceeding one twelfth (1/12) of the annual liability on this account;

(d) The whole or part of the expense on repair work or O&M Expenses including Fees collection expenses incurred by NHAI on account of exercise of any of its rights under this Agreement;

(e) All Concession Fees and Negative Grants payments due to NHAI from the Concessionaire under this Agreement.

(f) Reimbursements of expenditure incurred by NHAI, if any, for payment of insurance premia, etc., which are otherwise Concessionaire's responsibility, on account of failure on part of the Concessionaire to keep such insurance(s) effective and in force.

(g) Monthly proportionate provision of Debt Service Payments due in an Accounting Year and payment of Debt Service Payments in the month when due;

(h) One-half of such remuneration, cost and expenses of the Independent Consultant in case the Concessionaire does not reimburse the remuneration, cost and expenses of the Independent Consultant to NHAI within 15 (fifteen) days of receiving a statement of expenditure from NHAI.

(i) Any payments and Damages due and payable by the Concessionaire to NHAI pursuant to this Agreement including repayment of Revenue Shortfall Loans, recovery due to reduction in Scope of Work and penalty for O&M expenses incurred by NHAI and;

(j) Balance in accordance with the instructions of the Concessionaire.

The amounts specified in Clause 3.3.1 (a) to (i) constitute the Permitted Payments.

For each year, Bank Proforma would be separately provided by the Concessionaire to the Escrow Agent, with the permission of Lenders Representative, not later than 60 days prior to the first day of each year.

3.3.2 Notwithstanding anything to the contrary contained in this Agreement upon the earlier of (i) issue of Termination Notice (ii) termination of Concession Agreement, or (iii) the expiry of Concession Period, all amounts standing to

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the credit of the Escrow Account shall be appropriated and dealt with in the following order:-

(a) all taxes due and payable by the Concessionaire;

(b) all Concession Fees (including Negative Grant) due and payable to NHAI under this Agreement;

(c) all accrued Debt Service Payments;

(d) any payments and Damages due and payable by the Concessionaire to NHAI pursuant to this Agreement, including Termination claims, Recovery due to reduction in Scope of Work and repayment of Revenue Shortfall Loans;

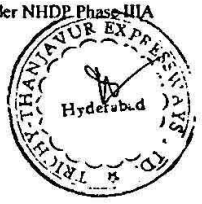
(e) all accrued O&M Expenses;

(f) any other payments required to be made under this Agreement; and

(g) balance, if any, on the instructions of the Concessionaire.

3.3.3 Not withstanding anything to the contrary contained in this agreement, any termination payments made by NHAI into the Escrow account shall not be appropriated therefrom for any purpose whatsoever, until the Vesting Certificate has been issued by NHAI. Provided, however, that this restriction shall not apply to appropriation in favor of the Senior Lenders to the extent of debt due.

3.3.4 From the date, which is two years prior to the expiry of the Concession period, a sum equal to the fees realizable during the last two years of the Concession period for a traffic volume calculated at the rate of 10,000 (ten thousand) PCUs per day per year, or, a higher sum estimated by the Independent Consultant for renewal works, shall not withstanding anything to the contrary contained in this agreement, be retained in the Escrow Account provided that if a Bank Guarantee of an equivalent sum in the form and content acceptable to NHAI has been furnished by the Concessionaire to NHAI, no such retention shall be made. If following the second Inspection, it is agreed or determined that no renewal works are required, then within 14 days of such agreement, 50 % of the sums thus retained shall be released from the Escrow account to the



Concessionaire. Within 14 days after the issue of Vesting Certificate issued (in accordance with Article XXXIII of the Concession agreement) the sums thus retained shall be released from the Escrow account to the Concessionaire.

3.4 Application of Insufficient Funds

As provided in Clause 3.3, the application of funds in the Escrow Account shall be in the serial order of priority set forth therein. If the funds available for payment to the Sub-Accounts are sufficient to pay a portion, but not all, of the amount required to be paid to any Sub-Account, the Escrow Agent shall apply such funds in the serial order of priority set forth in Clause 3.3, until exhaustion thereof.

4. Authorized Investments

4.1 Power to Invest

The Escrow Agent shall invest the amounts standing to the credit of any of the Sub-Accounts in Authorized Investments on the instructions of the Concessionaire as approved by the Lenders Representative, from time to time, in accordance with the provisions of the Agreement. The Escrow Agent shall not be bound to and shall not make investments under the Indian Trusts Act, 1882 without prior approval of the Lenders Representative.

4.2 Procedure for Investments

4.2.1 All Authorized Investments shall be made and/or realized by the Escrow Agent on the instructions of the Concessionaire as approved by the Lenders Representative from time to time, in accordance with the provisions of this Agreement.

4.2.2 All documents of title or other documentary evidence of ownership with respect to Authorized Investments made out of any Escrow Account will be held in the custody of the Escrow Agent.

4.3 Realizations

Upon the realization of any investment made under this Clause, the proceeds of realization shall immediately be credited to the relevant Sub-Account by the

Escrow Agent or immediately invested in another Authorized Investment in accordance with the Concessionaire's instructions as approved by the Lenders Representative.

4.4 Mandatory Realizations

In the event that the Concessionaire becomes aware that any Authorized Investment has ceased to be an Authorized Investment, the Concessionaire shall immediately instruct the Escrow Agent on a best efforts basis to realize such Authorized Investment on its maturity date or earlier if possible under intimation to the Lenders Representative or NHAI.

4.5 Accounts include Investments

Any reference in this Agreement to the balance standing to the credit of the Escrow Account shall be deemed to include a reference to the amount of the Authorized Investments in which all, or part of, such balance is for the time being invested.

4.6 Interest on Investments

Any interest or other income received on account of Authorised Investments shall be to the credit of the Escrow Account.

4.7 Enforcement Notice

On receipt of an Enforcement Notice from the Lenders Representative, the Escrow Agent shall realize the Authorized Investments, whether such investments have matured or not on a best effort basis, and apply the proceeds as directed by the Lenders Representative.

5. Withdrawals following Event of Default

5.1 If the Lenders Representative notifies the Escrow Agent that an Event of Default is likely to occur or has occurred, and is continuing, then, until such time as the Lenders Representative has notified the Escrow Agent that the Event of Default has been cured or waived under the Financing Documents, the Escrow Agent shall only make withdrawals from the Escrow Accounts

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which constitute Permitted Payment and shall not make any payments from the Escrow Account to the Concessionaire Accounts.

6. Escrow Agent Provisions

6.1 The Escrow Agent and the Lenders

The Concessionaire hereby appoints the Escrow Agent to act as trustee for the Lenders Representative in connection herewith and authorises the Escrow Agent to exercise such rights, powers, authorities and discretion as are specifically delegated to the Escrow Agent by the terms hereof together with all such rights, powers, authorities and discretion as are reasonably incidental hereto, and the Escrow Agent accepts such appointment pursuant to the terms hereof.

6.2 Particular Duties of the Escrow Agent

The Escrow Agent:

(A) may, in the absence of bad faith or gross negligence on its part, rely as to any matters of fact which might reasonably be expected to be within the knowledge of the Concessionaire upon a certificate signed by or on behalf of the Concessionaire;

(B) may, in the absence of bad faith or gross negligence on its part, rely upon the authenticity of any communication or documents believed by it to be authentic;

(C) shall, within five (5) Business Days after receipt, deliver a copy to the Lenders Representative of any notice or document received by the Escrow Agent in its capacity as the Escrow Agent from the Concessionaire or any other person hereunder or in connection herewith; and

(D) shall, within five (5) Business Days after receipt, deliver a copy to the Concessionaire of any notice or document received by the Escrow Agent from the Lenders Representative in connection herewith.

6.3 Segregation of Funds

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Monies and other property received by the Escrow Agent under this Agreement shall, until used or applied in accordance with this Agreement, be held by the Escrow Agent in trust for the purposes for which they were received, and shall be segregated from other funds and property of the Escrow Agent.

6.4 Termination

6.4.1 This Agreement shall remain in full force and effect so long as amounts remain outstanding from the Concessionaire in respect of the Financial Assistance received by it from the Senior Lenders or its obligations to NHAI, unless terminated earlier by the mutual consent of the parties or otherwise in accordance with the provisions of this Clause.

6.4.2 The Concessionaire may, by not less than 45 days prior notice to the Escrow Agent, NHAI and the Lenders Representative, terminate this Agreement and appoint a new Escrow Agent, provided that the new Escrow Agent is acceptable to the Lenders Representative and arrangements are made satisfactory to the Lenders Representative for transfer of amounts deposited in the Escrow Account to a new Escrow Account established with the successor Escrow Agent.

6.5 Fees

The Concessionaire shall pay the Escrow Agent fees in an amount and at such times as may be agreed between the Escrow Agent and the Concessionaire.

7. Escrow Agreement Defaults

7.1 If the Concessionaire is in breach of any of its obligations under this Agreement and, following a notice of default from the Lenders' Representative, fails to remedy the same:

(A) in the case of a failure to deposit funds received by the Concessionaire in the Escrow Account, by depositing the same in the Escrow Account within five Business Days of receipt of such notice;

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(B) in the case of a breach consisting of causing the Escrow Agent to transfer funds to any Concessionaire Account in breach of the terms of this Agreement, by depositing the relevant funds in the Escrow Account or any Sub-Account in which such transfer should have been made within five Business Days of receipt of such notice.

(C) in the case of a breach of the Concessionaire's obligations under Clause 4, by instructing the Escrow Agent to realise any investment made in breach of Clause 4 within five (5) Business Days of receipt of such notice; or

(D) in the case of any other breach, by remedying the same within five (5) Business Days to the satisfaction of the Lenders Representative.

7.2 The Concessionaire and the Escrow Agent agree and confirm that any default by either the Concessionaire or the Escrow Agent in the performance of their respective obligations under this Agreement resulting, in the opinion of the Lenders Representative, in a breach of this Agreement, shall qualify as an Event of Default under the Financing Documents/Security Documents.

8. Miscellaneous

8.1 Closure of Accounts

The Escrow Agent shall, at the request of the Concessionaire made on or after the payment by the Concessionaire of all outstanding amounts under the Financing Documents / Concession Agreement and upon confirmation of receipt, close the Escrow Accounts and pay any amount standing to the credit thereof to the Concessionaire.

Notwithstanding anything to the contrary contained in this Agreement, this Agreement shall remain in full force and effect till the Transfer Date provided however if NHAI shall certify to the Escrow Agent that Concession Agreement and/or the Concession has been terminated on account of default of the Concessionaire under this Agreement, then notwithstanding anything to the contrary contained herein, all the amounts standing to the credit of the Escrow Account shall be dealt with in accordance with provisions of Clause 3.3.2.

8.2 Successors and Assignors

This Agreement shall be binding on and shall enure to the benefit of the Parties and their respective successors and permitted assigns.

8.3 No Set Off

The Escrow Agent agrees not to claim or exercise any right of set off, banker's lien or other right or remedy with respect to amounts standing to the credit of the Escrow Accounts. For the avoidance of doubt, it is declared by the Escrow Agent that the monies and properties held by the Escrow Agent shall not be considered as part of the assets of the Escrow Agent and being trust property, shall in the case of bankruptcy or liquidation of the Escrow Agent be wholly excluded from the assets of the Escrow Agent in such bankruptcy or liquidation.

8.4 Notices

8.4.1 All notices or other communications to be given or made under this Agreement shall be in writing, shall either be delivered personally or sent by courier, registered or certified mail or facsimile. The address for service of each Party and its facsimile number is set out under its name on the signing pages hereto. All notices shall be effective upon actual receipt save that where a notice is received after 5.30 p.m. on a Business Day or on a day that is not a Business Day, such notice shall be deemed to be received on the first Business Day following the date of actual receipt. Without prejudice to the foregoing a Party giving or making a notice or communication by facsimile shall promptly deliver a copy of such notice or communication personally, by courier or mail to the addressee of such notice or communication.

8.4.2 Any party may by notice change the addresses and/or addresses to which such notices and communications to it are to be delivered or mailed. Such change shall be effective when all the Parties have notice of it.

8.5 Waiver

Failure by any Party at any time to enforce any provision of this Agreement or to require performance by other Parties of any provision of this Agreement shall not be construed as a waiver of such provision and shall not affect the

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validity of this Agreement or any part of it or the right of the relevant Party to enforce any provision in accordance with its terms.

8.6 Severability

If any condition, Clause or provision of this Agreement not being of a fundamental nature, is held to be illegal or unenforceable, the validity or enforceability of the remainder of this Agreement shall not be affected thereby.

8.7 Amendments

No amendment to this Agreement shall be binding unless in writing and signed by the duly authorized representatives of the Parties.

8.8 Governing Law

This Agreement shall be governed by and construed in accordance with Indian law.

8.9 Regulatory Approvals

The Escrow Agent shall use its best efforts to procure and shall thereafter maintain and comply with all regulatory approvals required for it to establish and operate the Escrow Accounts. The Escrow Agent represents and warrants that it is not aware of any reason why such regulatory approvals will not be ordinarily granted to the Escrow Agent.

8.10 Notification of Balances

Seven Business Days prior to each Payment Date (and for this purpose the Escrow Agent shall be entitled to rely on an affirmation by the Concessionaire and/or the Lenders Representative as to the relevant Payment Dates), the Escrow Agent shall notify the Lenders Representative of the balance of the Escrow Account as at the close of business on the immediately preceding Business Day.

IN WITNESS whereof the Concessionaire has caused its Common Seal to be affixed hereto and to a triplicate hereof on the date first above written and the Escrow Agent, NHAI and the Lenders Representative have caused the said triplicate to be executed by the hand of an authorized official.

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SIGNED AND DELIVERED BY)
..... within named Escrow Agent)
by the hand of)

an authorised official of the Account)
Trustee)
Address:

Fax Number:

Attention:.....

SIGNED AND DELIVERED by THE)
..... within named Lenders)
Representative by the hand of)
)
an authorised official of the Lenders)

Representative

Address:

Fax Number:

Attention: .....

SIGNED AND DELIVERED by)
NHAI within named by the hand of)
)
an authorised official of the NHAI)

Address:

Fax Number:
Attention:.....

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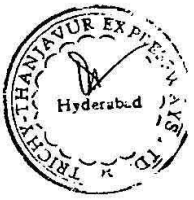
THE COMMON SEAL OF .....)
has pursuant to the Resolution)
of its Board of Directors passed in)
that behalf on the ..... day of .....200)
hereunto been affixed in the presence of)
Shri ..... and Shri .....)
Directors who have signed these)
Presents in token thereof and)
Secretary/authorised)
Person who has countersigned the)
Same in token thereof.)

Address:

Fax Number:

Attention:.....





SCHEDULE R

STATE SUPPORT AGREEMENT

THIS SUPPORT AGREEMENT is made on this _____day of _____ 200_ AMONG

1 THE GOVERNOR OF **THE STATE OF Tamil Nadu** through the Secretary, Ministry of _____, **Government of Tamil Nadu,** (hereinafter referred to as **"GOTN"** which expression shall unless repugnant to the context or meaning thereof include its successors and assigns),

2 **National Highways Authority of India, Government of India** , (hereinafter referred to as "NHAI" which expression shall unless repugnant to the context or meaning thereof include its administrators, successors and assigns),

AND

3 **Trichy-Thanjavur Expressways Limited,** a company incorporated under the provisions of the Companies Act, 1956 and having its registered office at Madhucon House, 8-2-272/82/A/1129/A, Road No. 36, Jubilee Hills, Hyderabad (hereinafter referred to as the "Concessionaire", which expression shall unless repugnant to the context or meaning thereof include its successors and substitutes).

WHEREAS

A. The NHAI intends to take up the improvement of strengthening of the existing carriageway from km 80.000 to km 135.750, on the Thanjavur-Trichy section of National Highway No.67 (NH-67 and widening thereof to 4 lanes and its Improvement, Operation and Maintenance in the State of Tamil Nadu, India on BOT basis.

B. NHAI had invited Request for Proposals for selection of BOT Entrepreneurs for executing the Project on BOT basis.

C. After evaluation of the bids so received, NHAI had accepted the bid of the Consortium and issued its Letter of Acceptance No. NHAI/BOT-I/11019/35/2005/316 dated 28th February, 2006 (the "LOA") to the

Consortium requiring, inter alia, the execution of the Concession Agreement pursuant thereto.

D. The Consortium has promoted and incorporated the Concessionaire as a limited liability company to enter into the Concession Agreement pursuant to the LOA for undertaking, inter alia, the design, engineering, financing, procurement, utility shifting , tree cutting, construction, operation and maintenance of the Project Highway, as defined hereinafter on BOT basis as referred to in Recital 'A' and to fulfill other obligations of the Concessionaire pursuant to the LOA and has requested NHAI to accept the Concessionaire as the entity which shall undertake and fulfill and perform the obligations and exercise the rights of the Consortium under the LOA, including the obligation to enter into the Concession Agreement for the design, engineering, financing, procurement, Utility Shifting , Tree cutting, construction, operation and maintenance of the Project Highway on BOT basis.

E. NHAI has agreed to the said request of the Consortium and has accordingly agreed to enter into the Concession Agreement with the Concessionaire pursuant to the LOA for, inter alia, the design, engineering, financing, procurement, Utility Shifting , Tree cutting, construction, operation and maintenance of the said Project Highway on BOT basis.

F. **GOTN**, NHAI and the Concessionaire agree that the implementation of the Concession including performance of its obligations by the Concessionaire under and in accordance with the Concession Agreement requires extensive continued support and grant of certain rights and authorities as hereinafter set forth by **GOTN** and is an essential pre-condition for mobilization of resources therefore by the Concessionaire.

NOW THEREFORE THE PARTIES HERETO HEREBY AGREE AND THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. DEFINITIONS AND INTERPRETATIONS

1.1 For the purposes of this Agreement the following terms shall have the meaning hereinafter respectively assigned to them.

1.1.1 "Agreement" means this Support Agreement and all annexures hereto and amendments if any thereto made in accordance with the provisions contained herein in this behalf.

1.1.2 "Concession Agreement" means the Concession Agreement dated _____ entered into between NHAI and the Concessionaire, and shall include all of its annexures and appendices and any amendments

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made thereto in accordance with the provisions contained in this behalf therein.

1.1.3 "MOSRTH" means Ministry of Shipping, Road Transport and Highways, earlier Ministry of Road Transport & highways

1.1.4 "Substitution Agreement" means the Substitution Agreement dated _____ entered into between the Senior Lenders, NHAI and the Concessionaire providing for substitution of the Concessionaire by the Selectee selected by the Senior Lenders in the manner and subject to and on the terms and conditions set forth therein. A copy of the said Substitution Agreement is annexed hereto and marked as "Annexure 'A'."

1.1.5 "GOTN Support" means the obligations assumed and the facilities agreed to be provided by GOTN to the Concessionaire hereunder or pursuant hereto.

1.2 The words and expressions beginning with or in capital letters used in this Agreement and not defined herein but defined in the Concession Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Concession Agreement. Words and expressions used in this Agreement and neither defined herein nor in the Concession Agreement but defined in the Substitution Agreement shall have the meaning respectively assigned to them in the Substitution Agreement.

1.3 In this Agreement unless the context otherwise requires-

(a) any reference to a statutory provision shall include such provision as is from time to time modified and re-enacted or consolidated so far as such modification or re-enactment or consolidation applies or is capable of applying to any transactions entered into hereunder;

(b) the words importing singular shall include plural and vice versa, and words denoting natural persons shall include partnerships, firms, companies, corporations, joint ventures, trusts, associations, organizations or other entities (whether or not having a separate legal entity);

(c) the headings are for convenience of reference only and shall not be used in and shall not affect the construction or interpretation of this Agreement;

(d) terms beginning with capital letters and defined in this Agreement shall have the meaning ascribed thereto herein;

(e) the words "include" and "including" are to be construed without limitation.

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(f) any reference to a "day" shall mean reference to a calendar day;

(g) any reference to "month" shall mean reference to a calendar month;

(h) the Annexures and appendices to this Agreement form an integral part of this Agreement and will be in full force and effect as though they were expressly set out in the body of this Agreement;

(i) any reference at any time to any agreement, deed, instrument, license or document of any description shall be construed as reference to that agreement, deed, instrument,, license or other document as amended, varied, supplemented, modified or suspended at the time of such reference provided that this clause shall not operate so as to increase liabilities or obligations of **GOTN** hereunder or pursuant hereto in any manner whatsoever.

(j) References to Recitals, Clauses, Sub-clauses, Paragraphs, Annexures or Appendices in this Agreement shall, except where the context otherwise requires, be deemed to be references to Recitals, Clauses, Sub-clauses, Paragraphs, Annexures and Appendices of this Agreement.

(k) Any agreement, consent, approval, authorization, proposal, notice, communication, information or report required under or pursuant to this Agreement from or by any Party or Senior Lender(s) shall be valid and effectual only if it is in writing under the hands of duty authorized representative of such Party or the Senior Lender(s), as the case may be, in this behalf and not otherwise; and

(l) Any reference to any period commencing "from" a specified day or date and "till" or "until" a specified day or date shall include both days or dates.

(m) "Concessionaire" shall include Selectee under the Substitution Agreement.

2. TERM

2.1 This Agreement shall come into force the date hereof and shall continue to be in full force and effect for the period the Concession Agreement is in force and effect including any extension thereof.

3. SUPPORT OF **GOTN**

3.1 Upon and with effect from the date hereof, GOTN agrees:

(i) so long as the Concessionaire is not in breach of its obligations under this Agreement, **GOTN** agrees to enable access to the Site to the Concessionaire for peaceful use of and operations at the Site by the Concessionaire under and in accordance with the provisions of the Concession Agreement without any let or hindrance from **GOTN** or persons claiming through or under it;

(ii) subject to the Concessionaire complying with Applicable Laws, provide to the Concessionaire Applicable Permits to the extent **GOTN** or any Governmental Agency of **GOTN** is entitled to issue;

(iii) upon written request from the Concessionaire, assist the Concessionaire in obtaining access to all necessary infrastructure facilities and utilities, including water, electricity and telecommunication facilities at rates and on terms no less favorable to the Concessionaire than those generally available to commercial customers receiving substantially equivalent services;

(iv) ensure that no barriers are erected or placed by **GOTN** or any Governmental Agency of **GOTN** that interrupts free flow of traffic on the Project Highway except on account of any law and order situation or upon national security considerations;

(v) provide the Concessionaire with assistance through a dedicated team against payment of prescribed fee and charges, if any, for regulation of traffic on the Project Highway;

(vi) provide the Concessionaire with police assistance in the form of dedicated highway patrol parties against payment of prescribed costs and charges, if any, for patrolling and provision of security on the Project Highway;

(vii) observe and comply with its obligations set forth in this Agreement;

(viii) support, cooperate with and facilitate NHAI and the Concessionaire in the implementation of the Project;

(ix) subject to and in accordance with the Applicable Laws, assist the Concessionaire in the procurement of all Applicable Permits required from any municipal and other local authorities and bodies including Panchayats in the State of Tamil Nadu for the implementation of the Project;

(x) ensure, subject to and in accordance with the Applicable Laws, that all relevant municipal and other local authorities and

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bodies including Panchayats in the State of **Tamil Nadu** do not put any barriers or other obstructions that interrupt free flow of traffic on the Project Highway; and

(xi) not do or omit to do any act, deed or thing which may in any manner be violative of or cause the Concessionaire to violate any of the provisions of the Concession Agreement.

3.2 Notwithstanding anything to the contrary contained in the Agreement, **GOTN** may construct and operate either itself or have the same, inter alia, built and operated on BOT basis or otherwise any Expressway or other toll road, not being a bye-pass, between inter alia, **Thanjavur-Trichy** (the "Additional Tollway"), provided that such Additional Tollway shall not be opened to traffic before expiry of 8 (eight) years from the Appointed Date

3.3 **GOTN** agrees and undertakes that it shall not levy any additional toll, fee, charge or tax on the use of whole or any part of the Project Highway. **GOTN** acknowledges the rights of Senior Lenders and *NHAI* under the Substitution Agreement and hereby covenants that upon substitution of the Concessionaire by the Selectee pursuant to the Substitution Agreement, it shall be deemed for the purposes of this Agreement that as if Selectee is a Party hereto and the Selectee shall accordingly be deemed to have succeeded to the rights and obligations of the Concessionaire under this Agreement on and with effect from the date of substitution of the Concessionaire by the Selectee.

4. CONCESSIONAIRE'S OBLIGATIONS

4.1 Concessionaire agrees and undertakes to perform, observe and comply with the following :

(i) All Applicable Laws and Applicable Permits;

(ii) The provisions of the Concession Agreement, the Substitution Agreement, and the Project Agreements; and

(iii) Observe, comply and perform its obligations under this Agreement.

5. REPRESENTATIONS AND WARRANTIES

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5.1 The Concessionaire represents and warrants to **GOTN** that :

(i) It is duly organized, validly existing and in good standing under the laws of India.

(ii) It has power and authority to execute, deliver and perform its obligations under this Agreement and to carry out the transactions contemplated hereby;

(iii) It has taken all necessary corporate and other action under Applicable Laws and its constitutional documents to authorize the execution, delivery and performance of this Agreement;

(iv) This Agreement constitutes its legal, valid and binding obligation enforceable against it in accordance with the terms hereof;

(v) It is subject to civil and commercial laws of India with respect to this Agreement and it hereby expressly and irrevocably waives any immunity in any jurisdiction in respect thereof;

(vi) All the information furnished to the **GOTN** pertaining to the Concessionaire including its constitution and existing and proposed shareholding structure is now and shall be true and correct as on the Appointed Date and COD and the Balance Sheet and Profit and Loss Account of the Concessionaire for each of its Accounting Year after the Appointed Date furnished to **GOTN** shall give true and fair view of the affairs of the Concessionaire.

(vii) The Concessionaire shall furnish a copy of its audited Balance Sheet within 120 (one hundred twenty) days of the close of its each Accounting Year after the Appointed Date and any material change subsequent to the date of such Balance Sheet shall be notified to **GOTN** by the Concessionaire within 30 (thirty) days of its occurrence and warrants that the Balance Sheet and the information furnished as aforesaid shall be true and correct;

(viii) The execution, delivery and performance of this Agreement will not conflict with, result in the breach of, constitute a default under or accelerate performance required by any of the terms of the Concessionaire's Memorandum and Articles of Association or any member of the Consortium or any Applicable Laws or Applicable Permits or any covenant, agreement, understanding, decree or order to which it is a party or by which it or any of its properties or assets is bound or affected;

(ix) There are no actions, suits, proceedings or investigations pending or, to the Concessionaire's knowledge, threatened against it at law or in equity before any court or before any judicial, quasi judicial or other authority, the outcome of which may result in the breach of or constitute a default of the Concessionaire under this Agreement or which individually or in the aggregate may result in any material adverse effect on its business, properties or assets or its condition, financial or otherwise, or in any impairment of its ability to perform its obligations and duties under this Agreement;

(x) The Concessionaire has no knowledge of any violation or default with respect to any order, writ, injunction or decree of any court or any legally binding order of any Governmental Agency which may result in any material adverse effect or impairment of the Concessionaire's ability to perform its obligations and duties under this Agreement;

(xi) The Concessionaire has complied with all Applicable Laws and Applicable Permits, and has not been subject to any fines, penalties, injunctive relief or any other civil or criminal liabilities which in the aggregate have or may have material adverse effect on its financial condition or its ability to perform its obligations and duties under this Agreement;

(xii) Each Consortium Member was and is duly organized and existing under the laws of the jurisdiction of its incorporation and has full power and authority to consent to and has validly

consented to the Concessionaire entering into this Agreement with the **GOTN**;

(xiii) No representation or warranty by the Concessionaire contained herein or in any other document furnished by it to **GOTN**, or to any Governmental Agency in relation to Applicable Permits contains or will contain any untrue statement of material fact or omits or will omit to state a material fact necessary to make such representation or warranty not misleading;

(xiv) The Concessionaire warrants that no sums have been paid or will be paid, by or on behalf of the Concessionaire, to any Person by way of fees, commission or otherwise for entering into this Agreement or for influencing or attempting to influence any officer or employee of NHAI, GOI or **GOTN** in connection therewith; and

(xv) The Concessionaire is subject to civil and commercial laws of India with respect to this Agreement.

5.2 **GOTN** represents and warrants to the Concessionaire that :

(i) It has full power and authority to execute, deliver and perform this Agreement.

(ii) It has taken all necessary governmental action to authorize the execution, delivery and performance of this Agreement; and

(iii) This Agreement constitutes the legal, valid and binding obligation of GOTN enforceable against it in accordance with its terms.

6. SOVEREIGN IMMUNITY

6.1 **GOTN** hereto unconditionally and irrevocably:

(i) Agrees that the execution, delivery and performance by it of this Agreement do not constitute sovereign acts;

(ii) Agrees that should any proceedings be brought against it or its assets in relation to this Agreement or any transaction contemplated by this Agreement, no sovereign immunity from such proceedings, execution, attachment or other legal process shall be claimed by or on behalf of itself or with respect to any of its assets, to the extent permitted by law; and

(iii) to the extent permitted by law, waives any right of sovereign immunity, which it or its assets now has or may acquire in the future.

6.2 Notwithstanding anything to the contrary herein contained such waiver of right of immunity shall not apply to

a) Property and assets of any consular or diplomatic mission or consulate or

b) Property belonging to the Defence services and such assets of the Union of India.

7. Breach and Compensation

7.1 In case **GOTN** is in breach of any of its obligations under this Agreement, which breach is not cured within 30 days of receipt of a notice in writing from the Concessionaire to **GOTN** and NHAI and which has not occurred as a result of Concessionaire's breach of its obligations under this Agreement or the Concession Agreement, **GOTN** shall pay to the Concessionaire, all direct additional costs suffered or incurred by the Concessionaire, determined by MOSRTH as arising out of such material default by **GOTN**.

7.2 In case of any dispute by **GOTN** on admissibility of the claim or extent of compensation determined by MOSRTH, the claim shall be settled as per provisions of the Dispute Settlement mechanism provided in Article IX of this Agreement.

7.3 Any such compensation payable shall be paid to the Concessionaire, in one lumpsum within 90 (ninety) days of receiving MOSRTH's determination of compensation.

8. INDEMNITY

8.1. The Concessionaire will indemnify, defend and hold GOTN harmless against any and all proceedings, actions and claims for any loss, damage, cost and expense of whatever kind and nature arising out of design, engineering, construction, operation and maintenance of the Project Highway or arising out of any breach by the Concessionaire of any of its obligations under this Agreement or on account of failure of the Concessionaire to comply with, and observe Applicable Laws and Applicable Permits;

8.2. GOTN will, indemnify, defend and hold harmless the Concessionaire against any and all proceedings, actions and third party claims for any loss, damage, cost and expense arising out of failure of GOTN to fulfill any of its obligations under this Agreement adversely affecting the performance of the Concessionaire's obligations under the Concession Agreement other than any loss, damage, cost and expense, arising out of acts done in discharge of their lawful functions by GOTN, its officers, servants and agents;

8.3. Without limiting the generality of Clause 8.2, the GOTN shall indemnify the Concessionaire and shall save it harmless from and against any payments required to be made by the Concessionaire with respect to levy of any Local Taxes provided nothing contained herein shall be construed or interpreted as restricting in any way or manner the right of GOTN or any municipal, panchayat or other local authorities to levy any taxes which they or any of them are lawfully entitled to levy, impose or collect (the "Expected Taxes"). The Concessionaire shall not be entitled to and GOTN shall be under no obligation to reimburse Expected Taxes to the Concessionaire or any person claiming through or under the Concessionaire;

8.4. In the event that either party hereto receives a claim from a third party in respect of which it is entitled to the benefit of an indemnity under Clause 8 or in respect of which it is entitled to reimbursement (the "Indemnified Party") within 14 (fourteen) days of receipt of the claim or payment, as the case may be, shall not settle or pay the claim without the prior approval of the Indemnifying Party. In the event that the Indemnifying Party wishes to contest or dispute the claim, it may conduct the proceedings in the name of the Indemnified Party and shall bear all costs involved in contesting the same. The Indemnified Party shall provide all cooperation and assistance in contesting any claim and shall sign all such writings, and documents as the Indemnified Party may reasonably require.

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9. GOVERNING LAW AND DISPUTE SETTLEMENT

9.1. This Agreement shall be governed by and construed and interpreted in accordance with the laws of India. The provisions contained in Clause 8 shall survive the termination of this Agreement.

9.2. Any dispute, difference or claim arising out of or in connection with or in relation to this Agreement which is not resolved amicably shall be decided finally by reference to arbitration to a Board or Arbitrators comprising of one nominee of each party to the dispute. Such arbitration shall be held in accordance with the Rules of Arbitration of the Indian Counsel of Arbitration and shall be subject to the provisions of the Arbitration and Conciliation Act, 1996. The Arbitrators shall issue a reasoned award. The venue of such arbitration shall be New Delhi, India. The Award shall be final and binding on the Parties.

10. MISCELLANEOUS

10.1. Alteration of Terms

All additions, amendments, modifications and variations to this agreement shall be effectual and binding only if in writing and signed by the duly authorized representatives of **GOTN** and the Concessionaire.

10.2. Time or Indulgence Allowed

An indulgence by one Party to the other in respect of any obligation or matter hereunder including time for performance to the other party hereunder or to remedy any breach hereof shall not be construed as a waiver of any of its rights hereunder Party may be on such terms and subject to such conditions as the Party giving it may specify and shall be without prejudice to that Party's then accrued rights under this Agreement except to the extent expressly varied in writing when giving such time or other indulgence.

10.3. Severance of Terms

If any provisions of this Agreement are declared to be invalid, unenforceable or illegal by any competent arbitration tribunal or court, such invalidity,

unenforceability or illegality shall not prejudice or affect the remaining provisions of this Agreement, which shall continue in full force and effect.

10.4. Language

All notices, certificates, correspondence or other communications under or in connection with the Agreement shall be in English

10.5. Notices

Any notice or communication hereunder shall be in writing and shall either be delivered personally or sent by registered post, with copy by facsimile transmission or other means of telecommunication in permanent written form. A copy of all the notices and communications will also be forwarded to the Lenders Representative. The service of notice shall unless otherwise notified by a notice hereunder to the parties at their following address:

IF to **GOTN** :
Attn :
Fax no :
Tel no.

IF to the NHAI
Attn:
Fax no.
Tel no.

IF to the Concessionaire :
Attn :
Fax no.
Tel no.

The notice pursuant hereto will be deemed to have been received on the date when such notice is in fact received by the addressee.

10.6. Authorised Representatives

Each of the Parties shall by notice in writing designate their respective authorised representatives through whom only all communications shall be

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made. A Party hereto shall be entitled to remove and/or substitute or make fresh appointment of its such authorised representative by similar notice.

10.7. Original Document

This Agreement is made in two counterparts, each of which shall be deemed to be an original.

IN WITNESS WHEREOF THE PARTIES HERETO HAVE PUT THEIR HANDS HEREUNTO ON THE DAY, MONTH AND YEAR FIRST ABOVE WRITTEN.

FOR **Trichy-Thanjavur Expressways Limited**	FOR **GOVT. OF (Name of the State)**
BY :_____	BY :_____
Name :_____	Name:_____
Title:_____	Title:_____

FOR NHAI

BY :_____

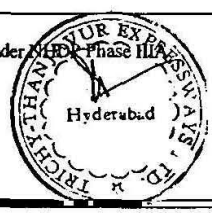
Name :_____

Title:_____

In the presence of:

1. 2.





Schedule-S

SAFETY REQUIREMENTS

1. OBJECTIVE

1.1 Safety of road users and Project workers is a vital requirement which the Concessionaire has to attend during the Concession Period under the Concession Agreement.

2. SAFETY STANDARDS

2.1 Objective

2.1.1 The objective of safety standards is to provide safe travel to the drivers of vehicles plying on the Project Highway at all times of the day, throughout the year and provide protection to the Project workers when they are on the work. This Schedule delineates the safety standards in terms of construction zones, signs and safety measures in work zones and during normal operations.

2.1.2 The guiding principles for safety measures shall include

(i) warning to the drivers unambiguously and sufficiently in advance of the situation on the highway;

(ii) providing clear demarcation for movement of vehicles;

(iii) providing devices to guide the drivers and their movements through construction zones/lane closures/traffic diversions etc.

