



National Highways Authority of India

(Ministry of Shipping, Road Transport & Highways)

Government of India

DESIGN, ENGINEERING, FINANCE, CONSTRUCTION,
OPERATION AND MAINTENANCE OF TRICHY -
DINDIGUL SECTION FROM KM 333.000 TO KM 421.600
OF NH - 45 IN THE STATE OF TAMIL NADU UNDER
NHDP PHASE IIIA ON BUILD, OPERATE AND
TRANSFER (BOT) BASIS

CONCESSION AGREEMENT

between

National Highways Authority of India,

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

and

TD Toll Road Private Limited

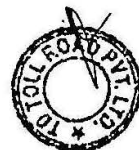
3rd Floor, Reliance Energy Centre, Santa Cruz (East),

Mumbai - 400 055

VOLUME - II

(SCHEDULES)

July 2007



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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 TRICHY - DINDIGUL SECTION FROM KM 333.000 TO KM 421.600 OF NH45 UNDER NHDP PHASE IIIA ON BUILD, OPERATE AND TRANSFER (BOT) BASIS

(Package No. : NHDP-III/BOT-I/TN/01)

INTERNATIONAL COMPETITIVE BIDDING (ICB)

REQUEST FOR PROPOSAL (RFP)

BID DOCUMENT

PART - IV

TECHNICAL SCHEDULES

December 2006

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



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4-Laning of Trichy - Dindigul Section from Km 333.000
to Km 421.273 of NH-45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



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SCHEDULE - A

SITE OF THE PROJECT

1. General

1.1 The Site

The Govt. of India (GOI) has approved 4 laning of 4000 kms length of National Highways on BOT basis under NHDP Phase IIIA and entrusted implementation of the programme to the NHAI. The Project Highway is one of such stretches which has been approved by GOI for 4 laning on BOT basis.

The Project Highway is a segment of NH-45 from Trichy (km 333/000) to Dindigul (km 421/600) and lies in the State of Tamilnadu. It connects the important city of Trichy to Dindigul which is located on the North - South Corridor and passes through places such as Manaparai, Vaiyampatti, Ayyalur and Vadamadurai.

The existing road of the Project Highway is a 2 lane road with flexible pavement having fair condition.

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 Concessionaire in evaluating the Project viability. The Concessionaire will carry out his own independent surveys for assessing actual position on the Project Highway.

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 or that may be faced by the Concessionaire in the course of performance of his obligations herein under.

2 Description of Project Highway

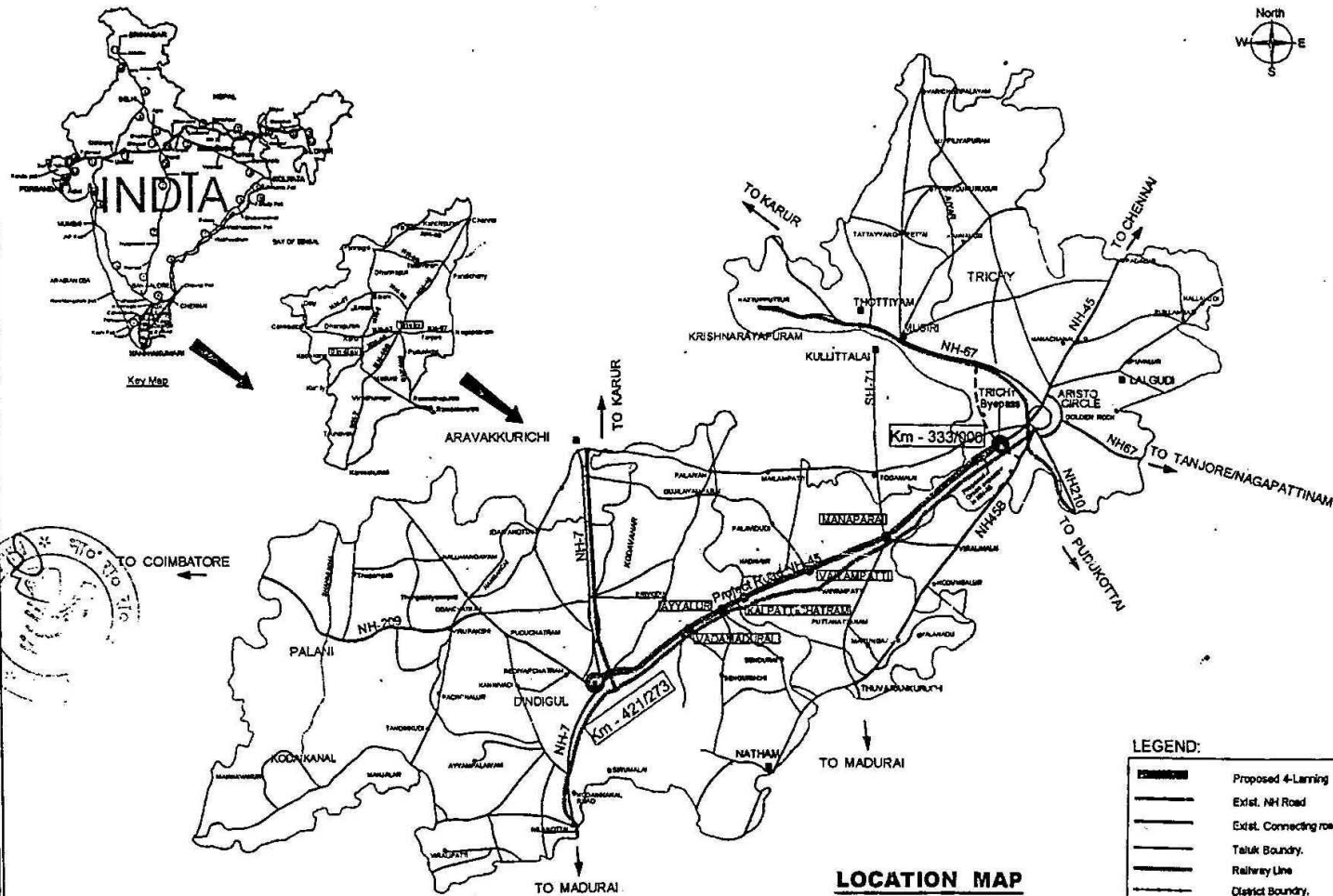
2.1 Location

The Project Highway starts at Km 333/000 of NH-45, in the outskirts of Trichy City and ends at Km 421/600 of NH-45 at Dindigul, where it meets with NH-7 (km 374/600) on North - South Corridor. The Project Highway stretch lies partly in Trichy District and partly in Dindigul district of Tamilnadu. Around 59 km i.e., from km 333/000 km 392/000 is found within Trichy district and the remaining stretch lies in the Dindigul district in the state of Tamilnadu. The Location Map and Key Map is enclosed at Annexure A-1.

2.2 Start and End of the Project Highway

The Project Highway starts at km 333/000 in Trichy district and ends at Km 421/600 of NH-45 at Dindigul in the State of Tamilnadu. Along the existing road, kilometer stones are fixed in entire length of the Project Highway. This is referred to as Existing Chainage. During the topographic survey with Total Station, observations made were not the same as kilometer stones fixed at site. The observations made during total station survey are referred to as Design Chainage. The relationship between the existing kilometer stone and design chainage is given below in the Table A-1. As per the Design Chainage, the actual length of the Project Highway is 88.273km.






LEGEND:

Proposed 4-Laning
Exist. NH Road
Exist. Connecting road
Taluk Boundary.
Railway Line
District Boundary.

ANNEXURE - A

<table><tr><td>Sl no</td><td>Date</td><td>Remarks</td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></table>	Sl no	Date	Remarks										Project 4-Laning of Trichy - Dindigul Section of NH-45 From Km 333.000 to Km 421.273 in the State of Tamil Nadu (Package No. NHDP-MDL-4/16)	TIME LOCATION MAP	 National Highways Authority of India (Ministry of Shipping, Road Transport & Highways) National Highways Development Programme - Phase II	Scale Drawn by: P.M. Checked by: A.S. Verified by: M.D.	 Mishra & Associates CONSULTANTS 101, Park Road, New Delhi-110001 Tel: 26101234, 26101235 Fax: 26101236, 26101237 E-mail: mishra@vsnl.com Web: www.mishraassociates.com	Draw No: NH/MS/45/Trichy/ Location Map File name: NH/MS/45/Trichy/Draw/ Location Map.dwg Date: 07.06.2009
Sl no	Date	Remarks																



ANNEXURE-A1




Table A-1 : Relationship between existing km stone and design chainage

Existing Chainage (km)	Design Chainage (km)	Existing Chainage (km)	Design Chainage (km)
333/000	333/000	378/000	377/900
334/000	334/003	379/000	378/900
335/000	334/992	380/000	379/896
336/000	336/000	381/000	380/896
337/000	337/017	382/000	381/895
338/000	338/027	383/000	382/893
339/000	339/026	384/000	383/890
340/000	340/035	385/000	384/893
341/000	341/054	386/000	385/889
342/000	342/060	387/000	386/882
343/000	343/061	388/000	387/888
344/000	344/075	389/000	388/872
345/000	345/089	390/000	389/865
346/000	346/090	391/000	390/853
347/000	347/087	392/000	391/856
348/000	348/113	393/000	392/859
349/000	349/111	394/000	393/861
350/000	350/146	395/000	394/854
351/000	351/169	396/000	395/846
352/000	352/190	397/000	396/657
353/000	353/200	398/000	397/656
354/000	354/200	399/000	398/639
355/000	355/200	400/000	399/645
356/000	356/166	401/000	400/637
357/000	357/050	402/000	401/642
358/000	358/050	403/000	402/639
359/000	359/055	404/000	403/638
360/000	359/978	405/000	404/579
361/000	360/941	406/000	405/587
362/000	361/919	407/000	406/579
363/000	362/922	408/000	407/574

Existing Chainage (km)	Design Chainage (km)	Existing Chainage (km)	Design Chainage (km)
364/000	363/935	409/000	408/568
365/000	364/938	410/000	409/562
366/000	365/934	411/000	410/788
367/000	366/940	412/000	411/618
368/000	367/950	413/000	412/624
369/000	368/971	414/000	413/700
370/000	369/972	415/000	414/693
371/000	370/900	416/000	415/673
372/000	371/915	417/000	416/670
373/000	372/917	418/000	417/659
374/000	373/916	419/000	418/673
375/000	374/909	420/000	419/672
376/000	375/905	421/000	420/655
377/000	376/902	421/600	421/273

2.3 Terrain

The entire length of the Project Highway runs through plain terrain except from km 389/400 to km 389/600 (Existing Chainage) near Vadamadurai, where the project road runs close to the forest area. The project road in its maximum length passes through embankments of height 0.50m to 1.50m and at certain locations, the height of embankment varies from 1.50m to 3.00m.

2.4 Road Inventory

The Project Highway generally lies between longitude N 10° 0' & 11° 30' and longitude E 77° 45' & E 78° 50'. The existing road along the Project Highway has 2 lane carriageway with 1.00m to 1.50m wide earthen shoulders on either side. Detailed Road Inventory is enclosed at Annexure A-2. At present, there is paved shoulder for a length of 12.00kms as per the details given below in Table A-2.

Table A-2 : Locations of Existing Paved Shoulders

S.No	From (Existing Chainage) Km	To (Existing Chainage) Km	Length (km)	Width (m)	Side (s)	Remarks
1.	361/000	365/400	4.40	1.5	Bothsides	Manaparai Bypass
2.	396/000	397/000	1.00	1.5	Bothsides	Ayyalur
3.	415/000	421/600	6.60	1.5	Bothsides	Dindigul Bypass

2.5 Traffic

The traffic counts details as per the 7-day classified volume count survey were conducted during the months of May & June 2005 on the Project Highway are given below in Table A-3.

Table A-3 : Average Annual Daily Traffic

Location (Existing Chainage) km	Average Annual Daily Traffic (AADT)	
	Veh/day	PCUs
Near Chatrapatty (km 338/400)	5673	9818
Near Manaparai (km 360/400)	7886	11112
Near Vaiyampatty (km 378/000)	7480	9960
Near Vadamadurai (km 406/200)	6567	9880

The break up details of 7-days Volume count is given in Annexure A-3. The detailed average annual daily traffic for all the four locations are given in the Annexure A-3(A).

2.6 Abutting land use

Agriculture is the predominant land use along the Project Highway. Agricultural, Residential, barren, rural, semi urban, urban and urban commercial are other land usage found along the Project Highway. There are many settlements and ribbon developments found along the Project Highway, the list of their location along the Project Highway are given in the Table A-4 below:

Table A-4 : Settlements along the Project Highway

S.No	Village Name	Chainage (existing km)		Taluk	District
		From	To		
1.	Vannankoil	335/000	335/400	Trichy	Trichy
2.	Chatrapatti	338/200	338/600	Trichy	Trichy
3.	Alampattipudur	347/400	347/630	Trichy	Trichy
4.	Maravanur	352/400	352/630	Manaparai	Trichy
5.	Chathiram	355/100	355/400	Manaparai	Trichy
6.	Muthapudayanpatti	357/800	358/200	Manaparai	Trichy
7.	Manaparai	361/100	364/400	Manaparai	Trichy
8.	Karattupatti	369/000	369/250	Manaparai	Trichy
9.	Vaiyampatti	376/300	378/200	Manaparai	Trichy
10.	Gandhi nagar	378/800	379/200	Manaparai	Trichy
11.	Palapatti	382/500	382/600	Manaparai	Trichy

S.No	Village Name	Chainage (existing km)		Taluk	District
		From	To		
12.	Chakkampatti	384/350	384/500	Manaparai	Trichy
13.	Nadupatti	385/350	386/230	Manaparai	Trichy
14.	Pathamudayanpatti	387/400	387/650	Manaparai	Trichy
15.	C.Kalpatti	388/000	388/900	Manaparai	Trichy
16.	Keeranur	390/200	390/300	Manaparai	Trichy
17.	Thangammampatti	392/650	393/600	Vedasandur	Dindigul
18.	Ayyalur	395/600	397/000	Vedasandur	Dindigul
19.	Kurumbapatti	398/800	399/000	Vedasandur	Dindigul
20.	Vadamadurai	403/400	405/000	Vedasandur	Dindigul
21.	Moonandipatti	409/800	410/100	Vedasandur	Dindigul
22.	Thamaraipadi	412/400	412/800	Vedasandur	Dindigul
23.	Mullipadi	414/100	414/300	Vedasandur	Dindigul
24.	Arokiasamy Nagar	415/300	415/600	Vedasandur	Dindigul
25.	Seevaapadi	419/900	421/000	Dindigul	Dindigul
26.	Settinayakkanpatti	421/000	421/600	Dindigul	Dindigul

The detailed land use pattern along the Project Highway is given in the road inventory enclosed at Annexure A-2.

2.7 Right of Way

The available Right-of-Way (ROW) varies from 20.00m to 35.00m except from km 417/000 to km 421/000 where it varies from 42.00m to 45.00m. The existing road is generally in the center of existing ROW and in order to construct another carriageway by the side of existing road additional land could be required on widening side. The existing Right of Way along the Project Highway with respect to the centerline of the existing carriageway is shown below in Table A-5.

Table A-5 : Existing Right of Way

S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
1	333/000	333/200	16.10	14.15	30.25
2	333/200	333/400	16.56	16.19	32.75
3	333/400	333/600	16.60	16.19	32.79
4	333/600	333/800	17.60	20.60	38.20

S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
5	333/800	334/000	17.00	16.40	33.40
6	334/000	334/200	17.99	25.68	43.67
7	334/200	334/400	8.55	23.00	31.55
8	334/400	334/600	14.00	18.70	32.70
9	334/600	334/800	14.90	15.65	30.55
10	334/800	335/000	13.00	12.00	25.00
11	335/000	335/200	15.00	32.92	47.92
12	335/200	335/400	14.45	15.00	29.45
13	335/400	335/600	12.80	15.00	27.80
14	335/600	335/800	9.80	10.08	19.88
15	335/800	336/000	11.57	11.25	22.82
16	336/000	336/200	14.60	12.40	27.00
17	336/200	336/400	14.76	13.29	28.05
18	336/400	336/600	15.10	17.20	32.30
19	336/600	336/800	15.00	15.46	30.46
20	336/800	337/000	15.60	14.05	29.65
21	337/000	337/200	23.67	10.78	34.45
22	337/200	337/400	14.03	15.57	29.60
23	337/400	337/600	14.03	14.04	28.07
24	337/600	337/800	12.00	16.10	28.10
25	337/800	338/000	12.40	15.60	28.00
26	338/000	338/200	13.06	15.42	28.48
27	338/200	338/400	15.70	16.20	31.90
28	338/400	338/600	16.20	10.55	26.75
29	338/600	338/800	17.00	11.90	28.90
30	338/800	339/000	12.44	16.24	28.68
31	339/000	339/200	14.70	12.20	26.90
32	339/200	339/400	13.00	12.40	25.40
33	339/400	339/600	14.54	11.29	25.83
34	339/600	339/800	14.40	14.30	28.70
35	339/800	340/000	14.70	9.10	23.80

S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
36	340/000	340/200	14.81	11.25	26.06
37	340/200	340/400	13.96	12.60	26.56
38	340/400	340/600	14.02	12.08	26.10
39	340/600	340/800	14.89	15.21	30.10
40	340/800	341/000	13.62	15.28	28.90
41	341/000	341/200	13.93	16.69	30.62
42	341/200	341/400	14.10	19.65	33.75
43	341/400	341/600	17.22	10.98	28.20
44	341/600	341/800	15.16	17.04	32.20
45	341/800	342/000	14.24	17.62	31.86
46	342/000	342/200	13.49	26.14	39.63
47	342/200	342/400	16.23	16.32	32.55
48	342/400	342/600	17.40	15.80	33.20
49	342/600	342/800	18.20	15.00	33.20
50	342/800	343/000	15.92	13.93	29.85
51	343/000	343/200	17.27	21.49	38.76
52	343/200	343/400	14.16	14.14	28.30
53	343/400	343/600	6.25	19.15	25.40
54	343/600	343/800	13.52	13.18	26.70
55	343/800	343/000	14.80	13.00	27.80
56	344/000	344/200	6.76	19.07	25.83
57	344/200	344/400	16.40	15.15	31.55
58	344/400	344/600	15.45	15.10	30.55
59	344/600	344/800	15.21	13.33	28.54
60	344/800	345/000	15.15	15.69	30.84
61	345/000	345/200	11.50	15.15	26.65
62	345/200	345/400	11.60	15.20	26.80
63	345/400	345/600	16.65	12.80	29.45
64	345/600	345/800	17.65	11.00	28.65
65	345/800	346/000	12.20	14.40	26.60
66	346/000	346/200	14.80	13.70	28.50



S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
67	346/200	346/400	14.30	16.00	30.30
68	346/400	346/600	11.50	17.20	28.70
69	346/600	346/800	7.07	22.92	29.99
70	346/800	347/000	13.20	14.50	27.70
71	347/000	347/200	16.80	13.35	30.15
72	347/200	347/400	13.50	12.80	26.30
73	347/400	347/600	13.00	17.30	30.30
74	347/600	347/800	12.50	14.70	27.20
75	347/800	348/000	14.10	13.15	27.25
76	348/000	348/200	11.10	15.30	26.40
77	348/200	348/400	17.85	15.55	33.40
78	348/400	348/600	15.50	46.50	62.00
79	348/600	348/800	18.10	9.10	27.20
80	348/800	349/000	14.50	12.10	26.60
81	349/000	349/200	13.00	14.50	27.50
82	349/200	349/400	12.50	15.20	27.70
83	349/400	349/600	12.80	17.70	30.50
84	349/600	349/800	14.50	16.00	30.50
85	349/800	350/000	16.80	14.80	31.60
86	350/000	350/200	16.10	9.80	25.90
87	350/200	350/400	22.75	14.30	37.05
88	350/400	350/600	25.00	15.00	40.00
89	350/600	350/800	22.50	14.50	37.00
90	350/800	351/000	26.40	11.60	38.00
91	351/000	351/200	20.80	14.10	34.70
92	351/200	351/400	12.85	15.60	28.45
93	351/400	351/600	15.05	14.10	29.15
94	351/600	351/800	11.00	15.50	26.50
95	351/800	352/000	13.50	17.10	30.60
96	352/000	352/200	15.60	13.80	29.40
97	352/200	352/400	14.00	17.10	31.10



S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
98	352/400	352/600	12.50	13.35	25.85
99	352/600	352/800	11.60	22.60	34.20
100	352/800	353/000	11.70	18.35	30.05
101	353/000	353/200	15.15	15.15	30.30
102	353/200	353/400	14.87	15.47	30.34
103	353/400	353/600	14.71	15.47	30.18
104	353/600	353/800	14.66	15.42	30.08
105	353/800	354/000	14.64	15.40	30.04
106	354/000	354/200	14.67	15.43	30.10
107	354/200	354/400	14.79	15.55	30.34
108	354/400	354/600	15.10	15.86	30.96
109	354/600	354/800	14.83	15.59	30.42
110	354/800	355/000	14.67	15.43	30.10
111	355/000	355/200	14.62	15.38	30.00
112	355/200	355/400	14.62	15.38	30.00
113	355/400	355/600	14.90	15.66	30.56
114	355/600	355/800	14.70	15.46	30.16
115	355/800	356/000	15.34	16.10	31.44
116	356/000	356/200	16.80	20.80	37.60
117	356/200	356/400	16.75	14.75	31.50
118	356/400	356/600	12.00	14.10	26.10
119	356/600	356/800	13.30	17.00	30.30
120	356/800	357/000	15.02	15.02	30.04
121	357/000	357/200	12.50	22.66	35.16
122	357/200	357/400	13.70	20.55	34.25
123	357/400	357/600	14.32	18.57	32.89
124	357/600	357/800	16.29	13.95	30.24
125	357/800	358/000	6.70	17.35	24.05
126	358/000	358/200	13.80	16.10	29.90
127	358/200	358/400	15.35	19.75	35.10
128	358/400	358/600	17.50	15.80	33.30



S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
129	358/600	358/800	13.35	16.25	29.60
130	358/800	359/000	25.60	13.50	39.10
131	359/000	359/200	26.90	12.75	39.65
132	359/200	359/400	14.80	12.65	27.45
133	359/400	359/600	21.00	16.10	37.10
134	359/600	359/800	25.00	13.50	38.50
135	359/800	360/000	22.87	20.36	43.23
136	360/000	360/200	17.35	13.15	30.50
137	360/200	360/400	19.50	21.25	40.75
138	360/400	360/600	17.80	19.80	37.60
139	360/600	360/800	17.10	14.60	31.70
140	360/800	361/000	16.00	14.16	30.16
141	361/000	361/200	19.00	17.60	36.60
142	361/200	361/400	18.60	19.60	38.20
143	361/400	361/600	13.70	16.50	30.20
144	361/600	361/800	29.60	10.60	40.20
145	361/800	362/000	15.60	14.95	30.55
146	362/000	362/200	18.70	18.20	36.90
147	362/200	362/400	23.14	13.50	36.64
148	362/400	362/600	24.00	7.75	31.75
149	362/600	362/800	12.35	19.45	31.80
150	362/800	363/000	17.65	20.30	37.95
151	363/000	363/200	21.35	18.00	39.35
152	363/200	363/400	13.00	13.96	26.96
153	363/400	363/600	22.85	6.55	29.40
154	363/600	363/800	14.50	14.25	28.75
155	363/800	364/000	23.30	12.60	35.90
156	364/000	364/200	14.55	27.85	42.40
157	364/200	364/400	38.80	18.30	57.10
158	364/400	364/600	12.70	16.70	29.40
159	364/600	364/800	16.50	15.40	31.90

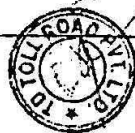
S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
160	364/800	365/000	11.50	30.00	41.50
161	365/000	365/200	14.80	26.00	40.80
162	365/200	365/400	19.50	13.50	33.00
163	365/400	365/600	14.70	20.40	35.10
164	365/600	365/800	28.75	25.25	54.00
165	365/800	366/000	36.13	32.62	68.75
166	366/000	366/200	19.77	16.24	36.01
167	366/200	366/400	16.95	13.45	30.40
168	366/400	366/600	17.10	13.60	30.70
169	366/600	366/800	15.20	11.70	26.90
170	366/800	367/000	20.30	16.80	37.10
171	367/000	367/200	16.95	13.45	30.40
172	367/200	367/400	16.92	13.42	30.34
173	367/400	367/600	16.62	19.12	35.74
174	367/600	367/800	17.80	20.30	38.10
175	367/800	368/000	20.52	22.75	43.27
176	368/000	368/200	17.30	19.80	37.10
177	368/200	368/400	15.25	17.75	33.00
178	368/400	368/600	16.55	19.05	35.60
179	368/600	368/800	13.75	16.25	30.00
180	368/800	369/000	13.22	15.72	28.94
181	369/000	369/200	14.20	16.70	30.90
182	369/200	369/400	11.60	14.10	25.70
183	369/400	369/600	17.00	12.80	29.80
184	369/600	369/800	15.35	11.15	26.50
185	369/800	370/000	16.22	12.02	28.24
186	370/000	370/200	15.07	10.87	25.94
187	370/200	370/400	15.40	11.20	26.60
188	370/400	370/600	15.22	11.02	26.24
189	370/600	370/800	17.30	13.10	30.40
190	370/800	371/000	14.52	10.32	24.84



S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
191	371/000	371/200	15.58	11.65	27.23
192	371/200	371/400	14.20	10.00	24.20
193	371/400	371/600	15.22	11.02	26.24
194	371/600	371/800	15.85	11.65	27.50
195	371/800	372/000	17.45	13.25	30.70
196	372/000	372/200	13.70	16.00	29.70
197	372/200	372/400	10.60	12.90	23.50
198	372/400	372/600	11.30	13.60	24.90
199	372/600	372/800	11.77	14.07	25.84
200	372/800	373/000	11.15	13.45	24.60
201	373/000	373/200	13.38	16.13	29.51
202	373/200	373/400	14.98	17.28	32.26
203	373/400	373/600	14.35	16.65	31.00
204	373/600	373/800	14.75	17.02	31.77
205	373/800	374/000	15.33	15.36	30.69
206	374/000	374/200	16.30	18.60	34.90
207	374/200	374/400	11.70	14.00	25.70
208	374/400	374/600	14.15	16.45	30.60
209	374/600	374/800	17.82	20.12	37.94
210	374/800	375/000	14.85	17.15	32.00
211	375/000	375/200	18.38	12.82	31.20
212	375/200	375/400	18.20	12.64	30.84
213	375/400	375/600	21.43	15.87	37.30
214	375/600	375/800	21.15	15.59	36.74
215	375/800	376/000	20.43	14.87	35.30
216	376/000	376/200	21.90	16.34	38.24
217	376/200	376/400	18.10	18.55	36.65
218	376/400	376/600	18.80	17.90	36.70
219	376/600	376/800	22.40	19.60	42.00
220	376/800	377/000	31.00	12.75	43.75
221	377/000	377/200	18.90	12.90	31.80