(iv) protection to Project workers on work site.

2.2 Construction zone

In order to plan and provide appropriate traffic management and safety measures, it is necessary to appreciate the concept of a construction zone. A construction zone can be defined as an area of the highway which involves the conflict of the right of use between the road users and authority responsible for the maintenance /improvement of the highway. From traffic safety point of view, a construction zone comprises four sub-zones (shown in Figure-1) as described hereinunder:

2.2.1 Advance Warning Sub-Zone

The advance warning sub-zone is meant to prepare the driver for an alert behaviour and is an essential part of any traffic control system. The warning system shall

prepare the driver well in advance by providing information regarding distance, extent and type of hazard ahead so that he can gradually reduce the speed of his vehicle. The information in this sub-zone is conveyed mostly through a series of traffic signs along its length.

2.2.2 Transition Sub-Zone

The transition sub-zone is the area in which the traffic is steered and guided into and out of the diverted path around the work sub-zone. This is the most crucial sub-zone from safety point of view since most of the movements are turning movements. The traffic in this sub-zone is mostly taken across with the help of barricades and channelizers.

2.2.3 Work Sub-Zone

This is the actual area where construction or maintenance activity is taking place and the main concern, therefore, is the safety of the workers at the site from the plying traffic. The path of the traffic must, therefore, be very clearly delineated to avoid intrusion of vehicles moving into the work area. The work sub-zones shall not be close to each other and the distance between the two work sub-zones shall be such that the flow of traffic can return to normal stream by permitting fast moving traffic to overtake slow moving vehicles. These distances shall preferably be 2 km on urban sections and 5 to 10 km on rural sections of the highway. The length of work sub-zones will vary. The length of warning and transition sub-zones shall be basically governed by the speed of approaching vehicles and shall be regulated as shown in table S-1 below:

Table S-1: Recommended Length of Construction Zones

Average Speed (kph)	Length of Advance Warning Sub-Zone (m)	Length of Transition Sub-Zone (m)	Length of Work Sub-zone (m)
50	100	50	
51-80	100-300	50-100	Varies
81-100	300-500	100-200	
Over 100	1000	200-300	

The traffic across these sub-zones is guided and taken with the help of various traffic control devices erected at the site.

2.2.4 Termination Sub-Zone

An information sign board shall be erected to inform road users of the end of Construction Zone.

2.3 Traffic Control Devices

Traffic control devices in the construction zones perform the crucial task of warning, informing and alerting the driver apart from guiding the vehicle movements so that the driver of the vehicle as well as the workers on site are protected and safe passage to the traffic is possible.

The primary traffic control devices used in work sub-zones are signs, delineators, barricades, cones, pylons, pavement markings, flashing lights etc. They shall be such that they are easily understood without any confusion, are clearly visible during day and night, conform to the prevailing speeds in immediate vicinity, stable against sudden adverse weather conditions and are easy in installation, removal and maintenance.

2.3.1 Signs

The construction and maintenance signs fall into the same three major categories viz. regulatory signs, warning signs and guide signs as other traffic signs do. The IRC: 67-2001 (Code of Practice for Road Signs) gives a comprehensive list of traffic signs to which the size, colour and placement of signs shall conform. These signs shall be placed on the left hand side of the road. Fig 2 shows typical positioning of signs. Some of the common type of signs which shall be provided in construction zones are discussed in the following para and shown in Fig 3.

2.3.1.1 Regulatory signs

Regulatory signs mean legal restrictions on the traffic. They shall be used only in consultation with the local police and /or authorities. The most common types for use in construction zones are "Do not Enter", "Road Closed", Give Way to Pedestrians", "Speed limit" etc.

2.3.1.2 Warning Signs

The most common type of warning signs to alert the drivers of the possible dangers ahead in construction zones are "Lane Closed", "Diversion to other Carriageway", "Divided Carriageway Starts", "Divided Carriageway Ends" and "Two Way Traffic" etc. Sometimes it might be advisable to explain these signs with the help of a rectangular definition plate of size appropriate to the size of warning triangle and placed 0.15 m below, from the bottom of the triangle.

2.3.1.3 Guide Signs

Guide signs in construction zones shall have different background colour than the normal informatory signs of IRC: 67-2001. These signs shall have black messages and arrows on yellow (Traffic Yellow of IS: 5-1978) background. The commonly used guide signs are : "Diversion", "Road Ahead Closed" and "Sharp Deviation of route" etc.

2.3.2 Delineators

These channelising devices such as cones, traffic cylinders, tapes, drums are placed in or adjacent to the roadway to guide the drivers along a safe path and to control the flow of traffic. These shall normally be retro-reflectorised for night visibility. IRC: 79-1981 (Recommended Practice for Road Delineators) gives details of some of the delineators. The other delineators are discussed in following paras.

2.3.2.1 Traffic Cones and Cylinders

Traffic cones shall normally be 0.5m to 0.75m high and 0.3m to 0.4m in diameter or in square shape at the base. These are mostly made of plastic or rubber with retro reflectorised red and white band and have suitable anchoring so that they are not easily blown over or displaced, it might be preferable to use double cones, one over the other. The cones shall be placed close enough together to give an impression of the continuity. The spacing shall be 3m (close) to 9m (normal). Larger size cones can be used for high speeds or where more conspicuous guidance is required.

2.3.2.2 Drums

Empty bitumen drums (made of metal) cut to the required height can be used as canalizing devices since they are highly visible , give the appearance of being formidable objects, thereby commanding the respect of the drivers. These drums can also be of plastic which are lighter, easy to transport and store. As delineators, these drums shall be about 0.80 to 1m high and 0.30m in diameter. They shall be painted in circumferential strips 0.10 m to 0.15 m wide, alternatively in black and white colours.

2.3.3 Barricades

Whenever the traffic has to be restricted from entering the work areas, such as excavations or material storage sites so that protection to workers is provided or there is a need for separating the two way traffic, barricades can be used. The barricades can be portable or permanent type and can be made of wooden planks, metal or other suitable material. The horizontal component facing the traffic is made of 0.30 m wide wooden planks joined together and painted in alternate yellow and white strips of 0.15 m width and sloping down at an angle of 45 degree in the direction of the traffic. Fig. 4 shows three types of barricades. Types I and II are portable type useful for small works and Type III is permanent type, suitable for major work areas. Suitable support or ballasting shall be provided so that they do not over turn or are not blown away in strong winds. In case of a permanent type barricade, a gate or movable section shall be separately provided to allow the movement of construction/supervision vehicles.

2.3.4 Flagmen

In large construction sites, flagmen with flags and sign paddles shall be effectively used to guide the safe movements. The flags for signalling shall be 0.60 m x 0.60 m size, made of a good red cloth and securely fastened to a staff of approximately 1m in length. The sign paddles shall conform to IRC: 67-2001 and provided with a rigid handle.

2.4 Safety & Management Practices

Measures for providing safe movement of traffic in some of the most commonly occurring work zones on highways shall be as follows:

2.4.1 Detour on Temporary Diversion

In the cases of major repairs or reconstruction of cross drainage structures on a highway section, damaged due to flood etc., the traffic may have to pass on a diversion, moving parallel to the highway.

2.4.1.1 A temporary diversion road shall basically satisfy the following requirements :

i) it shall have smooth horizontal and vertical profile with smooth vertical and horizontal curves;

ii) it shall not get overtopped by flood or drainage discharge under any conditions;

iii) it shall have adequate capacity to cater for the diverted traffic;

iv) it shall be dust free and shall ensure clear visibility at all times of day and night;

v) It shall be provided with the required safety standards ; and

vi) It shall be provided with suitable barricades to prevent intrusion affecting the movement of the traffic.

2.4.1.2 The warning for the construction ahead shall be provided by the sign "Men at Work" about 1 km earlier to the work zone. In addition, a supplementary plate indicating "Diversion 1 km ahead" and a sign "Road Closed Ahead" shall be placed. It shall be followed by "Compulsory Turn Right/Left Sign". The "Detour" and "Sharp Deviation" sign shall be used to guide the traffic onto the diversion. Hazard markers shall be placed just where the railings for the cross drainage structures on the diversion starts. Figure 5 illustrates a typical arrangement according to the above plan.

2.4.2 Partial Closure of existing two lane Carriageway

2.4.2.1 Such an eventuality will arise only in a special situation where the existing two lanes in use for the main traffic need emergency repairs and the new lanes under construction are not available for diversion of the traffic. It will become necessary to carryout special repairs through partial closure of the existing two lane facility.

2.4.2.2 In the said situation care shall be taken that the traffic is guided from the closed lane onto the operating lane without conflicting with the traffic from opposite direction.

2.4.2.3 The warning sign for "Men at Work" shall be the first sign to be seen by the drivers of the approaching vehicles. This sign shall have supplementary plate also showing the distance of work zone. The next warning sign shall be for the "Road Narrowing" (depending upon the lane closure). Compulsory "Keep Right" or "Keep Left" sign depending upon the situation shall be provided at the beginning of the transition zone and taper. The point from where the traffic is to deviate from its normal path, the channel for traffic shall be clearly marked with the aid of painted drums or traffic cones. The spacing of these cones and/or drums shall be about 9 m or closer as per site requirement.

"The traffic lane or carriageway closed" sign shall also be provided at barricades along with "Keep Right/Left" sign. A typical layout of signs for a two lane carriageway having one lane closure is shown in Figure 6.

2.4.3 Closure for Work on one side Carriageway of a 4 lane divided carriageway

The first sign shall be for the "Men at Work" alongwith distance plate for construction zone. Thereafter the sign for "Road Narrowing" shall be provided, followed by the signs for lane closure one after another. This shall be followed by sign for compulsory "Keep right/Left (depending upon site situation).The sign for the "Closure of carriageway" along with that for "keep Left/Right" shall be provided at the point from where the vehicle is expected to change the lane for the diversion. The sign for the "Diversion to the other carriageway" shall be provided between the "Carriageway Closure" sign and the median gap. The sign for "Sharp Diversion of Route" along with compulsory "Turn right/Left" shall be provided at the location where the gap in median opening starts and traffic is expected to get diverted to the other carriageway. The warning signs for "Two way traffic" alongwith the plate indicating the distance upto which the two way traffic is allowed, shall be placed at the median which shall be to the left of the moving traffic. Cones or painted drums shall be placed for delineation, starting from the sign location for "Carriageway Closed". A Typical arrangement is shown in Figure 7.

2.4.4 Carriageway Repairs

When the work is of small magnitude, to be done in the middle of the carriageway such as minor repairs of potholes, cracks and patches, then the

traffic control measures shall mainly consist of providing cautionary signs of "Men at Work", about 500m before the work zone for the approaching vehicle and other cautionary sign of "Road Narrows", shall be placed at 100m ahead of work area. Regulatory sign of "Keep Left/Right" shall be placed at the commencement point of the work zone and next to the barriers for the approaching vehicles. Movable type of barriers shall also be placed on both sides of the work area. Cones or drums shall be placed at suitable interval to demarcate the work area. The "Work Zone Ends" sign shall be installed 120m beyond the work area. If the operation is to continue during night time, necessary lighting arrangements with flashing lights shall be provided. A Typical arrangement is shown in Figure 8.

2.4.5 Construction of New Carriageway

2.4.5.1 Urban Section of the Project Highway

a) The service roads on either side together with side drains shall be constructed initially.

During this period the main traffic shall use the existing two lane carriageway. The construction traffic in the work zone shall be safely brought out from the main stream traffic by erecting appropriate signs at the beginning of the work site. Also on return it will be amalgamated with the mainstream traffic by erecting appropriate signs at the end of the work site. It shall be ensured that there shall be identified entry and exist points duly designed so that haphazard entry or exit of construction traffic is avoided. Conflicting turning movements shall be avoided. Fig. 9 illustrates the safety measures taken during construction stage-I in urban sections.

b) On completion of the Stage-I, the main traffic shall be diverted on their respective directions on to the newly constructed service roads and the additional four lanes shall be constructed (2 lanes on each side) of the existing carriageway duly including the 1.5m wide central median. During this stage, position of different signs/ delineators/barricades to ensure safety of workers and road uses shall be as illustrated in fig. 10.

c) On completion of the divided 4 lane carriageway of the project highway, the main traffic from the service roads shall be restored on them and informatory signs shall be installed as illustrated in fig.11.

2.4.5.2 Rural Section of the Project Highway

In rural section the new 2 lane carriageway and the central median shall be constructed eccentric to the Centre line of the existing carriageway. During this construction phase, the existing two lane carriageway shall be used for the main traffic. The construction traffic using the existing highway shall be guided on to the work zone and allowed to return to the main traffic stream safely. For this purpose identified exist and entry points duly designed shall be provided. It shall ensure against haphazard entry or exist of the Construction Traffic to/from the existing highway. Conflicting turning movements of the Construction traffic shall be avoided. During this phase, sign/barricading shall be as shown in Fig.9 on the construction side of the road.

On completion of the new 2 lane carriageway and the median throughout, the traffic on the existing highway shall be diverted on it and the strengthening of the existing 2 lanes and adding paved shoulder to it shall be taken up. Layout of signs and safety measures for this construction phase shall be as illustrated in fig.7.

2.5 Safety Measures During Normal Operation

2.5.1 Introduction

Parking of vehicles on the carriageways leads to accidents many a times, further, the fortuitous vehicle and/or debris on the carriageway are the cause of further accidents besides obstructing the smooth flow of the traffic. For smooth and normal flow of the traffic on the project highway, the actions stated hereinunder in 2.5.2 would be taken for the normal operation of the Project Highway.

2.5.2 Highway Patrol

Highway Patrolling shall be done to ensure safe, uninterrupted and smooth traffic flow so that :

(i) no parking of a vehicle on any of the divided carriageway takes place at anytime;

(ii) Immediate assistance is provided to accident victims and their rescue as per clause 18.8.2 of the Concession Agreement.

(iii) Minor debris and stalled vehicles are removed from carriageway within an hour's time.

(iv) In the incident of traffic congestion, adequate measures shall be taken to mitigate the same in maximum one hour's time and the approaching traffic is duly cautioned about it.

2.5.3 Safety, Vehicle Breakdown and Accident

2.5.3.1 In case of unsafe condition, vehicle breakdowns and accidents, the Concessionaire shall follow the relevant operating procedures, which shall include the setting up of temporary traffic cones and lights as well as the removal of obstruction and debris expeditiously as per clause 18.8.1 of the Concession Agreement.

2.5.3.2 The Concessionaire shall ensure that any diversion or interruption of traffic is remedied without delay as per clause 18.8.1 of the Concession Agreement.

2.6 Safety Measures During Concession Period

2.6.1 During the Concession Period or extension thereof as per the Concession Agreement many activities are involved at different stages and at various periods in respect of construction, operation and maintenance of the Project Highway. Safety of the road users and the Project workmen at site is of paramount importance and obligatory for the Concessionaire throughout the said period.

2.6.2 In Emergency arising on account of Force Majeure due to nature or administrative reasons especial safety measures may be called for the traffic and/or the workmen at site to be taken by the Concessionaire.

2.6.3 The following principles shall be kept in view in Emergency situations from safety considerations:

2.6.3.1 Where part width of the existing 2 lane carriageway is envisaged to be used for passage of two way traffic, paved shoulders shall be used on the side on which work is not proposed. A maximum of one lane (3.5 m wide) closure shall be allowed for a short duration depending on the extent on Emergency.

2.6.3.2 At the points where traffic is to deviate from its normal path, the channel for traffic shall be clearly marked with the aid of pavement markings or other similar device as directed by the Independent Consultant. At night the passage shall be delineated with lamps or lanterns or any suitable light source.

2.6.3.3 On the approach of any type of closure suitable regulatory/warning signs as approved by the Independent Consultant shall be installed for guidance of road users. At least two signs shall be put up one lose to the carriageway where transition of carriageway begins and the other 120 m ahead. The signs shall be

of approved design and of reflectory type as directed by Independent Consultant.

2.6.4 The Concessionaire shall ensure that safety standards specified in this schedule are strictly complied with in the event of any lane closure or diversion of traffic.

2.7 Safety of Project workmen at Site

2.7.1 Safety of the Project Workers at site during duty hours is the responsibility of the Concessionaire. It shall be ensured by him that safety measures appropriate for the job a workman performs shall be provided.

2.7.2 Also, safety measures against accidents of the Workers by the traffic using the highway and/or diversions shall be taken. The Concessionaire shall provide helmets and protective chest vests to its workmen at site and make it compulsory for them to wear the same.

2.7.3 The Concessionaire shall insure all the Project Workers against accident.

2.7.4 Labour Laws in force shall be followed.

2.8 Safety Requirements

2.8.1 Safety of Road users and workers on the Project Highway during its Construction, Operation and Maintenance is obligatory and the Concessionaire shall be fully responsible to discharge it in terms of the Concession Agreement including its Schedules.

2.8.2 In case of emergency situations the Concessionaire shall take action(s) for the safety of the road users and the workers as required by the site conditions immediately without waiting for consultation with the Independent Consultant and/or NHAI because any delay in it will not absolve the Concessionaire of its responsibilities under the Concession Agreement including its Schedules.

2.8.3 A breach by the Concessionaire of its obligations in respect of the safety standards shall be dealt with in terms of clause 18.8.3 of the Concession Agreement.

SCHEDULE T

CRITERIA FOR LIST OF CHARTERED ACCOUNTANTS

Selection of the Chartered Accountants for a mutually agreed list shall consist of the following steps :

1. Shortlisting of Chartered Accountants by the NHAI
2. Issue of Letter of Invitation (LoI) along with Terms of Reference to shorlisted Chartered Accountants.
3. Evaluation of Technical Proposal and selection of maximum of 15 (fifteen) Chartered Accountants.
4. Forwarding list of maximum 15 (fifteen) selected Chartered Accountants to Concessionaire to further select a maximum of 10 (ten), from which a Statutory Auditor shall be appointed.

SELECTION COMMITTEE FOR SHORTLISTING

A Selection Committee shall do the selection; the members of this committee shall be nominated by the NHAI.

1. Shortlisting by NHAI

For shortlisting, NHAI shall advertise for Expression of Interest (EoI) to serve as Statutory Auditors/ Chartered Accountants for the ongoing National Highway (NH-67) improvement project. The EoI will ask for summary information on

- Number of Partners and Professional Staff
- Experience of the firm on roads project
- Presence in India and in the region
- Experience of the firm on other similar work in other sectors.

2. Request for Technical Proposal

The request for technical proposals shall be sent to the shortlisted firms. This shall include a ToR besides information (Data Sheet) to the firms. It shall

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contain the guidelines for the preparation of technical proposals by the firms and submission.

The ToR shall include the following details:

1. Project background
2. Objectives
3. Scope of services
4. Interaction with NHAI
5. Reporting requirement
6. Performance clause
7. Consultant's Proposal
8. Period of Services

3. Evaluation of Technical Proposal

The technical proposals received from shortlisted firms shall be evaluated based on the following :

- Specific experience of the firm related to the assignment
- Adequacy of the proposed work plan and methodology in response to the ToR
- Qualifications and competence of the key staff for the assignment.

SCHEDULE U

SUBSTITUTION AGREEMENT

THIS SUBSTITUTION AGREEMENT is made at New Delhi on this the _____ day of _____ 200_.

BETWEEN

1. THE **National Highways Authority of India** (hereinafter referred to as "NHAI" which expression shall unless repugnant to the context or meaning thereof include its successors and assigns),

2. **Trichy-Thanjavur Expressways Limited,** a company incorporated under the provisions of the Companies Act, 1956 and having its Registered Office at Madhucon House, 8-2-272/82/A/1129/A, Road No. 36, Jubilee Hills, Hyderabad (hereinafter referred to as the "Concessionaire" which expression shall unless repugnant to the context or meaning thereof include it successors and assigns),

AND

3. _____, _____and having its registered office at _____acting for itself and for and on behalf of the Senior Lenders listed in Schedule 1 hereto (hereinafter referred to as the "Senior Lenders").

(NHAI, the Concessionaire and the Senior Lenders are hereinafter collectively referred to as the "Parties" and individually are hereinafter referred to as "Party").

WHEREAS

A. By the Concession Agreement dated ..... entered into between the NHAI and the Concessionaire, NHAI has granted to the Concessionaire the Concession for strengthening of the existing carriageway from km 80.000 to km 135.750, on the Thanjavur-Trichy section of National Highway No.67 (NH-67 and widening thereof to 4 lanes and its Improvement, Operation and Maintenance in the State of Tamil Nadu, India on Build, Operate and Transfer (BOT) basis subject to and on the terms, conditions and covenants setforth in the said Concession Agreement or forming part thereof.

B. With a view to help facilitate obtaining of financing for the said Project by the Concessionaire so as to enable the Concessionaire to build, operate and maintain the same pursuant to and in accordance with the Concession Agreement, the Parties have agreed subject to the terms and conditions of the Concession Agreement and the Financing Documents, that the Senior Lenders shall have the right to substitute the Concessionaire by a Selectee for the

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residual period of the Concession on the terms, conditions and covenants mentioned hereinbelow.

C. As a condition to making any disbursement pursuant to the Financing Documents, the Senior Lenders have required and it is deemed necessary and expedient to record the terms, conditions and covenants of the above agreement between the Parties.

NOW THEREFORE THE PARTIES HITHERTO HEREBY AGREE AND THIS AGREEMENT WITNESSES AS FOLLOWS:

ARTICLE 1

DEFINITIONS

1.1 For the purpose of this Agreement, the following terms shall have the meaning hereinafter respectively assigned to them :

1.1.1 "Concession" means the bundle of rights, obligations and covenants of the Concessionaire under and as setforth in the Concession Agreement.

1.1.2 "Concession Agreement" means the Concession Agreement dated ..... entered into between NHAI and the Concessionaire granting the Concession to the Concessionaire in respect of the Project Highway and includes without limitation any amendments thereto made in accordance with the provisions contained in this behalf therein.

1.1.3 "Event of Default" means occurrence of any of the following events :

(i) A Material Breach by the Concessionaire of the Concession Agreement, or the occurrence of a Concessionaire Event of Default as defined in the Concession Agreement.

(ii) A material default in payment by the Concessionaire to all or any of the Senior Lenders under the Financing Documents of any two installments, either of principal or interest or both, due and payable by it on account of Lenders Dues.

(iii) Any event of default under or breach of any of the terms of any of the Financing Documents or Project Agreements concerning the Project which in the sole opinion of the Lenders Agent is material or major and which may seriously affect the ability of the Concessionaire to meet its payment obligations to the Senior Lenders under the Financing Documents or to design engineer, construct, complete, operate and maintain the Project Highway pursuant to and in accordance with the Concession Agreement.

1.1.4 "Financial Assistance" means the loans, advances and other funding assistance including any syndicated/ participation facility provided by the Senior Lenders

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as setforth in Schedule II hereto for financing the whole or any part of the Project Cost,

1.1.5 "Financing Documents" means the documents executed/ to be executed by the Concessionaire or entered/to be entered into by the Concessionaire with the Senior Lenders and/or the Lenders Agent in respect of the Financial Assistance and include loan agreements, guarantees, notes, debenture, bonds and other security agreements and other documents relating to the Financial Assistance and brief particulars whereof are setforth in Schedule II hereto in relation to each Senior Lender.

1.1.6 "Lenders Agent" means ....., a company established under the provisions of the ..... and having its principal office ..... and any replacement thereof appointed by all the Senior Lenders, inter alia, on the condition that as security for the Financial Assistance they shall have the right to seek transfer and assignment of the Concession Agreement including the Concession in accordance with the provisions of this Agreement.

1.1.7 "Lenders Certificate" shall have the meaning ascribed thereto in Clause 2.2(b).

1.1.8 "Lenders Dues" means the aggregate of all monies owned by the Concessionaire to the Senior Lenders under the Financing Documents on account of principal thereunder for funding the Project Cost, and all accrued interest, additional interest, liquidated damages, commitment fees, commission, prepayment premium, costs, charges and other monies including financing charges and fees owed by the Concessionaire to the Senior Lenders under the Financing Documents for the Project upto the Transfer Date payable under the Financing Documents.

1.1.9 "Notice of Default" shall have the meaning ascribed thereto in Clause 2.2(a).

1.1.10 "Proposal" shall have the meaning ascribed thereto in Clause 3.1(iii).

1.1.11 "Project Agreements" means this Agreement, the Concession Agreement and certain other agreements and contracts entered into by the Concessionaire with NHAI and others relating to the Project and brief particulars whereof are set forth in Schedule III hereto.

1.1.12 "Project Cost" means the total capital cost of the Project upto the COD as approved by the Senior Lenders.

1.1.13 "Senior Lenders" means the financial institutions, trusts, funds, banks and such other persons who have provided or agreed to provide the finance to the Concessionaire under any of the Financing Documents for meeting all or any part of the Total Project Cost and who hold pari passu charge on the Project Assets.

1.1.14 "Selectee" means a new Concessionaire proposed by the Senior Lenders pursuant to this Agreement and approved by NHAI for substituting the Concessionaire for the residual period of the original Concession by amendment of the Concession Agreement or by execution of a fresh Concession Agreement.

1.1.15 "Substitution Notice" means the notice given by the Lenders Agent pursuant to Clause 2.2 (c) of this Agreement.

1.2 The words and expressions beginning with or in capital letters used in this Agreement not defined herein, shall have, unless repugnant to the context, the meaning respectively assigned to them in the Concession Agreement.

1.3 In this agreement unless the context otherwise requires :

a) any reference to a statutory provision shall include such provision as is from time to time modified or re-enacted or consolidated so far as such modification or re-enactment or consolidation applies or is capable of applying to any transactions entered into hereunder;

b) the words importing singular shall include plural and vice versa, and words denoting natural persons shall include partnerships, firms, companies, corporations, joint ventures, trusts, associations, organizations or other entities (whether or not having a separate legal entity);

c) the headings are for convenience of reference only and shall not be used in and shall not affect the construction or interpretation of this Agreement;

d) terms beginning with capital letters and defined in this Agreement shall have the meaning ascribed thereto herein;

e) the words "include" and "including" are to be construed without limitation;

f) any reference to a "day" shall mean reference to a calendar day;

g) any reference to "month" shall mean reference to a calendar month;

h) the Schedules to this Agreement form an integral part of this Agreement and will be in full force and effect as though they were expressly set out in the body of this Agreement;

i) any reference at any time to any agreement, deed, instrument, license or document of any description shall be construed as reference to that agreement, deed, instrument, license or other document as amended, varied, supplemented, modified or suspended at the time of such reference provided that this clause shall not operate so as to increase

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liabilities or obligations of NHAI hereunder or pursuant hereto in any manner whatsoever;

j) references to Recitals, clauses, sub-clauses, paragraphs, or schedules in this Agreement shall, except where the context otherwise requires, be deemed to be references to Recitals, Articles, clauses, sub-clauses, paragraphs, Annexures, appendices of this Agreement.

k) any agreement, consent, approval, authorization, proposal, notice, communication, information or report required under or pursuant to this Agreement from or by any Party or Senior Lender(s) shall be valid and effectual only if it is in writing under the hands of duly authorised representative of such Party or the Senior Lender(s), as the case may be, in this behalf and not otherwise; and

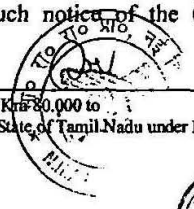
l) any reference to any period commencing "from" a specified day or date and "till" or "until" a specified day or date shall include both days or dates.

ARTICLE 2

SUBSTITUTION OF THE CONCESSIONAIRE BY A SELECTEE

2.1 NHAI hereby irrevocably agrees to substitute the Concessionaire by a Selectee (selected by the Senior Lenders in accordance with the provisions of this Agreement and approved by NHAI) by amendment of the Concession Agreement or by execution of a fresh Concession Agreement in favour of the Selectee for the purpose of securing the payments of the Lenders Dues, provided that nothing contained herein shall entitle the Senior Lenders to operate the Concession themselves as a Concessionaire under and in accordance with Concessionaire Agreement either individually or collectively. However, Senior Lenders may exercise the right of step-in to cure any breach or default subsisting on the day of such step-in or substitution. Provided further that if the Senior Lenders step in to operate and manage the Concession for a period not exceeding 90 (ninety) days, their liabilities shall be restricted to the obligations relating to and arising during such 90 (ninety) days period.

2.2 (a) The Lenders Agent shall notify by a notice in writing to the Concessionaire, with a copy thereof simultaneously to NHAI, about the occurrence of an Event of Default and requiring the Concessionaire to remedy and cure such default within 30 (thirty) days from the date of delivery of such notice of the Concessionaire (the "Notice of



Default"). The Notice of Default shall be accompanied by the Lenders Certificate.

(b) A certificate under the hands of an authorised officer of the Lenders Agent annexed to the Notice of Default certifying –

(i) the occurrence of an Event of Default, and

(ii) the Lenders Dues.

(the "Lenders Certificate") shall be conclusive evidence of occurrence of such Event of Default and of such Lenders Dues. Such Lenders Certificate shall be final, conclusive and binding upon the Concessionaire for the purposes of this Agreement and the Financing Documents.

(c) NHAI and the Concessionaire hereby irrevocably agree that the Lenders Agent may within 30 (thirty) days of the date of delivery of the Notice of Default of the Concessionaire and without prejudice to any other right or remedy available to the Senior Lenders under the Financing Document, notify NHAI and the Concessionaire on behalf of all the Senior Lenders about the Senior Lenders decision to invite, negotiate and procure offers, either through private negotiations or public auction or process of tendering for the residual period of the Concession and the rights and obligations of the Concessionaire under the Concession Agreement, by a Selectee, subject to the approval of such Selectee by NHAI (the "Substitution Notice").

(d) Upon assumption by the Selectee of the liability and obligations of the Concessionaire under the Financing Documents and the Concession Agreement including obligation to pay any sums then due and payable to NHAI under the Concession Agreement, NHAI shall grant the Concession to the Selectee on the same terms and conditions for the residual period of the original Concession, by amendment of Concession Agreement or, if required by the Lenders Agent by a separate agreement with the Selectee.

2. 3 The Lenders Agent shall apply in the selection of the following criteria:

(i) the Selectee shall be capable of properly discharging the duties, obligations and liabilities of the Concessionaire under the Concession Agreement;

(ii) the Selectee shall provide security to the satisfaction of Senior Lenders for repayment of the Lenders Dues;

(iii) the Selectee shall have the capability and shall unconditionally consent to assume the liability for the payment and discharge of dues of the





Concessionaire to NHAI under and in accordance with the Concession Agreement and of Lender's Dues upon terms and conditions as agreed to with the Senior Lenders ;

(iv) the Selectee shall have the net worth, experience and technical equity parameters as set forth in the Concession Agreement or prescribed by NHAI thereunder in respect of the Concessionaire or as relaxed subsequently by NHAI;

(v) the Selectee shall have not been in breach of any agreement between the Selectee and NHAI ; and

(vi) any other appropriate circumstance, whereby continuity in the performance of the Concessionaire's obligations under the Concession Agreement is maintained and the security in favor of Senior Lenders under the Financing Documents is preserved.

2.4 At any time prior to the acceptance of the Selectee by NHAI pursuant to this Agreement, the NHAI may require the Lenders Agent to satisfy NHAI as to the eligibility of the Selectee and the decision of the NHAI in this behalf (which shall be reasonable), shall be final, conclusive and binding on the Senior Lenders and the Selectee.

ARTICLE 3

MODALITY FOR SUBSTITUTION

5.1 The following modalities shall be applicable to any substitution of the Concessionaire by the Selectee pursuant to this Agreement :

3.1

(i) The Lenders Agent may invite, negotiate or procure offers either through private negotiations or public auction or process of tender or otherwise for the substitution of the Concessionaire by the Selectee;

(ii) The Lenders Agent shall on behalf of the Senior Lenders propose to NHAI pursuant to sub-clause (iii) below, the name of the Selectee for acceptance and shall apply as necessary to NHAI for :

a) grant to the Selectee (as substitute for the Concessionaire) the right to build, construct, complete, maintain, and operate the Project Highway under and in accordance with and subject to and on the terms and conditions set forth in the Concession Agreement,

b) amendment of the Concession Agreement so as to grant to the Selectee on the same terms and conditions, the residual period of the Concession under original Concession Agreement,

c) the execution of a new Substitution Agreement with the proposed Selectee for the residual period of Concession on the same terms and conditions, and

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(iii)The Lenders Agent on behalf of the Senior Lenders shall be entitled, within a period of 120 (one hundred twenty) days from the date of delivery to NHAI of the Substitution Notice pursuant to Clause 2(c) above, to select and propose to NHAI for its approval a Selectee (the "Proposal"). The Proposal of the Lenders Agent pursuant to this sub-clause (iii) shall contain the particulars and information in respect of the Selectee, the Lenders Dues and other data and information, all as prescribed in Schedule IV hereto. Without prejudice to the foregoing the Lenders Agent agrees and undertakes to provide to NHAI such further and other information and such clarifications in respect of any data, particulars or information furnished pursuant hereto by the Lenders Agent as NHAI may reasonably require. NHAI shall convey its approval or otherwise of such Proposal, including of Selectee, in its sole discretion within 60 (sixty) days of (a) the date of receipt of the Proposal by NHAI, or (b) the date when last of further and other information and such clarifications in respect of any data, particulars or information comprised in the Proposal, as have been provided in the Lenders Agent to NHAI, whichever is later. It is expressly agreed that the Proposal shall be accompanied by an unconditional undertaking of the Selectee that it shall upon approval by NHAI of the Proposal including the Selectee, observe, comply, perform and fulfill the terms, conditions and covenants of the Concession Agreement which according to its terms are required to be observed, complied with, performed and fulfilled by Concessionaire thereunder on the footing as if such Selectee were the concessionaire under the Concession Agreement and shall be liable for and shall assume, discharge and pay the Lenders Dues to the Senior Lenders under and in accordance with the Financing Documents. Upon approval of the Proposal including of the Selectee by NHAI, such Selectee shall become the Selectee hereunder.

(iv)NHAI shall, upon its satisfaction of the eligibility of the Selectee and in accordance with the provisions of this Agreement and subject to the provisions of Sub-clause (v) below proceed to substitute the Concessionaire or the Selectee by amendment of the Concession Agreement or by execution of fresh agreement or such other writing as NHAI may reasonably require on the same terms and conditions for the residual period of the Concession in favour of the Selectee.

(v) The substitution as aforesaid shall be subject to the Selectee, obtaining requisite Indian Government approvals, clearances and permission

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necessary for operating the Concession under and in accordance with the Concession Agreement.

(vi) The objection if any of NHAI to the substitution as aforesaid shall be reasoned and be made after hearing the Lenders Agent, provided however, that in the event of a refusal as stated above, the Lenders Agent may propose another Selectee. In the event that no objection is raised with respect to the Selectee by NHAI within the period setforth in sub-clause (iii) above, the Selectee shall be deemed to have been accepted by NHAI. NHAI shall, subject to the provisions of Sub-clause (v) above, grant the Concession for the residual period within 15 days of its acceptance/deemed acceptance of the Selectee.

(vii) The substitution as aforesaid, pursuant to the security interest hereby created in favor of the Senior Lenders, shall be deemed to be complete only upon the Selectee as Concessionaire accepting and complying with the terms and conditions stipulated in the Concession Agreement.

(viii) The decision of the Senior Lenders and NHAI in the selection of the Selectee shall be final and binding on the Concessionaire and shall be deemed to have been made with the concurrence of the Concessionaire and the Concessionaire hereby expressly waives all rights to objects to or challenges such selection of the Selectee on any ground whatsoever. No third party shall have the right to question the decision of the Senior Lenders/Lenders Agent and NHAI.

(ix) All actions of the Lenders Agent hereunder shall be deemed to be on behalf of the Senior Lenders, and be binding upon them. The Lenders Agent is authorised to receive payment of compensation, payment to cure default and any other payments, consideration for transfer in accordance with the Substitution Notice and the Financing Documents and give valid discharge on behalf of all Senior Lenders.

5.2 The terms and conditions for substitution of the Concessionaire by the Selectee shall be proposed by the Senior Lenders through the Lenders Agent to the NHAI, on the occurrence of an Event of Default and continuance thereof for six months but at least 2 months prior to the anticipated date of substitution as aforesaid for the residual period of the Concession.