S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
222	377/200	377/400	30.10	25.95	56.05
223	377/400	377/600	15.90	22.30	38.20
224	377/600	377/800	19.28	13.72	33.00
225	377/800	378/000	22.25	21.40	43.65
226	378/000	378/200	22.00	17.30	39.30
227	378/200	378/400	15.00	16.50	31.50
228	378/400	378/600	12.60	17.90	30.50
229	378/600	378/800	16.15	26.00	42.15
230	378/800	379/000	18.20	12.60	30.80
231	379/000	379/200	15.90	18.50	34.40
232	379/200	379/400	21.76	23.50	45.26
233	379/400	379/600	12.25	13.99	26.24
234	379/600	379/800	13.73	15.47	29.20
235	379/800	380/000	12.55	14.29	26.84
236	380/000	380/200	13.75	15.49	29.24
237	380/200	380/400	14.48	16.22	30.70
238	380/400	380/600	13.55	15.29	28.84
239	380/600	380/800	12.43	14.17	26.60
240	380/800	381/000	17.60	16.00	33.60
241	381/000	381/200	18.85	12.50	31.35
242	381/200	381/400	24.80	12.50	37.30
243	381/400	381/600	15.00	7.90	22.90
244	381/600	381/800	15.57	11.93	27.50
245	381/800	382/000	13.50	22.75	36.25
246	382/000	382/200	14.10	22.15	36.25
247	382/200	382/400	14.39	10.75	25.14
248	382/400	382/600	14.49	10.85	25.34
249	382/600	382/800	14.25	10.61	24.86
250	382/800	383/000	14.50	10.86	25.36
251	383/000	383/200	14.82	11.18	26.00
252	383/200	383/400	16.22	12.58	28.80



S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
253	383/400	383/600	14.77	11.13	25.90
254	383/600	383/800	13.97	10.33	24.30
255	383/800	384/000	18.32	14.68	33.00
256	384/000	384/200	14.24	13.25	27.49
257	384/200	384/400	15.60	13.20	28.80
258	384/400	384/600	13.20	12.75	25.95
259	384/600	384/800	12.30	12.00	24.30
260	384/800	385/000	14.24	13.25	27.49
261	385/000	385/200	13.33	16.66	29.99
262	385/200	385/400	10.83	14.16	24.99
263	385/400	385/600	12.33	15.66	27.99
264	385/600	385/800	12.18	15.51	27.69
265	385/800	386/000	7.83	11.16	18.99
266	386/000	386/200	9.33	12.67	22.00
267	386/200	386/400	21.83	25.17	47.00
268	386/400	386/600	10.83	14.17	25.00
269	386/600	386/800	9.84	13.16	23.00
270	386/800	387/000	10.33	13.66	23.99
271	387/000	387/200	20.84	24.16	45.00
272	387/200	387/400	23.34	26.66	50.00
273	387/400	387/600	14.63	10.37	25.00
274	387/600	387/800	16.64	12.36	29.00
275	387/800	388/000	28.13	23.87	52.00
276	388/000	388/200	32.13	27.87	60.00
277	388/200	388/400	19.14	14.86	34.00
278	388/400	388/600	18.13	13.87	32.00
279	388/600	388/800	18.64	14.36	33.00
280	388/800	389/000	15.14	10.86	26.00
281	389/000	389/200	8.63	14.37	23.00
282	389/200	389/400	11.14	16.86	28.00
283	389/400	389/600	16.14	11.86	28.00

S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
284	389/600	389/800	15.63	11.37	27.00
285	389/800	390/000	16.64	12.36	29.00
286	390/000	390/200	18.64	14.36	33.00
287	390/200	390/400	15.63	11.37	27.00
288	390/400	390/600	15.64	11.36	27.00
289	390/600	390/800	15.63	11.37	27.00
290	390/800	391/000	19.05	20.55	39.60
291	391/000	391/200	13.38	14.87	28.25
292	391/200	391/400	7.53	9.03	16.56
293	391/400	391/600	14.57	16.07	30.64
294	391/600	391/800	15.43	16.92	32.35
295	391/800	392/000	15.15	16.65	31.80
296	392/000	392/200	15.25	16.75	32.00
297	392/200	392/400	14.00	15.50	29.50
298	392/400	392/600	13.55	15.05	28.60
299	392/600	392/800	13.00	14.50	27.50
300	392/800	393/000	12.37	13.87	26.24
301	393/000	393/200	14.25	11.25	25.50
302	393/200	393/400	16.00	13.00	29.00
303	393/400	393/600	15.50	12.50	28.00
304	393/600	393/800	17.75	12.40	30.15
305	393/800	394/000	15.40	13.35	28.75
306	394/000	394/200	16.35	14.62	30.97
307	394/200	394/400	17.62	17.30	34.92
308	394/400	394/600	20.30	13.95	34.25
309	394/600	394/800	16.95	15.25	32.20
310	394/800	395/000	18.25	14.00	32.25
311	395/000	395/200	17.00	14.75	31.75
312	395/200	395/400	17.78	12.37	30.15
313	395/400	395/600	15.38	17.82	33.20
314	395/600	395/800	13.82	16.38	30.20



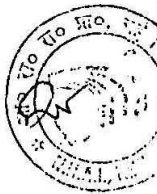
S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
315	395/800	396/000	12.37	17.83	30.20
316	396/000	396/200	13.80	15.05	28.85
317	396/200	396/400	11.05	20.00	31.05
318	396/400	396/500	16.00	19.95	35.95
319	396/600	396/800	15.95	18.70	34.65
320	396/800	397/000	17.30	10.70	28.00
321	397/000	397/200	21.40	14.50	35.90
322	397/200	397/400	14.25	16.50	30.75
323	397/400	397/600	12.30	13.80	26.10
324	397/600	397/800	11.60	12.80	24.40
325	397/800	398/000	13.60	13.10	26.70
326	398/000	398/200	12.10	17.50	29.60
327	398/200	398/400	20.60	21.30	41.90
328	398/400	398/600	21.00	16.00	37.00
329	398/600	398/800	14.00	9.80	23.80
330	398/800	399/000	14.10	13.76	27.86
331	399/000	399/200	15.00	20.00	35.00
332	399/200	399/400	13.50	16.30	29.80
333	399/400	399/600	16.10	14.00	30.10
334	399/600	399/800	11.60	13.80	25.40
335	399/800	400/000	19.70	17.50	37.20
336	400/000	400/200	20.00	16.00	36.00
337	400/200	400/400	19.20	18.80	38.00
338	400/400	400/600	15.15	14.85	30.00
339	400/600	400/800	19.50	20.50	40.00
340	400/800	401/000	26.00	24.70	50.70
341	401/000	401/200	28.10	29.70	57.80
342	401/200	401/400	20.20	20.20	40.40
343	401/400	401/600	19.10	19.55	38.65
344	401/600	401/800	14.10	16.50	30.60
345	401/800	402/000	14.85	15.00	29.85



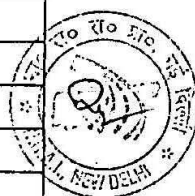
S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
346	402/000	402/200	17.60	16.90	34.50
347	402/200	402/400	15.15	18.75	33.90
348	402/400	402/600	15.10	10.00	25.10
349	402/600	402/800	17.12	9.49	26.61
350	402/800	403/000	14.40	11.10	25.50
351	403/000	403/200	14.90	11.30	26.20
352	403/200	403/400	16.70	19.50	36.20
353	403/400	403/600	19.70	23.40	43.10
354	403/600	403/800	21.30	23.15	44.45
355	403/800	404/000	18.20	20.00	38.20
356	404/000	404/200	14.10	21.40	35.50
357	404/200	404/400	15.90	23.00	38.90
358	404/400	404/600	13.10	34.10	47.20
359	404/600	404/800	14.15	22.15	36.30
360	404/800	405/000	26.40	28.90	55.30
361	405/000	405/200	18.90	18.30	37.20
362	405/200	405/400	18.60	19.55	38.15
363	405/400	405/600	21.50	22.50	44.00
364	405/600	405/800	16.13	16.92	33.05
365	405/800	406/000	15.16	15.94	31.10
366	406/000	406/200	16.80	14.50	31.30
367	406/200	406/400	16.90	17.10	34.00
368	406/400	406/600	19.50	10.40	29.90
369	406/600	406/800	16.20	14.85	31.05
370	406/800	407/000	16.86	15.14	32.00
371	407/000	407/200	14.70	12.00	26.70
372	407/200	407/400	14.26	20.34	34.60
373	407/400	407/600	18.10	10.50	28.60
374	407/600	407/800	12.60	13.00	25.60
375	407/800	408/000	20.10	19.00	39.10
376	408/000	408/200	16.80	14.40	31.20



S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
377	408/200	408/400	16.60	15.40	32.00
378	408/400	408/600	19.00	17.00	36.00
379	408/600	408/800	17.20	16.90	34.10
380	408/800	409/000	18.10	14.15	32.25
381	409/000	409/200	19.90	10.00	29.90
382	409/200	409/400	14.35	14.00	28.35
383	409/400	409/600	18.00	14.00	32.00
384	409/600	409/800	10.50	15.70	26.20
385	409/800	410/000	16.60	10.40	27.00
386	410/000	410/200	13.90	17.20	31.10
387	410/200	410/400	15.50	12.15	27.65
388	410/400	410/600	15.25	30.00	45.25
389	410/600	410/800	15.25	16.75	32.00
390	410/800	411/000	13.90	13.30	27.20
391	411/000	411/200	35.30	9.50	44.80
392	411/200	411/400	35.30	9.70	45.00
393	411/400	411/600	10.65	30.65	41.30
394	411/600	411/800	13.65	14.00	27.65
395	411/800	412/000	22.50	11.85	34.35
396	412/000	412/200	13.20	23.00	36.20
397	412/200	412/400	20.50	21.40	41.90
398	412/400	412/600	19.20	15.00	34.20
399	412/600	412/800	9.65	19.70	29.35
400	412/800	413/000	15.40	35.60	51.00
401	413/000	413/200	12.80	16.20	29.00
402	413/200	413/400	11.75	15.80	27.55
403	413/400	413/600	12.30	20.30	32.60
404	413/600	413/800	14.10	12.60	26.70
405	413/800	414/000	16.20	14.45	30.65
406	414/000	414/200	22.50	17.70	40.20
407	414/200	414/400	35.30	9.50	44.80



S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
408	414/400	414/600	28.00	12.80	40.80
409	414/600	414/800	18.55	17.45	36.00
410	414/800	415/000	14.60	15.75	30.35
411	415/000	415/200	18.00	12.50	30.50
412	415/200	415/400	13.70	23.30	37.00
413	415/400	415/600	17.50	19.20	36.70
414	415/600	415/800	22.70	21.20	43.90
415	415/800	416/000	19.20	21.50	40.70
416	416/000	416/200	15.25	18.10	33.35
417	416/200	416/400	20.10	16.00	36.10
418	416/400	416/600	18.20	21.80	40.00
419	416/600	416/800	18.30	18.40	36.70
420	416/800	417/000	18.70	20.00	38.70
421	417/000	417/200	17.00	19.50	36.50
422	417/200	417/400	17.00	19.50	36.50
423	417/400	417/600	22.35	28.50	50.85
424	417/600	417/800	15.70	35.60	51.30
425	417/800	418/000	23.00	36.10	59.10
426	418/000	418/200	28.10	30.00	58.10
427	418/200	418/400	29.20	30.00	59.20
428	418/400	418/600	27.70	30.00	57.70
429	418/600	418/800	26.50	31.00	57.50
430	418/800	419/000	28.30	29.50	57.80
431	419/000	419/200	30.60	28.20	58.80
432	419/200	419/400	29.75	30.30	60.05
433	419/400	419/600	29.50	28.75	58.25
434	419/600	419/800	30.00	31.50	61.50
435	419/800	420/000	27.50	29.25	56.75
436	420/000	420/200	2.80	30.00	32.80
437	420/200	420/400	26.30	28.25	54.55



S.No	Chainage (km/m)		Row in LHS from Existing Road C/L (m)	Row in RHS from Existing Road C/L (m)	Right of way (m)
	From	To			
438	420/400	420/600	17.00	29.75	46.75
439	420/600	420/800	23.60	28.65	52.25
440	420/800	421/000	26.90	26.30	53.20
441	421/000	421/200	17.30	29.60	46.90
442	421/200	421/400	17.30	29.60	46.90
443	421/400	421/600	20.69	32.66	53.35

It is the policy of GOI to have generally 60m ROW for the Projects under NHDP. The Concessionaire will work out the requirement of additional land based on detailed design and get the same approved from NHA. The Concessionaire shall carryout its obligations for acquisition of additional land as stipulated in the draft Concession Agreement.

2.8 Intersections

As many as 130 nos. of cross roads intersect the Project Highway. Out of these 11 are classified as major intersections, details of which are given below in Table A-6. The details of the 119 minor intersections are given in Table A-7.