5.3 The Concessionaire hereby irrevocably agrees and waives any right to challenge the Senior Lender's decision to apply to NHAI for substitution as aforesaid and neither the Concessionaire nor NHAI shall be entitled to prevent the Lenders Agent from proceeding to seek such a substitution of the Concessionaire by Selectee as hereinbefore provided. Notwithstanding NHAI's permission for

substitution pursuant to Lenders Agent's request, the Concessionaire agrees and confirms that the Concessionaire shall not have any right to seek re-valuation of the Concessionaire's assets including the Concession under the Concession Agreement, otherwise than as contracted in the Financing Documents. The Parties acknowledge that the rights of the Senior Lenders hereunder are irrevocable and shall not be contested in any proceedings before any court of authority and the Concessionaire shall have no right or remedy to prevent, obstruct, injunct or restrain NHAI and/or the Senior Lenders from effecting or causing the substitution as aforesaid.

5.4 Where no suitable Selectee can be found by the Lenders Agent or NHAI shall decide to take over the concession then NHAI shall advise the Lenders Agent of all steps it proposes to take under the Concession Agreement for determination of Termination Payments thereof.

3.5 (i) If NHAI decides to substitute the Concessionaire by any other person (NHAI Nominee), it shall take into account the Senior Lender's Dues while considering offers from such persons and shall include a suitable condition as agreed to by the Lenders Agent on behalf of the Senior Lenders for payment or take over of such dues by such NHAI nominee to the extent agreed by the Lenders Agent while substituting the Concessionaire by the NHAI nominee. The NHAI nominee shall similarly be bound to execute a supplementary/fresh substitution agreement on the same terms and conditions as provided herein.

(ii) Notwithstanding anything contained in Clause 3.4 and this Clause 3.5, NHAI shall not be required to take over, upon Termination of the Concession Agreement including the Concession, the liabilities representing the Lender's Dues save and except to the extent of Termination Payments due and payable upon such Termination under the Concession Agreement. In such an event NHAI's obligation shall be limited to assumption of such liabilities and payments of dues as NHAI has agreed to bear under the Concession Agreement.

5.5 Nothing contained in these presents shall mean or be interpreted as provision of any guarantee or surety by NHAI and it is expressly agreed that NHAI has not provided any surety, guarantee or counter guarantee whether directly or indirectly for the recovery of amount of Financial Assistance advanced by the Senior Lenders to the Concessionaire.

ARTICLE 4
INTERIM PROTECTION OF SERVICE AND PRESERVATION OF SECURITY

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5.6 In the event of the Senior Lenders notify NHAI and the Concessionaire of the Event of Default (and the Concessionaire has not cured the default for a period of 30 days) or in special circumstances affecting the security of the Senior Lenders, the Senior Lenders shall be entitled to institute protective legal proceedings for a receivership (the "Receiver") to maintain, preserve and protect the assets (other than the Concession Agreement including the Concession) held as security by the Senior Lenders provided always that such receiver shall be NHAI if such assets are in the opinion of NHAI necessary and required for the operation and maintenance of the Project Highway and the Parties hereby consent and agree to the same. The Lenders Agent shall in such an event notify NHAI to assume receivership of the assets held as security and NHAI shall operate and maintain the same pending the substitution of the Concessionaire by the Selectee. In the event NHAI does not assume receivership and declines the request of the Lenders Agent, the Lenders Agent shall for itself and each of the Senior Lenders, be entitled to seek the appointment of a Court Receiver for the Concessionaire's assets held as security and NHAI shall operate and maintain the same pending substitution as aforesaid and/or the takeover of the Concession Agreement including the Concession and the Project Highway in accordance with the Concession Agreement or this Agreement by the NHAI. All the receivables shall be deposited by the Receiver in the Escrow Account and shall be dealt with in accordance with the Concession Agreement. The Receiver shall be responsible for protecting the assets in receivership and shall render a true and proper account of the receivership to the Senior Lenders in accordance with the terms of its appointment. The Receiver shall make best efforts to operate and maintain the Project Highway, in accordance with the obligations of the Concessionaire under the Concession Agreement. Any person other than NHAI may be appointed as Receiver only with the prior consent of NHAI. In a declaratory suit for appointment of a Receiver, notwithstanding that no recovery or mortgage suit or any suit or proceeding for enforcement of the Senior Lenders' security under the Financing Documents is instituted by the Lenders Agent for itself or the Senior Lenders, any action for appointment of NHAI as Receiver or appointment of an Independent Court Receiver shall be without prejudice for the other rights and remedies of NHAI, and of the Senior Lenders under the Financing Documents.

ARTICLE 5

TERMINATION OF THE CONCESSION BY THE NHAI

5.7 If under the Concession Agreement an event occurs which shall entitle NHAI to Terminate the Concession Agreement, NHAI shall intimate the Senior Lenders prior to exercising of its decision to Terminate the Concession and advise the

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Senior Lenders to ensure the cure of the event which otherwise can result in termination of the Concession and the Concession Agreement. Such a notice shall entitle the Senior Lenders to cure any financial or other default of the Concessionaire within a period of two months from the date of the notice received from the NHAI failing which NHAI without any further notice to either the Concessionaire or the Lenders Agent/Senior Lenders, shall be entitled to Terminate the Concession Agreement.

5.8 Upon receipt of the Notice as referred to in Clause 5.1, intimating occurrence of an event which can entail Termination of the Concession Agreement including the Concession, the Senior Lenders shall be entitled to consider such notice as an Event of Default and may initiate steps to invite, negotiate and procure offers for the substitution of the Concessionaire by a Selectee in accordance with the procedure set forth in this Agreement.

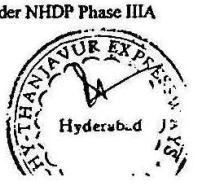
ARTICLE 6

SENIOR LENDERS RIGHT TO RECEIVE TERMINATION PAYMENTS

5.9 NHAI and Concessionaire hereby agree, and confirm that without prejudice to any other right or remedy, NHAI shall be entitled to deposit the Termination Payments into the Escrow Account and the Senior Lenders shall be entitled to receive the same without any further reference to or consent of the Concessionaire under and in accordance with the Concession Agreement towards the satisfaction of the Senior Lenders Dues out of and limited to the sum of Termination Payments worked out under and in accordance with the Concession Agreement. The Senior Lenders shall be entitled to appropriate any consideration received for the substitution as hereinabove provided from the Selectee towards the payment of their and NHAI's respective dues to the exclusion of the Concessionaire.

5.10 The Concessionaire hereby nominates, constitutes and appoints the Lenders Agent as its constituted attorney for doing all acts, deeds and things as may be required to be done for the substitution of the Concessionaire by the Selectee pursuant hereto and for receiving consideration for discharge of the Lenders' Dues pursuant to Clause 6.1.

5.11 The Concessionaire hereby expressly authorizes payment of sums by NHAI on account of Termination Payments into Escrow Account and the Lenders Agent to draw the same therefrom for and on behalf of the account of the Senior Lenders notwithstanding the pendency of any dispute or objection or claim that the Concessionaire may have against the Senior Lenders and/or NHAI. The deposit by NHAI into the Escrow Account and payment to the Senior Lenders directly or through the Lenders Agent in accordance with this Agreement, made or caused to be made by NHAI shall constitute a valid discharge of its obligation of the



payment thereof to the Concessionaire. All such payments shall stand charged to the Senior Lenders under the Financing Documents and shall be receivable by the Lenders Agent from the Escrow Account on behalf of the Senior Lenders to the exclusion of any receiver or liquidator appointed.

ARTICLE 7
GENERAL

5.12 The Parties hereto expressly represent and warrant that they are duly empowered to sign and execute this Agreement and the Lenders Agent is duly and fully authorised by each of the Senior Lenders to enter into this Agreement on their behalf.

5.13 Notices under this Agreement shall be sent to the Addresses first hereinabove mentioned. Any change in the address of any Party shall be duly notified by a Registered post acknowledgement due and delivered to the other Parties.

5.14 The expressions "NHAI", the "Concessionaire", the "Senior Lenders" and the "Lenders Agent" herein used shall unless there be anything repugnant to the subject or context includes their respective successors, legal representatives, administrators and permitted assigns.

5.15 This Agreement shall not be affected by reorganization of any Senior Lender, Lenders Agent or NHAI and the successor – in interest of such Senior Lender, Lenders Agent or NHAI shall have the benefit of this Agreement.

5.16 No amendment, variation or modification to this Agreement shall be valid and effectual unless made in writing and executed by the duly authorised representatives of all the Parties hereto.

5.17 All stamp duties or other imposts and charges as are applicable on this Agreement or on amendment of the Concession Agreement or execution of fresh Concession Agreement for the purpose of substitution as aforesaid shall be borne by and be to the account of the Concessionaire. In the event of the Senior Lenders making such payment for the time being, it shall be deemed to be a part of the Lenders Dues.

5.18 The Parties hereby expressly agree that for the purpose of giving full and proper effect to this Agreement, the Concession Agreement and this Agreement shall be read together and construed harmoniously. The terms of this Agreement shall prevail in the event of any inconsistency with the Concession Agreement.

5.19 The consultation, recommendation or approval of the Lenders Agent under this Agreement shall always be taken as consultation, recommendation or approval of every concerned Senior Lender and each such Senior Lender shall be bound by the same and hereby waives its right to question or dispute the same.

5.20 This Agreement shall be in addition to and shall not be in derogation of the terms of the Financing Documents.

5.21 It shall not be necessary for the Senior Lenders or the Lenders Agent to enforce or exhaust any other remedy available to them before invoking the provisions of this Agreement.

5.22 Any dispute, difference or claim arising out of or in connection with or in relation to this Agreement which is not resolved amicably shall be decided finally by reference to arbitration to a Board of Arbitrators comprising of one nominee of each party to the dispute. Such arbitration shall be held in accordance with the Rules of Arbitration of the Indian Council of Arbitration and shall be subject to the provisions of the Arbitration and Conciliation Act, 1996. The arbitrators shall issue a reasoned award. The venue of such arbitration shall be New Delhi, India. The Award shall be final and binding on the Parties. The Parties agree and undertake to carry out the award of the arbitrators (the "Award") without delay.

5.23 This Agreement and rights and obligations of the Parties shall remain in full force and effect pending the Award in any arbitration proceeding hereunder. The Courts in New Delhi alone shall have jurisdiction over all matters arising out of or relating to the arbitration agreement contained herein or proceedings arising out of or relating to the arbitration proceedings thereunder.

IN WITNESS WHEREOF THE PARTIES HITHERTO HAVE SET THEIR HANDS HEREUNTO ON THE DAY, MONTH AND YEAR HEREIN ABOVE MENTIONED.

SIGNED AND DELIVERED ON BEHALF OF
TRICHY-THANJAVUR EXPRESSWAYS LIMITED

BY : _____

Name :

Title :

SIGNED AND DELIVERED ON
BEHALF OF **THE NATIONAL HIGHWAYS AUTHORITY OF INDIA**

BY : _____

Name :

Title :

SIGNED AND DELIVERED ON BEHALF OF
SENIOR LENDERS

BY: _____

Name :

Title :

Schedule V

VESTING CERTIFI CATE

National Highways Authority of India ("NHAI") hereby acknowledges:

1. Compliance and fulfillment by the Concessionaire of the Divestment Requirements set forth in Clause 33.2 of the Concession Agreement in respect of the Project Highway;
2. Receipt of actual possession of the Project Highway from the Concessionaire; and
3. Receipt from the Concessionaire of a certificate confirming that there are no liens or encumbrances whatsoever on the Project Highway including Project Assets;

on the basis that upon the issue of this Vesting Certificate, NHAI shall be deemed to have acquired, and all title and interest of the Concessionaire in or about the Project Highway shall be deemed to have vested, unto NHAI free from all encumbrances, charges and liens whatsoever.

Notwithstanding anything to the contrary contained hereinabove, it shall be a condition of this Vesting Certificate that in the event of any defect or deficiency in any of the Divestment Requirements set forth in Clause 33.2 of the Concession Agreement being found or discovered at any time hereafter, nothing contained in this Vesting Certificate shall be construed or interpreted as waiving the obligation of the Concessionaire to rectify and remedy the same and/or relieving the Concessionaire in any manner of the same.

Agreed and accepted **For NHAI**

For the Concessionaire

By:..... By:.....

Name: Name:

Title: Title:

Dated: Dated:

SCHEDULE W

PASSENGER CAR UNIT FACTORS

The equivalency factor for the conversion of different types of vehicles into equivalent Passenger Car Units (PCUs) based on their relative interference value shall be as per the following table:

Sl. No.	Vehicle Type	Equivalency factor**
Fast Vehicles		
1.	Motor Cycle or Scooter	0.50
2.	Passenger Car, Pick-up Van or Auto-rickshaw	1.00
3.	Agricultural Tractor, Light Motor Vehicle	1.50
4.	Truck or Bus	3.00
5.	Truck-trailer, Agricultural Tractor-trailer	4.50
Slow Vehicles ***		
6.	Cycle	0.50
7.	Cycle-rickshaw	2.00
8.	Hand Cart	3.00
9.	Horse-drawn vehicle	4.00
10.	Bullock Cart*	8.00

* *For smaller bullock-carts, a value of 6 shall be appropriate.*

** *Recommended PCU factors for various types of vehicles in accordance with IRC:64-1990 on "Guidelines for Capacity of Road in Rural Areas"*

*** *While computing the Design service volumes and the capacity of highway, slow vehicles (of the table) shall not be considered for the sections where Service Roads are provided.*

SCHEDULE X

REPORTING AND RECORD REQUIREMENTS

1.0 INTROUDUCTION

The reporting and records requirements spelt out hereinunder have been provided in terms of the indicative type of information required. The Independent Consultant shall determine the following:

- Format of such reports and record requirements
- Software standards
- Number of Copies required
- The Language of the reports and records shall be English

2.0 Part I

Reporting Requirements

From the date of the Concession Agreement until the end of the Concession Period, the Concessionaire shall prepare and submit to the NHAI and Independent Consultant 1 copy each of the following reports/ Documents/ Drawings else otherwise stated in the Concession Agreement.

A. Design & Construction Stage

1 A detailed work plan supported with CPM/PERT charts for completion of all project activities related to the Project Highway, at the beginning of the Design Works.

2 ***Monthly Progress Report***: Within 5 Days of end of each month or a part thereof, which falls within the Construction Period, the Concessionaire shall provide to the NHAI and the Independent Consultant the monthly report, which shall at least identify the following:

- Working drawings submitted/ resubmitted to NHAI/ Independent Consultant during the month ended
- NHAI/ Independent Consultant's comments there on, if any.
- Concessionaire's compliance with NHAI/ Independent Consultant's comments on the drawings submitted to NHAI/ Independent Consultant, during the month ended.

- "As built" drawings submitted to NHAI/ Independent Consultant during the month ended.
- Progress of pre-construction activities such as utility relocation and other obstructions.
- Concessionaire' compliance with the Inspection Report during the month ended, if any.
- Construction Constraints.
- Progress data with 'S' curves, if applicable; Project Data with contract detail and sectional completion details.
- Tests carried out during the month ended, if any; results of these Tests furnished to the NHAI/ Independent Consultant during the month ended, if any.
- Remedial measures taken by the Concessionaire on the basis of these Tests, if any.
- Traffic management steps undertaken by the Concessionaire during the month (particularly on the existing two lanes of the Project highway).
- Achievement of a Project milestone (Schedule H) during the month, if any. The Concessionaire shall also provide information on delay in achievement of such milestone, if any.
- Any suspension of the Construction Works by NHAI as per provisions of the Concession Agreement, if any. The Concessionaire shall also provide information on reason of such suspension, duration of such suspension and the steps undertaken by it to revoke such suspension.
- Any Change of Scope Notice issued by NHAI and status thereof.
- All actual or potential departures from the Project Completion Schedule (Schedule H).
- All grounds for a substantial Dispute which have occurred or which may reasonably be foreseen as likely to occur.
- All substantial disagreements among the Concessionaire, and the NHAI and/or Independent Consultant to the design/ construction of the Project Highway.
- The proposed measures to be taken by the Concessionaire to overcome such departures or to resolve such grounds for a Dispute.
- The date on which the Concessionaire expects the Project Highway to be completed.
- The Concessionaire is required to maintain the existing two lanes during the Construction Period. This monthly construction report shall also contain information in respect of maintenance activity, if any, carried out by the

Concessionaire during the month ended in respect of these existing two lanes. The Concessionaire and the Independent Consultants shall agree on the information requirements in respect of these two existing lanes during the Construction Period.

- Monthly Weather Report giving daily temperature maximum and minimum value; rain fall and any other significant event.

3 Detailed Engineering Design Report including working drawings, and Environmental Management Plan.

4 Video Recording as per Clause 44.1 of the Concession Agreement.

5 Monthly Escrow Account Report: With in 5 Days of end of each month which falls within the Operations Period, the Concessionaire shall provide to the NHAI and the Independent Consultant a copy of the report containing the summary of the receipts in and payments from the Escrow Account for the month ended.

6 The Concessionaire shall supply to the NHAI free of charge the following documents prior to requesting the issue of the Completion Certificate:

6.1 Detailed, accurately scaled, and sequentially numbered plans of the Project Highway "As Built" covering all relevant engineering features, which in relation to structures shall also include cross sections in each plane; and

6.2 Copies of all geo-technical and borehole reports obtained by the Concessionaire in preparation for and during the construction of the Project Highway.

7 All other reports in accordance with the provisions of the Concession Agreement.

8 Such other reports as may be reasonably required by NHAI/ Independent Consultant.

9 Additional Reports: The Concessionaire shall supply to the NHAI free of charge copies of all information, records and test results (including any interpretation of such test results) resulting from any ground, physical or geophysical investigation or archaeological or ecological survey of the Site or Adjacent Areas.

B. <u>Operation Phase</u>

1 Monthly Traffic Report: With in 5 Days of end of each month which falls within the Operations Period, the Concessionaire shall provide to the NHAI and the Independent Consultant a copy of the report containing the following information:

Hyderabad

- Total traffic count by mode for each day of the month; and
- Tollable traffic count by mode for each day of the month.

2 Monthly Escrow Account Report: With in 5 Days of end of each month which falls within the Operations Period, the Concessionaire shall provide to the NHAI and the Independent Consultant a copy of the report containing the summary of the receipts in and payments from the Escrow Account for the month ended.

3 Monthly Operations Report: With in 5 Days of end of each month or a part thereof, which falls within the Operations Period, the Concessionaire shall provide to the NHAI and the Independent Consultant a copy of the report, which shall identify the following, at the minimum:

- Inspections undertaken by the Concessionaire during the month ended, if any.
- Maintenance Reports submitted to the Independent Consultant during the month ended, if any.
- O&M Inspection Compliance Report submitted to NHAI/ Independent Consultant during the month ended, if any.
- Preventive/ Periodic maintenance undertaken during the month ended, if any.
- Any material modifications made to the Project Highway during the month ended, if any.
- All the accidents or incidents on the Project Road during the month under report (including all accidents on which a report has previously been made to the Concession Agreement).
- Tests performed during operation and maintenance stage along with the defects identified on the Project Highway, if any.
- Number and type of the complaints received from Users and others in respect of the Project Highway and the conduct of Operations.
- Incidents of emergency de-commissioning of the Project Highway during the month ended, if any.
- Incidents of lane-closure on the Project Highway during the month ended, if any. The Concessionaire shall provide information on reason, time of such lane-closures.
- all actual or potential departures from the O&M Requirements as specified in 'Schedule L'.

- all grounds for substantial Dispute which have occurred or may reasonably be foreseen as likely to occur.
- the proposed measures to be taken by the Concessionaire to overcome such departures or to resolve such grounds for a Dispute.

4. An annual report on the working of the toll collection system. This report will provide information on method of toll collection (semi-automatic, automatic, etc.), usage of pass system (manual, electronic, etc.), average time taken in toll-collection, Concessionaire's suggestions on improvements in the toll-collection system, which would be considered by NHAI appropriately.

5. Accident Reports: As soon as practicable and in any event no later than 7 days following the occurrence of any accident on the Project Highway involving a fatality or serious personal injury or substantial property damage, the Concessionaire shall investigate the circumstances of such accident and submit to the NHAI and Independent Consultant a report setting out details of such accident and, to the extent they are known, the causes of such an accident, and the Concessionaire shall thereafter promptly report to the NHAI and/or Independent Consultant any additional details of such accident or its causes which become known to it.

6. Concessionaire shall submit a copy of the audited accounts within 120 days of the close of each Accounting Year after the Appointed Date.

7. All other reports in accordance with the provisions of the Concession Agreement.

8. Such other reports as may be reasonably required by NHAI/ Independent Consultant.

9. Additional Reports: The Concessionaire shall supply to the NHAI/Independent Consultant free of charge copies of all information, records and test results (including any interpretation of such test results) resulting from any ground, physical or geophysical investigation or archaeological or ecological survey of the Site or Adjacent Areas.

3.0 Part II

Record Requirements

The Concessionaire shall take the following action(s) in respect of preparation of the record, its submission to NHAI and retention by the Concessionaire itself.

1.	**Design**	**Retention Period of the Concessionaire**
1.1	Design standards containing all relevant design assumptions, codes of practice, design loadings, design parameters and product data sheets for all components of Project Highway.	Till handover to NHAI at Termination of the Concession
1.2	Full set of final design calculations for all parts of the Project Highway including details of the influence on design of actual construction methods, and any changes or any remedial works during construction.	Till handover to NHAI at Termination of the Concession
1.3	Full set of working drawings	Until 2 years after issue of the Completion Certificate
1.4	Full specification for construction and all revisions made thereto.	Until 2 years after issue of the Completion Certificate
1.5	Change of Scope Order(s)	Till handover to NHAI at Termination of the Concession
2.	**Construction**	
2.1	Video recording submitted to NHAI	Until 2 years after the issue of Completion Certificate
2.2	Full set of construction site records relating to progress, testing of materials, monitoring of standards of workmanship, meteorological conditions, instructions issued and other site correspondence.	Till handover to NHAI at Termination of the Concession
2.3	Full set of "As-Built" drawings and schedules incorporating all changes to the design and all remedial measures applied to the Project Highway during construction, and all final As-built details and dimensions of the Project Highway. These drawings shall include permanent modifications made to suit the construction method.	Till handover to NHAI at Termination of the Concession
2.4	Full set of Tests results	Till handover to NHAI at Termination of the Concession
2.5	The appropriate proprietary rights, licenses, agreements	Till handover to NHAI at

	and permissions for materials, methods, processes and systems used or incorporated into the Project Highway.	Termination of the Concession
2.6	Monthly Progress Reports	Till handover to NHAI at Termination of the Concession.
3.	**Operations and Maintenance**	
3.1	Full records of all incidents which affect the operation and/or maintenance of the Project Highway including traffic accidents.	Till handover to NHAI at Termination of the Concession
3.2	Full records of inspections and surveys and results of such inspections and surveys (including photographs where applicable).	Till handover to NHAI at Termination of the Concession
3.3	Details of all repairs to the Project Highway and/or replacement, including photographs. As-built drawings and other documentary records.	Till handover to NHAI at Termination of the Concession
3.4	Full sets of all Monthly Reports	Till handover to NHAI at Termination of the Concession
3.5	Adequate records of adverse meteorological conditions.	Till handover to NHAI at Termination of the Concession
3.6	Records of landscape planting.	Till handover to NHAI at Termination of the Concession
3.7	Schedule and strip plan of grassed areas with details of the Routine Maintenance required in the normal course.	Till handover to NHAI at Termination of the Concession
3.8	Record of all permanent traffic signs on the Project Highway.	Till handover to NHAI at Termination of the Concession
3.9	All traffic (both total and tollable) count for each day of the Operations Period	Till handover to NHAI at Termination of the Concession
3.10	Record of daily toll collection at each toll plaza	Till handover to NHAI at Termination of the Concession
3.11	All financial and accounting records to be maintained as per Applicable Laws	Till handover to NHAI at Termination of the Concession
3.12	Encroachment particulars and details	Till handover to NHAI at Termination of the Concession

4. All other records in accordance with the provisions of the Concession Agreement.

5. Additional Requirements

5.1 When there is a conflict between the Reporting and Record Requirement of Schedule 'X' and a requirement in respect of these stated elsewhere in this Agreement, the latter shall take precedence.

5.2 The requirements set out in Reporting and Record Requirements of this Schedule 'X' indicate the minimum requirements to be complied with but are not limited to else only.

5.3 Availability of Records shall be as follows:

5.3.1 All records of operational aspects of the record keeping system shall be retained.

5.3.2 Operations' Records shall be systematically and periodically up-dated and filed so as to be readily retrievable.

5.3.3 All records which have been superseded but are still of historical, contractual or legal importance shall be retained and filed systematically so as to be available anytime.

5.3.4 Texts of all documents shall be prepared and recorded using agreed software systems and retained in hard form and on diskette, with full back-up diskettes available in case of diskette corruption.

Final 146

National Highways Authority of India

(Ministry of Shipping, Road Transport & Highways)
Government of India

UPGRADATION OF 10,000 Kms NATIONAL HIGHWAYS UNDER NHDP PHASE III ON BUILD, OPERATE AND TRANSFER (BOT) BASIS

NAME OF WORK: DESIGN, ENGINEERING, FINANCE, CONSTRUCTION, OPERATION AND MAINTENANCE OF THANJAVUR-TRICHY SECTION FROM KM 80.000 TO KM 135.750 OF NH 67 UNDER NHDP PHASE IIIA ON BUILD, OPERATE AND TRANSFER (BOT) BASIS

(Package No. : NHDP-III/BOT/TN/03)

ADDENDUM NO. 1

TO

BIDDING DOCUMENT

TECHNICAL SCHEDULES
(PART - IV)

January 2006

THANJAVUR EXPRESSWAYS Hyderabad TRICHY

PART - IV: TECHNICAL SCHEDULES

1. Page A-4, Para 2.5 - Traffic

The following line shall be added at the end.
"Break up details of Classified Volume Count is given in Annexure A-1 (A)".
"Annexure A-1 (A)" is enclosed herewith (refer page 3-5).

2. Page B-8, Para 2.4.1 – Cross-Drainage (Bridges & Culverts)

The sub-para 4 has been replaced. This shall be read as follows:-
The GAD of the bridges are given in **Fig B-4** (separately hard bound with pages from **Fig B 4-1 to Fig B4-19**). Widening scheme indicated for the bridges in **Figs B1-1 to B1-57** only indicate widening scheme of road at that location. Detail requirement of bridges improvement shall be carried out as per **Table B5** and **Figs B4-1 to B4-19**. GAD for bridge at Design Chainage km 97.185 shall be modified to the extent that only 2 lane bridge shall be provided on right carriageway. The Finished road levels, as given in GAD shall be modified to the levels given in the alignment plan and profile given in **Fig B1**. Foundation levels and other dimensions given in GAD of bridges needs to be finalised based on detailed assessment of hydraulic, geo-technical parameters and detailed structural design.

3. Page B-22, Table B5- Improvement Details for Bridges, Sl. No. 23

The column "Proposed span Arrangement (m)" for Sl. No. 23 shows 1 - 8.8m. This should be deleted and 'NIL' entry made instead.

4. Page B-23, Para 2.4.2 - Grade Separators/Underpasses (12 nos)
Table B6 shall be replaced by the **Table B6 (Revised)** as given below:

Table B6 (Revised) – New Underpasses

Sl. No	Chainage (km)		Span Arrangement (m)	Usage	Type of Structure
	Design	Existing			
1	80.430	80.425	1 x 10m x 5.5m	VUP	RCC Box
2	80.515	80.510	1 x 10m x 5.5m	VUP	RCC Box
3	81.950	81.370	1 x 10m x 5.5m	VUP	RCC Box
4	84.150	83.530	1 x 10m x 5.5m	VUP	RCC Box
5	86.060	85.380	1 x 10m x 5.5m	VUP	RCC Box
6	88.750	88.050	2 x 10m x 5.5m	VUP	RCC Box
7	89.900	89.150	2 x 10m x 5.5m	VUP	RCC Box
8	94.150	-	1 x 10m x 5.5m	VUP	RCC Box
9	94.710	-	1 x 4m x 5m	CUP	RCC Box
10	95.520	-	1 x 10m x 5.5m	VUP	RCC Box

VUP – Vehicular underpass, CUP – Cattle/Pedestrian underpass

THANJAVUR EXPRESSWAYS LTD. Hyderabad

5. Page B-24, Para 2.4.3 – ROB (3 nos)

Table B7 shall be replaced by the **Table B7 (Revised)** as given below:

Table B7 (Revised) – Improvement Proposal for ROBs

Sl. No	Chainage (km)		Proposed Scheme	Span Arrangement (m)
	Design	Existing		
1	81.400	80.1376	New Four lane ROB	1 x 28
2	129.183	128.524	Replace the existing ROB by a new 4 lane ROB	1 x 23
3	135.729	134.983	Replace the existing ROB by a new 4 lane ROB	1 x 28

6. Page C-3, Para 7 – Highway lighting
This para shall be deleted.

7. Page D-3, Para 5.1 (c), ii – Strengthening of the existing carriageway: —

The 2nd and 3rd sentences shall be replaced as below:

"Requirement of strengthening of existing pavement shall be assessed by the Concessionaire and shall be approved by IC."

8. Page D-8, Para 13.9

The last sentence "The general Specifications mentioned in DPR shall be followed for this purpose" shall be deleted.

9. Page D-9, Para 15.1a shall be deleted.

N.H.A.I. NEW DELHI

THANJAVUR EXPRESSWAYS LTD. Hyderabad

Annexure A1(A) 7 days Classified Volume count at Chainage 121/000

Location: Thuvakkudi (Km 121/000)														Direction: Both (Trichy & Thanjavoor)											
Day	Date	Town Bus (Govt)	Town Bus (Pvt)	Mini Bus	Mofussil Bus(Gov)	Mofussil Bus (Pvt)	Tourist Bus	Total Buses	2 Axle	3 Axle	4 Axle	>4 Axle	LCV	Car/Jeep/ Van (Gov)	Car/Jeep/ Van(Pvt)	Two Wheelers	Auto	Cycle	Hand Carts	Animal Carts	Cycle Rikshaw	Ambulance	Tractor	Total Vehicles	Total PCU
Sunday	22nd May, 2005	89	44	12	742	259	143	1289	1767	439	52	10	252	29	3451	2064	264	741	13	9	13	9	23	10425	17114
Monday	23rd May, 2005	139	59	21	798	211	97	1325	1930	430	24	14	433	45	3118	2355	220	655	21	8	31	5	31	10645	17620
Tuesday	24th May, 2005	89	27	13	797	249	77	1252	2119	427	30	6	374	25	3206	2160	218	544	20	14	24	7	33	10459	17819
Wednesday	18th May, 2005	96	32	13	787	272	104	1304	2137	427	18	6	437	69	3147	2540	271	606	27	10	41	8	35	11025	18182
Thursday	19th May, 2005	126	33	18	805	238	95	1315	2061	442	28	11	390	37	3025	2451	196	629	7	13	20	16	51	10692	17914
Friday	20th May, 2005	100	24	17	761	269	86	1257	2110	441	24	6	392	37	3511	2203	190	499	22	12	18	2	36	10760	18127
Saturday	21st May, 2005	118	27	11	781	242	117	1296	2326	382	40	16	424	47	3466	2302	269	502	11	11	17	7	36	11152	18860
Average		108	35	15	782	249	103	1291	2064	427	31	10	386	41	3275	2296	233	597	17	11	23	8	35	10737	17948

Annexure A1(A) 7 days Classified Volume count at Chainage 85/000

Location: Thanjavur (Km 85/000) — **Direction: Both (Trichy & Nagapattanam)**

Day	Date	Town Bus (Govt)	Town Bus (Pvt)	Mini Bus	Mofussil Bus(Gov)	Mofussil Bus (Pvt)	Tourist Bus	Total Buses	2 Axle	3 Axle	4 Axle	>4 Axle	LCV	Car/Jeep/Van (Gov)	Car/Jeep/Van(Pvt)	Two Wheelers	Auto	Cycle	Hand Carts	Animal Carts	Cycle Rikshaw	Ambulance	Tractor	Total Vehicles	Total PCU
Sunday	29thMay, 2005	60	88	89	340	344	75	978	1083	364	2	7	312	0	1610	817	188	442	4	26	9	2	33	5895	10968
Monday	30thMay, 2005	58	76	50	330	351	55	920	1248	414	12	1	411	29	1658	969	254	363	4	36	9	2	33	6327	11945
Tuesday	31stMay, 2005	64	85	40	326	341	51	907	1587	410	7	1	460	49	1559	1003	264	372	1	20	10	7	33	6690	12796
Wednesday	01stJune, 2005	61	81	45	328	346	53	914	1502	412	10	1	436	39	1609	986	259	368	3	28	10	5	33	6527	12370
Thursday	02ndJune, 2005	63	83	43	327	344	52	910	1546	453	5	2	440	39	1500	943	265	393	2	22	11	3	32	6564	12757
Friday	03rdJune, 2005	62	82	44	328	345	53	912	1482	432	7	2	438	39	1554	964	262	380	2	25	10	4	33	6545	12564
Saturday	04thJune, 2005	59	82	70	335	348	65	958	1166	389	7	4	362	15	1634	893	221	403	4	31	9	2	33	6129	11456
Average		61	82	54	331	345	58	928	1373	411	7	3	408	30	1589	939	245	389	3	27	10	3	33	6382	12122

Annexure A1(A) 3 days Classified Volume count at Chainage 129/000

Location: Thiruvarambur (Km 129/000)														Direction. Both (Trichy & Thanjavoor)										
Day	Date	Town Bus (Govt)	Town Bus (Pvt)	Mini Bus	Mofussil Bus(Gov)	Mofussil Bus (Pvt)	Tourist Bus	Total Buses	2 Axle	3 Axle	4 Axle	>4 Axle	LCV	Car/Jeep/Van (Gov)	Car/Jeep/Van(Pvt)	Two Wheelers	Auto	Cycle	Hand Carts	Animal Carts	Cycle Rikshaw	Ambulance	Tractor	Total Vehicles	Total PCU
Sunday	08thMay, 2005	543	634	10	763	288	126	2364	1404	392	38	6	345	34	5458	11129	1102	1513	34	23	92	9	20	23963	27197
Tuesday	17thMay, 2005	593	591	24	696	215	94	2213	1781	467	80	19	536	63	4643	16989	1321	2070	14	18	153	5	10	30382	31368
Saturday	07th May, 2005	596	611	27	725	241	116	2316	2146	441	101	13	440	59	5180	13019	1554	1639	40	29	186	6	14	27183	31379
Average		587	606	23	718	237	108	2279	1884	445	83	15	468	57	4990	14450	1390	1806	28	23	158	6	13	28094	30777

ANNEXURES

Annexure I	NHAI Letter No. NHAI/BOT-I/11019/35/2005 dated 18/01/2006 - Addendum No.1 (Tender Notice)	I (1-2)
Annexure II	Madhucon Projects Limited letter dated 27/01/2006 (submission of proposal)	II (1)
Annexure III	Financial Proposal of Madhucon Projects Limited	III (1-2)
Annexure IV	Letter No.NHAI/BOT-I/11019/35/2005/316 dated 28/02/2006 (LOA)	IV (1-2)
Annexure V	Letter No. MPL/ND/NHAI/2006/178 dated 09/03/2006 (Acceptance of LOA by Madhucon Projects Limited [MPL])	V (1)
Annexure VI	MPL Letter No. MPL/2006/(Trichy-Than.)/278 dated 28/04/2006	VI (1-50)
Annexure VII	MPL Letter No. MPL/2006/(Trichy-Than.)/331 dated 18/05/2006	VII (1-4)
Annexure VIII	MPL Letter No. MPL/2006/(Trichy-Than.)/352 dated 24/05/2006	VIII (1-3)
Annexure IX	MPL Letter No. MPL/2006/(Trichy-Than.)/370 dated 02/06/2006	IX (1-3)
Annexure X	Entrustment to NHAI vide Notification dated 27/09/2005	X (1-3)

Volume III

Alignment Plan, Profile and Intersection Drawings (1-57)

Annexure I

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(पोत परिवहन, सड़क परिवहन और राजमार्ग मंत्रालय)
National Highways Authority of India
(Ministry of Shipping, Road Transport and Highways)
जी-5 एवं 6, सेक्टर-10, द्वारका, नई दिल्ली-110 075
G-5 & 6, Sector-10, Dwarka, New Delhi-110075

दूरभाष / Phone: 91-11-25074100/25074200
फैक्स / Fax: 91-11-25093507 / 25093514
एक्स. / Extn.: 2223 / 2318 / 2468 / 2553

MOST IMMEDIATE

NHAI/BOT-I/11019/35/2005/

January 18, 2006

To
As per the list

Sub: Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur - Trichy Section from Km 80.000 to Km 135.750 of NH - 67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis -Invitation of BOT Bids, reg.- ADDENDUM No. 1

Project Reference No.: NHDPIII/BOT/TN/03

Sir,

Please refer to the Invitation of BOT bid proposals for the following 6 BOT Projects in the States of Tamil Nadu and Pondicherry:-

S. No.	Project Reference	NH No.	NH Stretch	Construction Package (Chainage)		Total Project Length (Kms)	Total Project Cost (Rs. Crores)
				From	To		
1	NHDPIII/BOT/TN/01	45	Trichy - Dindigul	333.000	421.600	88.273	445
2	NHDPIII/BOT/TN/02	67	Trichy - Karur	135.800 (excluding Lalapet ROB)	218.000	79.70	393
3	NHDPIII/BOT/TN/03	67	Thanjavur - Trichy	80.000	135.750	56.490	280
4	NHDPIII/BOT/TN/04	45B	Madurai - Tuticorin	138.800	264.500	128.157	629
5	NHDPIII/BOT/TN/05	66	Pondicherry-Tindivanam	0.000	37.920	38.608	204
6	NHDPIII/BOT/TN/06	68	Salem - Chinna Salem	0.313	85.200	87.687	494

Contd. ... 2/-

I-1

Annexure - I

NHAI/BOT-I/11019/35/2005/ January 18, 2006

2. In the light of queries received from the prospective bidders till the pre-bid meeting held on 12/01/2006, necessary amendments to the bidding documents have been made and incorporated in the bid document through issuance of Addendum No. 1 enclosed herewith being an integral part of the RFP. Bidders are therefore, required to consider the enclosed Addendum No. 1 before submission of their BOT bid proposal for the above 6 projects.

3. We hereby invite you to submit the BOT bids for the above 6 BOT Projects including BOT bid for Thanjavur - Trichy Section of NH - 67.

4. The last date of submission of BOT bid for Thanjavur - Trichy Section of NH - 67 has been kept as 30th January, 2006 (1400hrs). Also, sale of bid documents shall be kept open till the last date of submission i.e. 30th January, 2006 (1300hrs).

5. The BOT bid ("Other Submissions") so received shall be opened on the same day (1600hrs).

Yours sincerely,

D. Sarangi
General Manger (BOT) IA

Encl : Addendum No. 1

धर्मानन्द षड़ङ्गी / DHARMANANDA SARANGI
महाप्रबंधक (बी.ओ.टी.) / General Manager (B.O.T.)
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
National Highways Authority of India
(परिवहन और राजमार्ग मंत्रालय)
(Ministry of Road Transport & Highways)
जी– 5 एवं 6,सैक्टर–10, द्वारका, नई दिल्ली – 7
G - 5 & 6, Sector 10, Dwarka, New Delhi - 7

N.H.A.I. NEW DELHI

TRICHY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

I-2

Annexure II

MADHUCON
PROJECTS LIMITED

ANNEX 1A

COVERING LETTER FOR PROPOSAL SUBMISSION

Date: 27th January 2006

To

Shri D. Sarangi
General Manager (BOT-IA)
National Highways Authority of India
G-5& G-6, Sector-10, Dwarka,
NEW DELHI-110 075.
Phone: +91-11 2507 4100 (extn-1203)
Fax: +91-11-2509 3524

Dear Sir,

Re: **Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur – Trichy Section of NH-67 from Km 80.000 to Km 135.750 in the State of Tamil Nadu.**

Being duly authorized to represent and act on behalf of Sole Lead Member (in case of consortium)/ Sole Applicant. I, the undersigned, having reviewed and fully understood all of the Proposal requirements and information provided hereby submit the Proposal for the Project referred above.

I am enclosing the Proposal (one original), with the details as per the requirements of this RFP, for your evaluation. The Proposal, shall be valid for a period of two hundred and eighty (280) days from the Proposal Due Date and the Bid Security shall be valid up to 45 days beyond the proposal validity period

Dated this 27th day of January 2006.

MADHUCON PROJECTS LIMITED

S. V. PATWARDHAN
Managing Director

MADHUCON PROJECTS LTD. D-87 E.O.K NEW DELHI

THANJAVUR EXPRESSWAY LTD. Hyderabad

100019

Administrative Office: D-87, East of Kailash, New Delhi - 110 065. Tel: 011-2642 5507 / 2642 5820
Fax: +91-11-26476713 E-mail: madhucon@ndb.vsnl.net.in URL: www.madhucon.com
Corporate Office: Madhucon House, 1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033
Tel: +91-40-2355 6001/2/3/4 Fax: +91-40-2355 6005 E-mail: hyd1_madhucon@sancharnet.in

IT-1

Annexure- III

NATIONAL HIGHWAYS AUTHORITY OF INDIA

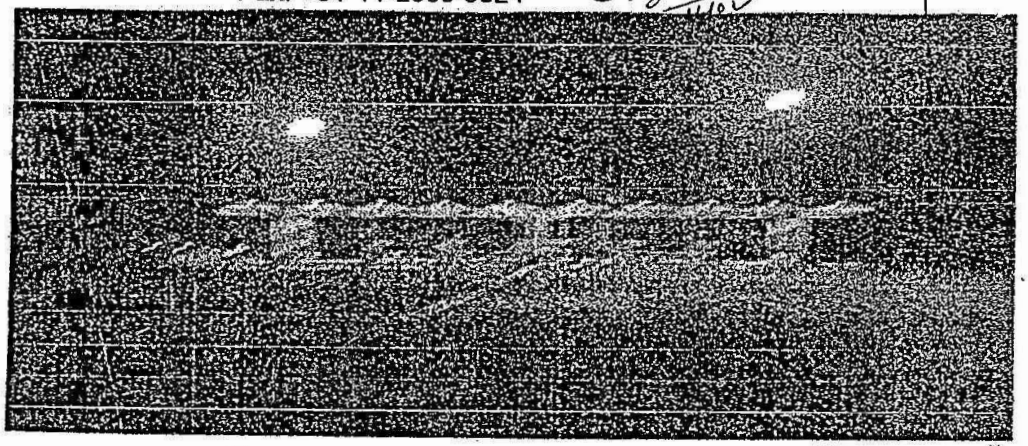
Bid for "Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur – Trichy Section of NH-67 from Km 80.000 to Km 135.750 in the State of Tamil Nadu on Build, Operate and Transfer (BOT) basis"

Package No.: NHDP-III/ BOT/ TN/ 03

PART 3: FINANCIAL PROPOSAL

Submitted to:

Shri D. Sarangi
General Manager (BOT-IA)
National Highways Authority of India
G-5& G-6, Sector-10, Dwarka,
NEW DELHI - 110 075.
Phone: +91-11 2507 4100 (Extn.1203)
Fax: +91-11-2509 3524



NIGHT VIEW OF TOLL PLAZA AT TADA- NALLORE
SECTION OF NATIONAL HIGHWAY NO.- 5

Submitted by:

MADHUCON PROJECTS LIMITED
D-27, East of Kailash
New Delhi-110 065
Tel: 011 – 26425507 / 26425820
Fax # +91-11-26476713
E-mail: madhucon@ndb.vsnl.net.in

Annexture-III

MADHUCON
PROJECTS LIMITED

- No cutting
- No overwriting

16.02.2006

ANNEX 6

"Design, Engineering, Finance, Construction, Operation and Maintenance of TANJAVUR -TRICHY Section of NH67 from Km 80.000 to Km 135.750 (the "Project") in the State of Tamil Nadu on Build, Operate and Transfer (BOT) basis."

Price Bid Format
(in Indian Rupees crores only)

For Grant

Grant during Construction Period	Rs 78.44 Crores

Rs Seventy eight crores forty four lakhs only

Or

For Negative Grant

Concession Year	Discount factor @ 10% (A)	Yearly Negative Grant (B)	Net present Value of Negative Grant (AxB)
		Fig / Words	Fig
1	0.909		
2	0.826		
3	0.751		
4	0.683		
5	0.621		
6	0.564		
7	0.513		
8	0.467		
9	0.424		
10	0.386		
11	0.350		
12	0.319		
13	0.290		
14	0.263		
15	0.239		
16	0.218		
17	0.198		
18	0.180		
Total Present Value on Proposal Due Date @ 10% per annum on Appointed			

Total Grant / Negative Grant: Rs. _____ (Rs. .....crores In words)

Total Cumulative Negative Grant on NPV @10% Rs. _____ (Rs. ..... crores In words)
(to be filled in, in case the Bidder is quoting Negative Grant)

(The figures quoted should be covered with a clear adhesive tape)

Corporate Office: Madhucon House, 1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033
Tel: +91-40-23556001/2/3/4 **Fax:** +91-40-23556005 **E-mail:** hyd1_madhucon@sancharnet.in **URL:** www.madhucon.com
Administrative Office: G-27, East of Kailash, New Delhi - 110 065. **Tel:** 011-26425507/26425820
Fax: 011-26476713 **E-mail:** madhucon@ndb.vsnl.net.in

III-2

Annexture - IV

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(पोत परिवहन, सड़क परिवहन और राजमार्ग मंत्रालय)
National Highways Authority of India
(Ministry of Shipping, Road Transport and Highways)
जी-5 एवं 6, सेक्टर-10, द्वारका, नई दिल्ली-110 075
G-5 & 6, Sector-10, Dwarka, New Delhi-110075

दूरभाष / Phone. 91-11-25074100/25074200
फैक्स / Fax : 91-11-25093507 / 25093514
एक्स. / Extn.: 2223 / 2318 / 2468 / 2553

NHAI/BOT-I/11019/35/2005/316

February 28, 2006

Madhucon Projects Ltd.
D - 27, East of Kailash
New Delhi - 110 065
Fax : 011 - 2647 6713

Kind Attn : Shri. S. V. Patwardhan

Sub: Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur - Trichy Section from Km 80.000 to Km 135.750 of NH - 67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis - *Contract Package No. NHDP-III/BOT/TN/03*

Ref : Your BOT submitted on 30/01/2006

Sir,

This is to notify that based on your above cited Proposal submitted on 30/01/2006 regarding "Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur - Trichy Section from Km 80.000 to Km 135.750 of NH - 67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis" involving Grant of Rs. 78.44 Crore (Rupees Seventy Eight Crore Forty Four Lacs Only) is hereby accepted by NHAI declaring you as the *"Successful Bidder"*. The Concession Period is 20 years including Construction Period of 30 months.

2. In accordance with the Contract Clause 1.36.1 (refer PART - I), you are hereby requested to confirm us of your acceptance of this LOA within 7 days of its issue. Thereafter, you are required to execute the Concession Agreement within 30 days of your acceptance of LOA.

3. Please note that the amount of accepted Grant is payable as per the conditions of the Bid Documents.

28.02.2006

अशोक वासन / ASHOK WASSON
मुख्य महाप्रबंधक / Chief General Manager
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
National Highways Authority of India
(पोत परिवहन, सड़क परिवहन और राजमार्ग मंत्रालय)
Ministry of Shipping, Road Transport & Hwys.
जी एवं 6, सेक्टर-10, द्वारका, नई दिल्ली
G-5 & 6, Sector-10, Dwarka, New Delhi

Contd. ... 2/-

IV-1

(Letter No. NHAI/BOT/11019/35/2005/..... dated February 28, 2006)

4. You are also required to furnish the Bank Guarantee towards Performance Security of Rs. 14 Crore (Rupees Fourteen Crores Only) within the period expiring on the 30th day from the date of issue of LOA but prior to the execution of the Concession Agreement (refer Clause 1.37.1 of PART - I). The Bank Guarantee shall be valid for a minimum period of ONE YEAR.

5. In case of default on your part, action as stated in Clause 1.14.5 and 1.37.3 (PART - I) of Bid Document shall be taken.

Please acknowledge.

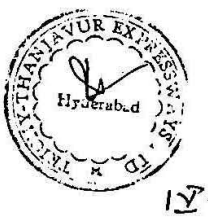
Yours faithfully

28.02.2006.

Ashok Wasson
Chief General Manager (BOT) I

अशोक वासन / ASHOK WASSON
मुख्य महाप्रबंधक / Chief General Manager
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
National Highways Authority of India
(पोत परिवहन, सडक परिवहन और राजमार्ग मंत्रालय)
Ministry of Shipping, Road Transport & Highways
पी- 5 एवं 6,सैक्टर-10, द्वारका, नई दिल्ली
P- 5 & 6, Sector 10, Dwarka, New Delhi





IV-2

09/3/06
Annexure-V

MADHUCON
PROJECTS LIMITED

Ref : MPL/ND/NHAI/2006/178

Date : 09/3/2006

National Highways Authority of Indian
G-5 & 6, Sector – 10, Dwarka
New Delhi – 110 075.

Kind Attn.: **Mr. Ashok Wasson, Chief General Manager (BOT) I**

Sub.: Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur – Trichy Section from Km. 80.000 to Km. 135.750 of N.H. – 67 in the State of Tamil Nadu under NHDP Phase-IIIA on Build, Operate and Transfer (BOT) basis. (Package No. NHDP-III/BOT/TN/03

3390/(GM(BOT)I
10/3/06

- Letter of Acceptance reg.

Dear Sir,

We acknowledge with thanks receipt of your letter No. NHAI/BOT-I/11019/35/2005/316 dated 28 February 2006 regarding above project and accept the terms and conditions stipulated therein.

As per the requirement of the bid we are arranging to get Performance Security from our Bankers as per stipulated proforma.

Thanking you,

1. On file pl.
2. Pl. examine

Yours faithfully

MADHUCON PROJECT LIMITED

GM(BOT)IB
09.03.06
Manager (F)(BOT)
10/03/06

S.V. PATWARDHAN
MANAGING DIRECTOR

TRICHY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

Administrative Office: D-27, East of Kailash, New Delhi - 110 065. Tel: 011-2642 5507 / 2642 5820
Fax: +91-11-26476713 E-mail: madhucon@ndb.vsnl.net.in URL: www.madhucon.com
Corporate Office: Madhucon House, 1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033
Tel: +91-40-2355 6001/2/3/4 Fax: +91-40-2355 6005 E-mail: hyd1_madhucon@sancharnet.in

V-1

995/GM(BOT)/IIB-
29/4/06
Annexure-VI

MADHUCON
PROJECTS LIMITED

Ref: MPL / 2006 / (Trichy - Than.) / 278

Date: 28th April 2006

The General Manager (BOT) II-A
National Highways Authority of India Ltd
G-5 & 6, Sector-10, Dwarka
New Delhi-110 075.

Kind Attn.: Mr. Rajesh Poonia, General Manager (BOT) II-A

Sub:Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur - Trichy Section from Km 80.000 to Km 135.750 of NH-67 under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis. Contract Package No. (NHDP-III/ BOT/ TN-03)

- Execution of Concession Agreement

Dear Sir,

With reference to your letter No. NHAI/BOT-I/11019/35/2005/689 dt April 26, 2006. The following documents are submitted as under, as desired by your above-mentioned letter.

i) Certified copy of Memorandum of Association and Article of Association of the SPV.

ii) Introduction letter from the authorized signatory to introduce the SPV.

iii) Board Resolution of the SPV mentioning that New SPV is authorized to execute the Concession Agreement and name of authorized signatories for execution of the Concession Agreement on behalf of the SPV.

iv) Project milestone as per Schedule 'H' duly signed by the authorized signatory

Kindly, issue draft of proposed Concession Agreement for our study and comments if any.

Please acknowledge.

Thanking you,

Yours faithfully,
MADHUCON PROJECTS LTD.

(S.V. PATWARDHAN)
MANAGING DIRECTOR

S.V. PATWARDHAN
Managing Director
Madhucon Projects Ltd.

Encl. As above.

THANJAVUR EXPRESSWAY LTD. Hyderabad

Administrative Office: D-27, East of Kailash, New Delhi - 110 065. **Tel:** 011-2642 5507 / 2642 5820
Fax: +91-11-26476713 **E-mail:** madhucon@hd6.vsnl.net.in **URL:** www.madhucon.com

Corporate Office: Madhucon House, 1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033
Tel: +91-40-2355 6001/2/3/4 **Fax:** +91-40-2355 6005 **E-mail:** hyd1_madhucon@sancharnet.in

VI-1

Annexure VI

MADHUCON
PROJECTS LIMITED

Ref: MPL ND: NHAI 277

28th April, 2006

National Highways Authority of India
G-5 & 6, Sector-10, Dwarka,
New Delhi-110 075.

Kind Attn. : Mr. Rajesh Poonia, General Manager (BOT) IIA

Reg : Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur - Trichy Section from Km 80.000 to Km 135.750 of NH-67 under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis. Contract Package No. (NHDP-III/ BOT/ TN-03)

Sub: Introduction of Trichy -Thanjavur Expressways Limited

Dear Sir,

As per the terms of the bid document for the above-mentioned project Madhucon Projects Limited has formed an **Special Purpose Vehicle (SPV)** in the name and style of **Trichy -Thanjavur Expressways Limited.** The company is registered with the Registrar of Companies (ROC), A.P. The ROC has allotted **Company No. 01- 49815** with registered office address as Madhu Complex, 1-7-70, Jublipura, Khammam-507 003, AP-India.

We hereby introduce **M/s Trichy -Thanjavur Expressways Limited** as an SPV formed by us for improvement, operation and maintenance of rehabilitation and strengthening of the above mentioned road project.

Thanking you,

Yours faithfully,
For **MADHUCON PROJECTS LIMITED**

Manager (BOT) (I)

(S.V.PATWARDHAN)
MANAGING DIRECTOR

S.V. PATWARDHAN
Managing Director
Madhucon Projects Ltd.

THANJAVUR EXPRESSWAYS LTD. Hyderabad

Administrative Office: D-27, East of Kailash, New Delhi - 110 065. Tel: 011-2642 5507 / 2642 5820
Fax: +91-11-26476713 E-mail: madhucon@ndb.vsnl.net.in URL: www.madhucon.com

Corporate Office: Madhucon House, 1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033
Tel: +91-40-2355 6001/2/3/4 Fax: +91-40-2355 6005 E-mail: hyd1_madhucon@sancharnet.in

VF'2

Annexture-VI

Company No. 01-49815

सत्यमेव जयते

CERTIFICATE OF COMMENCEMENT OF BUSINESS

Pursuant of Section 149(3) of the Companies Act, 1956.

I hereby certify that the TRICHY-THANJAVUR EXPRESSWAYS LIMITED

which was incorporated under the Companies Act, 1956, on the THIRTEENTH day of APRIL 2006 and which has this day filed a duly verified declaration in this prescribed from that the conditions of Section 149(1) (a) to (d) / 149 (2) (a) to (c) of the said Act, have been complied with is entitled to commence business.

Given under my hand at Hyderabad this EIGHTEENTH day of APRIL

Two Thousand and SIX.

(N. S. PONNUNAMBI)
REGISTRAR OF COMPANIES
ANDHRA PRADESH, HYDERABAD

CERTIFIED COPY

VI-3

Annexture-VI

Memorandum of Association
And
Articles of Association

CERTIFIED COPY
U. SURYANARAYANA
M.B.A., L.L.B., F.C.S.
Company Secretary
(FCS-336)

TRICHY-THANJAVUR EXPRESSWAYS LIMITED

N.H.A.I. NEW DELHI

TRICHY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

VI-4

Annexure VI

प्रारुप आई आर

Form I

[See Regulation 16(1)]

निगमन का प्रमाण - पत्र

CERTIFICATE OF INCORPORATION

ता ..... का सं .....

No. 01- 49815 of 06 - 2007

मै एतद्द्वारा प्रमाणित करता हूं कि आज .....

.....

.....

कम्पनी अधिनियम, 1956 के आधीन निगमित की गई है यह कम्पनी परिसीमित है।

I hereby certify that TRICHY-THANJAVUR EXPRESSWAYS LIMITED

.....

.....

is this day incorporated under the Companies Act, 1956 * (and that the Company is limited.)

मेरे हस्ताक्षर से आज ता ..... को दिया गया।

Given under my hand at HYDERABAD this THIRTEENTH day of APRIL Two thousand and SIX

(TWENTY THIRD CHITRA, 1927 SAKA)

CIN - U45200AP2006PLC49815

Seal

जे.एस.सी. 1

J.S.C -

(D.RAMAKRISHNAN)
कम्पनियों का रजिस्ट्रार
Registrar of Companies
Andhra Pradesh : Hyderabad.

* TO BE OMITTED IN RESPECT OF UNLIMITED COMPANY

CERTIFIED COPY

Hyderabad

VI-5

Annexure-VI

PURCHASER / EXECT/CLNT S/O OF S.R. D.R. OFFICE HYDERABAD

INDIA APR 06 2006 Rs.100.00 PB1074 STAMP DUTY ANDHRA PRADESH

CERTIFIED COPY

SUB-REGISTRAR
SUPERINTENDENT
EX-OFFICIO STAMP VENDOR
R.O. HYDERABAD.

INCORPORATED

UNDER THE COMPANIES ACT, 1956
(Act 1 of 1956)

COMPANY LIMITED BY SHARES

MEMORANDUM OF ASSOCIATION OF TRICHY-THANJAVUR EXPRESSWAYS LIMITED

I. The name of the Company is TRICHY-THANJAVUR EXPRESSWAYS LIMITED.

II. The Registered Office of the Company will be situated in the State of Andhra Pradesh.

III. The objects for which the Company is established are:

A. THE MAIN OBJECTS TO BE PURSUED BY THE COMPANY ON ITS INCORPORATION ARE:

01. To design, construct, develop, finance, operate, maintain, improve and repair highways, bridges, flyovers, culverts and other structures, approach roads including maintenance, toll collections from the users and receive of grants from Central/State Governments and/or NHAI or from other agencies in the entire concession period of the Highway Project on Build Own Operate (BOT)/Annuity basis.

02 To carry on the business, to bid for and secure Contracts on item rate, turnkey &EPC or BOT(Build Operate and Transfer)/Annuity Basis in the field of construction of Roads, Bridges, other structures, Flyovers, Highways, Expressways, property development, including, construction, maintenance, toll collections from the users and receive of grants from Central/State Governments and/or NHAI or from other agencies in the entire concession period of the project on BOT/Annuity basis and to construct, execute, undertake, carryout the business of all types of civil engineering works of canals, tunnels, irrigation projects, dams, property development, industrial parks, entertainments centers, food and hospitality units like hotels motels and civil works including all types earth works using the latest technology

TRICHY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

VI-6

03 To carry on the business, to render Professional and Technical Knowhow, Consultancy, Project preparation on turnkey basis and advise any individual, firm, company, Government or statutory undertaking or corporation or any other body carrying on any business whatsoever in the field of Design and Engineering, Research and Development, Business and General Management relating to Infrastructure Projects.

OBJECTS ANCILLARY OR INCIDENTAL TO THE ATTAINMENT OF THE MAIN OBJECTS:

01 To carry on the business, to acquire and undertake the whole or any part of the business, property and liabilities of any person or company carrying on or proposing to carry on any business which the Company is authorized to carry on or possession of property suitable for the purposes of the Company which can be carried on in conjunction therewith or which is capable of being conducted so as to directly or indirectly benefit the Company.

02 To purchase, take on lease or in exchange, hire or otherwise acquire any lands, apartments, houses, flats, any rights, privileges and easements and concessions and factories, machinery, implements, tools, live and dead stock, stores, effects and other property, real or personal, immovable or movable of any kind which may be required for attaining the main object.

03 To develop and turn to account any land acquired by the Company which it is interested and in particular by laying out and preparing the same for building purposes, constructing, altering, pulling down, decorating, painting, paving, draining, farming and letting buildings on lease or building arrangements and by advancing money to and entering into contracts and arrangements of all kinds with builders, architects and others.

04 To amalgamate, enter into partnership or into any arrangement for sharing profits, joint ventures or for limiting competition with any person or company carrying on or engaged in or about to carry on or engage in, any business or transaction which the Company is authorized to carry on or engage in or which can be carried on in conjunction therewith or which is capable of being conducted so as to directly or indirectly benefit the Company.

05 To improve, manage, develop, grant rights or privileges in respect of, or otherwise deal with, all or any part of the property and rights of the Company

06 To appoint EPC (Engineering Procurement Construction) Contractors for carrying the execution of the said works.

07 To subscribe for, take or otherwise acquire and hold shares, stock, debentures or other securities of any other Company having objects altogether or in part similar to those of the Company, or carrying on any business capable of being conducted, so as to directly or indirectly benefit the Company.

08 To invest and deal with the money of the Company not immediately required in any manner.

09 To lend and advance money or give credit to such persons or Companies and on such terms as may seem expedient and in particular to customers and others having dealings with the Company and to guarantee the performance of any contract or obligation and the payment of money of or by any such persons or Companies and generally to give guarantees and indemnities.

10 To receive money on deposit or loan and borrow or raise money in such a manner as the Company shall think fit and in particular by the issue of debentures or debenture stock (perpetual or otherwise) and to secure the repayment of any money borrowed, raised or owing by mortgage, charge or lien upon all or any of the property or assets of the Company/ both present and future), including its uncalled capital and also by a similar mortgage charge or lien to secure and guarantee the performance by the Company or any other persons or Company of any obligation undertaken by the Company or any other persons or Company as the case may be.

11 To draw, make, accept, endorse, discount, execute and issue promissory notes, bills of exchange, bills of lading, warrants, debentures and other negotiable or transferable instruments.

12 To sell, lease, mortgage or otherwise dispose of the property, assets or undertakings of the Company or any part thereof for such consideration as the Company may think fit and in particular for shares, stocks, debentures or other securities whether or not having objects altogether or in part similar to those of the Company.

13 To give donations or subscriptions to any religious, charitable or social institutions or to give any charity incidental to or conducive to any business that may be carried on by the Company.

14 To pay out of the funds of the Company, all expenses which the Company may lawfully pay with respect to the formation and registration of the Company or the issue of its capital, including brokerage and commission for obtaining applications for or taking, placing or underwriting or producing the underwriting of shares, debentures or other securities of the Company.

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15 To establish or promote or concur in establishing or promoting any Company or Companies for the purpose of acquiring all or any of the property, rights and liabilities of the Company or for any other purpose which may be seen directly or indirectly calculated to benefit the Company and to place or guarantee the placing of, underwriting, subscribing for or otherwise acquiring all or any part of the shares, debentures or other securities of any such other Company.

16 To create any depreciation funds, reserve fund, insurance fund, sinking funds or any other special fund whether for depreciation or repair replacement, improving, extending or maintaining any of the properties of the Company or for any other purposes conducive to the interests of the Company.

17 To capitalize its reserves and issue Bonus shares to the Shareholders in proportion of their then given shareholdings in the Company.

18 To undertake and execute any trust the undertaking of which may seem desirable to Company either gratuitously or otherwise.

19 To do all such other things as may be deemed incidental or conducive to the attainment of the above mentioned main objects or any of them.

IV The liability of the members of the Company is limited.

V The Authorized Share Capital of the Company is Rs.1,00,00,000/- (Rupees One Crore) divided into 10,00,000 Equity Shares of Rs.10/- (Rupees ten) each.

The Company will have the right to increase or reduce its capital and to divide the shares in the capital for the time being into several classes and to attach there to respectively any preferential, qualified or special rights, privileges or conditions in such a manner, as may for the time being, provided by the Companies Act, 1956 or provided by the Regulations of the Company for the time being.

Contd...5...

Annexure - VI

We the several persons whose names and addresses are subscribed hereunder are desirous of forming Company in pursuance of this Memorandum of Association and we respectively agree to take the number of shares in the capital of the Company set opposite our respective names:

S.No	Name, address, description, occupation of the subscriber	No.of Equity shares taken by each subscriber	Signature of Subscriber	Name & Address, occupation of witness to the signature of subscriber with his signature
01.	Madhucon Projects Limited (CIN: U74210AP1990PTC001114) 1-7-70, Jubilipura, Khammam-507003 Andhra Pradesh Represented by: S. Vaikuntanathan. Director (Finance)	20000 Twenty Thousand only	[signature]	
02	Nama Nageswar Rao S/o Late N. Muthaiah. H NO. 648. Plot NO. 214.1 Road NO. 14 Jubilli hills. Hyderabad - 500033. Occ: Business	8888 Eight thousand eight hundred eighty eight	[signature]	[illegible]
03	Nama. Seethaiah S/o late Muthaiah Varalakshmi Nilayam H.No. 11-4-65/C Nehru Nagar Khammam 507001 Occ. Business	8888 (Eight thousand Eight hundred Eighty Eight only)	[signature]	
04	Kamma. Sriniwasa Rao. S/o Sri Kamma. Nageswara Rao. Varalakshmi Nilayam. H.No: 11-4-65/c, Nehru Nagar, Khammam - 507001 Occu: Business	8888 Eight thousand Eight hundred Eighty Eight only	[signature]	

THICKY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

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05	Nama. Krishnaiah. S/o Late N. muthaiah Varalakshmi nilayam H.No. 11-4-65/C. Nehru nagar Khammam - 507001 Occu: Business.	1888 One Thousand Eight hundred Eighty Eight only	[signature]	Practising Company Secretary FCS 33 CP 2768 Ashok Nagar Colony Hyderabad 500072
06	Nama Rama Rao. S/o Late N muthaiah Varalakshmi Nilayam. H.NO: 11-4-65/C, Nehru Nagar Khammam - 507001 OCCU: Business	560 (five hundred sixty only)	[signature]	Udyoga Narayana (U. SUAYARA AYANA) S/o late U. Venkatesam Plot No: 836A, Vivekananda Nagar Colony Kukatpally Hyderabad
07	Mallempati Madhu, S/o Late. M. Gopal Rao Varalakshmi Nilayam H.NO: 11-4-65/C, Nehru Nagar Khammam - 507001 Occu: Business	888 Eight hundred Eighty Eight only	[signature]	

Dated: 8.4.2006
Place: Hyderabad

Total 50,000 Fifty Thousand Eighty Shares only.

भा० रा० रा० प्रा०, नई दि...
N.H.A.I., N...

TRICHY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

Annexure-VI

CERTIFIED COPY
SURYANARAYANA
M.S.A., L.L.B., F.C.S.
Company Secretary
CP 2768 (FCS-336)

PURCHASER
DIRECT/CLIENT
SEC OF S.R.
D.R. OFFICE
HYDERABAD
143214 APR 06 2006
Rs.0015000 PB1074
INDIA STAMP DUTY ANDHRA PRADESH

SUB-REGISTRAR
SUPERINTENDENT
OFFICIOSTAMPVENDOR
D.R. HYDERABAD

ARTICLES OF ASSOCIATION
OF
Trichy-Thanjavur Expressways Limited
(Incorporated under the Companies Act, 1956)
Company Limited by Shares

Constitution-Table "A" not to apply	01	The Regulations contained in Table "A" of the First Schedule to the Companies Act, 1956, shall not apply to the Company except so far as the they are embodied in the following Articles, which shall be the regulations for the Management of the Company.
Company to be governed by these Articles	02	The Regulations for the Management of the Company and for the observance of the members thereof and their representatives shall, subject to as aforesaid and to any exercise of the Statutory Powers of the Company in reference to the repeal or alteration of or addition to its Articles of Association by Special Resolution, as prescribed or permitted by the Act, be as contained in these Articles.
Interpretation	03	In the interpretation of these Articles, the following expressions shall have the following meanings, unless repugnant to the subject or context:
The Act	a)	"The Act" means the Companies Act, 1956 as amended upto date.
The Articles	b)	"The Articles" means the Articles of Association of the Company, for the time being in force.
The Company or This Company	c)	"The Company" or "This Company" means "Trichy-Thanjavur Expressways Limited".
Board of Directors or Board	d)	"Board of Directors or Board" in relation to a Company means the Board of Directors of the Company duly constituted for the time being.
Director and Directors	e)	"Director" includes any person occupying the position of Director, by whatever name called. "Directors" means the Directors for the time being of the Company.

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Capital	f)	"Capital" means the capital for the time being raised or authorised to be raised for the purposes of the Company.
Dividend	g)	'Dividend' includes 'Bonus'.
In writing	h)	"In Writing" includes printing, lithography, typewriting and any other modes of representating or reproducing words in a visible form and includes computer printouts.
Gender	i)	Words importing the masculine gender also include the feminine gender.
Members / Share holders	i)	Members" shall mean members or shareholders of the Company holding a share or shares of any class and registered in the Register of Members of the Company.
Month	k)	"Month" shall mean the calendar month.
Persons	l)	Persons" shall include any Corporation as well as individuals.
Proxy	m)	"Proxy" includes attorney duly constituted under a Power of Attorney.
Presents / Regulations	n)	These "presents" or "Regulations" means these Articles of Association as originally framed or altered from time to time and in force for the time being and includes the Memorandum of Association where the context so requires.
Register	o)	"Register" means the Register of members to be kept pursuant to the Act.
Seal	p)	"The Seal" means the Common seal for the time being of the Company.
Shares or Stock	q)	"The Shares" or "Stock" into which the Capital is divided and the interest corresponding with such Shares or Stock.
Singular / Plural	r)	Words importing the "singular" shall include the "plural" and words importing the plural shall include the "singular".
Section	s)	"Section" means Section of the Companies Act, 1956.
Special Resolution	t)	"Special Resolution" shall have the meaning assigned thereto by Section-189 of the Companies Act, 1956.
Year	u)	"Year" means year of account of the Company.

Expressions in the Act to bear the same meaning in Articles	v)	Subject as aforesaid, any words or expressions defined in the Act shall, except where the subject or context forbids bear the same meaning in these Articles.
Marginal notes	w)	The marginal notes hereto shall not effect the Construction hereof:

COMMENCEMENT OF BUSINESS

Commencement of Business	04	The Company shall commence business or exercise any borrowing powers only after the requirements of Section 149 of the Act have been complied with.
Power of Company To purchase its Own Shares	05	Subject to the Provisions of Secs.77A, 77A A and 77B of the Act, a Company may purchase its own shares as "buy-back" out of (i) its free reserves: or (ii) the Securities Premium Account; or (iii) the proceeds of any shares or other specified securities shall be made out of the proceeds of an earlier issue of the same kind of Share or same kind of other specified securities.
Share Capital	06	The Authorised Share Capital of the Company is Rs.1,00,00,000/- (Rupees One Crore) divided into 10,00,000 (Ten Lakhs) Equity Shares of Rs.10/- each. The Company will have the right to increase or reduce its capital and to divide the shares in the capital for the time being into several classes and to attach here respectively any preferential, qualified or special rights, privileges or conditions in such a manner, as may for the time being be provided by the Companies Act, 1956 or provided by the Regulations of the Company for the time being.
	07 (a)	The Board may at its discretion, convert the unissued Equity Shares into preference shares or redeemable preference shares and vice versa and the Company may issue any part or parts of the unissued shares upon such terms and conditions and with such rights and privileges annexed thereto as the Company thinks fit subject to the provisions of Section-86 of the Act and in particular may issue such shares with such Preferential or Qualified right as to dividends and in the distribution of the assets of the Company as the Company may, subject to the aforesaid section, determine in its general meetings.
Allotment of Shares	08	The Board shall duly comply with the Provisions of Section-75 of the Act with regards to allotment of Shares from time to time.





09 The Board may, at any time increase the subscribed Capital of the Company by issue of new Shares out of the unissued part of the Share Capital in the Original Part or subsequently created capital, but subject to Section-81 of the Act and the following provisions, namely:

(a) Where the offer and allotment of such shares are made within two years from the date of incorporation of the Company or within one year from the first allotment of Shares made after its incorporation, whichever is earlier, the Board shall be at liberty to offer the Shares and all the same to any person or persons at their discretion.