Table A-6: Details of Major Intersections

S.No	Existing Chainage (km / m)	Design Chainage (Km / m)	Status of Cross Road	No.of arms	Width of Cross Road (m)
1	333/888	333/882	Intersection with NH-67 bypass	4 arms	10.00
2	360/300	360/252	SH 71	3 arms	7.20
3	361/600	361/525	MDR	3 arms	7.00
4	364/200	363/955	MDR	3 arms	7.00
5	377/550	377/459	ODR	4 arms	3.70
6	396/200	396/120	MDR	4 arms	3.60
7	403/400	403/055	MDR	3 arms	7.00
8	405/050	404/563	MDR	3 arms	7.20
9	417/380	417/225	MDR	3 arms	7.00
10	418/790	418/329	SH 74	4 arms	7.20
11	421/600	421/273	NH-7	4 arms	7.50

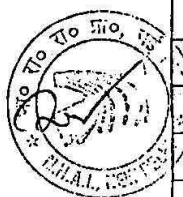
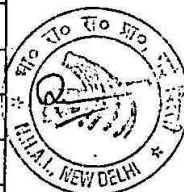


Table A-7: Details of Existing Minor intersections

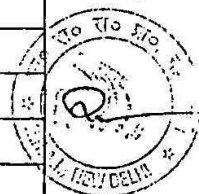
S.No	Existing Chainage (km / m)	Design Chainage (Km / m)	Status of Cross Road	No.of arms	Width of Cross Road (m)	Remarks
1.	333/220	333/221	Village road	3 arms	3.75	
2.	333/575	333/576	Village road	3 arms	3.75	
3.	334/550	334/543	Village road	3 arms	3.75	
4.	335/130	335/157	Village road	3 arms	5.50	
5.	335/300	335/561	Village road	3 arms	3.75	
6.	335/610	335/612	Village road	3 arms	3.75	
7.	336/450	336/456	Village road	3 arms	3.75	
8.	336/800	336/781	Village road	3 arms	3.30	
9.	337/975	337/985	Village road	3 arms	3.75	
10.	338/175	338/180	Village road	3 arms	3.70	
11.	338/575	338/548	Village road	3 arms	3.60	
12.	339/200	339/214	Village road	3 arms	3.50	
13.	339/450	339/464	Village road	3 arms	3.50	
14.	340/200	340/235	Village road	3 arms	3.55	
15.	341/000	341/068	Village road	3 arms	3.20	
16.	341/450	341/509	ODR	3 arms	5.50	
17.	341/450	341/519	Village road	3 arms	3.60	
18.	342/100	342/265	Village road	3 arms	3.50	
19.	342/780	342/849	Village road	3 arms	3.40	
20.	344/720	344/824	Village road	3 arms	3.50	
21.	345/820	345/933	ODR	4 arms	3.50	
22.	347/650	347/736	ODR	3 arms	3.50	
23.	348/170	348/274	Village road	3 arms	5.00	
24.	348/800	348/925	Village road	3 arms	3.50	
25.	349/350	349/470	Village road	3 arms	6.00	
26.	350/175	350/350	Village road	3 arms	3.50	
27.	350/800	350/950	Village road	3 arms	3.75	



S.No	Existing Chainage (km / m)	Design Chainage (Km / m)	Status of Cross Road	No.of arms	Width of Cross Road (m)	Remarks
28.	351/980	352/131	Village road	3 arms	3.60	
29.	352/380	352/579	Village road	3 arms	3.50	
30.	352/600	352/851	Village road	3 arms	3.70	
31.	353/900	354/105	Village road	3 arms	3.75	
32.	354/010	354/214	ODR	3 arms	3.60	
33.	354/375	354/576	Village road	3 arms	3.50	
34.	354/590	354/787	Village road	3 arms	3.60	
35.	355/790	355/953	Village road	3 arms	3.50	
36.	356/350	356/401	Village road	3 arms	3.00	
37.	357/100	357/134	Village road	3 arms	3.60	
38.	357/820	357/869	Village road	3 arms	3.50	
39.	357/950	358/014	ODR	3 arms	3.70	
40.	358/700	358/743	Village road	3 arms	3.50	
41.	359/000	359/030	ODR	3 arms	3.30	
42.	359/710	359/760	Village road	3 arms	3.40	
43.	361/100	361/055	Village road	3 arms	3.75	
44.	361/100	361/063	Village road	3 arms	3.75	
45.	362/400	362/300	Village road	3 arms	3.50	
46.	363/200	363/082	ODR	3 arms	3.75	
47.	363/212	363/094	Village road	3 arms	3.75	
48.	364/380	364/299	Village road	3 arms	3.50	
49.	364/900	364/994	Village road	3 arms	3.50	
50.	365/100	365/029	Village road	3 arms	3.75	
51.	366/090	366/206	Village road	3 arms	3.50	
52.	366/720	366/617	Village road	3 arms	3.50	
53.	366/950	366/856	Village road	3 arms	3.50	
54.	367/660	367/663	Village road	3 arms	3.60	
55.	369/100	369/101	Village road	3 arms	3.00	



S.No	Existing Chainage (km / m)	Design Chainage (Km / m)	Status of Cross Road	No.of arms	Width of Cross Road (m)	Remarks
56.	370/500	370/442	Village road	3 arms	3.55	
57.	371/060	370/950	Village road	3 arms	3.50	
58.	371/100	370/990	Village road	3 arms	2.75	
59.	371/200	371/108	Village road	3 arms	3.50	
60.	372/000	371/892	Village road	3 arms	3.50	
61.	374/050	373/962	Village road	3 arms	3.20	
62.	374/100	374/042	ODR	3 arms	3.50	
63.	374/116	374/058	Village road	3 arms	3.50	
64.	374/500	374/412	Village road	3 arms	3.60	
65.	375/550	375/432	Village road	3 arms	3.50	
66.	375/900	375/808	Village road	3 arms	3.60	
67.	378/100	377/968	ODR	3 arms	3.75	
68.	378/940	378/821	Village road	3 arms	3.30	
69.	379/050	378/942	Village road	3 arms	3.50	
70.	379/725	379/630	Village road	3 arms	3.65	
71.	380/090	379/991	Village road	3 arms	3.30	
72.	383/400	383/392	Village road	3 arms	3.75	
73.	383/610	383/534	Village road	3 arms	3.50	
74.	387/005	386/945	Village road	3 arms	3.70	
75.	387/930	387/829	Village road	3 arms	3.50	
76.	388/970	388/680	Village road	3 arms	3.30	
77.	389/390	389/264	Village road	3 arms	3.10	
78.	395/571	395/380	Village road	3 arms	3.50	
79.	397/620	397/275	Village road	3 arms	3.00	
80.	398/500	398/140	Village road	3 arms	3.00	
81.	400/010	399/680	Village road	3 arms	3.75	
82.	400/450	400/091	Village road	3 arms	3.55	
83.	402/030	401/691	Village road	3 arms	3.60	



S.No	Existing Chainage (km / m)	Design Chainage (Km / m)	Status of Cross Road	No.of arms	Width of Cross Road (m)	Remarks
84.	402/725	402/360	Village road	3 arms	3.75	
85.	403/050	402/723	Village road	3 arms	3.20	
86.	404/070	403/716	ODR	3 arms	5.50	
87.	404/675	404/240	ODR	3 arms	3.50	
88.	404/682	404/252	Village road	3 arms	3.50	
89.	405/625	405/198	Village road	3 arms	3.75	
90.	405/975	405/533	Village road	3 arms	3.60	
91.	406/370	405/953	Village road	3 arms	3.70	
92.	407/100	406/581	Village road	3 arms	3.50	
93.	408/175	406/696	Village road	3 arms	3.60	
94.	409/250	408/832	Village road	3 arms	3.75	
95.	409/675	409/252	Village road	3 arms	3.60	
96.	409/850	409/434	Village road	3 arms	3.40	
97.	410/800	410/359	Village road	3 arms	3.50	
98.	411/950	411/548	Village road	3 arms	3.60	
99.	412/450	412/084	Village road	3 arms	3.40	
100.	412/750	412/346	ODR	3 arms	3.70	
101.	413/300	412/948	Village road	3 arms	3.50	
102.	413/830	413/546	Village road	3 arms	3.00	
103.	414/190	413/869	Village road	3 arms	3.20	
104.	415/300	415/007	Village road	3 arms	3.00	
105.	415/750	415/425	Village road	3 arms	3.20	
106.	415/775	415/450	Village road	3 arms	6.50	
107.	416/820	416/503	Village road	3 arms	3.20	
108.	417/050	416/723	Village road	3 arms	3.00	
109.	417/400	417/083	Village road	4 arms	5.50	
110.	418/808	418/467	Village road	3 arms	3.75	
111.	419/114	418/787	Village road	3 arms	3.50	
112.	419/800	419/480	Village road	3 arms	3.75	



S.No	Existing Chainage (km / m)	Design Chainage (Km / m)	Status of Cross Road	No.of arms	Width of Cross Road (m)	Remarks
113.	420/215	419/760	Village road	3 arms	3.50	
114.	420/575	419/895	Village road	4 arms	3.50	
115.	421/017	420/672	Village road	3 arms	3.50	
116.	421/018	420/674	Village road	3 arms	3.50	
117.	421/164	420/819	Village road	3 arms	3.50	
118.	421/358	421/015	Village road	4 arms	3.00	
119.	421/436	421/094	Village road	3 arms	3.50	

2.9 Road Geometry

The Project Highway generally has good geometrics conforming to the IRC Standards. However, nearly 148 nos of curves are found in this stretch. Out of this, 11 nos of curves have radius less than 360 mts, which requires improvement. The Project Highway has smooth vertical gradients for most of its length.

2.10 Pavement Composition and Condition

The overall condition of the pavement ranges from fair to good. Cracking is the predominant distress along the Project Highway. The roughness values range from 2000mmv/km to 5000mm/km. Annexure A-4 gives the details of the pavement condition survey done for the project road stretch kilometer wise. The abstract of the pavement condition survey is also enclosed in the following Table A-8. These surveys were conducted in the month of June 2005 and further distress has been found during the rain/floods in October/ November 2005. Also, the Benkelman beam deflection survey results are enclosed in Annexure A-5.

Table A-8: Condition of existing pavement surface

Chainage (existing Km)		Classification
From	To	
340/000	341/000	Poor
341/000	352/000	Fair
352/000	353/000	Good
353/000	355/000	Poor
355/000	356/000	Good
356/000	361/000	Poor
361/000	362/000	Good
362/000	367/000	Fair



Chainage (existing Km)		Classification
From	To	
367/000	368/000	Poor
368/000	369/000	Good
369/000	370/000	Poor
370/000	371/000	Good
371/000	375/000	Poor
375/000	380/000	Fair
380/000	385/000	Poor
385/000	386/000	Good
386/000	388/000	Poor
388/000	390/000	Fair
390/000	391/000	Poor
391/000	402/000	Fair
402/000	403/000	Poor
403/000	408/000	Fair
408/000	408/500	Poor
408/500	421/000	Fair

The pavement is mainly composed of BT layer, WBM base over sub grade. At few places sub base is present in the form of granular material. The summary of existing pavement composition data, collected from test pit investigations is presented in Table A-9. Overall thickness of paved shoulders varies from 220mm to 460 mm.

Table A-9: Existing Pavement Crust Details

S.No.	Location		Pavement Thickness(cm)		
	Existing Chainage (km)	Side	BM/SD/BC	WBM	Gravel
1.	334/500	RHS	22.00	20.00	25.00
2.	335/000	LHS	15.00	12.00	20.00
3.	335/500	RHS	18.00	20.00	30.00
4.	336/500	RHS	20.00	15.00	20.00
5.	337/000	LHS	15.00	15.00	20.00
6.	337/500	RHS	15.00	15.00	20.00

S.No.	Location		Pavement Thickness(cm)		
	Existing Chainage (km)	Side	BM/SDBC	WBM	Gravel
7.	338/000	LHS	15.00	15.00	25.00
8.	338/500	RHS	20.00	15.00	20.00
9.	339/000	LHS	15.00	15.00	20.00
10.	339/500	RHS	10.00	20.00	20.00
11.	340/000	LHS	12.00	20.00	25.00
12.	340/500	RHS	20.00	15.00	15.00
13.	341/000	LHS	15.00	20.00	20.00
14.	341/500	RHS	20.00	15.00	30.00
15.	342/000	LHS	15.00	15.00	25.00
16.	343/000	LHS	15.00	15.00	30.00
17.	343/500	RHS	15.00	15.00	25.00
18.	344/000	LHS	15.00	15.00	20.00
19.	344/500	RHS	15.00	17.00	20.00
20.	345/000	LHS	15.00	15.00	20.00
21.	345/500	RHS	15.00	15.00	15.00
22.	346/000	LHS	20.00	15.00	20.00
23.	346/500	RHS	20.00	15.00	15.00
24.	347/000	LHS	15.00	15.00	20.00
25.	347/500	RHS	15.00	15.00	25.00
26.	348/000	LHS	15.00	20.00	25.00
27.	349/000	LHS	25.00	15.00	25.00
28.	350/000	LHS	15.00	15.00	20.00
29.	350/500	RHS	20.00	15.00	20.00
30.	351/000	LHS	10.00	22.00	25.00
31.	352/000	LHS	18.00	22.00	25.00
32.	352/500	RHS	15.00	18.00	20.00
33.	353/000	LHS	18.00	21.00	35.00
34.	353/500	RHS	15.00	20.00	20.00
35.	354/000	LHS	15.00	24.00	20.00

4-laning of Trichy – Dindigul Section of NH – 45 in Tamil Nadu



S.No.	Location		Pavement Thickness(cm)		
	Existing Chainage (km)	Side	BMSDBC	WBM	Gravel
36.	354/500	RHS	16.00	22.00	25.00
37.	355/000	LHS	15.00	20.00	20.00
38.	355/500	RHS	16.00	30.00	20.00
39.	356/000	LHS	15.00	20.00	25.00
40.	357/000	LHS	15.00	22.00	25.00
41.	357/500	RHS	15.00	20.00	20.00
42.	358/000	LHS	20.00	15.00	15.00
43.	358/500	RHS	12.00	20.00	15.00
44.	359/000	LHS	12.00	18.00	20.00
45.	359/500	RHS	12.00	18.00	20.00
46.	360/500	RHS	12.00	18.00	20.00
47.	361/000	LHS	15.00	15.00	20.00
48.	361/500	RHS	27.00	15.00	20.00
49.	362/000	LHS	15.00	12.00	25.00
50.	365/000	LHS	10.00	10.00	25.00
51.	365/500	RHS	12.00	15.00	20.00
52.	366/500	RHS	16.00	15.00	20.00
53.	367/000	LHS	15.00	15.00	25.00
54.	367/500	RHS	15.00	20.00	20.00
55.	368/000	LHS	14.00	20.00	25.00
56.	368/500	RHS	17.50	15.00	20.00
57.	369/000	LHS	10.00	15.00	25.00
58.	369/500	RHS	10.00	10.00	25.00
59.	370/000	LHS	10.00	15.00	20.00
60.	370/500	RHS	20.00	15.00	25.00
61.	371/000	LHS	12.00	10.00	30.00
62.	371/500	RHS	10.00	15.00	20.00
63.	372/000	LHS	15.00	18.00	20.00
	372/500	RHS	10.00	15.00	20.00