(b) In respect of offer and allotment made subsequent to the date set out in Clause (a) above, the Directors shall, subject to Provisions of Section-81 of the Act and of Clause-(c) hereunder, observe the following conditions:

i) Such new shares shall be offered to the persons who at the date of the offer are shareholders of the Equity Shares of the Company in proportion, as nearly as circumstances admit, to the Capital paid-up on these shares at the date.

ii) The offer aforesaid shall be made by notice by specifying the number of shares offered and limiting a time not being less than thirty days from the date of the offer within which the offer, if not accepted, will be deemed to have been declined.

iii) The offer aforesaid shall be deemed to include a right exercisable by the person concerned to renounce the shares offered to him or any of them in favour of any other person and the notice referred to in clause (2) above shall contain a statement of this right.

iv) After the expiry of the time specified in the notice aforesaid or earlier intimation from the person to whom such notice is given that he declines to accept the shares offered, the Board may dispose of them in such a manner as it thinks most beneficial to the Company.

(c) The Directors may, with the sanction of the Company in General Meeting offer and allot shares to any person at their discretion provided that such sanction is accorded either by:

a special resolution passed at a General Meeting, or

ii) by an ordinary resolution passed at a General Meeting evidenced by majority of the votes cast and with the approval of the Central Government in accordance with Section 81 of the Act.

Nothing in this clause shall apply to the increase of the subscribed capital of the Company caused by the exercise of an option attached to debentures issued or loans raised by the Company.

i) To convert such debentures or loans into shares in the Company, or

ii) To subscribe for shares in the Company.

Provided that the terms of issue of such debentures or the terms of such loans include therein providing for such option and such term:

a) Have been approved by a special resolution passed by the Company in a General Meeting before the issue of the debentures or the raising of the loans and also.

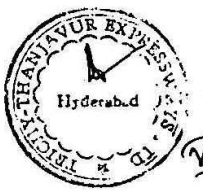
b) Have either been approved by the Central Government before the issue of the debentures or the raising of the loans or is in confirmity with the rules, if any, made by the Government, in this behalf.

Option or right to calls on shares is not be given to any person except with the sanction of the Company in a General Meeting.

Power of General Meeting to offer Shares to such persons as the company may resolve

10 In addition to and without derogating from the powers for the purpose conferred on the Board under Article 9, the Company in a General Meeting may determine that any shares (Whether forming part of the original capital or of any increased capital of the Company) shall be offered to such person (Whether members or holders of debentures of the Company or not) in such proportions and on such terms and conditions either at a premium or at par (subject to compliance with the provisions of Section 79 of the Act) or at a discount, as such General Meeting shall determine and with the power to give to any person (Whether a member or holder of debentures of the Company or not) the option to call for or be allotted shares of any class of the Company either at a premium or at par, or (subject to compliance with the provisions of Section-79 of the Act) at a discount,





such option being exercisable at such times and for such consideration as may be directed by such General Meeting or the Company in a General Meeting may make any other provision whatsoever for the issue, allotment or disposal of any shares.

Variation of rights

11 The rights attached to each class of shares (unless otherwise provided by the terms of issue of the shares of the class) may, subject to the provisions of "Section-106 and 107 of the Act, be varied with the consent in writing of the holders of three-fourths of the issued shares of that class or with the sanction of a Special Resolution passed at a separate meeting of the holders of the Shares of that class. To every such separate meeting, the provisions of these Articles relating to General Meetings shall mutatis mutandis apply, except that the necessary quorum shall be two persons atleast holding or representing by proxy one-tenth of the issued shares of that class.

Issue of further Shares pari passu shall not affect the right of shares already issued

12 The rights conferred upon the holders of the shares of any class issued with preferential or other rights shall not, unless otherwise expressly provided for by the terms of issue of the shares of that class, be deemed to be varied by the creation or issue of further shares ranking pari passu therewith.

No issue with disproportionate rights

13 The Company shall not issue any shares, not being preference shares, which carry voting rights or right in the Company as to dividend, capital or otherwise which are disproportionate to the rights attached to the holders of other shares not being preference shares.

Commission for placing shares debentures etc.

14 1. Subject to the provisions of Section 76 of the Act, the Company may, at any time, pay a commission to any person for subscribing or agreeing to subscribe (Whether absolutely or conditionally) for any shares, debentures or debenture stock of the Company or procuring or agreeing to procure subscriptions (Whether absolute or conditional) for any shares, debentures or debenture stock of the Company, but so that the statutory conditions and requirements shall be observed and complied with and the amount or rate of commission shall not exceed five percent of the price at which the shares are issued and in case of debentures the rate of commission shall not exceed two and a half percent of the price at which the debentures are issued.

2. The Company may also, on any issue, pay such brokerage as may be lawful.

Issue of Sweat Equity Shares	15	The Company may issue Sweat Equity Shares to its employees or Directors at a discount or for a consideration other than cash for providing know-how or making available rights in the nature of intellectual property rights or value additions by whatever name called, subject to Provisions of Section.79A of the Act. All the limitations, restrictions and provisions relating to Equity Shares shall be applicable to such Sweat Equity Shares issued.
Issue other than for cash	16	1.The Directors may allot and issue shares in the capital of the Company as payment or part payment for any property sold or transferred, goods or machinery and appliances supplied or for services rendered to the Company in or about the formation or promotion of the Company or the acquisition and or conduct of its business; and any shares which may be so allotted, may be issued as fully paid up share, and if so issued, shall be deemed to be fully paid up shares.
		2. The said power vested in the Board by this Article shall not be exercised except by the unanimous consent of all the Directors or with the previous sanction by a special resolution passed at a General Meeting of the Company.
Joint Holders	17	Where two or more persons are registered as joint holders of any share they shall be deemed to hold the same as joint tenants with benefit of survivorship subject to the following provisions:
	a)	The person whose name stands first on the register in respect of such share shall alone be entitled to delivery of certificate thereof.
	b)	Any one of such persons may give effectual receipt for any dividends, bonus or return of capital payable in respect of such share, and such joint holders shall be severally, as well as jointly liable for payment of all installments and calls due in respect of such share/shares.
	c)	Any one such person may vote at any meeting either personally or by proxy in respect of such shares, as if he was solely entitled thereto, and if more than one of such joint holders be present at any meeting personally or by proxy, that one of the said persons so present whose name stands first on the register in respect of such share, shall

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alone be entitled to vote in respect thereof. Several executors or administrators, or a deceased member in whose names any shares stand shall for the purpose of this article, be deemed joint holders, thereof.

d) In case of death of any one or more of such joint holders, the survivors shall be the only persons recognised by the Company as having any title to or interest in such share, but the Directors may require such evidence of death, as they may deem fit; and nothing herein contained shall be taken to release the estate of a deceased jointly with any other person.

e) All notices directed to be given to the members shall be given to such person named first in the register, and notice so given shall be sufficient notice to all the holders of such shares.

Nomination of Shares

18 1. Every holder of Shares in, or holder of debentures of, a company may, at any time, nominate, in the prescribed manner, a person to whom his Shares in, or debentures of, the Company shall vest in the event of his death.

2. Where the Shares in, or debentures of, a company are held by more than one person jointly, the joint holders may together nominate, in the prescribed manner, a person to whom all the rights in the shares or debentures of the company shall vest in the event of death of all the joint holders.

3. Notwithstanding anything contained in any other Law for the time being in force or in any disposition, whether testamentary or otherwise, in respect of such shares in, or debentures of, the company, where a nomination made in the prescribed manner purports to confer on any person the right to vest the shares in, or debentures of, the company, the nominees shall, on the death of the shareholders or holder of debentures of, the company or, as the case may be , on the death of the joint holders become entitled to all the rights in the Shares or debentures of the company or, as the case may be all the joint holders, in relation to such shares in, or debentures of the Company to the exclusion of all other persons, unless the nomination is varied or cancelled in the prescribed manner.

4. Where the nominee is a minor, it shall be lawful for the holder of shares or holder of debentures, to make the nomination to appoint in the prescribed manner any person to become entitled to Shares in or debentures of the company in the event of his death, during the minority.

SHARE CERTIFICATES

Issue of Share Certificates

19 Every Certificate of title to shares shall be issued under the seal of the Company. Every Share Certificate and every document of title to the shares whether in renewal of an existing share certificate or other document of title or issued for the first time shall be issued, under the authority of the Board of Directors and in accordance with the provisions of the Companies (Issue of Share Certificates) Rules 1960 or any modification thereof and in accordance with provisions of Law or other rule having the force of law applicable thereto.

Right to Certificate

20 1. Every person whose name is entered as a member in the Register shall be entitled to receive without payment.

a) One certificate for all his shares; or

b) Where the shares so allotted at any one time exceed the number of shares fixed as marketable lot in accordance with the usages of the Stock Exchange, or at the request of the share holder, several certificates one each per marketable lot and one for the balance.

2. The Company shall within two months after the allotment or within one month after application for the registration of the transfer of any shares or debentures complete and have ready for delivery, the certificates for all the shares and debentures so allotted or transferred unless the conditions of issue of the said shares or debentures otherwise provide.

3. Every certificate shall be issued under the seal of the company and shall specify the shares or debentures to which it relates and the amount paid up thereon.

4. The provisions of clauses (2) and (3) above shall apply mutatis mutandis to debentures and debenture stock allotted or transferred.

5. No fee shall be charged for the issue of a new share certificate or for consolidation of several certificates into one or for issue of fresh share certificates in lieu of share certificates on the back of which there is no space for

endorsement for transfer or for registration of any probate, Letters of Administration, Succession Certificate or like document, or for registration of any Power of Attorney, Partnership Deed, Memorandum and Articles of the Companies, or other similar documents.

One certificate for joint holders

21 In respect of any share held jointly by several persons, the Company shall not be bound to issue more than one certificate for the same share and delivery of a certificate of a share to one of several joint holders shall be sufficient delivery to all such holders. Subject to the provisions as aforesaid that the joint holders shall be entitled to apply for several certificates each for one or more shares held by them in accordance with Article 20 above.

Endorsement of Transfer

22 In respect of any transfer of shares registered in accordance with the provisions of these Article, the Board may, at their discretion direct an endorsement of the transfer and the name of the transferee and other particulars on the existing share certificates and authorise any director or Officer of the Company to authenticate such endorsement on behalf of the Company or direct the issue of a fresh share-certificate, in lieu of and in cancellation of the existing certificate, in the name of the transferee.

Renewal of Certificates

23 If a Certificate be worn out, defaced, destroyed or lost or if there is no further space on the back thereof for endorsement of transfer, it shall, if requested, be replaced by a new certificate free of charge, provided, however, that such new certificate shall not be granted except upon delivery of the worn-out or defaced or used up certificate for the purpose of cancellation, in accordance with the Companies (Issue of Shares Certificates) Rules, 1960 or upon proof of destruction or loss and on such indemnity as the Board may require in the case of the certificate having been destroyed or lost. Any duplicate certificate shall be marked as such.

Company's lien on shares

24 The company shall have a first and paramount lien upon all the shares (other than fully paid-up shares) registered in the name of each member (whether solely or jointly with others)and upon the proceeds of a sale thereof for all monies (whether presently payable or not) called or payable at a fixed time in respect of such shares and no equitable interest in any shares shall be created except upon the footing and the condition that this Article will have full effect. And such lien shall extend to all dividends and bonus from time to time declared in respect of such shares.

Enforcing of lien by sale

25 For the purpose of enforcing such lien, the Board may sell the shares subject thereto in such a manner as they think fit but no sale shall be made until the expiration of 14 days after a notice in writing demanding payment of such amount in respect of which the lien exists has been given to the registered holder of the shares for the time being, or to the person entitled to the shares by reason of the death or insolvency of the registered holder.

Authority to transfer

26 To give effect to such sale, the Board of Directors may authorise some person to transfer the shares sold to the purchaser thereof and the purchaser shall be registered as the holder of the shares comprised in any such transfer. The purchaser shall not be bound to see the application of the purchase money, nor shall his title to the share be affected by any irregularity or invalidity in the proceedings in reference to the sale.

Application or proceeds of sale

27 1. The net proceeds of any such sale shall be received by the Company and applied in payment of such part of the amount in respect of which the lien exists as is presently payable.

2. The residue if any, shall, subject to a like lien for sums not presently payable as existed upon the shares before the sale, be paid to the person entitled to the shares at the date of the sale.

Application of any money due to shareholder

28 Any money due from the Company to a shareholder, may without the consent of such shareholder, be applied by the Company in or towards payment of any money due from him, either alone or jointly with any other person to the company in respect of calls or otherwise.

CALLS ON SHARES

Calls

29 Subject to the provisions of Section 91 of the Act, the Board of Directors may, from time to time make such calls as they think fit upon the members in respect of all monies unpaid on the shares held by them respectively and not by the conditions of allotment thereof made payable at fixed times and each member shall pay the amount of each call so made on him or Company at the time, date and place or at the date, times and places appointed by the Board of Directors.





Call when deemed to be made

30 The Board of Directors, may when making a call by resolution, determine the date on which such calls shall be deemed to have been made not being earlier than the date of resolution making such call and there upon the call shall be deemed to have been made on the date so determined and if no such date is fixed, the call shall be deemed to have been made on the date on which the resolution of the Board to make the call was passed.

Notice for calls

31 Not less than 14 day notice for any call shall be given, specifying the date, time and place of payment, provided that before the time for payment of such call, the directors may give notice in writing to the members extending the time for payment thereof.

Sums payable at fixed date to be treated as calls

32 If by the terms of issue of any shares or otherwise any amount is made payable at any fixed date or by installments at fixed dates, whether on account of the nominal value of the share or by way of premium, every such amount of installment shall be payable as if it were a call duly made by the Directors and of which due notice had been given and all the provisions herein contained in respect of calls shall relate to such amount or installment accordingly.

Calls to carry interest

33 1. If a sum called in respect of the shares is not paid before or on the day appointed for payment thereof, the person from whom the sum is due shall pay interest upon the sum at the rate fixed by the Board of Directors from the day appointed thereof to the time of actual payment, but the Board of directors shall be at liberty to waive payment of that interest wholly or in part.

2. The provisions of this article to payment of interest shall apply in the case of non-payment of any such sum which by the terms of issue of shares becomes payable at fixed date whether on account of the amount of the share or by way of premium, as if the same had become payable by virtue of a call duly made and notified.

Payment of call in advance

34 The Board of Directors may, if they think fit, receive from any member, willing to advance the same, all or any part of the money uncalled and unpaid upon any shares held by him and upon all or any part of the money so advanced, may (until the same would, but for such advance, become presently payable) pay interest at such rate not exceeding (without the sanction of the company in general meeting) [illegible] annum as may be agreed upon between the

member paying the sum in advance and the Board of Directors but shall not, in receipt of such advances, confer a right to the dividend or to participate in profits or to any voting rights.

Partial payment not to preclude forfeiture

35 Neither a judgement nor a decree in favour of the Company for calls or other money due in respect of any share, nor any part payment or satisfaction there under, nor the receipt by the Company of a portion of any money which shall, from time to time, be due from any member in respect of any share, either by way of principal or interest, nor any advance granted by the Company in respect of the payment of any such money, shell preclude the company from thereafter proceeding to enforce a forfeiture of such shares as herein under provided.

36 If, by any conditions of allotment of any share, the whole or part of the amount or issue price thereof shall be payable by installments, every such installment, shall, when due, be paid to the Company by the person who for the time being and from time to time shall be the registered holder of the shares or his legal representative, if any.

FORFEITURE OF SHARES

If call or installment not paid notice may of be given

37 a. If any member fails to pay any call or installment of a call on the day appointed for payment thereof, the Board may, at any time thereafter, during such times as any part the call or installment remains unpaid, serve a notice on him requiring payment of so much of the call or installments as is unpaid together with any interest that may have accrued and all expenses that may have been incurred by the company by reason of such non-payment.

Form of Notice of forfeiture

b. The notice aforesaid shall further:

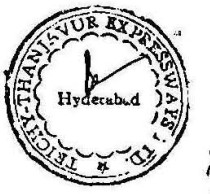
i) Specify a day (not earlier than the expiry of fourteen days from the date of notice) on or before which the payment required by the notice is to be made, and

ii) State that in the event of non-payment on or before the day so specified, the shares in respect of which the call was made will be liable to be forfeited.

Board's right to forfeit if requirements of notice are not complied with

c. If the requirements of any such notice as aforesaid are not complied with, any share in respect of which the notice has been given may, at any time thereafter, before the payment required by the notice has been made, be forfeited by a resolution of the Board to that effect.





Sale of forfeited Shares

d) i) A forfeited share may be sold or otherwise disposed off on such terms and in such manner as the Board thinks fit.

Liability of forfeiture

ii) At any time before sale or disposal as aforesaid, the Board, may annul the forfeiture on such terms it thinks fit.

e) A person whose shares have been forfeited shall cease to be member.

Declaration of Forfeiture

f) i) A duly verified declaration in writing that the declarant is a Director, the Manager or the Secretary of the Company and that a share in the Company has been duly forfeited on a date stated in the declaration shall be conclusive evidence of facts therein stated against all persons claiming to be entitled to the share.

iii) The Company may receive the consideration, if any, given for the share on any sale or disposal thereof and may execute a transfer of the share in favour of the person to whom the share is sold or disposed off.

iv) The transferee shall, thereupon, be registered as the holder of the share.

v) The transferee shall not be bound to see the application of the purchase money, if any, nor shall his title to the shares be effected by any irregularity or invalidity in the proceedings in reference to the forfeiture, sale or disposal of the share.

Non-payment of sums payable

g) The provisions of these regulations as to forfeiture shall apply in the case of non-payment of any sum which, by the terms of issue of a share, become payable at a fixed time, whether on account of the nominal value of the share or by way of premium, as if the same had been payable by virtue of a call duly made and notified.

h) Any member whose shares have been forfeited shall, notwithstanding the forfeiture, be liable to pay the company all calls, installments, interest or other moneys owing upon or in respect of such shares on the date of forfeiture together with interest thereon from the date of forfeiture until payment at such rate not exceeding eighteen percent pr annum as the Directors may determine.

i) The forfeiture of shares shall involve the extinction of all interest in and also all claims and demands against the company in respect of the share and all other rights incidental to the share, except only such of those rights as by these Articles are expressly saved

TRANSFER & TRANSMISSION OF SHARES

Procedure as transfer of Shares

38 1. The instrument of transfer of any shares in the Company shall be executed both by the transferor and the transferee and the transferor shall be deemed to remain holder of the shares until the name of the transferee is entered in the register of members in respect thereof. The instrument of transfer shall be in respect of only one class of shares and should be in the form prescribed under section 108 of the Act.

2. The Board of Directors shall not register any transfer of shares unless a proper instrument of transfer duly stamped and executed by the transferor and transferee has been delivered to the Company along with the certificate relating to the shares and such other evidence as the company may require to prove the title of the transferor or his right to transfer the shares.

Provided that where it is proved to the satisfaction of the Board of Directors that an instrument of transfer signed by the transferor and transferee has been lost, the company may, if the Board of Directors, think fit, on an application in writing made by the transferee and bearing the stamp required on an instrument of transfer register the transfer on such terms as to indemnity, as the Board of Directors may think fit.

3. An application for the registration of the transfer of any share or shares may be made either by the transferor or by the transferee, provided that where such application is made by the transferor no registration shall in the case of partly paid shares be effected unless the Company gives notice of the application to the transferee and the Company shall, unless objection is made by the transferee within two weeks from the date of receipt of the notice, enter the name of the transferee in the register in the same manner and subject to the same conditions as if the application for registration was made by the transferee.

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4. For the purpose of sub-clause (3) notice to the transferee shall be deemed to have been duly given if dispatched by prepaid registered post to the transferee at the address given in the instrument of transfer and shall be deemed to have been delivered in the ordinary course of post.

5. Nothing in clause (4) shall prejudice any power of the Board to register as a share holder any person to whom the right to any share has been transmitted by operation of law.

6. Nothing in this Article shall prejudice the power of the Board of Directors to refuse to register the transfer of any shares to a transferee, whether a member or not.

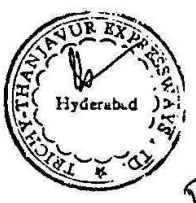
Form of Register 39 The Shares in the Company shall be transferred by an instrument in writing in the prescribed from, duly stamped and in the manner provided under the provisions of Section 108 of the Act and any modification thereof and the Rules prescribed there under.

Board's right to refuse to register 40 1. Subject to the provisions of Section 111 of the Act, the Board may at any time in their absolute discretion and without assigning any reasons decline to register any transfer of or transmission of operation of law of the right to a share, whether fully paid up or not and whether the transferee is a member of the company or not and may also decline to register any transfer of shares on which the Company has lien.

Provided further that the registration of transfer shall not be refused on the ground of the transferor being alone or either jointly with any other person or persons indebted to the Company on any account except lien on the shares.

2. If the Board refuses to register any transfer or transmission of right, they shall within one month from the date on which the instrument of transfer or the intimation of such transmission was delivered to the Company, send notice of refusal to the transferee and the transferor or to the person giving intimation of such transmission, as the case may be.





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3. In case of such refusal by the Board, the decision of the Board shall be subject to the right to appeal conferred by Section 111, of the Act.

4. The provisions of this clause shall apply to transfers of stock also.

Further right of Board of Directors to refuse to register

41 The Board of Directors may also decline to recognise any instrument of transfer unless:

a) The instrument of transfer is accompanied by the certificate of shares to which it relates and such other evidence as the Board of Directors may reasonably require to show the right of the transferor to make the transfer; and

b) The instrument of transfer is in respect of only one class of Shares.

Endorsement of transfer and issue of certificate

42 1. Every endorsement upon the certificate of any share in favour of any transferee shall be signed by the Managing Director or by some other person for the time being duly authorised by the Managing Director in his behalf. In case any transferee of a share shall apply for a new certificate in lieu of the old or existing certificate he shall be entitled to receive a new certificate in respect of which the said transfer has been applied for and upon his surrendering every old or existing certificate which is to be replaced by a new one.

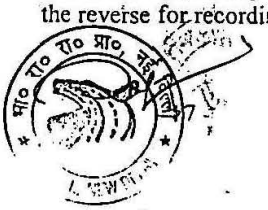
2. Not withstanding any other provisions to the contrary in these presents, no fee shall be charged for any of the following viz.,

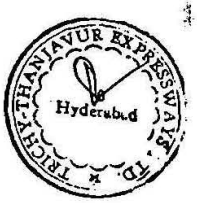
a) For registration of transfers and debentures; or for transmission of shares and debentures;

b) For sub-division and consolidation of share and debenture certificates and for sub-division of letters of allotment and split, consolidation, renewal and pucca transfer receipts into denominations corresponding to the market units of trading;

c) For sub-division of renounceable Letters or Rights;

d) For issue of certificates in replacement of those which are old, decrepit or worn out, or where the cages on the reverse for recording transfers have been fully utilised.





e) For registration of any power of attorney, probated letters of administration or similar other documents.

Register of Members

43 The Company shall keep a book to be called the "Register of Members" and therein shall be entered the particulars of every transfer or transmission of any shares and all other particulars of shares required by the Act to be entered in such Register.

Closure of Register of Members

44 The Board of Directors may after giving not less than 7 days' previous notice by advertisement in some newspapers circulating in the district in which the Registered Office of the Company is situated close the Register of Members or the Register of Debenture holders for any period or periods not exceeding in the aggregate 45 days in each year but not exceeding 30 days at any one time.

Transmission of Registered Shares

45 1. The Executor or administrators of a deceased member (not being one of several joint holders) shall be the only persons recognised by the Company, as having any title to the Shares registered in the name of such member and in the case of death of any one or more of the joint holders of any registered shares, the survivors shall be only persons recognised by the Company as having any title to or interest in such shares.

Provided that if the member should have been a member of a joint Hindu Family the Board on being satisfied to that effect and on being satisfied to that the shares standing in his name in fact belong to the joint family may recognise the survivors or the Karta thereof as having title to the shares registered in the name of such members. Provided further in any case it shall be lawful for the Board in their absolute discretion to dispense with the production of probate or letters of administration or other legal representation upon such terms as to indemnity or otherwise, as the Board may deem just.

2. Nothing in clause (1) shall release the estate of a deceased joint holder from any liability in respect of any shares which were jointly held by him with other persons.

Rights and liabilities of legal representatives

46 1. Any person becoming entitled to a share in consequence of the death or insolvency of a member may, upon such evidence being produced as may from time to time be required by the Board and subject as hereinafter provided, elect either:

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a) To be registered himself as holder of the shares; or

b) To make such transfer of the share as the deceased or insolvent member could have made.

2. The Board shall, in either case, have the same right to decline or suspend registration as they would have had, if the deceased or insolvent member had transferred the shares before his death or insolvency.

DEVOLUTION OF RIGHTS

Notice of election by Legal Representative

47 1. If the person so becoming entitled shall elect to the registered as holder of the shares himself, he shall deliver or send to the Company a notice in writing by him stating that he so elects.

2. If the person aforesaid shall elect to transfer the share, he shall testify his election by executing a transfer of the shares.

3. All the limitations, restrictions and provisions of these regulations to the right to transfer and the registration of transfer of shares shall be applicable to any such notice or transfer as aforesaid as if the death or insolvency of the members had not occurred and the notice of transfer were signed by that member.

4. A person becoming entitled to a share by reason of the death or insolvency of the holder shall be entitled to the same dividends and other advantages to which he would be entitled if he were the registered holder of the share except that he shall not, before being registered as a member in respect of the share, be entitled in respect of it to exercise any right conferred by membership is relation to meetings of the Company. Provided that the Board may, at any time, give notice requiring any such person to elect either to be registered himself or transfer the share and if the notice is not complied within 90 days, the Board may thereafter withhold payment of all dividends, bonuses or other money payable in respect of the share, until the requirements of the notice have been complied with.

Company's right to register by apparent legal owner

48 The company shall incur no liability or responsibility whatsoever in consequence of their registering or giving effect to any transfers of shares made or purporting to be made by any apparent legal owners thereof (as shown or appearing in the register) to the prejudice of persons having or claiming any equitable right, title or interest to or in the

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same shares not withstanding that the Company may have had notice of such equitable rights or referred thereto in any books of the company and any Company shall not be bound by or required to regard to attend to or give effect to any notice which may be given to if of any equitable rights, title or interest or be under any liability whatsoever for refusing or neglecting so to do though if may have been entered or referred to in the books of the Company, but the Company, shall nevertheless be at liberty to have regard and attend to any such notice and given effect thereto if the board shall think fit, subject to the provisions of Section 187-C.

CONVERSION OF SHARES INTO STOCK

Conversion of Shares

49 The Company may by ordinary resolution, convert all or any of its fully paid up shares of any denomination into stock and vice versa.

Transfer of Stock

50 The holders of stock may transfer the same or any part thereof in the same manner as and subject to the same regulations under which the shares from which the stock are so held before the conversion have been transferred, or as near thereto as circumstances admit.

Right of Stock holders

51 The holders to stock shall, according to the amount of stock held by them, have the same rights, privileges and advantages as regard dividends, voting at meetings of the Company and other matters as they held the shares from which the stock arose; but no such privileges or advantages (except participation in the dividends and profits of the company and in the assets on winding up) shall be conferred by an amount of stock which would not, if existing in shares, have conferred that privilege or advantage.

Regulations applicable to shares (paid-up) apply to stock or stock holders

52 Such of the regulations contained in these presents (other than those relating to the share warrants), as are applicable to paid up shares shall apply to stock and the words, "share" and "share-holder" in these presents shall include "stock" and "stock holder" respectively.

ALTERATION OF CAPITAL

Alteration and consolidation of Capital

53 The Company may from time to time but subject to the provisions of Section-94 of the Act, alter the conditions of its Memorandum as follows:

a) Increase its share capital by such amount as it thinks expedient by issuing new shares.

b) Consolidate and divide all or any of its share capital into shares of larger amount than its existing shares.

c) Convert all or any of its fully paid up shares into stock and reconvert that stock into fully paid up shares of any denominations.

d) Subdivide its shares, or any of them into shares of smaller amount than is fixed by the Memorandum, so however, that in the sub-division the proportion between the amount, if any unpaid on each reduced share shall be the same as it was in the case of other share from which the reduced share is derived.

e) Cancel any shares which at the date of the passing of the resolution in that behalf, have not been taken or agreed to be taken by any person and diminish the amount of its shares capital by the amount of the shares so cancelled.

f) The resolutions whereby any share is sub-divided may determine that as between the holders of the shares resulting from such sub-divisions, one or more of such shares shall have some preference or special advantages as regards dividend, capital, voting or otherwise over or as compared with the others.

Application of Provisions to new shares

54 The new shares shall be subject to the same provisions with reference to the payment of calls, lien, transfer, transmission, forfeiture and otherwise as the shares in the original share capital.

Reduction of capital etc., by Company

55 The Company may, by Special Resolution, reduce in any manner and with and subject to, any incident authorised and consent required by law:

a) Its share capital
b) Any capital redemption reserve account; or
c) Any share premium account

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SHARE WARRANTS

Issue of share warrants

56 1. The Company may issue shares warrants subject to and in accordance with provisions of Sections 114 and 115 of the Act and accordingly, the Board may in their discretion with respect to any share registered as fully paid up, on application in writing signed by the person registered as holder of the share and authenticated by such evidence, if any, as the board may, from time to time, require as to the identity of the person signing the application and on receiving the certificate if any of the share and the amount of the stamp duty on the warrant and such fee as the Board may from time to time prescribe, issue a share warrant and may provide by coupons or otherwise for the payments of the future dividends on the shares specified in the share warrant.

2. A share warrant shall entitle the bearer to the Shares included in and the share shall be transferred by the delivery of the share warrant and provisions of the Articles of the Company with respect to transfer and transmission of shares shall not apply thereto.

3. The bearer of share warrant shall, on surrender of the warrant to the Company for cancellation and on payment of such fee as the Board may from time to time prescribe, be entitled to have his name entered as a member in the Register of Members in respect of the shares included in the warrant.

Requirements of Meetings by Bearer of share warrants

57 1. The bearer of share warrant may at any time deposit the warrant at the Registered Office of the Company and so long as the warrant remains so deposited the depositor shall have the same right of signing a requisition for calling a meeting of the Company and of attending and voting and exercising the other privileges of a member at any meeting held after the expire of the two clear days from the time of deposit as if his name was inserted in the Register of Members as the holder of the shares included in the deposit warrant.

2. Not more than one person shall be recognised as depositor of the share warrant

3. The company shall on two days written notice return the deposited share warrant to the depositor.

Disabilities of holders	58	1. Subject as herein otherwise expressly provided, no person shall as bearer of a share warrant sign a requisition for calling a meeting of the company or attend or vote or exercise any other privileges of a member at a meeting of the Company, or be entitled to receive any notice from the Company. 2. The bearer of a share warrant shall be entitled in all other respects the same privilege and advantages as if he was named in the Register of members as the holder of the Shares included in the warrant and he shall be a member of the company.
Renewal	59	The Board, may from time to time, make rules as to the terms on which, if they shall think fit, a new warrant or coupon may be issued by way of renewal in case of defacement, loss or destruction of the original warrant or coupon.

GENERAL MEETINGS

Annual General Meeting	60	The Company shall in addition to other meetings hold a general meeting which shall be styled as its Annual General Meeting at intervals and in accordance with the provisions specified below: a) An Annual General Meeting of the Company shall be held once in every calender year within 6 months after the expiry of each financial year subject however to the power of the Registrar of Companies to extend the time within which such a meeting can be held for a period not exceeding 3 months and subject thereto not more than fifteen months shall elapse from the date of one annual general meeting and that of the next. b) Every Annual General Meeting shall be called for at time during the business hours on a day which is not a public holiday and shall be held either at the Registered Office of the Company or at some other place within the city, town or village in which the Registered Office of the Company is situated. c) Notice calling such meetings shall specify them as the Annual General Meetings. d) All other meetings shall be referred to as extra-ordinary General Meetings.

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Extra-ordinary General Meeting

61 The Board of Directors may whenever they think fit, convene an Extra-ordinary General Meetings at such time and at such place as they deem fit, subject to such directions, if any, given by the Board, the Managing Director or the Secretary may convene an Extra-ordinary General Meeting.

Extra-ordinary General Meeting by requisition

62 a) The Board of Directors shall on the requisition of such number of members of the Company as is specified below proceed duly to call an Extra-ordinary General Meeting of the Company and Comply with the provisions of the Act in relation to meetings on requisition.

b) The requisition shall set out matters for consideration of which the meeting is to be called, shall be signed by the requisitionists and shall be deposited at the Registered Office of the Company or send to the Company by registered post addressed to the company at its Registered Office.

c) The requisition may consist of several documents in like forms each signed by one or more requisitionists.

d) The number of members entitled to requisition a meeting with regard to any matter shall be such number of them as holding at the date of the deposit or despatch to the Registered Office of the requisition, not less than 1/10th of such of the paid-up capital of the company as at that date carries the right of voting in regard to the matter set out in the requisition.

e) If the Board of Directors do not, within twenty one days from the date of deposit of requisition with regard to any matters, proceed duly to call a meeting for the consideration of those matters on a date not later that 45 days from the date of deposit of the requisition, the meeting may be called by the requisitionists themselves or such of the requisitionists as represent either majority in value of the paid up share capital held by all of them or of not less than 1/10th of such paid up capital of the Company as is referred to in sub-clause (d) above.

Length of notice for calling meeting

63 A General Meeting of the Company may be called by giving not less than 21 days notice in writing, provided that a General Meeting may be called after giving shorter notice

if consent thereto is accorded in the case of the Annual General Meeting by all the members entitled to vote thereat and in the case of any other meeting, by members of the Company holding not less than 95% of that part of the paid-up share capital which gives the right to vote on the matters to be considered at the meeting, provided that where any members of the company are entitled to vote only on some resolution or resolutions to be moved at a meeting and not on the others, those members shall be taken into account for purpose of this Article in respect of the former resolution or resolutions and not in respect of the latter.

Accidental omission to give notice not to invalidate meeting	64	The accidental omission to give notice of any meeting to or the non-receipt of any such notice by any of the members shall not invalidate the proceedings of or any resolution passed at such meeting.
Special Business	65	a) All business shall be deemed special that is transacted at an Extra-ordinary General Meeting and also that is transacted at the Annual General Meeting with the exception of business relating to i) The consideration of the Accounts, Balance Sheet, reports of the Directors and Auditors; ii) The declaration of dividend iii) The appointment of Directors in the place of those retiring; and iv) The appointment and fixing of the remuneration of the Auditors. b) Where any items of business to be transacted at the meeting are deemed to be special as aforesaid, there shall be annexed to the notice of the meeting a statement setting out all material facts concerning each such item of business, including in particular the nature of the concern or interest if any, therein of every director and the Managing Director if any, where any item of business consists of the according of approval to any document by the meeting, the time and place where such document can be inspected shall be specified in the statement aforesaid. Provided that where any item of special business as aforesaid is to be transacted at the meeting of the Company relates to or affects any other company, the extent of share holding interest in that other company of every Director

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and the Managing Director of the Company, shall also be set out in the statement if the extent of such share holding interest is not less than 20% of the paid up share capital of that other company.

PROCEEDINGS AT GENERAL MEETINGS

Quorum 66 Five members personally present shall be a quorum for a general meeting and no business shall be transacted at any general meeting unless the requisite quorum is present at the commencement of the business.

If quorum not present when meeting to be dissolved and when to be adjourned 67 If within half an hour from the time appointed for the meeting a quorum is not present, the meeting, if called upon by the requisition of members, shall be dissolved; in any other case, it shall stand adjourned to the same day in the next week at the same time and place or such other day and at such other time and place as the Board may determine and if at the adjourned meeting, a quorum is not present within half an hour from time appointed from the meeting the members present shall be a quorum.

Chairman of General Meeting 68 The Chairman, if any, of the Board of Directors shall preside as Chairman at every General Meeting of the Company.

Meeting when Chairman absent, choice of another to take place the Chair 69 If there is no such Chairman, or if at any meeting he is not present within fifteen minutes after the time appointed for holding the meeting, or is unwilling to act as Chairman, the Directors present shall choose another director as chairman and if no directors be present or if all the Directors decline to take the chair, then the members present shall choose someone of them to be Chairman.

Adjournment of Meeting 70 The Chairman may, with the consent of any meeting at which a quorum is present (and shall, if so directed by the meeting) adjourn that meeting from time to time and from place to place, but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place. When a meeting is adjourned for 30 days or more, notice of the adjourned meeting shall be given as nearly as may be in the case of original meeting, save as aforesaid, it shall not be necessary to give any notice of any adjournment or of the business to be transacted at an adjourned meeting.

Annexure-VI

Question at General Meeting how decided	71	At any general meeting resolution put to the vote of the meeting shall be decided on a show of hands, unless a poll is (before or on the declaration of the result of the show of hands) demanded in accordance with the provisions of Section 179 of the Act. Unless a poll is so demanded, a declaration by the Chairman, that a resolution, on a show of hands, been carried unanimously or by a particular majority or lost and an entry to that effect in the book of the proceedings of the Company shall be conclusive evidence of the fact without proof of the number of proportion of the votes recorded in favour of or against that resolution.
Taking of poll	72	If a poll is duly demanded in accordance with the provisions of Section 179, it shall be taken in such a manner as the Chairman in accordance with the provisions of Section 184 and 185 of the Act direct and the results of the poll shall be deemed to the decision of the meeting on the resolution on which the poll was taken.
Chairman to have casting vote	73	In the case of an equality of votes, the Chairman shall, both on a show of hands and on a poll, have a casting vote in addition to the vote to which he may be entitled to as a Member.
In what case poll taken without adjournment	74	A poll demanded on the election of Chairman or on a question of adjournment shall be taken at such time not being later than 48 hours from the time when demand was made, as the chairman may direct.

VOTING RIGHTS OF MEMBERS

Voting rights of members	75	1. Every member holding any equity shares shall have a right to vote in respect of such shares on every resolution placed before the meeting. On a show of hands every such member present in person shall have one vote. On a poll, his voting right in respect of his equity shares shall be in proportion to his share of the paid-up capital in respect of the equity shares. 2. In the event of the Company issuing any preference shares the holders of such preference shares shall have the voting rights set out in that behalf in Section 87 of the Act.
Business may proceed notwithstanding demand for poll	76	A demand for a poll shall not prevent the continuance of meeting for the transaction of any business other than on which a poll has been demanded. The demand for a poll may be withdrawn at any time by the person who made the demand.

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Voting rights of joint holders	77	In the case of joint holders the vote of the first named of such joint holders who tends a vote whether in person or by proxy, shall be accepted to the exclusion of the votes of other joint holders.
Voting by members of unsound mind	78	Any member having unsound mind or in respect of whom an order has been made by any Court having jurisdiction in lunacy may vote, whether on a show of hands or on a poll, by his committee or other legal guardian and any such committee or guardian may, on a poll vote by proxy.
No member entitled to vote while call due to Company	79	No member shall be entitled to vote in any general meeting unless all calls or other sums presently payable by him in respect of his shares in the company have been paid.
Proxies permitted on poll	80	On a poll, votes may be given either personally or by proxy.
Proxies	81	Any member entitled to attend and vote a meeting of the Company, shall be entitled to appoint any person whether a member or not as his proxy to attend and vote instead of himself, but the proxy so appointed shall not unless he be a member have any right to speak at the meeting and shall not be entitled to vote except on a poll.
Instrument of Proxy	82	1. The instrument appointing a proxy shall be in writing under the hand of the appointer or of his attorney duly authorised in writing or if the appointer is a Corporation either under the common seal or under the hand of an officer or attorney so authorised. Any person may act as proxy whether he is a member or not. 2. A Corporate Body (whether a company within the meaning of the Act or not) may, if it is a member or a creditor or a debenture holder of the Company, by the resolution of its Board of Directors or other governing body authorise such person as it thinks fit to act as its representative at any meeting of the Company or at any meeting of any class of members of the Company held in pursuance of the provision contained in any Debenture or Trust Deed as the case my be. The person so authorised by resolution as aforesaid shall be entitled to exercise the same rights and powers (including the right to vote by proxy) on behalf of the body corporate which he represents, as that body could exercise if it were an individual member, creditor or holder of debentures of the Company.

Proxy to be deposited at the office

83 The instrument appointing a proxy and the power of attorney or other authority if any, under which it is signed or a notarially certified copy of that power or authority, shall be deposited at the Registered Office of the Company not less than 48 hours before the time for holding the meeting or adjourned meeting at which the person named in the instrument proposes to vote, or in the case of poll, not less than 24 hours before the time appointed for the taking of the poll; and in default the instrument of proxy shall not be treated as valid.

Valid of vote by proxy

84 A vote given in accordance with the terms of an instrument of proxy shall be valid, notwithstanding the previous death of the principal or the revocation of the proxy, or the transfer of the share in respect of which the proxy is given, provided that no intimation in writing of the death, revocation or transfer shall have been received at the Registered Office of the company before the commencement of the meeting or adjourned meeting at which the proxy is used.

85 Every instrument appointing a proxy shall be retained by the Company and shall be in either of the forms specified in Schedule IX of the Act or a form as near thereto as circumstances will admit.

Chairman's ruling regarding votes final

86 Subject to the provisions of the Companies Act, 1956, the Chairman of a General Meeting shall be the sole and absolute judge of the validity of every vote tendered at such meeting, or at a poll demanded at such meeting, and may allow or disallow any vote tendered, accordingly as he shall be of opinion that the same is or is not valid.

DIRECTORS

Number of Directors

87 Unless otherwise determined by a General Meeting the number of Directors shall not be less than three and not more than twelve.

First Directors

88 The persons hereinafter named shall become and be the first Directors of the Company:

01 Nama Nageswar Rao
02 Nama Seethaiah
03 Kamma Srinivas Rao

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Share qualification not necessary	89	Any person whether a member of the Company or not may be appointed as Director and no qualification by way of holding shares shall be required of any Director.
Director's power to fill up casual vacancy	90	Any casual vacancy occurring in the Board of Directors may be filled up by the Board of Directors and the person so appointed shall hold office upto the date upto which the Director in whose place he is appointed would have held office if it had not been vacated as aforesaid.
Additional Directors	91	The Board of Directors shall have power at any time, and from time to time to appoint one or more persons as Additional Directors provided, that the number of Directors and Additional Directors together shall not exceed the maximum number fixed. An Additional Director so appointed shall hold office upto the date of the next Annual General Meeting, but he shall be eligible for election by the Company at that Meeting.
Alternate Director	92	The Board of Directors may appoint an Alternate Director to act for a Director (hereinafter called the original Director) during the absence of the original director for a period of not less than three months from the State in which the meetings of the Board are ordinarily held. An alternate Director ceases to be a Director when the original Director returns to the State in which meetings of the Board are ordinarily held. If the term of office of the original Director is determined before he so returns to the State aforesaid, any provision for the automatic reappointment of retiring Director in default of another appointment shall apply to the original and not to the Alternate Director.
Remuneration of Directors	93	Every Director other than the Managing Director and the whole time Director shall be paid a sitting fee not exceeding such sum as may be prescribed by the Act or the Central Government form time to time for each meeting of the Board of Directors or of any Committee thereof attended by him and shall be paid in addition thereto all travelling, hotel and other expenses properly incurred by him in attending and returning from the meetings of the Board of Directors or any Committee thereof or General Meeting of the Company or in connection with the business of the Company to and from any place.

Remuneration for extra services	94	If any Director being willing, shall be called upon to perform extra services or to make any special exertions in going or residing away from the town in which the Registered office of the Company may be situated for any purposes of the Company or in giving special attention to the business of the Company or as a member of the Board, then subject to Sections 198, 309, 310 and 314 the Board may remunerate the Director so doing and such remuneration may be either in addition to or in substitution for any other remuneration to which he may be entitled.
Continuing Directors may act	95	The continuing Director or Directors may act, notwithstanding any vacancy in the Board, but if and so long as their number is reduced below three, the continuing Directors or Director may act for the purpose of increasing the number of directors to three or of summoning a General Meeting of the Company but for no other purpose.
Vacation of Office of Director	96	The Office of a Director shall be, vacated, if:

a) He is found to be of unsound mind of a Court of Competent Jurisdiction; or

b) He applies to be adjudicated or is adjudged an insolvent; or

c) He fails to pay calls made on him in respect of shares held by him within 6 months from the last date fixed for the payment of the call unless the Central Government has by notification in the official gazette, removed the disqualification incurred by such failure; or

d) He is convicted by a Court of any offence involving moral turpitude and sentenced in respect thereof to imprisonment for not less than six months; or

e) He absents himself from three consecutive meetings of the Board or from all meetings of the Board for a continuous period of three months whichever is longer, without obtaining leave of absence from the Board; or

f) He (whether by himself or by any person for his benefit or on account) or any firm in which he is a partner or any private Company of which he is a Director accepts a loan, or any guarantee or security for a loan from the Company in contravention of Section 295; or

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g) He acts in contravention of Section 299; or

h) He becomes disqualified by an order of Court under Section 203; or

i) He is removed in pursuance of Section 284; or

j) Having been appointed a Director by virtue of his holding any office or other employment in the company, he ceases to hold such office or other employment in the Company.

Provided that notwithstanding any thing in sub-clause (b), (d) & (h) above the disqualification referred to in those clauses shall not take effect:

a) For thirty days from the date of the adjudication, sentence or order;

b) Where any appeal or petition is preferred within the thirty days aforesaid against the adjudication, sentence or conviction resulting in the sentence or order until the expiry of seven days from the date on which such appeal or petition is disposed of or

c) Where within the seven days aforesaid, any further appeal or petition is preferred in respect of the adjudication, sentence, conviction or order and the appeal or petition, if allowed would result in the removal of the disqualification, until such further petition or appeal is disposed of.

Director may contract with company 97 Subject to the provisions of the Act, the Directors including the Managing Director, if any shall not be disqualified by reason of their office as such from contracting with the Company either as Vendor, purchaser, lender, agent, broker, or otherwise nor shall any contract or arrangement entered into by or on behalf of the Company with any Director or the Managing Director or with any company or partnership of or in which any Director or with any company or partnership of or in which any Director or the Managing Director shall be a member or otherwise interested be avoided nor shall any Director or the Managing Director so contracting or being such member or so interested be liable to account to the Company for any profit realised by such contract or arrangement by reason only of such Director or the Managing Director holding that office or of the fiduciary relation thereby established but the nature of the interest must be disclosed by him or them at the meeting of the Board at which the contract or arrangement is determined on, if the interest then exists or

in any other case at the meeting of the Board after the acquisition of the interest.

Provided nevertheless that no Director shall take part in the discussion of or vote as a Director in respect of any contract or arrangement in which he is so interested as aforesaid and if he does so his vote shall not be counted but he shall be entitled to be present at the meeting during the transaction of the business in relation to which he is precluded from voting although he shall not be counted to the purpose of ascertaining whether there is quorum of Directors present. The provisions shall not apply to any contract by or on behalf of the Company to give to the Directors or the Managing Director (s) or any of them any security by way of indemnity against any loss which they or any of them suffer by becoming or being sureties for the Company or to any contract or arrangement entered into or to be entered into with a public company, or private company which is subsidiary of a public company in which the interest of the Director aforesaid consists solely in his being a Director of such Company and the holder of not more than shares of such number or value therein as is requisite to qualify him for appointment as a Director thereof, he having been nominated as such Director by Company or in his being a member holding not more than 20% of its paid up share capital.

2. A general notice that any Director is a Director or a member of any specified company or is a member of any specified firm and is to be regarded as interested in any subsequent transaction, with such company or firm shall, as regards any such transaction, be sufficient disclosure under this Article and after such general notice it shall not be necessary to give any special notice relating to any particular transaction with such Company or firm.

3. A Director may be or become, a Director or member of any Company promoted by this company or in which this Company may be interested as Vendor, shareholder or otherwise and no such Director shall be accountable to the company for any benefits received as a Director or member of such company.

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Equal power to Directors	98	Except as otherwise provided in these Articles all the Directors of the Company shall have in all matters equal rights and privileges and be subject to equal obligations and duties in respect of the affairs of the Company.
Retirement of Directors	99	a) Not less than two-thirds of the total number of the Directors of the Company for the time being holding office shall be Directors whose period of office is liable to be determined by retirement by rotation and who shall be appointed by the Company in General Meeting. b) At every Annual General Meeting of the Company one third of such of the Directors as are liable to retire by rotation for the time being or if their number is not three or multiple of three, the number nearest to one-third shall retire from office.
Retiring Directors eligible for re election	100	A retiring Director shall be eligible for re-election and the Company at the Annual General Meeting at which a Director retires in the manner aforesaid may fill up the vacated office by electing a person thereto.
Which Director to retire	101	The Directors to retire in every year shall be those who have been longest in office since their last election, but as between persons who became Directors on the same day, those to retire shall unless they otherwise agree among themselves be determined by lot.
Retiring Director to remain in office till successors appointed	102	Subject to the provisions of Section 256 of the Act, if at any meeting at which an election of Directors ought to take place, the place of the vacating Directors is not filled up and the meeting has not expressly resolved not to fill up the vacancy, the Meeting shall be adjourned till the same day in the next week at the same time and place or if that day is a public holiday till the next succeeding day which is not a public holiday at the same time and place and if at the adjourned meeting the place of retiring Directors is not filled up and the Meeting has also not expressly resolved not to fill up the vacancy then the retiring Directors or such of them as have not had their places filled up shall be deemed to have been reappointed at the adjourned Meeting.
Power to General Meeting	103	Subject to the provisions of section 252, 255 and 259 and other applicable provisions of the Act, the Company in General Meeting may by ordinary resolution increase or reduce the number of its Directors within the limit fixed by Article 87.

Power to remove Directors by ordinary resolution	104	Subject to the provisions of Section 284 of the Act, the Company may by an ordinary resolution in General Meeting remove any Director before the expiration of his period of office and may be an ordinary resolution appoint another person instead; the person so appointed shall be subject to retirement at the same time as if he had become a director on the day on which the Director in whose place he is appointed was last elected as Director.
Right of persons other than retiring Directors to stand for Directorship	105	A person not being a retiring Director shall be eligible for appointment to the office of a Director at any General Meeting if he or some other member intending to propose him as a Director not less than 14 days before the meeting has left at the office of the Company a notice in writing under his hand signifying his candidature for the office of Director or the intention of such member to propose him as a candidate for that office as the case may be, along with a deposit of Rs. 500/- which shall be refunded to such person or as the case may be, to such member if the person succeeds in getting elected as Director.
		PROCEEDINGS OF THE DIRECTORS
Meeting of the Board	106	1. The Board of Directors shall meet at least once in every three calendar months for the despatch of business, adjourn and otherwise regulate its meetings and proceedings as it thinks fit provided that at least four such meetings shall be held in every year. 2. The Managing Director may at any time summon a meeting of the Board and the Managing Director or a Secretary on the requisition of a Director shall at any time summon a meeting of the Board. Notice in writing of every meeting of the Board shall be given to every Director for the time being in India, and at his usual address in India to every other Director.
Quorum	107	The quorum for a meeting of the Board shall be one-third of the total strength (any fraction contained in that one-third being rounded off as one) or two Directors whichever is higher provided that where at any time the number of interested Directors is equal to or exceed two-third of total strength, the number of remaining Directors, that is to say the number of Directors who are not interested present at the meeting being not less than two, shall be the quorum during such time. The total strength of the Board shall mean the number of Directors actually holding office as Directors on the date of the resolution or meeting, that is to say, the total strength of Board after deducting there from the number of Directors, if any, whose places are vacant at the time.

Questions how decided	108	1. Save as otherwise expressly provided in the Act, a meeting of the Board for the time being at which a quorum is present shall be competent to exercise all or any of the authorities, powers and discretions by or under the regulations of the Company for the time being vested in or exercisable by the Directors generally and all questions arising at any meeting of the Board shall be decided by a majority of the Board.
Casting vote of Chairman		2. In case of any equality of votes, the Chairman shall have the a second or casting vote in addition to his vote as a Director.
Right of continuing Director when there is no quorum	109	The continuing Directors may act notwithstanding any vacancy in the Board but if and so long as their number is reduced below three, the continuing Directors or Director may act for the purpose of increasing the number of Directors to three or of summoning a General Meeting of the Company but of no other purpose.
Election of Chairman of Board	110	1. The Board may elect a Chairman of its meeting and determine the period for which he is to hold office.
		2. If no such Chairman is elected, or at any meeting the Chairman is not present within five minutes after the time appointed from holding the meeting, the Directors present may choose one of them to be Chairman of the Meeting.
Delegation of Powers	111	1. The Board, may subject to the provisions of the Act, delegate any of its powers to committees consisting of such member or members of its body as it thinks fit.
		2. Any committee so formed shall, in the exercise of the power so delegated, conform to any regulations that may be imposed on it by the Board.
Election of	112	1. If the Chairman of the Board is a member of the Chairman of Committee, he shall preside over all meetings of the Committee committee. If the Chairman of the Board is not a member of the committee, the committee members shall elect one of their member as Chairman. If no such Chairman is elected, or if at any meeting the Chairman is not present within five minutes after the time appointed for holding the meeting, the members present may choose one of their member to be Chairman of the Meeting.
		2. The quorum of committee may be fixed by the Board of Directors and until so fixed if the committee is of single member or two members, shall be one and if more than two members shall be two

Questions how determined 113

1. A Committee may meet and adjourn as it thinks proper.

2. Questions arising at any meeting of a Committee shall be determined by sole member of the Committee or by majority of votes as the members present as the case may be and in case of an equality of vote, the Chairman shall have a second or casting vote in addition to his vote as member of the committee.

Validity of acts done done by Board or a Committee 114

1. All acts done by any meeting of the Board or all Acts Committee thereof or by any person acting as a Director shall notwithstanding that it may be afterwards discovered that there was some defect in the appointment of any one or more of such Directors or of any person acting as aforesaid or that they or any of them were disqualified be as valid as if even such Director or such person had been duly appointed and was qualified to be a Director.

Resolution by 115

1. Save as otherwise expressly provided in the Act, a Circulation resolution in writing circulated in draft together with the necessary papers, if any, to all the Directors or to all the members of the Committee then in India, and to all other Directors or members at their usual addresses in India and approved by such of the Directors as are then in India, or by a majority of such of them as are entitled to vote on the resolution shall be valid and effectual as if it had been a resolution duly passed at a meeting of the Board or Committee duly convened and held.

POWERS & DUTIES OF DIRECTORS

General Powers of Company Directors 116

The business of the Company shall be managed by the Board of Directors, who may exercise all such powers of vested in the Company as are not by the Act or any statutory modification thereof for the time being in force, or by these presents, required to be exercised by the company in General Meeting, subject nevertheless to any regulation of these presents, to the provisions of the said Act and to such regulations being not inconsistent with the aforesaid regulations or provisions as may be prescribed by the Company in General Meeting, but no regulation made by Company in General Meeting shall invalidate any prior act of the Board which would have been valid if that regulation has not been made.

Further power of Directors 117

Without prejudice to the generality of foregoing, it is hereby expressly declared that the Directors shall have the following powers, that is to say, power.

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1. To carry on and transact the several kinds of business specified in Clause-III of the Memorandum of Association of the Company.

2. To draw, accept endorse, discount, negotiate and discharge on behalf of the Company all bills of exchange, promissory notes other Government instruments, bonds, debentures or debenture stock of Corporation, local bodies, port trust, improvement trusts, or other corporate bodies and execute transfer deeds for transferring stocks, share or stock certificates of the Government and other local or corporate bodies in connection with any business or any subject of the Company.

3. At their discretion to pay for any property rights or privileges acquired by or services rendered to the Company, either wholly or partially in cash or in shares, bonds, debentures or other securities of the Company, and any such shares may be issued either fully paid up or with such amount credited as paid up thereon as may be agreed upon and any such bonds, debentures or other securities may be either specifically charged upon all or any of the property of the Company or no so charged.

4. To engage and in their discretion to remove, suspend, dismiss and remunerate bankers, legal advisers, accountants, cashiers, agents, commission agents, dealers, brokers, foreman, servants, employees of every description and to employ such professional or technical or skilled assistants as from time to time may in their option be necessary or advisable in the interest of the Company and upon such terms as to duration of employment, remuneration or otherwise and may be required security in such instances and to such amount as the Directors think fit.

5. To accept from any member, on such terms and conditions as shall be agreed a surrender of his shares or stock or any part thereof.

6. To secure the fulfillment of any contracts or agreements entered into by the Company by mortgage or charge of all or any of the property of the Company or in such other manner as they may think fit.

7. To institute, conduct, defend, compound or abandon any actions, suits and legal proceedings by or against the company or its officers or otherwise concerning the affairs of the Company and also to compound or compromise or subject to arbitration the same actions, suits and legal proceedings

8. To determine who shall be entitled to sign on the Company's behalf bills of exchange, pronotes, dividend warrants, cheques and other negotiable instruments, receipts, acceptances, endorsements, releases, contracts, deeds and documents.

9. From time to time regulate the affairs of the company abroad in such manner as they think fit and in particular to appoint any person to be the attorneys or agents of the Company either abroad or in India with such powers including power to sub-delegate and upon such terms as may be thought fit.

10. To invest and deal with any moneys of the company not immediately required for the purpose thereof upon such securities as they think fit.

11. To execute in the name and on behalf of the company in favour of any Director or other person who may incur or be about to incur any personal liability for the benefit of the Company's, property (present and future) as they think fit and any such mortgage, may contain a power of sale and such other power, covenants and provisions as shall be agreed upon.

12. To give to any person employed by the company a commission on the profits, or any particular business or transactions or a share in the profits of the company and such commission or share of profits, shall be treated as part of the working expenses of the company.

13. From time to time to make, vary and repeal by-laws for the regulations of the business of the company, its officers and employees.

14. To enter into all such negotiations and contracts and rescind and vary all such contracts and execute and do all such acts, deeds and things in the name of and on behalf of the company as they may consider expedient for or in relation to any of the matters aforesaid or otherwise for the purpose of the company.

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15. To pay gratuities, bonus, rewards, presents and gifts to employees or dependents of any deceased employees to charitable institutions or purposes, to subscribe for provident funds and other associations for the benefit of the employees.

Powers to delegate to Committee

118 Subject to the provisions of Section 292 of the Act and other provisions of the Act the Board may delegate from time to time and at any time to a Committee formed out of the Directors all or any powers, authorities and discretions for the time being vested in the Board and any such delegations may be made on such terms and subject to such conditions as the Board may think fit.

Attorney of the Company

119 The Board may appoint, at any time and from time to time by a power of attorney under the Company's seal any person to be the attorney of the Company for such purpose and with such powers, authorities and discretions not exceeding those vested in or exercisable by the Board under these Articles and for such period and subject to such conditions as the Board may from time to time think fit and any such appointment may, if the Board thinks fit, be made in favour of the members or any of the members of any firm or Company or the members, directors, nominees or managers of any firm or Company or otherwise in favour of any body of persons whether nominated directly or indirectly by Board and any such power of attorney may contain such provision for the protection or convenience of persons dealing with such attorney as the Board may think fit.

Power to authorise sub-delegation

120 The Board may authorise any such delegate or attorney as aforesaid to sub-delegate all or any of the powers, authorities and discretions for the time being vested in it.

Duty to maintain Registers etc., and records of minutes

121 1. The Board shall duly comply with the provisions of the Act and in particular with the provisions in regard to the Registration of the particulars of the mortgages and charges affecting the properties of the company or created by it and to maintain a Register of the Directors and sending to the Registrar an annual list of members and a summary of particulars of shares and stock and copies of special resolutions and other resolutions of the Board as are required to be filed with the Registrar under Section 192 of the Act and a copy of the Register of Directors and notification of any changes therein.

2. The Company shall comply with the requirements of Section 193 of the Act, in respect of keeping of the minutes of all proceedings of every General Meeting and of every meeting of the Board or any Committee of the Board.

3. The Chairman of the meeting may exclude at his absolute discretion such of the matters as are or could reasonable be regarded as defamatory of any person, irrelevant or immaterial to the proceedings, or detrimental to the interest of the Company.

Secretary	122	The Board shall have power to appoint as the Secretary a person possessing the prescribed qualifications and fit in their opinion for the said office, for such period and on such terms and conditions as regards remuneration and otherwise as they may determine. The Secretary shall have such powers and duties as may, from time to time, be delegated or entrusted to him by Directors.
Powers as to commencement business or branch business	123	Any branch or kind of business which by the Memorandum of Association of the Company or these presents it expressly of or by implication authorised to be undertaken by the Company may be undertaken by the Board at such time or times as they shall think fit and may be kept in abeyance whether such branch or kind of business may have been actually commenced or not, so long as the Board may deem it expedient not to commence or proceed with such branch or kind or business.
Delegation of powers	124	Subject to the provisions of Section 292 the Board may delegate all or any of their powers to any Directors jointly or severally or to any one Director at their discretion.
Borrowing Powers	125	The Board of Directors may from time to time but with such consent of the Company in General Meeting as may be required under Section 293 raise any moneys or sums of money for the purpose of the Company provided that the moneys to be borrowed by the Company other than temporary loans from bankers in the ordinary course of business shall not without the sanction of the Company at a General Meeting exceed the aggregate of the paid up Capital of the Company and its free reserves, that is to say reserves not set apart for any specific purpose and in particular, but subject to the provisions of Section 292 of the Act, the Board may from time to time at their discretion raise or borrow or secure the payment of any such sum of money for the purpose of the Company, but the issue of debentures perpetual or otherwise, including debentures convertible into shares of this or any other company or perpetual annuities and in

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security of any such money so borrowed, raised or received, mortgage, pledge or charge, the whole or any part of the property, assets or revenue of the company present or future, including its uncalled capital by special assignment or otherwise or to transfer or convey the same and other powers as may be expedient and to purchase, redeem or pay off any such securities.

Provided that every resolution passed by the Company in General Meeting in relation to the exercise of the power to borrow as stated above shall specify the total amount upto which money may be borrowed by the Board of Directors.

2. The Directors may by a resolution at a meeting of the Board delegate the above power to borrow money otherwise than on debentures to a Committee of Directors or the Managing Director, if any, within the limits prescribed.

3. Subjects to the provisions of the above sub-clause, the Directors may from time to time, at their discretion, raise or borrow or secure the repayment of any sum or sums of money for the purpose of the Company, at such time and in such manner and upon such terms and conditions in all respects as they think fit and in particular, by promissory notes or by opening current accounts or by receiving deposits and advances with or without security or by the issue of bonds, perpetual or redeemable debentures or debenture-stock of the Company (both present and future) including its uncalled capital for the time being or by mortgaging or charging or pledging any lands, buildings, goods or other property and Securities of the Company, or by such other means as to them may seem expedient.

Assignment of debenture 126

Such debentures, debenture-stock, bonds or other securities may be made assginable free from any equities between the company and the person to whom the same may be issued.

Terms of debenture issues 127

a) Any such debentures, debenture-stock, bonds or other securities may be issued at a discount, premium or otherwise and with any special privileges as to redemption, surrender, drawings, allotment of shares of the Company, appointment of Directors or otherwise, Debentures, debenture stock, bonds or other securities with a right of conversion into or allotment of shares shall be issued only with the sanction of the Company in General Meeting.

b) Any trust for the securing of any debenture-stock and or any mortgage deed and or other bond for securing payment of moneys borrowed by or due by the company and or may contract or any agreement made by the Company with any person, firm, body

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corporate, Government or authority who may render or agree to render any financial assistance to the Company by way of loans advanced or by guaranteeing of any loan borrowed or other manner, may provide for the appointment, from time to time by any such mortgage, lender, trustees or holders of debentures or contracting party as aforesaid, of one or more person to be a Director or Directors of the Company. Such trust deed, mortgage deed, bond or contract may provide, that the person appointing a Director as aforesaid may from time to time remove any Director so appointed by him and appoint any other person in his place and appoint any other person in his place and provide filling up of any casual vacancy created by such person vacating office as such Director. Such power shall determine and terminate on the discharge or repayment of the respective mortgage, loan or debt or debentures or on the termination of such contract and any person so appointed as Director under mortgage or bond or debenture trust deed or under such contract shall cease to hold office as such Director on the discharge of the same. Such appointment and provision in such document as aforesaid shall be valid and effective as if contained in these presents.

Nominated Directors

128 The Director or Directors so appointed by or under a mortgage deed, debenture trust deed or other contract as aforesaid shall be called "Nominated Directors". The words 'Nominated Director shall mean the Director appointed as aforesaid and for the time being holding such office. The Nominated Director shall not be required to hold any qualification shares and shall not be liable to retire by rotation or to be removed from office by the Company. Such mortgage deed or bond or trust deed or contract may contain such auxiliary provision as may be and all such provisions shall have effect notwithstanding any of the other provisions herein contained but subject to the provisions of the Act.

Register of Mortgages

129 The Directors shall cause a proper register to be kept, in accordance with the Act, of all mortgages and charges specifically affecting the property of the Company and shall duly comply with the requirements of the Act in regard to the Registration of mortgages and charges therein specified.

Subsequent assignees of uncalled capital

130 Where any uncalled capital of the Company is charged, all persons taking any subsequent charge thereon shall take the same, subject to such prior charge and shall not be entitled, by notice to the shareholders or otherwise, to obtain priority over such prior charge.

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Charge in favour of Director for indemnity

131 If the Directors or any other persons, shall become personally liable for the payment of any sum primarily due from the Company, the Board may execute or cause to be executed any part or assets of the company by way of indemnity to secure the Directors or other persons so becoming liable as aforesaid from any loss in respect of such liability.

Powers to be exercised by Board only at Meeting

132 1. The Board of Directors shall exercise the following powers on behalf of the Company and the said powers shall be exercised only by resolutions passed at the meeting of the Board.

a) Power to make calls on shareholders in respect of monies unpaid on their shares;

b) Power to issue debentures;

c) Power to borrow moneys otherwise than on debentures;

d) Power to invest the funds of the Company;

e) Power to make loans

2. The Board of Directors may by a meeting delegate to any committee of the Directors or to the Managing Director the powers specified in sub-clause (c), (d) and (e) above.

3. Every resolution delegating the power set out in sub-clause (c) above shall specify the total amount upto which money be borrowed by the delegate.

4. Every resolution delegating the power referred to in sub-clauses (d) above shall specify the total amount upto which the funds may be invited and the nature of the investments which may be made by the delegate.

5. Every resolution delegating the power referred to in sub-clause (e) above shall specify the total amount upto which the loans may be made by the delegatee the purpose for which the loans may be made and the maximum amount of loans which may be made for each such purpose in individual cases.

MANAGING DIRECTOR (S) / WHOLE THE DIRECTOR (S)

133 a) The Board may from time to time subject to the provisions of the Act and with or without such sanction of the Central Government as may be required by law, appoint one or

more of their body to the office of the Managing Director or Managing Directors or Wholetime Director (s).

b) In the event of any vacancy arising of in the office of a Managing Director or whole time Director vacancy shall be filled by the Board of Directors and the Managing Director or Wholetime Director so appointed shall hold the office for such period as the Board of Directors may fix.

c) If a Managing Director or Wholetime Director ceases to hold office as Director, shall ipso facto and immediately cease to be a Managing Director / Wholetime Director.

Powers and duties of Managing Director or Wholetime Director	134	Managing Director / Wholetime Director shall subject to the supervision, control and direction of the Board and subject to the provisions of the Act, exercise such powers as are exercisable under these presents by the Board of Directors as they may think fit and confer such powers for such time and to be exercised for such objects, purposes and upon such terms and conditions and with such restrictions as they may think expedient and they may confer such power either collaterally with or to the exclusion of any such power or substitution for all or any of the powers of the Board of Directors in that behalf and may from time to time revoke, withdraw, alter or vary all or any of such powers. The Managing Director (s) Wholetime Director (s) may exercise all the powers entrusted to them by the Board of Directors in accordance with Board's direction.
Remuneration of Managing Directors / Wholetime Directors	135	Subject to the provisions of the Act and subject to such sanction of the Central Government as may be required for the purpose, the Managing Directors / Wholetime Directors shall receive such remuneration (whether by way of salary, commission or participation in profits or partly in one way and partly in another) as the Company in General Meeting may from time to time determine.
Reimbursement of expenses	136	The Managing Director / Wholetime Director shall be entitled to charge and be paid for all actual expenses, if any, which they may incur for or in connection with the business of the Company, they shall be entitled to appoint part time employees in connection with the management of the affairs of the Company and shall be entitled to be paid by the Company any remuneration that they may pay to such part time employees..
Restriction of powers	137	1. The Managing Director / Wholetime Director shall have subject to the supervision control and directions of

the Board, the management of the whole of the business of the Company and of all its affairs and shall exercise all powers and perform all duties in relation to the Management of the affairs and transactions of Company, except such powers and such duties as are required by law or by these presents to be exercised or done by the Company in General Meeting or by the Board of Directors and also subject to such conditions or restriction imposed by the Companies Act or by these presents.

2. Without prejudice to the generality of the foregoing and subject to the supervision and control of the Board of the Directors, the business of the Company shall be carried on by the Managing director/Wholetime Director and he shall have and exercise all the powers set out in Article 117 above, except those which are by law or by these presents or by any resolution of the Board required to be done by the Company in General Meeting or by the Board.

3. The Board may from time to time, delegate to the Managing Director or Wholetime Director such of their powers and duties and subject to such limitations and conditions as they may deem fit. The Board may from time to time revoke, withdraw, alter or vary all or any of the powers conferred on the Managing Director or Wholetime Director by the Board or by these presents.

COMMON SEAL

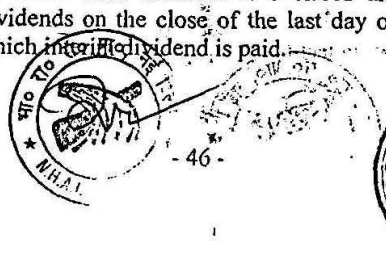
Common seal

138 The seal shall not be affixed to any instrument except by Authority of a Resolution of the Board of Directors and in the presence of atleast two persons, one of whom shall be the Managing Director or whole-time Director/Directors and the other shall be such other person(s) as the Board may appoint for the purpose.

DISTRIBUTION OF PROFITS

Right to dividend

139 a) The profits of the Company, subject to any special rights, relating thereto created or authorised to be created by these presents and subject to the provisions of the presents, as to the reserve fund, shall be divisible among the members in proportion to the amount of capital paid up on the shares held by them respectively on the last day of the year of account in respect of which such dividend is declared and in the case of interim dividends on the close of the last day of the period in respect of which interim dividend is paid.



b) Where capital is paid upon any shares in advance of calls, upon the footing that the same shall carry interest, such capital shall not, while it carrying interest, confer a right to participate in profits.

Declaration of Dividends	140	The Company in General Meeting may declare dividends but no dividend shall exceed the amount recommended by the Board.
Interim Dividends	141	The Board may from time to time pay to the members such interim dividends as appear to them to be justified by the profits of the Company.
Dividends to be paid out of Profits	142	No dividend shall be payable except out of the profits of the year or any other undistributed profits except as provided by Section 205 of the Act.
Reserve Funds	143	1. The Board may before recommending any dividends set aside out of the profits of the Company such sums as it thinks proper as a reserve or reserves which shall at the discretion of the Board, be applied for any purpose to which the profits of the Company may be properly applied, including provisions for meeting contingencies or for equalising dividends and pending such application, may, at the like discretion either be employed in the business of the Company or be invested in such investments (other than shares of the Company) as the Board may from time to time think fit. 2. The Board may also carry forward any profits when it may think prudent not to divide, without setting them aside as Reserve.
Deduction for Arrears of calls	144	The Board may deduct from any dividend payable to any members all sums of money, if any, presently payable by him to the Company on account of calls or otherwise in relation to the shares of the Company.
Adjustment of dividends against calls	145	Any General Meeting declaring a dividend or bonus may make a call on the members of such amount as the meeting fixes, but so that the call on each member shall not exceed the dividend payable to him and so that the call be made payable at the same time as the dividend and the dividend may if so arranged between the Company and the members be set off against the call.
Payment by cheque or warrant	146	1. Any dividend, interest or other money payable in cash in respect of shares may be paid by cheque or warrant sent through post direct to the registered address of the

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holders or in the case of joint holders to the registered address of that one of the joint holders who is first named on the register of members or to such person and to such address as the holder or joint holders may in writing direct.

2. Every such cheque or warrant shall be made payable to the order of the person to whom it is sent.

3. Every such cheque shall be posted within thirty days from the date of declaration of dividend.

Receipt of joint holders

147 Any one of two or more joint holders of a share may give effectual receipt for any dividends bonus or other money payable in respect of such shares.