S.No.	Location		Pavement Thickness(cm)		
	Existing Chainage (km)	Side	BM/SDBC	WBM	Gravel
65.	373/000	LHS	10.00	18.00	25.00
66.	373/500	RHS	10.00	15.00	25.00
67.	374/000	LHS	20.00	10.00	30.00
68.	374/500	RHS	20.00	15.00	20.00
69.	375/000	LHS	20.00	15.00	25.00
70.	375/500	RHS	10.00	12.00	30.00
71.	376/000	LHS	12.00	20.00	25.00
72.	376/500	RHS	22.00	15.00	20.00
73.	378/500	RHS	12.00	18.00	20.00
74.	379/500	RHS	20.00	15.00	20.00
75.	380/000	LHS	12.00	18.00	20.00
76.	382/000	LHS	15.00	15.00	25.00
77.	382/500	RHS	20.00	15.00	25.00
78.	383/000	LHS	10.00	15.00	25.00
79.	383/500	RHS	15.00	15.00	25.00
80.	384/000	LHS	12.00	15.00	25.00
81.	386/000	LHS	15.00	20.00	20.00
82.	386/500	RHS	10.00	20.00	25.00
83.	387/000	LHS	25.00	13.00	20.00
84.	387/500	RHS	12.00	15.00	20.00
85.	388/500	RHS	15.00	15.00	25.00
86.	389/000	LHS	15.00	12.00	25.00
87.	390/000	LHS	20.00	15.00	25.00
88.	390/500	RHS	15.00	15.00	20.00
89.	391/000	LHS	12.00	18.00	20.00
90.	391/500	RHS	15.00	10.00	30.00
91.	392/000	LHS	20.00	15.00	25.00
92.	392/500	RHS	15.00	18.00	20.00
93.	393/000	LHS	20.00	18.00	30.00

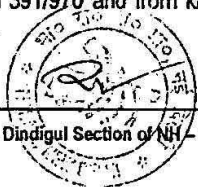


S.No.	Location		Pavement Thickness(cm)		
	Existing Chainage (km)	Side	BM/SDBC	WBM	Gravel
94.	393/500	RHS	15.00	15.00	25.00
95.	394/000	LHS	20.00	15.00	25.00
96.	394/500	RHS	18.00	15.00	25.00
97.	395/500	RHS	15.00	20.00	20.00
98.	396/500	RHS	10.00	15.00	20.00
99.	397/000	LHS	15.00	18.00	20.00
100.	397/500	RHS	18.00	20.00	25.00
101.	398/000	LHS	15.00	20.00	25.00
102.	398/500	RHS	15.00	20.00	20.00
103.	399/000	LHS	10.00	15.00	20.00
104.	399/500	RHS	15.00	20.00	25.00
105.	400/000	LHS	18.00	16.00	20.00
106.	400/500	RHS	20.00	20.00	25.00
107.	401/000	LHS	15.00	18.00	25.00
108.	401/500	RHS	20.00	15.00	20.00
109.	402/000	LHS	10.00	16.00	20.00
110.	402/500	RHS	12.00	18.00	20.00
111.	403/000	LHS	12.00	15.00	25.00
112.	403/500	RHS	15.00	18.00	25.00
113.	404/000	LHS	15.00	18.00	25.00
114.	404/500	RHS	10.00	15.00	20.00
115.	405/000	LHS	12.00	17.00	20.00
116.	405/500	RHS	15.00	15.00	20.00
117.	406/000	LHS	15.00	15.00	15.00
118.	406/500	RHS	16.00	18.00	20.00
119.	407/000	LHS	17.00	15.00	20.00
120.	407/500	RHS	18.00	15.00	25.00
121.	408/000	LHS	22.00	15.00	25.00
122.	408/500	RHS	15.00	18.00	20.00

S.No.	Location		Pavement Thickness(cm)		
	Existing Chainage (km)	Side	BM/SDBC	WBM	Gravel
123.	409/000	LHS	18.00	18.00	25.00
124.	409/500	RHS	18.00	18.00	20.00
125.	410/000	LHS	17.00	20.00	20.00
126.	410/500	RHS	12.00	10.00	15.00
127.	411/000	LHS	20.00	15.00	15.00
128.	411/500	RHS	17.00	15.00	20.00
129.	412/000	LHS	15.00	10.00	15.00
130.	412/500	RHS	12.00	10.00	20.00
131.	413/000	LHS	10.00	10.00	30.00
132.	414/000	LHS	10.00	10.00	20.00
133.	414/500	RHS	20.00	10.00	20.00
134.	415/000	LHS	20.00	10.00	20.00
135.	416/000	LHS	10.00	15.00	25.00
136.	417/000	LHS	10.00	15.00	25.00
137.	417/500	RHS	11.00	10.00	20.00
138.	418/000	LHS	15.00	15.00	20.00
139.	418/500	RHS	14.00	10.00	25.00
140.	419/000	LHS	10.00	15.00	20.00
141.	419/500	RHS	10.00	12.00	30.00
142.	420/000	LHS	15.00	15.00	25.00
143.	420/500	RHS	12.00	15.00	20.00

2.11 Drainage

The drainage facilities along the roadside are found to be inadequate for the entire road stretch. In majority of the built up sections, roadside drains are non-existent. Drains wherever existing are found to be blocked and not functioning. The roadside drainage along the Project Highway needs improvement, predominantly in built up stretches. Overtopping was observed at km 370/400; km 390/000, km 391/970 and from km 414/950 to km 415/600 during the floods in October and November 2005.



2.12 Cross Drainage Structures

There are about 190 cross drainage structures on the Project Highway. Out of these, 5 nos. are Major Bridges, 10 nos. are Minor Bridges and the remaining 175 nos. are culverts. The detailed inventory of the 175 nos. of culverts are given in the Table A-10 with the inventory of 15 nos. of bridges in Table A-11.

Table A-10: Inventory Details of Existing Culverts

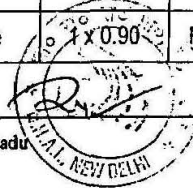
S.No	Existing Chainage(km)	Existing Type of Culvert	Span (m)	Type of proposed	Existing Width of Culvert
1.	333/842	One row RCC pipe	1 x 0.90	Reconstruction	12.95
2.	334/033	One row RCC pipe	1 x 0.90	Reconstruction	12.95
3.	335/553	One row RCC pipe	1 x 0.90	Reconstruction	12.60
4.	335/766	Three row RCC Pipe	3 x 0.90	Reconstruction	12.80
5.	336/267	Three row RCC Pipe	3 x 0.90	Reconstruction	12.95
6.	337/175	Two row RCC pipe	2 x 0.90	Reconstruction	12.90
7.	337/913	Single row RCC Pipe	1 x 0.90	Reconstruction	12.90
8.	338/500	One row RCC pipe	1 x 0.90	Reconstruction	12.20
9.	338/595	RCC Slab	1 x 3.00	Reconstruction	12.00
10.	338/889	Cut Stone	2 x 1.20	Reconstruction	14.80
11.	339/081	RCC Slab	1 x 2.00	Reconstruction	12.75
12.	340/623	One row RCC pipe	1 x 0.90	Reconstruction	12.70
13.	341/815	Two row RCC pipe	2 x 0.90	Reconstruction	12.55
14.	342/556	Single row pipe	1 x 0.90	Widening	12.30
15.	342/932	Two row RCC pipe	2 x 0.90	Reconstruction	12.30
16.	343/561	One row RCC pipe	1 x 0.90	Reconstruction	12.20
17.	343/834	One row RCC pipe	1 x 0.90	Reconstruction	12.25
18.	344/574 & 344/583	Cut Stone	1 x 0.90	Reconstruction	12.55
19.	345/398	RCC Slab	1 x 2.00	Widening	12.10
20.	346/658	Two row RCC pipe	2 x 0.90	Reconstruction	12.55



S.No	Existing Chainage(km)	Existing Type of Culvert	Span (m)	Type of proposed	Existing Width of Culvert
21.	347/013	Cut Stone	1 x 1.50	Reconstruction	11.70
22.	347/045	One row RCC pipe	1 x 0.90	Reconstruction	12.20
23.	347/693	One row RCC pipe	1 x 0.90	Reconstruction	12.15
24.	347/953	One row RCC pipe	1 x 0.90	Reconstruction	12.40
25.	348/050	One row RCC pipe	1 x 0.30	Reconstruction	12.20
26.	348/689	One row RCC pipe	1 x 0.90	Widening	12.20
27.	348/809	One row RCC pipe	1 x 0.90	Reconstruction	14.95
28.	349/239	One row RCC pipe	1 x 0.90	Reconstruction	12.25
29.	349/420	RCC Slab	1 x 3.00	Widening	12.10
30.	349/609	Cut Stone	3 x 0.95	Reconstruction	12.85
31.	349/793	One row RCC pipe	1 x 0.90	Reconstruction	12.20
32.	349/914	One row RCC pipe	1 x 0.90	Widening	12.30
33.	351/077	One row RCC pipe	1 x 0.90	Reconstruction	17.00
34.	351/242	RCC Slab	1 x 3.00	Widening	12.45
35.	351/495	One row RCC pipe	1 x 0.90	Widening	15.90
36.	351/609	One row RCC pipe	1 x 0.90	Reconstruction	14.20
37.	351/804	One row RCC pipe	1 x 0.90	Reconstruction	13.90
38.	352/415	One row RCC pipe	1 x 0.90	Reconstruction	12.35
39.	352/552	One row RCC pipe	1 x 0.90	Reconstruction	12.40
40.	352/700	One row RCC pipe	1 x 0.90	Reconstruction	12.25
41.	352/918	One row RCC pipe	1 x 0.90	Widening	12.20
42.	353/197	RCC Slab	1 x 2.00	Reconstruction	12.80
43.	353/735	Two row RCC pipe	2 x 0.90	Widening	12.25
44.	354/493	RCC Slab	1 x 6.00	Widening	12.00
45.	354/971	One row RCC pipe	1 x 0.90	Widening	12.45



S.No	Existing Chainage(km)	Existing Type of Culvert	Span (m)	Type of proposed	Existing Width of Culvert
46.	355/222	One row RCC pipe	1 x 0.90	Reconstruction	14.60
47.	355/478	One row RCC pipe	1 x 0.90	Reconstruction	12.3
48.	355/848	RCC Slab	1 x 3.00	Reconstruction	12.20
49.	356/719	RCC Slab	1 x 3.00	Reconstruction	12.00
50.	356/799	One row RCC pipe	1 x 0.90	Widening	12.20
51.	357/315	RCC Slab	1 x 5.00	Widening	12.20
52.	357/508	One row RCC Pipe	1 x 0.90	Widening	12.10
53.	358/390	RCC Slab	1 x 4.50	Widening	12.00
54.	358/776	RCC Slab	1 x 2.00	Widening	12.10
55.	359/466	One row RCC pipe	1 x 0.90	Widening	21.90
56.	359/847	RCC Slab	1 x 2.00	Widening	11.90
57.	360/040	RCC Slab	1 x 2.00	Reconstruction	11.90
58.	360/497	One row RCC pipe	1 x 0.90	Reconstruction	12.00
59.	360/875	RCC Slab	1 x 2.00	Reconstruction	11.90
60.	361/876	One row RCC pipe	1 x 0.90	Reconstruction	12.30
61.	362/361	One row RCC pipe	1 x 0.90	Reconstruction	12.30
62.	362/388	Two row RCC pipe	2 x 0.90	Reconstruction	12.30
63.	362/479	One row RCC pipe	1 x 0.90	Reconstruction	12.30
64.	362/572	One row RCC pipe	1 x 0.90	Reconstruction	12.30
65.	362/700	RCC Slab	1 x 3.00	Reconstruction	12.30
66.	362/847	One row RCC pipe	1 x 0.90	Reconstruction	12.30
67.	362/941	One row RCC pipe	1 x 0.90	Reconstruction	12.30
68.	362/971	One row RCC pipe	1 x 0.90	Reconstruction	12.30
69.	363/065	One row RCC pipe	1 x 0.90	Reconstruction	12.30
70.	363/710	One row RCC pipe	1 x 0.90	Reconstruction	12.30



S.No	Existing Chainage(km)	Existing Type of Culvert	Span (m)	Type of proposed	Existing Width of Culvert
71.	363/750	One row RCC pipe	1 x 0.90	Reconstruction	12.30
72.	363/982	One row RCC pipe	1 x 0.90	Widening	17.20
73.	365/230	One row RCC pipe	1 x 0.90	Reconstruction	12.30
74.	366/543	Two row RCC pipe	2 x 0.90	Widening	12.40
75.	366/662	RCC Slab	1 x 2.00	Widening	12.30
76.	366/895	One row RCC pipe	1 x 0.90	Reconstruction	12.25
77.	367/007	One row RCC pipe	1 x 0.90	Reconstruction	13.90
78.	367/388	Two row RCC pipe	2 x 0.90	Reconstruction	13.30
79.	367/812	One row RCC pipe	1 x 0.90	Reconstruction	12.30
80.	369/049	One row RCC pipe	1 x 0.90	Widening	12.10
81.	369/854	Two row RCC pipe	2 x 0.90	Widening	12.40
82.	370/313	Two row RCC pipe	2 x 0.90	Widening	12.40
83.	371/029	One row RCC pipe	1 x 0.90	Reconstruction	12.30
84.	371/279	Three row RCC pipe	3 x 0.90	Reconstruction	11.55
85.	371/473	One row RCC pipe	1 x 0.90	Reconstruction	14.95
86.	372/220	Two row RCC pipe	2 x 0.90	Reconstruction	14.95
87.	372/910	One row RCC pipe	1 x 0.90	Reconstruction	12.50
88.	373/592	One row RCC pipe	1 x 0.90	Reconstruction	12.45
89.	374/078	One row RCC pipe	1 x 0.90	Widening	12.40
90.	374/763	One row RCC pipe	1 x 0.90	Widening	22.07
91.	374/857	One row RCC pipe	1 x 0.90	Widening	17.20
92.	375/830	Cut stone	1 x 0.90	Reconstruction	22.40
93.	376/454	One row RCC pipe	1 x 0.90	Widening	12.20
94.	377/453	One row RCC pipe	1 x 0.90	Reconstruction	12.20
95.	378/166	RCC Slab	1 x 4.00	Widening	12.25



S.No	Existing Chainage(km)	Existing Type of Culvert	Span (m)	Type of proposed	Existing Width of Culvert
96.	379/283	Two row RCC pipe	2 x 0.90	Widening	13.00
97.	379/698	RCC Slab	1 x 2.80	Widening	12.00
98.	379/838	RCC Slab	1 x 2.80	Widening	12.10
99.	381/143	RCC Slab	1 x 6.00	Widening	12.20
100.	380/339	RCC Slab	1 x 4.30	Widening	12.20
101.	380/890	Two row RCC pipe	2 x 0.90	Widening	12.20
102.	381/137	RCC Slab	1 x 3.60	Widening	11.65
103.	381/658	RCC Slab	1 x 6.00	Widening	12.30
104.	383/248	RCC Slab	1 x 3.90	Widening	11.80
105.	383/763	Two row RCC pipe	2 x 0.90	Widening	12.10
106.	383/917	RCC Slab	1 x 2.00	Reconstruction	12.20
107.	384/129	RCC Slab	1 x 3.00	Widening	12.10
108.	384/758	One row RCC pipe	1 x 0.90	Reconstruction	12.10
109.	384/967	RCC Slab	1 x 3.00	Widening	14.10
110.	385/169	RCC Slab	1 x 3.00	Widening	12.25
111.	385/721	RCC Slab	1 x 5.50	Reconstruction	12.00
112.	386/119	RCC Slab	1 x 4.00	Widening	12.20
113.	387/560	One row RCC pipe	1 x 0.90	Widening	12.10
114.	387/747	One row RCC pipe	1 x 0.90	Reconstruction	12.35
115.	388/230	RCC Slab	1 x 2.00	Reconstruction	12.00
116.	388/856	One row RCC pipe	1 x 0.90	Widening	14.70
117.	389/089	One row RCC pipe	1 x 0.90	Reconstruction	19.35
118.	389/251	One row RCC pipe	1 x 0.90	Widening	19.35
119.	389/297	RCC Slab	1 x 4.60	Widening	11.75
120.	389/357	One row RCC pipe	1 x 0.90	Reconstruction	16.80

S.No	Existing Chainage(km)	Existing Type of Culvert	Span (m)	Type of proposed	Existing Width of Culvert
121.	390/421	One row RCC pipe	1 x 0.90	Reconstruction	12.20
122.	390/693	RCC Slab	1 x 1.50	Reconstruction	12.30
123.	391/172	RCC Slab	1 x 3.00	Reconstruction	12.00
124.	391/412	One row RCC pipe	1 x 0.90	Widening	12.35
125.	392/209	One row RCC pipe	1 x 0.90	Widening	12.25
126.	392/769	RCC Slab	1 x 6.00	Reconstruction	12.00
127.	393/429	RCC Slab	1 x 4.00	Reconstruction	12.20
128.	394/585	RCC Slab	1 x 1.50	Widening	11.65
129.	395/147	RCC Slab	1 x 2.00	Widening	12.20
130.	395/507	RCC Slab	1 x 1.50	Widening	12.15
131.	396/133	RCC Slab	1 x 2.00	Reconstruction	11.95
132.	397/093	RCC Slab	1 x 1.50	Reconstruction	11.85
133.	397/621	RCC Slab	1 x 1.80	Reconstruction	12.30
134.	401/702	RCC Slab	1 x 4.00	Widening	12.05
135.	402/039	RCC Slab	1 x 2.00	Reconstruction	12.10
136.	402/498	RCC Slab	1 x 4.00	Reconstruction	12.20
137.	402/598	RCC Slab	1 x 2.00	Reconstruction	12.20
138.	403/237	RCC Slab	1 x 1.50	Widening	12.05
139.	403/479	One row RCC pipe	1 x 0.90	Widening	12.55
140.	403/641	One row RCC pipe	1 x 0.90	Widening	12.30
141.	404/046	One row RCC pipe	1 x 0.90	Reconstruction	12.25
142.	404/113	Two row RCC pipe	2 x 0.90	Reconstruction	12.25
143.	404/686	RCC Slab	1 x 2.00	Widening	12.25
144.	405/340	RCC Slab	1 x 1.50	Widening	12.60
145.	405/763	RCC Slab	1 x 1.50	Widening	12.30
146.	406/994	RCC Slab	1 x 1.50	Widening	12.10



S.No	Existing Chainage(km)	Existing Type of Culvert	Span (m)	Type of proposed	Existing Width of Culvert
147.	407/269	RCC Slab	1 x 1.50	Widening	12.10
148.	408/368	RCC Slab	1 x 1.50	Widening	12.10
149.	408/958	RCC Slab	1 x 1.50	Widening	12.00
150.	409/340	RCC Slab	1 x 2.00	Widening	11.80
151.	409/906	RCC Slab	1 x 2.00	Widening	12.00
152.	411/201	RCC Slab	1 x 4.00	Reconstruction	12.00
153.	411/654	RCC Slab	1 x 2.00	Reconstruction	12.00
154.	412/140	RCC Slab	1 x 1.50	Widening	12.20
155.	412/207	One row RCC pipe	1 x 0.90	Reconstruction	12.20
156.	412/746	RCC slab	1 x 2.00	Reconstruction	12.20
157.	413/500	RCC slab	1 x 4.00	Widening	12.10
158.	413/825	RCC slab	1 x 2.00	Widening	12.10
159.	414/542	RCC slab	1 x 2.00	Reconstruction	12.00
160.	414/858	One row RCC pipe	1 x 0.90	Reconstruction	12.00
161.	415/088	RCC slab	1 x 4.00	Reconstruction	11.70
162.	415/163	RCC slab	1 x 2.00	Reconstruction	11.95
163.	415/814	RCC slab	1 x 2.00	Widening	18.40
164.	416/563	One row RCC pipe	1 x 0.90	Reconstruction	12.10
165.	416/948	RCC slab	1 x 2.00	Widening	11.95
166.	417/542	Two row RCC pipe	2 x 0.90	Widening	12.00
167.	417/558	Two row RCC pipe	2 x 0.90	Widening	12.00
168.	418/037	RCC slab	1 x 6.00	Reconstruction	12.10
169.	418/554	One row RCC pipe	1 x 0.90	Widening	12.30
170.	418/647	Two row RCC pipe	2 x 0.90	Widening	12.60
171.	418/698	One row RCC pipe	1 x 0.90	Widening	12.10



S.No	Existing Chainage(km)	Existing Type of Culvert	Span (m)	Type of proposed	Existing Width of Culvert
172.	419/524	One row RCC pipe	1 x 0.90	Reconstruction	12.10
173.	419/635	Two row RCC pipe	2 x 0.90	Widening	12.00
174.	420/765	RCC slab	1 x 5.00	Reconstruction	12.10
175.	421/228	Two row RCC pipe	2 x 0.90	Widening	10.50

Table A-11 : Inventory Details of Existing Bridges

S. No.	Location		Bridge No.	Name of River Crossing	Existing span arrangement	Condition of Bridges				
	Existing Chainage	Design Chainage				Abutment	Piers	Slab	Bearings	Parapet
1.	335/628	335/621	336/2	New Kattalai Canal	3 x 4.5	Good	Good	Good	Nil	Fair
2.	350/529	350/678	351/1	Ariyar	10 x 13.25	Good	Good	Good	Poor	Fair
3.	360/812	360/782	361/3	Mamundi	9 x 8.72	Good	Fair	Fair	Nil	Poor
4.	363/263	363/177	364/2	Manaparai Koral River	8 x 4.75	Good	Good	Good	Nil	Poor
5.	364/150	364/077	365/1	Siru Odai	2 x 5.80	Fair	Fair	Fair	Nil	Fair
6.	367/492	367/454	368/2	Dompachi	5 x 13.20	Good	Fair	Good	Fair	Poor
7.	382/260	382/149	383/1	Palapatti Odai	1 x 8.70	Good	Fair	Fair	Nil	Poor
8.	386/383	386/261	387/2	Chetty Odai	2 x 8.25 (Skew 37°)	Good	Good	Fair	Nil	Fair
9.	387/973	387/841	388/3	Kalpatti Odai - 1	1 x 7.80 (Skew 27°)	Good	Nil	Good	Nil	Good
10.	388/493	388/366	389/2	Kalpatti Odai - 2	1 x 16.30	Fair	Nil	Fair	Fair	Good
11.	397/941	397/587	398/3	Mallatar River	4 x 10.10 (Skew 32°)	Good	Good	Fair	Fair	Poor
12.	398/101	397/747	399/1	Malayadipatti Odai - 1	1 x 9.00 (Skew 15°)	Good	Nil	Fair	Nil	Fair
13.	399/017	398/645	400/1	Malayadipatti Odai - 2	2 x 6.70	Fair	Fair	Fair	Nil	Fair
14.	411/454	411/030	412/2	Kallar	6 x 10.30 (Skew 38°)	Fair	Fair	Fair	Fair	Poor
15.	414/395	414/080	415/1	Sandhanavarthini	8 x 9.00 (Skew 15°)	Good	Fair	Good	Nil	Poor



2.12 (a) Road Under Bridge (RUB)

The Project Highway at km 417/400 (design chainage) passes under the Trichy – Karur broad gauge railway line with 4-lane Road under bridge.

2.13 Existing Facilities

Large numbers of bus stops are found along the project highway but there are no bus bays. Besides, number of Petrol Bunks, Vehicular Repair Shops, Telephone Booths, Dhabas are also found along the Project Highway. The list of existing Petrol Pumps along the Project Highway is given below in Table A-12.

Table A-12 : Existing Petrol Pumps

S.No	Existing Location (chainage in km)	Existing Petrol Pumps	Direction	Distance from Existing road centre line (m)
1.	325/100	IOCL	LHS	10
2.	333/600	BP	RHS	10
3.	344/700	IOCL	LHS	25
4.	361/500	BP	LHS	15
5.	361/700	HP	RHS	25
6.	362/100	IOCL	RHS	25
7.	362/800	IOCL	RHS	25
8.	376/750	IOCL	RHS	7
9.	401/950	IOCL	RHS	6
10.	406/000	BP	LHS	5
11.	417/180	IOCL	RHS	12

2.14 Environment and Climate

The climate of the area is principally tropical. Hot summers, moderate monsoons, cold winters are the climatic features of this region. The seasons are well marked for their periods.

Southwest Monsoon	:	June to September
Northeast Monsoon	:	October to December
Winter Season	:	November to January
Pre Monsoon or summer	:	February to June

Air quality and noise level appears to be within limits as per CPCB standards. In the immediate vicinity, no major sources (factories, power plants, etc) are observed which might contribute to air and noise pollution.

The rainfall occurs mainly during the Northeast Monsoon. The rain occurs during the later part of June till the end of September.

ANNEXURE A2 : ROAD INVENTORY

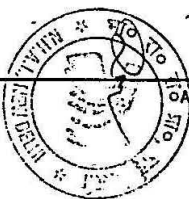
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification : National Highways
Date of Survey : 16.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 333/000 - 334/000																	
333.000	333.200	Plain	Barren	-	11.85	BT	6.60	F	ER	1.20	F	0.30	-	-	-	-	Earthen drain on both sides
333.200	333.400	Plain	Barren	Cholan Nagar	12.50	BT	6.80	F	ER	1.20	F	1.00	-	333/210	To Kali kudi on LHS	3.75	Accident Zone
333.400	333.600	Plain	Built up area	Cholan Nagar	12.10	BT	6.80	F	ER	1.25	F	1.50	-	333/575	To Cholan Nagar on LHS	3.75	-
333.600	333.800	Plain	Built up area	Cholan Nagar	12.00	BT	6.80	F	ER	1.00	F	1.00	-	-	-	-	Berath Petroleum on RHS at 333/610
333.800	334.000	Plain	Agricultural land	-	11.50	BT	6.80	F	ER	1.00	F	1.50	-	-	-	-	PWD Control canal on RHS 333/800 to 334/600

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor.