Notice of dividends

148 Notice of any dividend that may have been declared shall be given to the persons entitled to share thereto in the manner mentioned in the Act.

149 No dividend shall bear interest against the Company

Unpaid dividend

150

1. Where dividend has been declared by the Company but has not been paid or the warrant in respect thereof has not been posted within thirty days from the date of declaration to any shareholder entitled to the payment of dividends, the Company shall within7 days from the date of expiry of the said thirty days pay to amount of dividend which remains unpaid or in relation to which no dividend warrant has been posted with the said period of thirty days to a special account to be opened by the Company in that behalf in any schedule Bank to be called 'Unpaid dividend Account of TRICHY-THANJAVUR EXPRESSWAYS LIMITED.

2. Any money transferred to the unpaid dividend account of the Company in pursuance of sub-class (a) which remains unpaid or unclaimed for a period of 7 years from the date of such transfer shall be transferred by the Company to the Investor Education and Protection Fund.

Transfer of Shares not to pass prior to dividends

151 Any transfer of shares shall not pass the right to any dividend declared thereon before the registration of the transfer.

CAPITALISATION OF PROFITS

Capitalisation of profits

152 1. The Company in General Meeting, may on recommendation of the Board, resolve:

a) That it is desirable to capitalise any part of the

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amount for the time being standing to the credit of the Company's reserve accounts or to the Credit of the profit and loss Account or otherwise available for distribution: and

b) That such sum be accordingly set free from distribution in the specified in sub-clause (2) amongst the members who would have been entitled thereto if distributed by way of dividend and in the same proportion.

2. The sum aforesaid shall not be paid in cash but shall applied, subject to the provisions contained in sub-clause (3) either in or towards;

i) Paying up any amounts for the time being unpaid on shares held by such members respectively;

ii) Paying up in full, unissued shares of the Company to be allotted and distributed, credited as fully paid up, to and amongst such members in the proportions aforesaid ; or

iii) Partly in the way specified in sub-clause (i) and partly in that specified in sub-clause (ii).

2. A share premium account and a capital redemption reserve fund may, for the purpose of this regulation only, be applied in the paying up of unissued shares to be issued to members of the Company as fully paid bonus shares.

3. The Board shall give effect to the resolutions passed by the Company in pursuance of this regulation.

Power of Directors for declaration of bonus

153 1. Whenever such a resolution as aforesaid shall have been passed the Board shall:

Make all appropriations and applications of the undivided profits resolved to be capitalised thereby and all allotments and issues of fully paid shares, if any; and

a) Generally do all acts and things required to give effect thereto.

2. The Board shall have full power:

a) To make such provisions, by the issue of fractional certificates or by payments in cash or otherwise as it thinks fit, in the case of shares or debentures becoming distributable in fraction; and also

b) To authorise any person to enter on behalf of all the members entitled thereto into an agreement with the Company providing for the allotment to the respectively credited as fully paid up of any further shares or debentures

to which they may be entitled upon such capitalisation or (as the case may require) for the payment of by the Company on their behalf, by the application thereto of their respective proportions of the profits resolved to be capitalised of the amounts or any part of the amounts remaining unpaid on the shares.

3. Any agreement may under such authority shall be effective and binding on all such members.

ACCOUNTS

Books of account to be kept

154 1. The Board of Directors shall cause true accounts to be kept of all sums of money received and expanded by the Company and the matters in respect of which such receipts and expenditure takes place, of all sales and purchases of goods by the Company and of the assets, credits and liabilities of the Company.

2. If the Company shall have a branch office, whether in or outside the India proper books of account relating to the transactions effected to that office shall be kept at the office and proper summarised returns made upto date at intervals of not more than three months, shall be sent by the Branch Office, to the Company at its Registered Office or to such other place in India, as the Board thinks fit, where the main books of the Company are kept.

3. All the aforesaid books shall give a fair and true view of the affairs of the Company or of its Branch Office, as the case may be, with respect to the matters aforesaid and explain its transactions.

Where books of account to be kept

155 The Books of account shall be kept at the Registered Office or at such other place in India, as the Directors think fit.

Inspection by Members

156 The Board of Directors shall from time to time determine whether and to what extent and at what time and place and under what conditions or regulations, the accounts and books and documents of the Company or any of them, shall be open to the inspection of the members and no member (not being a Director) shall have any right of inspecting any account or books of account or documents of the Company except as conferred by statute or authorised by the Directors or by a resolution of the Company in General Meeting.

Statement of accounts to be furnished to Meeting

157 The Board of Directors shall lay before each Annual General Meeting a Profit and Loss Account for the financial year of the Company and a Balance sheet made General up as at the end of the financial year which shall not

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proceed the day of the meeting by more than six months or such extended period, as shall have been granted by the Registrar under the provisions of the Act..

Form of Balance Sheet Profit & Loss A/c	158	1. Subject to the provisions of Sec.211 of the Act every Balance Sheet and Profit & Loss account of the Company shall be in the form set out in parts I and II respectively of Schedule VI of the Act, or as near thereto as circumstances admit. 2. So long as the Company is a Holding Company having a subsidiary, the Company shall conform to Section 212 and other applicable provisions of the Act.
Authentication Of Balance Sheet and Profit & Loss	159	1. Every Balance Sheet and every Profit & Loss Account of the Company shall be signed on behalf of the Board by Secretary, if any, and by not less than two Account Directors of the Company one of whom shall be the Managing Director when there is one. 2. The Balance Sheet and the Profit & Loss Account shall be approved by the Board of Directors before they are signed on behalf of the Board in accordance with the provisions of this Article and before they are submitted to the Auditors for their report thereon.
Profits & Loss Account to be annexed and Auditors' Report to be attached to the Balance Sheet	160	The Profit and Loss Account shall be annexed to the Balance Sheet and the Auditors Report shall be attached thereto.
Board's Report to be attached to Balance Sheet	161	1. Every Balance Sheet laid before the Company in General Meeting shall have attached to it a report by the Board of Directors with respect to the state of the Company's affairs, the amounts if any, which it proposes to carry to any Reserves in such Balance Sheet and the amount if any which it recommends to be paid by way of dividend, material changes and commitments if any affecting the financial position of the Company which have occurred between the end of the financial year of the Company to which the Balance Sheet relates and the date of the Report. 2. The Report shall, so far as it is material for the appreciation of the State of the Company's affairs by its members and will not in the Board's opinion be harmful to the business of the Company or of any of its subsidiaries, deal with any changes





which have occurred during the financial year in the nature of the Company's business, or in the Company's subsidiaries or in the nature of the business carried on by them and generally in the classes of business in which the Company has a interest.

3. The Board's Report shall also include a statement showing the name of every employee of the company who was in receipt of such remuneration as may be prescribed by the Act or the Central Government from time to time during the year to which the Report retains.

4. The Board's Report shall also specify the reasons for the failures, if any, to complete the buyback within the time specified in sub-section(4) of Section.77A of the Act.

5. The Board shall also give the fullest information and explanation in its report in cases falling under the provision to Section 222 in an addendum to that report, on every reservation, qualification or adverse remark contained in the Auditor's report.

6. The Board's Report and addendum (if any) thereto shall be signed by its Chairman if he is authorised in that behalf by the Board; and where he is not so authorised shall be signed by such number of Directors as are required to sign the Balance Sheet and the Profit and Loss Account of the Company by virtue of sub-clauses (1) and (2) of Article 167.

Rights of members to Copies of Balance Sheet and Auditors report

162 The Company shall comply with the requirements of Section 219 of the Act.

ANNUAL RETURNS

Annual Returns

163 The Company shall make the requisite Annual Returns in accordance with sections 159 and 162 of the Act.

AUDIT

Account to be audited

164 Every Balance Sheet and Profit & Loss Account shall be Audited by one or more Auditors to be appointed as hereinafter set out.

165 1. The Company at the Annual General Meeting in each year shall appoint an Auditor or Auditor's to hold office from the conclusion of the meeting until the conclusion of the next Annual General Meeting and every

Auditor so appointed shall be intimated of his appointment within seven days. Provided that before the appointment of reappointment of Auditors is made by the Company at any General Meeting a written certificate shall be obtained by the Company from the Auditor or Auditors proposed to be so appointed to the effect that the appointment or appointments if made will be in accordance with the limits specified in sub-section I-B of section 224. Every auditor so appointed shall within 30 days of the receipt from the Company of the intimation of his appointment shall inform the Registrar of Companies in writing that he has accepted or refused to accept the appointment.

2. Subject to the provisions of sec-224 I-B and section 224-A at any Annual General Meeting a retiring Auditor by whatsoever authority appointed shall be reappointed unless:

a) He is not qualified for reappointment;

b) He has given the Company notice in writing of his unwillingness to be reappointed.

c) A resolution has been passed at that meeting appointing somebody instead of him or providing expressly that he shall not be reappointed or

d) Where notice has been given of an intended resolution to appoint some person in the place of a retiring Auditor and by reason of the death incapacity or disqualification of that person or of all those persons, as the case may be the resolution cannot be proceed with.

3. Where at an Annual General Meeting, no auditors are appointed, the Central Government my appoint a person to fill the vacancy.

4. The Company shall within seven days of the Central Government's power under sub-clause (4) becoming exercisable, given notice of that fact to the Government.

5. The Directors may fill any casual vacancy in the office of an Auditor, but while any such vacancy continues, the remaining Auditor or Auditors (if any) may act, where such a vacancy is caused by the resignation of an Auditor, the vacancy shall only be filled by the Company in General Meeting.

A person other than a retiring Auditor, shall not be

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capable of being appointed at an Annual General Meeting unless special notice of a resolution of appointment of that person to the office of Auditor has been given by a member to the Company not less than fourteen days before the meeting in accordance with Sec.190 and the Company shall send a copy of any such notice to the retiring Auditor and shall give notice there of to the members in accordance with the provisions of Sec.190 and all other provisions of Section 225 shall apply in the matter. The provisions of this sub-clause shall also apply to the resolution that a retiring Auditor shall not be reappointed.

7. The persons qualified for appointment as auditors shall be only those referred to in section 226 of the Act.

8. None of the persons mentioned in section 226 of the Act, as is not qualified for appointment as Auditor shall be appointed as Auditor of the Company.

9. The Company or its Board of Directors shall not appoint or reappoint any person or firm as its Auditors if such person or firm is at the date of such appointment or reappointment, holds appointment as Auditor of the specified number of companies shall be construed as specified number of companies per partner of the firm, provided further that where any partner of the firm is also a partner of any other firm of auditors the number of companies which may be taken into account by all the firms together in relation to such partner shall not exceed the specified number in the aggregate. Provided also that where any partner of a firm of auditors is also holding office in his individual capacity as auditor of one or more companies the number of companies which may be taken into number in the aggregate. Specified number means in the case of a partner of firm holding appointment as auditor of a number of companies each of which has a paid up share capital of less than Rs.25 lakhs, 20 companies and in any other case 20 companies out of which not more than ten shall be companies each of which has a paid up share capital of Rs.25lakhs or more.

Audit of branch Offices

166 The Company shall comply with the provisions of section 228 of the Act in relation to the audit of the accounts of Branch Offices of the Company.

Remuneration of Auditors

167 The remuneration of the Auditors shall be fixed by the Company in General Meeting except that the remuneration of any Auditor appointed to fill any casual vacancy may be fixed by the Board.

168 1. Every Auditor of the company shall have a right of

access at all times to the books of account and vouchers of the Company and shall be entitled to require from the Directors and Officers of the Company such information and explanation as may be necessary for the performance of his duties as Auditor.

2. All Notices, of, and other communications relating to any General Meeting of the Company which any member of the Company is entitled to have sent to him shall also be forwarded to the Auditor and the Auditor shall be entitled to attend any General Meeting and to be heard at any General Meeting which he attends on any part of the business which concerns him as Auditor.

3. The Auditor shall make a report to the members of the Company on the Accounts examined by him and on every Balance Sheet and Profit & Loss Account and on every other document declared by this Act to be party or assumed to the Balance Sheet and Profit and Loss Account which are laid before the Company in General Meeting during his tenure of office and the Report shall state whether, in his opinion and to the best of his information and according to the explanations given to him, the said accounts give the information required by the Act in the manner so required and give a true and fair view;

i) In the case of the Balance Sheet of the state of the Company's affairs as at the end of its financial year, and

ii) In the case of the Profit & Loss Account of the Profit or Loss for its financial year.

4. The Auditor's Report shall also state:

a) Whether he has obtained all the information and explanation which to the best of his knowledge and belief were necessary for the purpose of his audit;

b) Whether in his opinion, proper books of accounts as required by law have been kept by the Company so far as appears from his examination of those books and proper returns adequate for the purposes of his audit have been received from branches not visited by him;

c) Whether the report on the accounts of any branch office audited under Section 228 by a person other than the Company's Auditor has been forwarded to him as required by

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clause (c) of sub-section (3) of Section 228 of the Act and how he has dealt with the same in preparing Auditor's Report; and

d) Whether the Company's Balance Sheet and Profit & Loss account dealt with the report are in Agreement with the Books of Account and returns.

e) Whether in his opinion, the Profit and Loss Account and Balance Sheet Comply with the accounting standards referred to Sec.211(3) of the Act.

5. Whether any of the matters referred to in items (i) and (ii) of sub-clause (3) above or in items (a), (b), (c) and (d) of sub-clause (4) above is answered in the negative or with a qualification, the Auditor's Report shall state the reasons for the answer.

6. The accounts of the Company shall not be deemed as not having been properly drawn up on the ground merely that the Company has not disclosed certain matters if;

a) Those matters are such as the Company is not required to disclose by virtue of any provisions contained in the Companies Act or any other Act; and

b) Those provisions are specified in the Balance Sheet and Profit and Loss Account of the Company.

7. The Auditor's Report shall be read before the Company in General Meeting and shall be open to inspection by any member of the Company.

Accounts when audited and approved to be conclusive except as to errors discovered within 3 months

169 Every account of the Company when audited and approved by a General Meeting shall be conclusive except as regards any error discovered therein, within three months next after the approval thereof. Whenever any such error is discovered within that period the account shall forthwith be corrected and shall henceforth be conclusive.

SERVICE OF DOCUMENTS AND NOTICE

Service of documents on the Company

170 A document may be served on the Company or to an officer at the Registered Office of the Company by post under a certificate of posting or by Registered post, or by leaving it at the Registered Office.

How document is to be served members

171 1. A document (which expression for this purpose shall be deemed to include any summons, notice, served on on requisition, process, order, judgement or any other

documents in relation to or in the winding up of the Company (may be served or sent by the Company) on or to any member either personally or sending it by post to him to his registered address, in India or (if he has not registered address in India) to the address, if any, within India supplied by him to the Company for the giving of notice to him.

2. A notice shall, with respect to any registered shares to which persons are entitled jointly, be given to whichever of such persons is named first in the Register and notice so given shall be sufficient notice to all the holders of such share.

3. Where a document is sent by post:

a) Service thereof shall be deemed to be effected by properly addressing, prepaying and posting a letter containing the notice, provided that where a member as intimated to the Company in advance that documents should be sent to him under a certificate of posting or by registered post without acknowledgement due and has deposited with the Company a sum sufficient to defray the expenses of doing so, service of the documents shall not be deemed to be effected unless it is sent in the manner intimated by the member, and

b) Unless the contrary is provided, such service shall be deemed to have been effected;

i) in the case of a notice of a meeting, at the expiration of forty eight hours after the letter containing the notice is posted; and

ii) in any other case, at the time at which the letter would be delivered in the ordinary course of post.

Members to notify address in India 172 Each registered holder of shares from time to time notify in writing to the Company some place in India be registered as his address and such registered place of address shall for all purpose be deemed his place of residence.

Service on members having No registered address 173 If a member has no registered address in India and has not supplied to the company an address within India for the giving of notices to him, a document advertised in a newspaper circulating in the neighborhood of Registered Office of the Company shall be deemed to be duly served on him on the day on which the advertisement appears.

Service on persons acquiring shares on death or insolvency of members 174 A document may be served by the Company on the persons entitled to a share in consequence of the death or insolvency of a member by sending it through the post in a prepaid letter addressed to them by name or by the title or representatives of the deceased, or assignees of the insolvent or by any like description at the address (if any) in India supplied for the

purpose by the persons claiming to be so entitled, or (until such as address has been so supplied) by serving the document in any manner in which the same might have been served if the death or insolvency had not occurred.

Persons entitled to Notice of General Meetings

175 Subject to the provisions of the Act and these Articles, Notice of General Meeting shall be given

i) To the members of the Company as provided by the Articles in any manner authorised by Articles 178 and 180 as the case may be or as authorised by Act;

ii) To the persons entitled to a share in consequence of the death or insolvency of a member as provided by Article. 181 or as authorised by the Act;

iii) To the Auditor or Auditors for the time being of the Company, in the manner authorised by Articles 178 as in the case of any member or members of the Company.

Notice by advertisement

176 Subject to the provisions of the act any document required to be served or sent by the company or to the members, or any of them and not expressly provided for by these presents, shall be deemed to be duly served or sent if advertised in newspaper circulating in the District in which the Registered Office is situated.

Members bound by document given to previous holders

177 Every person, who by the operation of law, transfer, or other means whatsoever, shall become entitled to any share shall be bound by every document in respect of such share which previously to his name and address being entered on the Register, shall have been duly served on or sent to the person from whom he derived his title to such share.

178 Any notice to be given by the Company shall be signed by the Managing Director or by such other Officer as the Directors may appoint. The signature to any notice to be given by the Company may be written or printed or lithographed.

AUTHENTICATION OF DOCUMENTS

Authentication of documents and proceedings

179 Save as otherwise expressly provided in the Act or these Articles, a document or proceeding requiring authentication by the Company may be signed by a Director, the Managing Director, the Manger, the Secretary or an authorised officer of the Company and need not be under its seal.

WINDING UP

Division of assets of the Company in Specie Among Members

180 If the company shall be wound up whether voluntarily or otherwise, the liquidators may, with the sanction of a Special resolution divide among the contributors in specie or kind, any part of the assets of the Company, and may with the like sanction vest any part of the assets of the Company in trustees upon such trusts for the benefit of the contributors or any of them, as the liquidators with the like sanction shall think fit. In case any shares to be divided as aforesaid involve a liability to calls or otherwise any persons entitled under such division to any of the said shares may within ten days after the passing of the special resolution by notice in writing direct the liquidators to sell his proportion and pay him the net proceeds, and the liquidators shall, if practicable, act accordingly.

INDEMNITY AND RESPONSIBILITY

Directors and Others right To indemnity

181 a) Subject to the provisions of section 201 of the act, the Managing Director and every Director, Manager, Secretary and other officer or employee of the Company shall be indemnified by the Company against any liability and it shall be the duty of directors, out of the funds of the Company to pay, all costs and losses and expenses (including travelling expenses) which any such Director, Officer or Employee may incur or become liable to by reason of any contract entered into or act or deed done by him as such Managing Director, Director, Officer or employee or in any way in the discharge of his duties.

b) Subject as aforesaid the Managing Director and every Director, Manager, Secretary or other Officer or Employee of the Company shall be indemnified against any liability incurred by them or him in defending any proceedings whether civil or criminal in which judgement is given in their or his favour or in which he is acquitted or discharged or in connection with any application under Section 633 of the Act which relief is given to him by the Court.

Not responsible for acts of others

182 1. Subject to the provisions of Section 201 of the Act no director or other Officer of the Company shall be liable for the acts, receipts, neglects or defaults of any other Director or Officer, or for joining in any receipt of other act for conformity or for any loss or expenses happening to the Company through insufficiency or deficiency of any security in or upon which any of the moneys of the company shall be invested, or for any loss or damage arising from the bankruptcy, insolvency, or tortious act of any person, Company or Corporation, with whom any

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moneys, securities or effects shall be entrusted or deposited or for any loss occasioned by any error of judgement or oversight on his part, or for any other loss or damage or misfortune whatever which shall happen in the execution of the duties of his office or in relation thereto, unless the same happens through his own wilful act or default.

2. Without prejudice to the generality of foregoing it is hereby expressly declared that any filing fee payable on any document required to be filed with the Registrar of Companies in respect of any act done or required to be done by any Director or other officer by reason of his holding the said office, shall be paid and borne by the Company.

SECRECY CLAUSE

Secrecy

183 No member shall be entitled to inspect the Company's works without the permission of the Director or Managing Director or to require discovered of any information respecting any detail of the Company's trading or any matter which is or may be in the nature of trade secret, mystery of trade or secret process which may relate to the conduct of the business of the Company and which in the opinion of the Directors it will be in expedient in the interest of the members of the Company to communicate to the public.

Duties of Officers to Observe secrecy

184 Every Director, Managing Director, Manger, Secretary, Auditor, trustee, Members of a Committee, Officer, Servant, Agent, accountant or other person employed in the business of the Company, shall if so required by the Director before entering upon his duties, or at any time during his term of office, sign a declaration pledging himself to observe strict secrecy respecting all transactions of the Company and the state of Accounts and in matters relating thereto and shall be such declaration pledge himself not to reveal any of the information which may come to his knowledge in the discharge of his duties except when required so to do by the Directors or any meeting or by a Court of Law or by the person to whom such matters relate and except so far as may be necessary in order to comply with any of the provisions of these Articles or Law.

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S.No	Name, address, description, occupation of the subscriber	Signature of Subscriber	Name & Address, occupation of witness to the signature of subscriber with his signature
01.	Madhucon Projects Limited (CIN: U74210AP1990PTC001114) 1-7-70, Jubilipura, Khammam-507003 Andhra Pradesh. Represented by: S. Vaikuntanatham Director (Finance)	[signature]	Udusyanarayana Company Secretary (U. Surya Narayana) FCS 336 CP 2746 S/o Late U. Venkatesam. Plot No. 836A, Vivekanandanagar Kukatpally, Hyderabad 500072
02.	Nama Nageswara Rao. S/o Late P. Muthaiah H.NO 648 Plot No. 214 Road No. 14 Jubilihills Hyderabad. 500003 Occ. Busin.	[signature]	
03.	Nama. Seethaiah S/o. Late Muthaiah Varalaxmi Nilayam H.No. 4-11-65/C Nehru Nagar Khammam-507001 Occ. Business	[signature]	
04.	Kamma. Srinivasa Rao, S/o Sri. Kamma. Nageswara Rao, Varalaxmi Nilayam, H.No: 4-11-65/C Nehru Nagar Khammam - 507001 Occu: Business	[signature]	

Hyderabad

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05	Nama. Lakshmaiah. S/o Late. N. muttaiah. & Varalaxminilayam H.No: 11-4-65/C, Nehrunagar Khammam 507001 Occu: Business.		
06	Nama Rama Rao S/o Late N Muthaiah Varalakshmi Nilayam H.No: 11-4-65/C, Nehru Nagar Khammam - 507 001 Occu: Business		
07	Mallempati Madhu S/o Late M. Gopalrao. Varalakshmi Nilayam H.No: 11-4-65/C, Nehru Nagar Khammam - 507001 Occu Business.		

Dated: 8.4.2006
Place : Hyderabad

CERTIFIED COPY

U. SURYANARAYANA
M.B.A., L.L.B., F.C.S.
Company Secretary
CP-2768 (FCS-336)

TRICHY-THANJAVUR EXPRESSWAY (P) LTD.
Hyderabad

Annexture-VI

TRICHY - THANJAVUR EXPRESSWAYS LIMITED

Regd. Office : ' Madhucon House" , Plot No.1129/A, Road No.36, Hitech City Road, Jubilee Hills, Hyderabad - 500033.

EXTRACT OF THE RESOLUTION DULY PASSED AT THE MEETING OF THE BOARD OF DIRECTORS OF TRICHY THANJAVUR EXPRESSWAYS LIMITED HELD ON WEDNESDAY THE 19TH APRIL 2006 AT THE REGISTERED OFFICE OF THE COMPANY AT MADHUCON HOUSE, PLOT No.1129/A, ROAD No.36, JUBILEE HILLS, HITECH CITY ROAD, HYDERABAD - 500 033 WHEREIN ALL THE DIRECTORS WERE PRESENT.

SUB: CONSTITUTION OF SPECIAL PURPOSE VEHICLE (SPV)

Chairman briefed the members that Madhucon Projects Limited incorporated a Special Purpose Vehicle under the name and style of Trichy-Thanjavur Expressways Limited vide Certificate of Incorporation No. 01-49815, dtd.13.04.2006(CIN:U45200AP2006PLC49815) for execution of the Project works TN-3 for Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur-Trichy Section from Km 80.000 to Km 135.750 of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis.

The Board on detailed deliberation Resolved that the company do hereby authorized to execute the Concession Agreement on behalf of Madhucon Madhucon Projects Limited with National High-Way Authority of India for execution of Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur-Trichy Section from Km 80.000 to Km 135.750 of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis.

FURTHER RESOLVED THAT Sri. S.V.Patwardhan, Managing Director, Madhucon Projects Limited or Sri N. Seethaiah, Joint Managing Director Madhucon Projects Limited and Director, Trichy-Thanjavur Expressways Limited be and hereby authorized to execute the above referred Concession Agreement on behalf of Trichy-Thanjavur Expressways Limited under the common seal of the Company.

FURTHER RESOLVED THAT Sri N.Nageswar Rao, Chairman be and hereby authorized to submit this Resolution duly certified to NHAI for reference and record.

Certified Copy

N.NAGESWAR RAO
Chairman
Trichy-Thanjavur Expressways Limited

CERTIFIED COPY

SURYANARAYANA
M.B.A., L.L.B., F.C.S.
Company Secretary
CP: 3765 (FCS-3765)

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Annexure-VI

VII

MADHUCON
PROJECTS LIMITED

EXTRACTS OF THE RESOLUTION OF THE MEETING OF THE BOARD OF DIRECTORS OF MADHUCON PROJECTS LIMITED HELD ON FRIDAY THE 31ST MARCH 2006 AT 4.00 PM AT THE CORPORATE OFFICE, MADHUCON HOUSE, Plot No.1129/A, ROAD NO.36, HITEC CITY ROAD, JUBILEE HILLS, HYDERABAD-500 033

Sub: Subscribers to the Memorandum & Articles of Association of Trichy-Thanjavur Expressways Limited.

The Board noted that Trichy-Thanjavur Expressways Limited, a Public Limited Company with an authorized capital of Rs.1.00 Crore (Rupees One Crore) is being promoted and incorporated in Andhra Pradesh by Sri. N.Nageswar Rao and associates as a special purpose vehicle for execution of BOT Project of NHAI for Design, Engineering, Finance, Operation and Maintenance of Trichy-Thanjavur Section from Km 80.000 to Km 135.750 of NH 67 in the State of Tamil Nadu under NHDP Phase III A on Build Operate & Transfer (BOT) basis; The Chairman proposed that Madhucon Projects Limited be one of the subscribers to the Memorandum and Articles of Association of Trichy-Thanjavur Expressways Limited and to subscribe 20,000 Equity Shares of Rs.10/- each by Madhucon Projects Limited.

After detailed deliberations the Board approved the proposal and passed the following resolution:

Resolved that Sri. S. Vaikuntanathan, Director-Finance of Madhucon Projects Limited be and hereby authorised to sign on behalf of Madhucon Projects Limited under the company seal as subscriber to the Memorandum and Articles of Association of Trichy-Thanjavur Expressways Limited and to take initially 20,000 (Twenty Thousand) Equity Shares of Rs. 10/- each by Madhucon Projects Limited.

Further resolved to authorize Sri.N.Nageswar Rao, Chairman to certify this resolution for submission to Registrar of Companies, Andhra Pradesh for reference and record.

Certified Copy

N.NAGESWAR RAO
CHAIRMAN
MADHUCON PROJECTS LIMITED

MADHUCON PROJECTS LTD. HYD.

CERTIFIED COPY

U. SURYANARAYANA
M.B.A., L.L.B., F.C.S.
Secretary
(FCS-335)

TRICHY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

Corp. Off: Madhucon House, 1129/A, Road No. 36, Hitec City Road, Jubilee Hills, Hyderabad - 500 033. India
Tel: +91-40-23556001/2/3/4 Fax: +91-40-23556005 E-mail: hydmadhucon@gmail.com
Admn. Off: D-27, East of Kailash, New Delhi-110065. Tel: +91-11-26425507/26425820
Fax: +91-11-26476713 E-mail: madhucon@ndb.vsnl.net.in

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TRICHY - THANJAVUR EXPRESSWAYS LIMITED

Regd. Office : ' Madhucon House" , Plot No.1129/A, Road No.36, Hitech City Road, Jubilee Hills, Hyderabad - 500033.

TTEL/HYD/2006/
April 15, 2006

The Registrar of Companies
Andhra Pradesh, Kendriya Sadan
Sultan Bazar, Koti, Hyderabad-500 195.

Dear Sir,

Sub: Filing of e-Form - 2 regarding Allotment of 50,000 Equity Shares of Rs.10/- each to the Subscribers against the monies received.

Ref: Registration No. 01- 49815 (CIN U45200AP2006PLC49815)
Nominal Capital: Rs. 1.00 Crore

Enclosed please find herein e-Form 2 regarding Allotment of 50,000 Equity Shares of Rs.10/- each of Trichy - Thanjavur Expressways Limited, to the subscribers against the monies received.

Filing fee is being remitted in cash counter.

You are requested to register the above documents as per the provisions of the Companies Act, 1956.

Thanking you.

Yours faithfully,
for TRICHY - THANJAVUR EXPRESSWAYS LIMITED

N.Nageswar Rao
Chairman

Encl: as above

CERTIFIED COPY

DEPARTMENT OF COMPANY AFFAIRS
ROC CASH COUNTER RECEIPT
OFFICE OF THE REGISTRAR OF COMPANIES

REGISTRAR OF COMPANIES, HYDERABAD17/04/2006
REC NO.: 582179 REG NO.: 01-049815
TRICHY-THANJAVUR EXPRESSWAYS LIMITED

TYPE OF DOCUMENT	MODE OF PAYMENT	DATE OF DOCUMENT	AMOUNT RS.
FORM 2	CASH -H	H	500

TOTAL 500

N: NORMAL FEE A: ADDITIONAL FEE

COMPUTER SUPPORT BY INDUSTRY DIVISION N.I.C

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Annexure -VI

FORM 2

[Pursuant to Section 75(1) of the Companies Act, 1956]

Return of allotment

Note – All fields Marked in * are to be mandatorily filled.

1(a).*Corporate identify number (CIN) of company U45200AP2006PTC49815 Pre-Fill

(b). Global location number (GLN) of company

2(a). Name of the company TRICHY-THANJAVUR EXPRESSWAYS LIMITED

(b). Address of the registered office of the company Madhucon House,Plot No.1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033

3. *Date of allotment 15.04.2006 (DD/MM/YYYY)

4. Shares allotted payable in cash

Class of shares ☐ preference ☑ Equity

Class of Shares		Preference	Equity
Number of shares allotted		Nil	50,000
Nominal amount per share	(in Rs.)	Nil	10
Total nominal amount	(in Rs.)	Nil	5,00,000
Amount paid per share on application	(in Rs.)	Nil	10
Total amount paid on application	(in Rs.)	Nil	5,00,000
Amount due and payable per share on allotment (excluding premium)	(in Rs.)	Nil	Nil
Total amount paid on allotment (excluding premium)	(in Rs.)	Nil	Nil
Premium amount per share due and payable (if any)	(in Rs.)	Nil	Nil
Total premium amount due and payable (if any)	(in Rs.)	Nil	Nil
Premium amount paid per share (if any)	(in Rs.)	Nil	Nil
Total Premium amount paid (if any)	(in Rs.)	Nil	Nil
Amount of discount per share (if any)	(in Rs.)	Nil	Nil
Total discount amount (if any)	(in Rs.)	Nil	Nil

For Trichy-Thanjavur Expressways Ltd.

Chairman

CERTIFIED COPY

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Annexure - VI

5. Shares allotted for consideration otherwise than in cash

Class of shares [ ] Preference [ ] Equity

Class of Shares		Preference	Equity
Number of shares allotted		Nil	Nil
Nominal amount per share	(in Rs.)	Nil	Nil
Amount to be treated as paid-up on each share	(in Rs.)	Nil	Nil
The consideration for which such shares have been allotted		Nil	Nil
(a).Property and assets acquired	Description	Nil	Nil
	Amount (in Rs.)	Nil	Nil
(b).Goodwill	Description	Nil	Nil
	Amount (in Rs.)	Nil	Nil
(c).Services (give nature of services)	Description		
	Amount (in Rs.)	Nil	Nil
(d).Other items (to be specified)	Description		
	Amount (in Rs.)	Nil	Nil

6. Bonus shares issued

(a) Number of bonus shares — Nil

(b) Nominal amount per share (in Rs.) — N.A

(c) Amount to be treated as paid-up per share (in Rs.) — N.A

For Trichy_Thanjavur Expressways Ltd.

Chairman

CERTIFIED COPY

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Annexure-VI

7(a). Total nominal value of equity shares issued including the present allotment (in Rs.) 5,00,000

(b). Total nominal value of preference shares issued including the present allotment in Rs.) Nil

8(a). Date of passing the special resolution authorizing issue under section 81 N.A (DD/MM/YYYY)

(b). Service request number (SRN) of From 23 N.A

Attachments

1. Copy of the resolution authorizing the issue of bonus shares — Attach
2. *List of allottees — Attach
3. Copy of the resolution for the issue of shares at a discount with a copy of the order of the Central Government — Attach
4. Copy of the contract, if any, for allotment of shares for consideration otherwise than in cash — Attach
5. Optional attachment(s) – if any — Attach

List of attachments

List of Allottees

Remove attachment

Declaration

To the best of my knowledge and belief, the information given in this form and its attachments is correct and complete.
I have been authorized by the board of directors' resolution dated * (DD/MM/YYYY)
To sign and submit this form.

~~To be digitally~~ signed by

For Trichy Thanjavur Expressways Ltd.

~~Managing Director~~ or director or ~~manager or secretary~~ of the company

N.Nageswar Rao Chairman
Chairman

CERTIFICATE

It is hereby certified that I have verified the above particulars from the books of account and records of M/s TRICHY-THANJAVUR EXPRESSWAYS LIMITED and found them to be true and correct.
Chartered accountant or cost accountant or company secretary (in whole-time practice)

Modify | Check Form | Pre-scrutiny | Submit

For office use only:
This e-Form is hereby registered
Digital signature of the authorizing officer

Submit to RO

CERTIFIED COPY.

Hyderabad

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Annexure -VI

Annexure

Names, addresses and occupation of the allottees of **Trichy-Thanjavur Expressways Limited**:

Date of Allotment	Name of allottee in full	Address and occupation Of the allottee		Number of shares allotted	
			Equity	Preference shares other than Redeemable preference shares	Redeemable Preference Shares
1	2	3	4	5	6
15/04/2006	Madhucon Projects Limited CIN: U74210AP1990PLC0011114	1-7-70, Jublipura, Khammam-507 003, Andhra Pradesh	20000	Nil	Nil
15/04/2006	Sri. Nama Nageswar Rao S/o.Late N Muthaiah	H.No.648, Plot No.214-1, Road No.14, Jubilee Hills, Hyderabad-500 033	8888	Nil	Nil
15/04/2006	Sri. Nama Seethaiah S/o.Late N Muthaiah	H.No.648, Plot No.214-1, Road No.14, Jubilee Hills, Hyderabad-500 033	8888	Nil	Nil
15/04/2006	Sri.Kamma Srinivasa Rao S/o. Sri.K.Nageswar Rao	Varalakshmi Nilayam, H.No.11-4-65/C, Nehru Nagar, Khammam – 507 001	8888	Nil	Nil
15/04/2006	Sri. Nama Krishnaiah S/o.Late N Muthaiah	Varalakshmi Nilayam, H.No.11-4-65/C, Nehru Nagar, Khammam – 507 001	1888	Nil	Nil
15/04/2006	Sri. N.Rama Rao S/o. Late N Muthaiah	Varalakshmi Nilayam, H.No.11-4-65/C, Nehru Nagar, Khammam – 507 001	560	Nil	Nil
15/04/2006	Sri.Mallempati Madhu S/o. Late M. Gopal Rao	Varalakshmi Nilayam, H.No.11-4-65/C, Nehru Nagar, Khammam – 507 001	888	Nil	Nil
		Total Equity Shares	**50000 (Fifty Thousand)**		

For Trichy_Thanjavur Expressways Ltd.

Chairman

THANJAVUR EXPRESSWAYS LTD. Hyderabad

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Annexure-VI

TRICHY-THANJAVUR EXPRESSWAYS LIMITED

Regd. Office : ' Madhucon House" , Plot No.1129/A, Road No.36, Hitech City Road, Jubilee Hills, Hyderabad - 500033.

EXTRACT OF THE RESOLUTION DULY PASSED AT THE MEETING OF THE BOARD OF DIRECTORS OF TRICHY-THANJAVUR EXPRESSWAYS LIMITED HELD ON SATURDAY THE 15TH APRIL 2006 AT THE REGISTERED OFFICE OF THE COMPANY AT MADHUCON HOUSE, PLOT No.1129/A, ROAD No.36, JUBILEE HILLS, HITECH CITY ROAD, HYDERABAD - 500 033

Allotment of Shares to the Subscribers of the Memorandum of Association:

Chairman informed the Board that the signatories of the Memorandum who have agreed to take the Equity Shares of Rs.10/- each as detailed in the Memorandum of Association subscribed their share amount in full. The Board allotted the shares and the following resolution was passed:

Resolved that the Company's 50,000 Equity Shares of Rs.10/- each be and hereby allotted to the following subscribers to the Memorandum of Association against the monies received.

Sl.No.	Name of the Subscriber	No. of shares	Distinctive No. From	Distinctive No. To	Value Rs.
1.	Madhucon Projects Limited	20000	000001	020000	2,00,000/-
2.	Nama Nageswar Rao	8888	020001	028888	88,880/-
3.	Nama Seethaiah	8888	028889	037776	88,880/-
4.	Kamma Srinivasa Rao	8888	037777	046664	88,880/-
5.	Nama Krishnaiah	1888	046665	048552	18,880/-
6.	Nama Rama Rao	560	048553	049112	5,600/-
7.	Mallempati Madhu	888	049113	050000	8,880/-

Further resolved that the share certificates be issued with the signatures of Sri.N.Nageswar Rao, Chairman and Sri.N.Seethaiah, Director under the Common seal of the Company.

Trichy-Thanjavur Expressways Ltd. Hyderabad

Certified copy

N.Nageswar Rao
Chairman

CERTIFIED COPY

TRICHY-THANJAVUR EXPRESSWAYS LTD. Hyderabad

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Annexure-VI

FORM 18

[Pursuant to section 146 of the Companies Act, 1956]

Notice of situation or change of situation of registered office

Note – All fields marked in * are to be mandatorily filled.

1. *This form is for (•) New company ( ) Existing company

2(a). *Corporate identity number (CIN) of company or Form 1A reference number: RAP/NA/70839/KBR

(b). Global location number (GLN) of company: [ ] Pre-Fill

2(a). Name of the company: TRICHY-THANJAVUR EXPRESSWAYS LIMITED

(d). Address of the registered office of the company: Plot No.1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033

4. Notice is hereby given that

(a). The address of the registered office of the company with effect from

[ ] (DD/MM/YYYY)

(•) The date of incorporation of the company is

*Address Line I: "Madhucon House", 8-2-272/82/A/1129/A.

Line I: Road No.36, Jubilee Hills

*City: Hyderabad

*District:

*State: Andhra Pradesh

*Country: India

*Pin Code: 500 033

(b) The full address of the police station under whose jurisdiction the registered office of the company is situated

*Name: Jubilee Hills Police Station

*Address Line I: Baniara Hills Division. Cyberabad Police District.

Line I:

*City: Hyderabad

*State: Andhra Pradesh

*Pin code: 500 033

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Annexure-VI

Attachment

1. Optional attachment(s) – if any | Attach |

List of attachments

Remove Attachment

Declaration

To the best of my knowledge and belief, the information given in this form and its attachments is correct and complete.

☐ I have been authorized by the board of directors' resolution dated [ ] (DD/MM/YYYY) to sign and submit this form.

☑ I am authorized to sign and submit this form.

To be digitally signed by

Managing Director or director or manager or secretary of the company

(N.Nageswar Rao)
Promoter Director

Certificate

It is hereby certified that I have verified the above particulars from the books of account and records of M/s Trichy-Thanjavur Expressways Limited

and found them to be true and correct.

Chartered accountant or cost accountant or company secretary (in whole-time practice)

M. NARAYANA
M.E.A., L.L.B., F.C.S.
Company Secretary
CP-2768 (FCS-336)

Modify | Check Form | Prescrutiny | Submit

For office use only

This e-Form is hereby registered

Digital signature of the authorizing officer

Submit to BO

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Annexure-VII

MADHUCON
PROJECTS LIMITED

Ref: MPL / 2006 / (Trichy - Than.) / 331 Dated: [illegible]

The Manager (Finance) BOT
National Highways Authority of India Ltd
G-5 & 6, Sector-10, Dwarka
New Delhi-110 075.

Kind Attn : Mr. Atul Kumar Garg, Manager (Finance) BOT

Sub: Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur – Trichy Section from Km. 80.000 to Km. 135.750 of NH – 67 in the State of Tamil Nadu under NHDP Phase – III-A on Build, Operate and Transfer (BOT) basis. (Package No. NHDP-III/BOT/TN/03).

Dear Sir,

This is with reference to your letter No. NHAI / BOT-I / 11019 / 35 / 2005 / 303 dated 16th May 2006.

Further to our IOM No. MPL / 2006 / (Trichy – Than.) / 324 dated 15th May 2006 (photocopy enclosed) in which we have forwarded you, the following documents as desired by your consultant M/s. Price Water House, for your kind perusal.

a) Letter of undertaking to confirm that Sh. Nama Seethaiah, who is subscriber and the Director of M/s. Trichy – Thanjavur Expressways Limited are part of Associates of Madhucon Projects Limited.

b) Copy of Minutes of Board Meeting of Board of Directors authorizing to invest in Equity Share of M/s. Trichy – Thanjavur Expressways Limited of dated 10th May 2005

Thanking you,

Yours faithfully,
MADHUCON PROJECTS LTD.

COL. (RETD.) S.K. SAHNI
CHIEF GENERAL MANAGER

Encl. As above.

Copy to: Mr. Rajesh Poonia, General Manager (BOT) II-A, NHAI, G-5 & 6, Sector-10, Dwarka, New Delhi – 110 075.

Administrative Office: D-27, East of Kailash, New Delhi - 110 065. **Tel:** 011-2642 5507 / 2642 5820
Fax: +91-11-26476713 **E-mail:** madhucon@ndb.vsnl.net.in **URL:** www.madhucon.com

Corporate Office: Madhucon House, 1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033
Tel: +91-40-2355 6001/2/3/4 Fax: +91-40-2355 6005 E-mail: hyd1_madhucon@sancharnet.in

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Annexure VII

MADHUCON
PROJECTS LIMITED

Ref: MPL / 2006 / (Trichy - Than.) / 324 Dated: 15th May 2006

The General Manager (BOT) II-A
National Highways Authority of India Ltd.
G-5 & 6, Sector-10, Dwarka
New Delhi-110 075.

Kind Attn.: Mr. Rajesh Poonia, General Manager (BOT) II-A

Sub: **Design, Engineering, Finance, Construction, Operation and Maintenance of Thunjavur – Trichy Section from Km. 80.000 to Km. 135.750 of NH – 67 under NHDP Phase – III-A on Build, Operate and Transfer (BOT) basis. [Package No. NHDP-III/BOT/TN/03].**

Dear Sir,

1. We have perused the Draft Concession Agreement provided by you and find that the clause 57.2 on page 61 of 97 provides two months for obtaining insurance while the document issued along with the bid documents provides for four months. You may therefore kindly correct this change.
2. The changes suggested by M/s. Price Water House, your consultant have been taken care of and the documents in this regard are enclosed herewith.
3. Registrar of Companies have not so far issued 'Commencement of Business' Certificate. After receipt of this certificate the banker's will issues Bank Guarantee on behalf of SPV. we will furnish this document as soon as obtained.

4. Copy of Memo & Articles of Association

You may kindly bear with us for the delay but we hope that we will complete these requirements by the end of the May 2006.

Thanking you,

Yours faithfully,
MADHUCON PROJECTS LTD.

(S.V. PATWARDHAN)
MANAGING DIRECTOR

Encl. As above.

Administrative Office: D-27, East of Kailash, New Delhi - 110 065. **Tel:** 011 - 26425507/26425820
Fax: +91-11-26476713 **E-mail:** madhucon@ndb.vsnl.net.in

Corporate Office: Madhucon House, 1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033
Tel: +91-40-23556001/2/3/4 **Fax:** +91-40-23556005 **E-mail:** hyd1_madhucon@sancharnet.in

Annexure VII

MADHUCON
PROJECTS LIMITED

To
National Highways Authority of India,
(Ministry of Shipping, Road Tansport and Highways)
G-5 & 6, Sector 10, Dwaraka,
New Delhi – 110 075.

Kind Attn: Sri.Rajesh Poonia, General Manager (BOT) IB

Letter of Undertaking

Sub: 4 laning of Thanjavur – Trichy section of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA.

With reference to the Memorandum and Articles of Association of Trichy – Thanjavur Expressways Limited, a company incorporated under the Companies Act as a Special Purpose Vehicle for execution of the project works TN3 for Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur – Trichy section from Km 80.000 to Km. 135.750 of NH-67 in the state of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis, we confirm that Sri.Nama Seethaiah who is subscriber and first Director of Trichy – Thanjavur Expressways Limited are part of associates of Madhucon Projects Limited.

Thanking you.

Yours faithfully,
for MADHUCON PROJECTS LIMITED

Authorised Signatory.

Corp. Off: Madhucon House, 1129/A, Road No. 36, Hitec City Road, Jubilee Hills, Hyderabad - 500 033. India
Tel: +91-40-23556001/2/3/4 Fax: +91-40-23556005 E-mail: hydmadhucon@gmail.com

Admn. Off: D-27, East of Kailash, New Delhi-110065. Tel: +91-11-26425507/26425820
Fax: +91-11-26476713 E-mail: madhucon@ndb.vsnl.net.in

Annexure - VII

MADHUCON
PROJECTS LIMITED

CERTIFIED TRUE COPY OF THE MINUTES OF BOARD MEETING OF BOARD OF DIRECTORS OF MADHUCON PROJECTS LIMITED HELD ON WEDNESDAY THE 10TH MAY 2006 AT 11.00 AM AT THE CORPORATE OFFICE OF THE COMPANY AT MADHUCON HOUSE, PLOT NO. 1129/A, ROAD NO. 36, HITEC CITY ROAD, JUBILEE HILLS, HYDERABAD – 500 033.

Sub: Authorization to invest in Equity Shares of M/s. Trichy – Thanjavur Expressways Limited.

Chairman briefed the members that Madhucon Projects Limited incorporated a Special Purpose Vehicle under the name and style of Trichy – Thanjavur Expressways Limited vide Certificate of Incorporation No. 01-49815, dt. 13.04.2006 (CIN: U45200AP2006PLC49815) for execution of the Project works TN-3 for Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur – Trichy Section from Km 80.000 to Km 135.750 of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis.

Chairman further informed that the Investment of Madhucon Projects Limited along with its Associates shall not be less than 51% of issued and paid up Equity Capital during Construction period and for 3 years following Commercial operation date and a minimum of 26% during balance remaining operating period.

After detailed discussions the board passed the following resolution unanimously.

"RESOLVED THAT" subject to Section 372 (a) of the companies Act and other applicable provisions and approvals the Chairman of Madhucon Projects Limited be and is hereby authorized to make investment in the Equity capital of Trichy – Thanjavur Expressways Limited not exceeding 51% of the issued and paid up Equity Capital of the Trichy – Thanjavur Expressways Limited along with the Associates during Construction Period and for 3 years following Commercial operation date.

"FURTHER RESOLVED THAT" the Equity Investment shall not fall less than 26% during remaining operation period on such terms and conditions as the Chairman may deem think fit.

Certified True copy

SOMESWAR RAO
Company Secretary

Corp. Off: Madhucon House, 1129/A, Road No. 36, Hitec City Road, Jubilee Hills, Hyderabad - 500 033. India
Tel: +91-40-23556001/2/3/4 **Fax:** +91-40-23558005 **E-mail:** hydmadhucon@gmail.com

Admn. Off: D-27, East of Kailash, New Delhi-110065. **Tel:** +91-11-26425507/26425820
Fax: +91-11-26476713 **E-mail:** madhucon@ndb.vsnl.net.in

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Annexure-VIII

MADHUCON
PROJECTS LIMITED

Ref: MPL / 2006 / (Trichy - Than.) / 352

Dated: 24th May 2006

The Manager (Finance) BOT
National Highways Authority of India Ltd.
G-5 & 6, Sector-10, Dwarka
New Delhi-110 075.

Kind Attn.: Mr. Atul Kumar Garg, Manager (Finance) BOT

Sub: Design, Engineering, Finance, Construction, Operation and Maintenance of Thunjavur – Trichy Section from Km. 80.000 to Km. 135.750 of NH – 67 in the State of Tamil Nadu under NHDP Phase – III-A on Build, Operate and Transfer (BOT) basis. [Package No. NHDP-III/BOT/TN/03].

Dear Sir,

In continuation to your letter No. NHAI/BOT-I/11019/35/2005/727 dated 22nd May 2006 We are re-submitting the following documents as desired by you

a) Board Resolution dated 10/05/2006 of Madhucon Projects Limited duly corrected the wording as to invest in the equity capital of Trichy-Thanjavur Expressways Limited "not less than 51%" of its issued and paid up capital along with associates.

b) Board Resolution dt. 10.05.2006 Trichy-Thanjavur Expressways Limited duly corrected that

In modification to the earlier Board Resolution dated 19th April 2006 the Board resolved to authorize Sri. N. Seethaiah, Director, Trichy-Thanjavur Expressways Limited to sign and execute the above referred Concession Agreement with NHAI.

Further resolved that the common seal of the Company be affixed wherever necessary in the presence of Sri N. Seethaiah, Director of the Company and Col. (Retd) S.K. Sahni. CGM, MPL and authorized person shall sign the same in token thereof.

We are sure, you will find our submission in order

Thanking you.

Yours faithfully,
MADHUCON PROJECTS LTD.

COL. (RETD.) S.K. SAHNI
CHIEF GENERAL MANAGER

Administrative Office: D-27, East of Kailash, New Delhi - 110 065. **Tel:** 011 - 26425507/26425820
Fax: +91-11-26476713 **E-mail:** madhucon@ndb.vsnl.net.in

Corporate Office: Madhucon House, 1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033
Tel: +91-40-23556001/2/3/4 **Fax:** +91-40-23556005 **E-mail:** hyd1_madhucon@sancharnet.in

Annexure-VIII

MADHUCON
PROJECTS LIMITED

CERTIFIED TRUE COPY OF THE MINUTES OF BOARD MEETING OF BOARD OF DIRECTORS OF MADHUCON PROJECTS LIMITED HELD ON WEDNESDAY THE 10TH MAY 2006 AT 11.00 AM AT THE CORPORATE OFFICE OF THE COMPANY AT MADHUCON HOUSE, PLOT NO. 1129/A, ROAD NO. 36, HITEC CITY ROAD, JUBILEE HILLS, HYDERABAD – 500 033.

Sub: Authorization to invest in Equity Shares of M/s. Trichy – Thanjavur Expressways Limited.

Chairman briefed the members that Madhucon Projects Limited incorporated a Special Purpose Vehicle under the name and style of Trichy – Thanjavur Expressways Limited vide Certificate of Incorporation No. 01-49815, dt. 13.04.2006 (CIN: U45200AP2006PLC49815) for execution of the Project works TN-3 for Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur – Trichy Section from Km 80.000 to Km 135.750 of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis.

Chairman further informed that the Investment of Madhucon Projects Limited along with its Associates shall not be less than 51% of issued and paid up Equity Capital during Construction period and for 3 years following Commercial operation date and a minimum of 26% during balance remaining operating period.

After detailed discussions the board passed the following resolution unanimously.

"**RESOLVED THAT**" subject to Section 372 (a) of the companies Act and other applicable provisions and approvals the Chairman of Madhucon Projects Limited be and is hereby authorized to make investment in the Equity capital of Trichy – Thanjavur Expressways Limited not less than 51% of the issued and paid up Equity Capital of the Trichy – Thanjavur Expressways Limited along with Associates during Construction Period and for 3 years following Commercial operation date.

"**FURTHER RESOLVED THAT**" the Equity Investment shall not fall less than 26% during remaining operation period on such terms and conditions as the Chairman may deem think fit.

CERTIFIED COPY
FOR MADHUCON PROJECTS LIMITED.
Company Secretary.

Corp. Off: Madhucon House, 1129/A, Road No. 36, Hitec City Road, Jubilee Hills, Hyderabad - 500 033. India
Tel: +91-40-23556001/2/3/4 Fax: +91-40-23556005 E-mail: hydmadhucon@gmail.com

Admn. Off: D-27, East of Kailash, New Delhi-110065. Tel: +91-11-26425507/26425820
Fax: +91-11-26476713 E-mail: madhucon@ndb.vsnl.net.in

Annexure-VIII

TRICHY - THANJAVUR EXPRESSWAYS LIMITED

Regd. Office : ' Madhucon House" , Plot No.1129/A, Road No.36, Hitech City Road, Jubilee Hills, Hyderabad - 500033.

EXTRACT OF THE RESOLUTION DULY PASSED AT THE MEETING OF THE BOARD OF DIRECTORS OF TRICHY THANJAVUR EXPRESSWAYS LIMITED HELD ON WEDNESDAY THE 10TH MAY 2006 AT THE REGISTERED OFFICE OF THE COMPANY AT MADHUCON HOUSE, PLOT No.1129/A, ROAD No.36, JUBILEE HILLS, HITECH CITY ROAD, HYDERABAD - 500 033.

SUB: Authorization

Chairman briefed the members that Madhucon Projects Limited incorporated a Special Purpose Vehicle under the name and style of Trichy-Thanjavur Expressways Limited vide Certificate of Incorporation No. 01-49815, dtd.13.04.2006(CIN:U45200AP2006PLC49815) for execution of the Project works TN-3 for Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur-Trichy Section from Km 80.000 to Km 135.750 of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis.

The Board on detailed deliberation Resolved that the company do hereby authorized to execute the Concession Agreement on behalf of Madhucon Projects Limited with National High-Way Authority of India for execution of Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur-Trichy Section from Km 80.000 to Km 135.750 of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis.

In modification to the earlier Board Resolution dated 19th April 2006 the Board resolved to authorize Sri.N.Seethaiah, Director, Trichy-Thanjavur Expressways Limited to sign and execute the above referred Concession Agreement with NHAI.

Further Resolved that the common seal of the Company be affixed wherever necessary in the presence of Sri.N.Seethaiah, Director of the Company and COL.(Retd).SK.Sahni, Chief General Manager, Madhucon Projects Limited and authorized person shall sign the same in token thereof.

Trichy Thanjavur Expressways Ltd. Hyderabad

CERTIFIED COPY

U. SURYANARAYANA
M.S.A., L.L.B., F.C.S.
Company Secretary
CP-2768 (FCS-336)

THANJAVUR EXPRESSWAYS LTD. Hyderabad

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Annexure- IX

MADHUCON
PROJECTS LIMITED

Ref: MPL / 2006 / (Trichy - Than) / 370 Dated: 2[illegible]

The General Manager (BOT) – II-A
National Highways Authority of India Ltd.
G-5 & 6, Sector-10, Dwarka
New Delhi-110 075

Kind Attn.: Mr. Rajesh Poonia, General Manager (BOT) – II-A

Sub: Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur – Trichy Section from Km. 80.000 to Km. 135.750 of NH – 67 in the State of Tamil Nadu under NHDP Phase – III-A on Build, Operate and Transfer (BOT) basis [Package No. NHDP-III / BOT / TN / 03].

Dear Sir,

In continuation to your letter No. NHAI/BOT-I/11019/35/2005/743 dated 26th May 2006 we are submitting the following documents as desired by you

a) "RESOLVED THAT subject to the provisions of the Companies Act, 1956, the Chairman acting for and on behalf of the Company is hereby authorized to make investment in the equity capital of Trichy – Thanjavur Expressways Limited.

FURTHER RESOLVED that in order to comply with the minimum equity requirement stipulated in the Request for Proposal issued by the NHAI for the four laning of Thanjavur – Trichy Section of NH – 67 in the State of Tamil Nadu under NHDP Phase – III-A, the aggregate initial investment of the Company along with its associates shall not be less than 51% of the equity capital of Trichy – Thanjavur Expressways Limited and that the investment, at any time during the Construction Period of 3 years following Commercial Operation Date, should not fall below 51%.

FURTHER RESOLVED that the investment in the equity capital of Trichy – Thanjavur Expressways Limited shall not fall below 26% during the balance remaining Operation Period."

b) For Trichy – Thanjavur Expressways Limited – Draft Resolution for affixing the Common Seal (i.e. the last para)

"FURTHER RESOLVED that the common seal of the Company be affixed wherever necessary in the presence of Sri. N. Seethaiah, Director of the Company and Col. (Retd.) S.K. Sahni, Chief General Manager, Madhucon Projects Limited who is hereby appointed as the authorized person for the purpose and both the above named persons shall sign the same in token therefore."

We are sure, you will find our submission in order

Thanking you,

Yours faithfully,
MADHUCON PROJECTS LTD.

COL. (RETD.) S.K. SAHNI
CHIEF GENERAL MANAGER

Encl: As above

Manager (F) BOT

06.06.06

Administrative Office: D-27 East of Kailash, New Delhi - 110 065. Tel: 011 - 26425507/26425820
Fax: +91-11-26476713 **E-mail:** madhucon@ndb.vsnl.net.in

Corporate Office: Madhucon House, 1129/A, Road No.36, Hitec City Road, Jubilee Hills, Hyderabad-500 033
Tel: +91-40-23556001/2/3/4 **Fax:** +91-40-23556005 **E-mail:** hyd1_madhucon@sancharnet.in

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Annexure-1X

TRICHY - THANJAVUR EXPRESSWAYS LIMITED

Regd. Office : ' Madhucon House" , Plot No.1129/A, Road No.36, Hitech City Road, Jubilee Hills, Hyderabad - 500033.

EXTRACT OF THE RESOLUTION DULY PASSED AT THE MEETING OF THE BOARD OF DIRECTORS OF TRICHY THANJAVUR EXPRESSWAYS LIMITED HELD ON WEDNESDAY THE 10TH MAY 2006 AT THE REGISTERED OFFICE OF THE COMPANY AT MADHUCON HOUSE, PLOT No.1129/A, ROAD No.36, JUBILEE HILLS, HITECH CITY ROAD, HYDERABAD - 500 033.

SUB: Authorization

Chairman briefed the members that Madhucon Projects Limited incorporated a Special Purpose Vehicle under the name and style of Trichy-Thanjavur Expressways Limited vide Certificate of Incorporation No. 01-49815, dtd.13.04.2006(CIN:U45200AP2006PLC49815) for execution of the Project works TN-3 for Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur-Trichy Section from Km 80.000 to Km 135.750 of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis.

The Board on detailed deliberation Resolved that the company do hereby authorized to execute the Concession Agreement on behalf of Madhucon Projects Limited with National High-Way Authority of India for execution of Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur-Trichy Section from Km 80.000 to Km 135.750 of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis.

In modification to the earlier Board Resolution dated 19th April 2006 the Board resolved to authorize Sri.N.Seethaiah, Director, Trichy-Thanjavur Expressways Limited to sign and execute the above referred Concession Agreement with NHAI.

Further Resolved that the common seal of the Company be affixed wherever necessary in the presence of Sri.N.Seethaiah, Director of the Company and Col.(Retd.) S.K.Sahni, Chief General Manager, Madhucon Projects Limited who is hereby appointed as the authorized person for the purpose and both the above named persons shall sign the same in token therefore.

Further Resolved that Sri.N.Nageswar Rao, Chairman be and hereby authorized to submit this Resolution duly certified to NHAI for reference and record.

Certified Copy

N.NAGESWAR RAO
Chairman
TRICHY - THANJAVUR EXPRESSWAYS LIMITED

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Annexure IX

MADHUCON
PROJECTS LIMITED

CERTIFIED TRUE COPY OF THE MINUTES OF BOARD MEETING OF BOARD OF DIRECTORS OF MADHUCON PROJECTS LIMITED HELD ON WEDNESDAY THE 10TH MAY 2006 AT 11.00 AM AT THE CORPORATE OFFICE OF THE COMPANY AT MADHUCON HOUSE, PLOT NO. 1129/A, ROAD NO. 36, HITEC CITY ROAD, JUBILEE HILLS, HYDERABAD – 500 033.

Sub: Authorization to invest in Equity Shares of M/s. Trichy – Thanjavur Expressways Limited.

Chairman briefed the members that Madhucon Projects Limited incorporated a Special Purpose Vehicle under the name and style of Trichy – Thanjavur Expressways Limited vide Certificate of Incorporation No. 01-49815, dt. 13.04.2006 (CIN: U45200AP2006PLC49815) for execution of the Project works TN-3 for Design, Engineering, Finance, Construction, Operation and Maintenance of Thanjavur – Trichy Section from Km 80.000 to Km 135.750 of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA on Build, Operate and Transfer (BOT) basis.

Chairman further informed that the Investment of Madhucon Projects Limited along with its Associates shall not be less than 51% of issued and paid up Equity Capital during Construction period and for 3 years following Commercial operation date and a minimum of 26% during balance remaining operating period.

After detailed discussions the board passed the following resolution unanimously.

"**RESOLVED THAT** subject to the provisions of the Companies Act 1956, the Chairman, acting on behalf of the Company is hereby authorized to make investment in the equity capital of Trichy-Thanjavur Expressways Limited".

FURTHER RESOLVED that in order to comply with the minimum equity requirement stipulated in the Request for Proposal issued by the NHAI for the four laning of Thanjavur-Trichy Section of NH-67 in the State of Tamil Nadu under NHDP Phase IIIA, the aggregate initial investment of the Company along with its associates shall not be less than 51% of the equity capital of Trichy-Thanjavur Expressways Limited and that the investment, at any time during the Construction Period or 3 years following Commercial Operation Date, should not fall below 51%.

"**FURTHER RESOLVED** that the investment in the equity capital of Trichy-Thanjavur Expressways Limited shall not fall below 26% during the balance remaining Operation Period".

CERTIFIED TRUE COPY

For MADHUCON PROJECTS LTD.

Company Secretary

Corp. Off: Madhucon House, 1129/A, Road No. 36, Hitec City Road, Jubilee Hills, Hyderabad - 500 033. India
Tel: +91-40-23556001/2/3/4 Fax: +91-40-23556005 E-mail: hydmadhucon@gmail.com

Admn. Off: D-27, East of Kailash, New Delhi-110065. Tel: +91-11-26425507/26425820
Fax: +91-11-26476713 E-mail: madhucon@ndb.vsnl.net.in

Annexure-X

रजिस्ट्री सं० डी० एल०-33004/99

REGD. NO. D. L.-33004/99

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY
भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

... 1031] नई दिल्ली, मंगलवार, सितम्बर 27, 2005/आश्विन 5, 1927
No. 1031] NEW DELHI, TUESDAY, SEPTEMBER 27, 2005/ASVINA 5, 1927

पोत परिवहन, सड़क परिवहन और राजमार्ग मंत्रालय

(सड़क परिवहन और राजमार्ग विभाग)

अधिसूचना

नई दिल्ली, 27 सितम्बर, 2005

का.आ. 1398(अ).—केन्द्रीय सरकार, राष्ट्रीय राजमार्ग अधिनियम, 1956 (1956 का 48) की धारा 5 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत सरकार के पोत परिवहन, सड़क परिवहन और राजमार्ग मंत्रालय की अधिसूचना सं. का. आ. 1096(अ), तारीख ... गस्त, 2005 में निम्नलिखित संशोधन करती है, अर्थात् :—

उक्त अधिसूचना की अनुसूची में, क्रम सं. 22 और उससे संबंधित प्रविष्टियों के स्थान पर निम्नलिखित क्रम सं. और प्रविष्टियां रखी जाएंगी, अर्थात् :—

अनुसूची

क्रम सं.	राष्ट्रीय राजमार्ग का वर्णन	राज्य सरकार का नाम
22	राष्ट्रीय राजमार्ग सं. 4 [0.0 किमी. से 107.00 किमी. तक (चेन्नई से रानीपेट) और रा. रा. 4 के 13.8 किमी. से प्रारंभ होकर और रा. रा. 5 के 12.6 किमी. पर मिलने वाले बाईपास (चेन्नई बाईपास फेज-2) को छोड़कर], सं. 45क, सं. 47 (केरल/तमिलनाडु सीमा-कन्याकुमारी सेक्शन को छोड़कर), [0.000 किमी. से 182.040 किमी. तक (सेलम से तमिलनाडु/केरल सीमा) को छोड़कर], सं. 49, सं. 66 (तमिलनाडु/पांडिचेरी सीमा-टिंडीवनम-थिरुवन्नमलाई-कृष्णागिरि सेक्शन को छोड़कर), सं. 205 (तमिलनाडु/आन्ध्र प्रदेश सीमा-थिरूथनाई-चेन्नई सेक्शन को छोड़कर), सं. 207, सं. 208, सं. 209, सं. 219 और सं. 220, जो तमिलनाडु राज्य के भीतर स्थित भाग है और राष्ट्रीय राजमार्ग सं. 45 (डिंडीगुल-टेनी सेक्शन) सं. 67 (नागपट्टिनाम-तांजावूर-ट्रिचीं-करूर-कोयम्बटूर सेक्शन और कोयम्बटूर-मेट्टूपलायम-तमिलनाडु/कर्नाटक सीमा सेक्शन को छोड़कर), सं. 68 (सेलम-उलन्दूरपेट सेक्शन को छोड़कर), सं. 45ख [illegible]-अरुप्पुकोटई-टूटीकोरिन सेक्शन को छोड़कर) और सं. 210 ।	तमिलनाडु राज्य सरकार''

[फा. सं. एनएच-14012/17/2005-डी एंड एस]

प्रभाकर अपर-सचिव

- मूल अधिसूचना भारत के राजपत्र में अधिसूचना सं. का.नि.आ. 1118, तारीख 4 अप्रैल, 1957 द्वारा प्रकाशित की गई थी, जिसे सं. का.आ. 1096(अ), तारीख 4 अगस्त, 2005 द्वारा अधिक्रान्त किया गया था।

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MINISTRY OF SHIPPING, ROAD TRANSPORT AND HIGHWAYS

(Department of Road Transport and Highways)

NOTIFICATION

New Delhi, the 27th September, 2005

S.O. 1398(E).—In exercise of the powers conferred by Section 5 of the National Highways Act, 1956 (48 of 1956), the Central Government hereby makes the following amendment in the notification of the Government of India in the Ministry of Shipping, Road Transport and Highways Number S.O. 1096 (E) dated the 4th August, 2005 namely:—

In the Schedule to the said notification, for serial number 22 and the entries relating thereto, the following serial number and entries shall be substituted, namely :—

SCHEDULE

Serial Number	Description of National Highway	Name of the State Government
"22	So much of National Highway No. 4 [excluding from Km. 0.0 to Km. 107.200 (from Chennai to Ranipet) and the bypass starting from Km. 13.8 of NH 4 and joining at Km. 12.6 of NH 5 (Chennai Bypass Phase-II)], No. 45A, No. 47 (excluding Kerala/Tamil Nadu Border-Kanyakumari Section), [excluding from Km. 0.000 to Km. 182.040 (from Salem to Tamil Nadu/Kerala Border)], No. 49, No. 66 (excluding Tamil Nadu/Pondicherry Border-Tindivanam-Thiruvannamalai-Krishnagiri Sections), No. 205 (excluding Tamil Nadu/Andhra Pradesh Border-Thiruthanai-Chennai Sections), No. 207, No. 208, No. 209, No. 219 and No. 220 as are situated within the State of Tamil Nadu and National Highway No. 45 (Dindigul-Teni Section), 67 (excluding Nagapatinam-Thanjavur-Trichy-Karur-Coimbatore Sections and Coimbatore Mettupalayam-Tamil Nadu/Karnataka Border Sections), No. 68 (excluding Salem-Ulundurpet Sections), No. 45B (excluding Madurai-Arupukotai-Tuticorin Section) and No. 210.	State Government of Tamil Nadu"

[F. No. NH-14012/17/2005-P&M]

PRABHAKAR, Dy. Secy.

Foot Note : The principal notification was published in the Gazette of India *vide* number S.R.O 1118 dated 4th April, 1957 which was superseded *vide* No. S.O. 1096(E) dated 4th August, 2005.

अधिसूचना

नई दिल्ली, 27 सितम्बर, 2005

का.आ. 1399(अ).—केन्द्रीय सरकार, राष्ट्रीय राजमार्ग प्राधिकरण अधिनियम, 1988 (1988 का 68) की धारा 11 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, नीचे सारणी(जिसे इसमें इसके पश्चात् उक्त सारणी कहा गया है) के स्तंभ (1) में यथावर्णित राष्ट्रीय राजमार्गों को उक्त सारणी के स्तंभ (2) में उनके सामने यथा उल्लिखित तत्स्थानी सेक्शन के उक्त सारणी के स्तंभ (3) में विनिर्दिष्ट भूखंडों को भारतीय राष्ट्रीय राजमार्ग प्राधिकरण को सौंपती है।

राष्ट्रीय राजमार्ग सं.	सेक्शन	भूखंड किलोमीटर में
(1)	(2)	(3)
45	डिंडीगुल-त्रिची	421.650 किमी. से 324.000 किमी. तक
45ख	मदुराई-अरुपकोटई-टयूटीकोरन	138.000 किमी. से 264.000 किमी. तक
47	केरल/तमिलनाडु सीमा-कन्याकुमारी	599.000 किमी. से 655.000 किमी. तक
66	तमिलनाडु/पांडिचेरी सीमा-टिंडीवनम-थिरुवन्नमलाई-कृष्णागिरि	3.520 किमी. से 214.200 किमी. तक

THANJAVUR EXPRESS Hyderabad

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(1)	(2)	(3)
67	नामपटीनम-तंजावूर-त्रिची-कुरुर-कोयमबटूर-मेट्टूपलायम-तमिलनाडु/कर्नाटक सीमा	0.000 किमी. से 504.400 किमी. तक
68	सेलम-उलंडरपेट	0.000 किमी. से 134.200 किमी. तक
205	तमिलनाडु/आन्ध्रप्रदेश सीमा-थिरुथनी-चेन्नई	0.000 किमी. से 81.500 किमी. तक

[फा. सं. एनएच-14012/17/2005-पीएंडएम]

प्रभाकर, उप सचिव

NOTIFICATION

New Delhi, the 27th September, 2005

S.O. 1399(E).—In exercise of the powers conferred by Section 11 of the National Highways Authority of India Act, 1988 (68 of 1988), the Central Government hereby entrusts the stretches, specified in column (3) of the Table below (hereinafter referred to as the said Table), of the corresponding Section as mentioned against it in column (2) of the said Table, of the National Highway as described in column (1) of the said Table, to the National Highways Authority of India.

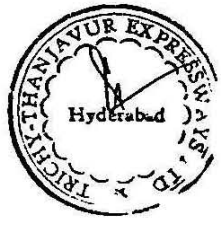
TABLE

National Highway Number	Section	Stretches in Kilometer
(1)	(2)	(3)
5	Dindigul-Trichy	Km. 421.650 to Km. 324.000
5B	Madurai-Arupukotai-Tuticorin	Km. 138.000 to 264.000
7	Kerala/Tamil Nadu Border-Kanyakumari	Km. 599.000 to Km. 655.000
6	Tamil Nadu/Pondichcary Border Tindivanam-Thiruvannamalai-Krishnagiri	Km. 3.520 to Km. 214.200
7	Nagapatinam-Thanjavur-Trichy-Karur-Coimbatore-Mettupalayam-Tamil Nadu/Karnataka Border	Km. 0.000 to Km. 504.400
8	Salem-Ulundurpet	Km. 0.000 to 134.200
05	Tamil Nadu/Andhra Pradesh Border-Thiruthani-Chennai	Km. 0.000 to Km. 81.500

[F. No. NH/14012/17/2005/P & M]

PRABHAKAR, Dy. Secy.





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