ANNEXURE A2 : ROAD INVENTORY

Road Name :
Location (From Km) :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 16.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 334/000 - 335/000																	
334.000	334.200	Plain	Agricultural	-	11.50	BT	6.50	G	ER	1.3	F	1.30	-	-	-	-	Newly relaid with SDBC
334.200	334.400	Plain	School Zone	Lourdhu Nagar	10.80	BT	6.60	G	ER	1.2	F	1.50	-	-	-	-	Newly relaid with SDBC
334.400	334.600	Plain	Agricultural	-	11.50	BT	6.70	G	ER	1.5	F	1.00	-	334/550	To Vadaku madu on RHS	3.75	Newly relaid with SDBC
334.600	334.800	Plain	Agricultural	-	10.50	BT	6.70	G	ER	1.5	F	1.50	-	-	-	-	Newly relaid with SDBC
334.800	335.000	Plain	Agricultural Built up area	Vannan kovil	11.50	BT	6.80	G	ER	1.3	F	1.70	-	-	-	-	Newly relaid with SDBC

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

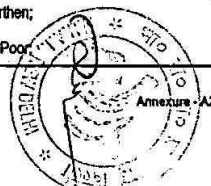
ANNEXURE A2 : ROAD INVENTORY

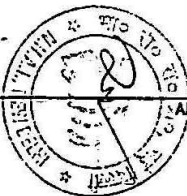
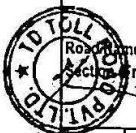
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 17.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 335/000 - 336/000																	
335.000	335.200	Plain	Built up area	Vannan kovil	11.50	BT	6.30	G	ER	1.75	G	-	-	335/130	To Navalur kuttapatti on RHS	5.50	Newly relaid with SDBC
335.200	335.400	Plain	Built up area	Vannan kovil	14.80	BT	6.50	G	ER	1.75	G	-	-	335/300	To Poongul on LHS	3.75	Stone masonry drain on RHS 335/00 to 335/500
335.400	335.600	Plain	Built up area	Vannan kovil	11.50	BT	6.70	G	ER	1.75	G	0.30	-	-	-	-	Newly relaid with SDBC, School Zone
335.600	335.800	Plain	Agricultural (LHS), College on RHS - Muthu kulam	Agricultural College on RHS - Muthu kulam	12.00	BT	6.80	G	ER	1.50	G	1.00	-	335/610	To Paganur on RHS	3.75	Newly relaid with SDBC
335.800	336.000	Plain	Agricultural (LHS), College on RHS - Muthu kulam	Agricultural College on RHS - Muthu kulam	11.80	BT	6.70	G	ER	1.50	G	1.50	-	-	-	-	Earthen drain on both sides

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor





ANNEXURE A2 : ROAD INVENTORY

Trichy to Dindigul
Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 17.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 336/000 - 337/000																	
336.000	336.200	Plain	Agricultural (LHS),	Agricultural College on RHS - Muthu kulam	10.50	BT	6.70	F	ER	1.25	F	1.50	-	-	-	-	Earthen drain on both sides
336.200	336.400	Plain	Agricultural (LHS),	Agricultural College on RHS - Muthu kulam	11.00	BT	6.90	F	ER	1.25	F	1.75	-	-	-	-	Earthen drain on both sides
336.400	336.600	Plain	Donboso ITI	Agricultural College on RHS - Muthu kulam	11.25	BT	6.80	F	ER	1.25	F	1.50	-	336/450	Agricultural college research institute	3.75	Earthen drain on both sides
336.600	336.800	Plain	Donboso ITI	Agricultural College on RHS - Muthu kulam	11.30	BT	6.50	F	ER	1.30	F	1.50	-	-	-	-	Earthen drain on both sides
336.800	337.000	Plain	Barren	-	10.95	BT	3.70	F	ER	0.75	P	1.50	-	-	-	-	Earthen drain on both sides
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

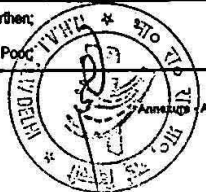
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 17.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 337/000 - 338/000																	
337.000	337.200	Plain	Barren	-	10.75	BT	6.80	G	ER	1.50	F	1.50	-	-	-	-	Newly relaid with SDBC
337.200	337.400	Plain	Barren	Vijaya nagar	11.10	BT	6.90	G	ER	1.20	F	1.00	-	-	-	-	Newly relaid with SDBC
337.400	337.600	Plain	Barren	Vijaya nagar	10.80	BT	6.70	G	ER	1.20	F	0.75	-	337/600	To Teacher training centre on LHS	3.50	Newly relaid with SDBC
337.600	337.800	Plain	Barren	-	11.20	BT	7.00	G	ER	1.00	F	0.75	-	-	-	-	Newly relaid with SDBC
337.800	338.000	Plain	Barren	-	11.60	BT	6.80	G	ER	1.30	F	0.75	-	337/975	To Mela Paganur on LHS	3.75	Newly relaid with SDBC

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
 Section (From Km): Km 333.000 to Km 421.600

Road No. : NH-45
 Road Classification: National Highways
 Date of Survey : 17.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 338/000 - 339/000																	
338.000	338.200	Plain	Barren	Vijaya nagar	12.10	BT	6.80	G	ER	1.30	G	0.75	-	338/175	Chatrapatti	3.70	Newly relaid with SDBC
338.200	338.400	Plain	Agricultural LHS Builtup area on RHS	Chatrapatti	11.60	BT	6.70	G	ER	1.50	G	0.50	-	-	-	-	Newly relaid with SDBC
338.400	338.600	Plain	Builtup area	Periya nayagi Chatram	11.90	BT	7.00	G	ER	1.50	G	0.30	-	338/575	Ariyavur	3.75	Newly relaid with SDBC
338.600	338.800	Plain	Builtup area	Periya nayagi Chatram	11.20	BT	7.00	G	ER	1.00	F	1.50	-	-	-	-	Newly relaid with SDBC
338.800	339.000	Plain	Barren	-	11.20	BT	6.60	G	ER	1.30	F	1.80	-	-	-	-	Newly relaid with SDBC

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;

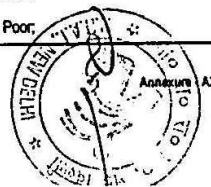
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 17.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/WP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/WP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 339/000 - 340/000																	
339.000	339.200	Plain	Barren	VGP Rathanapur	11.40	BT	6.90	G	ER	1.50	G	1.50	-	339/200	Sannosipati	3.75	Earthen drain on both sides
339.200	339.400	Plain	Barren	VGP Rathanapur	11.50	BT	7.00	G	ER	1.50	F	1.00	-	-	-	-	Earthen drain on both sides
339.400	339.600	Plain	Barren	VGP Rathanapur	11.50	BT	6.80	G	ER	1.30	F	1.00	-	339/450	VGP Rathanapur	3.50	Earthen drain on both sides
339.600	339.800	Plain	Barren	-	11.70	BT	7.00	G	ER	1.30	F	1.20	-	-	-	-	Earthen drain on both sides
339.800	340.000	Plain	Barren	-	11.20	BT	6.80	G	ER	1.20	F	1.20	-	-	-	-	Earthen drain on both sides

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;





ANNEXURE A2: ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 17.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Detail of Cross Road			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 340/000 - 341/000																	
340.000	340.200	Plain	Built up area	Poolangulathu patti	11.2	BT	6.70	G	ER	1.4	G	0.8	-	-	-	-	Earthen drain on both sides
340.200	340.400	Plain	Partially Built up area	Poolangulathu patti	11.8	BT	6.90	G	ER	1.5	G	0.6	-	340/200	To Poolangulathu patti on RHS	3.50	Earthen drain on both sides
340.400	340.600	Plain	Barren	-	12.1	BT	6.80	G	ER	1.35	G	0.75	-	-	-	-	Pavement minor cracks are developed
340.600	340.800	Plain	Barren	-	12.7	BT	6.80	G	ER	1.5	G	1.5	-	-	-	-	CD No 341/1 - 1 x 0.9m dia RCC Pipe Culvert at 340/620
340.800	341.000	Plain	Barren	-	12.25	BT	6.90	G	ER	1.45	G	1.5	-	-	-	-	Earthen drain on both sides
Note: mn Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

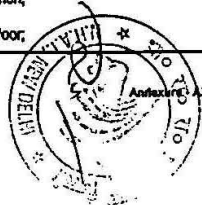
ANNEXURE A2 : ROAD INVENTORY

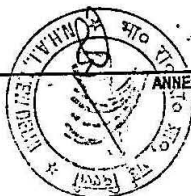
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 17.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 341/000 - 342/000																	
341.000	341.200	Plain	Barren	-	13.2	BT	6.60	F	ER	1.65	F	0.8	-	341/00	To Poolangulathu patti on RHS	3.00	Pavement minor cracks are developed
341.200	341.400	Plain	Barren	-	12.75	BT	6.70	F	ER	1.7	F	0.6	-	-	-	-	Earthen drain on both sides
341.400	341.600	Plain	Built up area	Ammapattal JJ Engineering college	10.8	BT	6.80	F	ER	1.7	F	0.3	-	341/450	To Inamkulathur on LHS To Ammapattal on LHS	5.5 3.6	JJ Engineering college on RHS
341.600	341.800	Plain	Built up area	Ammapattal JJ Engineering college	10.5	BT	6.90	F	ER	1.4	F	0.5	-	-	-	-	JJ Engineering college on RHS
	342.000	Plain	Barren(LHS) JJ college (RHS)	-	11.2	BT	6.90	F	ER	1.4	F	1.25	-	-	-	-	CD No 342/1 - 2x0.9m dia RCC pipe culvert at 341/810

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;





ANNEXURE A2 : ROAD INVENTORY



Road Name :
Section (From Km) :

Trichy to Dindigul
Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 17.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 342/000 - 343/000																	
342.000	342.200	Plain	Barren	-	11.00	BT	6.75	F	ER	1.25	F	1.25	-	342/100	To Seethapatti on RHS	3.50	H. Curve on LHS 341/900 to 342/400
342.200	342.400	Plain	Barren	-	10.80	BT	7.00	F	ER	1.3	F	1.3	-				BT surface are Fair Condition
342.400	342.600	Plain	Barren	-	10.80	BT	6.90	F	ER	0.9	F	1.8	-	342/400	To Seethapatti medu on RHS	3.00	Earthen drain on both sides
342.600	342.800	Plain	Barren	-	11.30	BT	6.90	F	ER	1.2	F	1.4	-	342/780	Anna Nagar	3.50	World Peace Trust RHS
342.800	343.000	Plain	Barren	-	11.80	BT	6.90	F	ER	1.2	F	1.5	-				CD No 343/2 - 2x0.9m dia RCC pipe culvert at 342/900
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

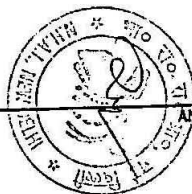
Road No. : NH-45
Road Classification: National Highways
Date of Survey : 17.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 343/000 - 344/000																	
343.000	343.200	Plain	Barren	-	12.30	BT	6.75	F	ER	1.35	F	1.00	-	-	-	-	BT surface are Fair Condition
343.200	343.400	Plain	Barren	-	11.85	BT	6.80	F	ER	1.20	F	0.75	-	343/300	To Sri Balaji Catering College on RHS	3.50	Earthen drain on both sides
343.400	343.600	Plain	Barren	-	12.10	BT	6.75	F	ER	1.25	F	0.80	-	-	-	-	CD No 344/1 - 1x0.9mdia RCC pipe culvert at 343/550
343.600	343.800	Plain	Barren	-	11.60	BT	6.90	F	ER	1.40	F	1.30	-	-	-	-	H. Curve on RHS 343/600 to 343/800
343.800	344.000	Plain	Partially built area	Samathuvapuram	12.00	BT	6.90	F	ER	1.40	F	0.40	-	343/990	Samathuvapuram	3.50	CD No 344/2 - 1x0.9mdia RCC pipe culvert at 343/825

Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

Annexure - A2



ANNEXURE A2 : ROAD INVENTORY

Trichy to Dindigul
Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 18.06.05

From (Km)	To (Km)	Terrain / Rolling / Hilly	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 344/000 - 345/000																	
344.000	344.200	Plain	Barren	-	12.1	BT	6.80	G	ER	1.30	F	0.85	-	-	-	-	H. Curve on LHS at 344/100 -344/200
344.200	344.400	Plain	Barren	-	11.6	BT	6.90	G	ER	1.30	F	1.15	-	-	-	-	H. Curve on RHS at 344/425 to 344/625
344.400	344.600	Plain	Barren	-	11.4	BT	6.85	G	ER	1.25	F	1.60	-	-	-	-	2Nos CD at 344/575 & 344/580
344.600	344.800	Plain	Partially built area	Vada cherry	12.1	BT	7.00	F	ER	1.40	F	0.70	-	344/720	To Puthur on (RHS)	3.50	IOCL Plant on LHS at 344/800 to 345/300
344.800	345.000	Plain	Industries	IOCL on LHS	12.8	BT	7.00	F	ER	1.25	F	0.3 L - 0.8 R	-	-	-	3.00	H. Curve on LHS at 344/800 -345/150
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

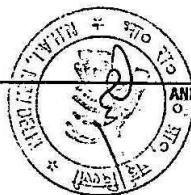
Road No. : NH-45
Road Classification: National Highways
Date of Survey : 18.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 345/000 - 346/000																	
345.000	345.200	Plain	Industries	Indian Oil Corporation	17.1	BT	6.30	F	ER	1.30	F	0.0 L - 0.8 R	-	-	-	-	RCC Concrete Drainage on LHS
345.200	345.400	Plain	Industries	Indian Oil Corporation	17.2	BT	6.90	F	ER	1.25	F	0.80	-	345/200	Indian Oil Corporation	7.00	CD No 345/1 - RCC slab culvert 1x1.2m at 345/200
345.400	345.600	Plain	Barren (LHS) AIR (RHS)	-	11.2	BT	6.60	F	ER	1.25	F	0.60	-	-	-	-	H. Curve on LHS at 345/200 - 345/400
345.600	345.800	Plain	Barren (LHS) AIR (RHS)	-	12.5	BT	6.70	F	ER	1.30	F	0.45	-	345/700	All Indian Radio Trichy	3.50	AIRBCCI on RHS
345.800	346.000	Plain	Barren	Valley vadi	12.2	BT	6.50	F	ER	1.50	F	0.75	-	345/820	To Inamkulathur on RHS, To Valley Vadi on LHS	3.5 3.0	H. Curve on RHS at 345/750 to 345/950

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;

Annexure - A2

A-55



ANNEXURE A2 : ROAD INVENTORY

Road Name :
Section (from Km) :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 18.06.05

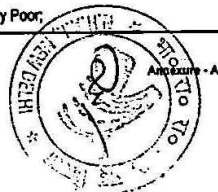
From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 346/000 - 347/000																	
346.000	346.200	Plain	Barren	-	12.20	BT	6.50	G	ER	1.50	F	0.60	-	-	-	-	Earthen drain on both sides
346.200	346.400	Plain	Barren	-	11.80	BT	6.50	G	ER	1.40	F	1.00	-	-	-	-	Earthen drain on both sides
346.400	346.600	Plain	Barren	-	12.10	BT	6.50	G	ER	1.30	F	0.80	-	346/480	Annal Nagar	3.50	Accident Zone
346.600	346.800	Plain	Barren	-	11.85	BT	6.80	F	ER	1.30	F	1.00	-	-	-	-	CD No 347/1 - RCC pipe culvert 1x0.9m dia at 346/700
346.800	347.000	Plain	Barren	-	12.30	BT	6.80	F	ER	1.50	F	1.20	-	-	-	-	Earthen drain on both sides
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH -45
Road Classification: National Highways
Date of Survey : 18.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 347/000 - 348/000																	
347.000	347.200	Plain	Barren	Open area	11.5	BT	6.50	G	ER	1.50	F	1.20	-	-	-	-	RCC Slab culvert at 347/000, RCC Pipe culvert at 347/030
347.200	347.400	Plain	Partially built area	Alam pati puthur	11.3	BT	6.80	G	ER	1.40	F	0.80	-	-	-	-	Burial ground on LHS
347.400	347.600	Plain	Built up area	Alam pati puthur	12.1	BT	6.50	G	ER	1.50	F	0.30	-	-	-	-	H. Curve on RHS 347/400 - 347/700
347.600	347.800	Plain	Built up area	Alam pati puthur	13.4	BT	6.90	G	ER	1.35	F	-	-	347/650	To Alam pati on LHS To Chinnalam pati RHS	3.5 3.5	Stone masonry drain on RHS
347.800	348.000	Plain	Built up area	Alam pati puthur	12.3	BT	6.50	G	ER	1.40	F	-	-	-	-	-	CD No 348/3 - RCC pipe culvert 1x0.9m dia at 347/900
Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	





ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 18.06.05



1	2	3	4	5	6	Carriageway			Shoulder			13	14	Details of Cross Roads			18
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)							Embankment Height (m)	Submergence (cm)				
Km: 348/000 - 349/000																	
348.000	348.200	Plain	Partially built area	Alam patti puthur	12.50	BT	6.50	F	ER	1.50	F	0.50	-	348/190	Chitta Natham	3.50	H. Curve on LHS 348/100 - 348/600
348.200	348.400	Plain	Partially built area	Alam patti puthur	12.80	BT	6.90	F	ER	1.60	F	0.60	-	-	-	-	BT surface are Fair Condition
348.400	348.600	Plain	Barren	-	14.00	BT	6.50	F	ER	1.25	F	1.00	-	-	-	-	H. Curve on RHS 348/700 - 349/000
348.600	348.800	Plain	Barren	-	10.20	BT	6.90	F	ER	1.30	F	2.00	-	-	-	-	CD No 349/1 - RCC pipe culvert 1x0.9m dia at 348/700
348.800	349.000	Plain	Barren	-	12.50	BT	6.80	F	ER	1.40	F	1.00	-	348/800	To Karaiyam patti on RHS	3.50	CD No 349/2 - RCC pipe culvert 1x0.9m dia at 348/800

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 323.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 18.06.05

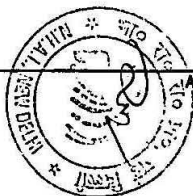
From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 349.000 - 350.000																	
349.000	349.200	Plain	Barren	-	10.8	BT	6.50	F	ER	1.5	F	1.75	-	-	-	-	BT surface are Fair condition
349.200	349.400	Plain	Barren	-	10.8	BT	6.80	F	ER	1.3	F	1.5	-	349/350	To Kalingappatty on LHS	6.00	CD No 350/1- RCC pipe culvert 1x0.9m dia at 349/225
349.400	349.600	Plain	Barren	-	11.2	BT	6.50	F	ER	1.4	F	1.5	-	-	-	-	CD No 350/2- RCC Slab culvert 1x3m dia at 349/410
349.600	349.800	Plain	Barren	-	11.2	BT	6.90	F	ER	1.25	F	1.75	-	-	-	-	H.curve on RHS 349/400 - 349/700
349.800	350.000	Plain	Barren	-	11.2	BT	6.60	F	ER	1.5	F	2.2	-	-	-	-	CD No 350/3- RCC pipe culvert 1x0.9m dia at 349/780

Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

Annexure - A2

A-59



ANNEXURE A2 : ROAD INVENTORY

Road Name :
Section (From Km) :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 18.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V/P)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V/P)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 350/000 - 351/000																	
350.000	350.200	Plain	Barren	Kathikeeran patti	12.1	BT	6.90	F	ER	1.4	F	2.2	-	350/175	To Kathikeeranpatti on LHS	3.50	H.curve on RHS 350/000 to 350/400
350.200	350.400	Plain	Barren	-	11.1	BT	6.90	F	ER	1.3	F	2.7	-	-	-	-	-
350.400	350.600	Plain	Barren	Arayar River	8.4	BT	7.00	F	-	-	-	-	-	-	-	-	12 span of 13.25 m Major bridge at 350/500
350.600	350.800	Plain	Barren	-	8.4	BT	7.00	F	-	1.2	F	3.2	-	350/800	To Kavakarapatti on RHS	3.75	H.curve on RHS 350/700 to 351/300
350.800	351.000	Plain	Barren	-	9.85	BT	7.10	F	-	1.25	F	3.6	-	-	-	-	Embankment Side Stone pitching are available
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

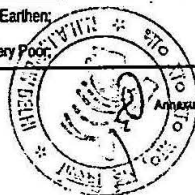
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 18.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agrl / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 351/000 - 352/000																	
351.000	351.200	Plain	Barren	-	11	BT	7.00	F	ER	1.25	F	2.75	-	-	-	-	CD No 352/1- RCC pipe culvert 1x0.9m dia at 351/100
351.200	351.400	Plain	Barren	-	11.7	BT	6.90	F	ER	1.20	F	2.5	-	-	-	-	Water logged area
351.400	351.600	Plain	Barren	-	12.1	BT	7.00	F	ER	1.30	F	2.5	-	-	-	-	CD No 352/3- RCC pipe culvert 1x0.9m dia at 351/500
351.600	351.800	Plain	Barren	-	12.1	BT	7.00	F	ER	1.20	F	2	-	-	-	-	CD No 352/4- RCC pipe culvert 1x0.9m dia at 351/600
351.800	352.000	Plain	Barren	-	11.8	BT	6.90	F	ER	1.00	F	1.75	-	351/980	kottapatti	3.60	CD No 352/5- RCC pipe culvert 1x0.9m dia at 351/600

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor.



Annexure - A2



ANNEXURE A2 : ROAD INVENTORY

Road Name :
Section (From Km):Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 18.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 352/000 - 353/000																	
352.000	352.200	Plain	Agricultural	-	15.1	BT	6.90	G	ER	1.30	G	0.5	-	-	-	-	Newly resurfaced with SDBC
352.200	352.400	Plain	Agricultural	-	14.5	BT	6.80	G	ER	1.25	G	0.7	-	352/380	To Kalarampatti on LHS	3.50	School Zone CD No 353/1- RCC pipe culvert 1x0.9m dia at 352/400
352.400	352.600	Plain	Built up area	Maravanur	12.1	BT	7.00	G	ER	1.25	G	0.6	-	-	-	-	H. curve on RHS 352/300 - 352/700
352.600	352.800	Plain	Built up area	Maravanur	11.15	BT	6.90	G	ER	1.40	G	0.5	-	352/600	To Samuthram on LHS	3.70	CD No 353/2 & 353/3 - RCC pipe culvert 1x0.9m dia at 352/575 & 352/700
352.800	353.000	Plain	Built up area	Maravanur	10.85	BT	6.90	G	ER	1.50	G	0.7	-	-	-	-	H. curve on RHS 352/750 - 353/200
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

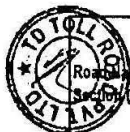
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 19.06.05

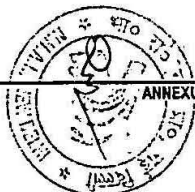
From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 353/000 - 354/000																	
353.000	353.200	Plain	Agricultural	Maravanur	12	BT	7.00	G	ER	1.10	G	0.65	-	-	-	-	Newly resurfaced with SDBC, Lake on RHS
353.200	353.400	Plain	Barren	-	12.3	BT	6.40	G	ER	1.25	G	1.3	-	-	-	-	CD No 354/1 - RCC slab culvert 1x2m at 353/250
353.400	353.600	Plain	Barren	-	12.1	BT	7.00	G	ER	1.50	G	2.5	-	-	-	-	H. curve on RHS 353/500 - 353/800
353.600	353.800	Plain	Barren	-	11.8	BT	7.00	G	ER	1.50	G	2.5 (L)	-	-	-	-	CD No 354/2 - RCC Pipe culvert 1x0.9m at 353/700
353.800	354.000	Plain	Barren	-	11.2	BT	6.90	G	ER	1.40	G	2.7 (L)	-	353/900	To Serpatti on RHS	3.75	Lake on RHS

Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor



Road Name :
Section (From Km):

Trichy to Dindigul
Km 333.000 to Km 421.600



ANNEXURE A2 : ROAD INVENTORY

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 19.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 354/000 - 355/000																	
354.000	354.200	Plain	Barren	-	11.7	BT	7.00	F	ER	1.25	G	1.6	-	354/010	To Palapatti on LHS	3.60	H. curve on LHS 354/200
354.200	354.400	Plain	Barren	-	12.1	BT	6.90	F	ER	1.10	G	1.3	-	354/400	To Chathirappatti on RHS	3.50	Lake on RHS H. curve on LHS 354/400 - 354/650
354.400	354.600	Plain	Barren	-	11.8	BT	6.70	F	ER	1.30	G	1.7	-	354/590	To Chathirappatti on LHS	3.50	CD No 355/1- RCC Slab culvert 1x5m at 354/500
354.600	354.800	Plain	Agricultural	-	11.5	BT	6.70	F	ER	1.30	G	1.5	-	-	-	-	H. curve on LHS 354/700 - 354/900
354.800	355.000	Plain	Agricultural	-	11.8	BT	6.70	F	ER	1.40	F	1.3	-	-	-	-	CD No 355/2- RCC Pipe culvert 1x0.9 m dia at 354/975

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

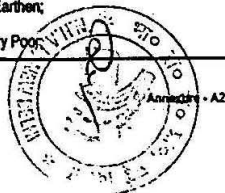
ANNEXURE A2 : ROAD INVENTORY

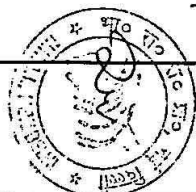
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 19.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agr / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (m)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 355/000 - 356/000																	
355.000	355.200	Plain	Agricultural	Open area	11.2	BT	7.00	G	ER	1.25	F	1.3	-	-	-	-	Newly relaid with SDBC
355.200	355.400	Plain	Built up area	Manikkam Pillai Chattiram	11.1	BT	6.90	G	ER	1.30	F	0.8	-	-	-	-	H.curve on RHS 355/450 to 355/700
355.400	355.600	Plain	Agricultural	-	11.5	BT	6.80	G	ER	1.30	F	1.3	-	-	-	-	CD No 356/1- RCC Pipe culvert 1x0.9 m dia at 355/500
355.600	355.800	Plain	Barren	-	10.3	BT	6.90	G	ER	1.25	F	3.2	-	355/790	Kanudaiyan pattil	3.50	H.curve on RHS 355/750 to 356/000 Embankment stone pitching available
355.800	356.000	Plain	Barren	-	11.1	BT	6.80	G	ER	1.25	F	3.4	-	-	-	-	CD No 356/2- RCC Slab culvert 1x4.0 m dia at 355/825

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor





ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 19.06.05



From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 356/000 - 357/000																	
356.000	356.200	Plain	Barren	-	11.20	BT	7.00	F	ER	1.30	P	3.50	-	-	-	-	H.curve on LHS 356/000 to 356/450 Embankment stone pitching available
356.200	356.400	Plain	Barren	-	11.50	BT	6.90	F	ER	1.30	P	3.30	-	356/350	Kanudaiyan pattl	3.00	Water logged area
356.400	356.600	Plain	Barren	-	10.95	BT	6.90	F	ER	1.00	F	2.85	-	-	-	-	H.curve on RHS 356/500 to 356/800
356.600	356.800	Plain	Barren	-	11.50	BT	6.90	F	ER	1.25	F	3.2	-	-	-	-	CD No 357/1- RCCslab culvert 1x3m at 355/750
356.800	357.000	Plain	Barren	-	11.20	BT	6.80	F	ER	1.25	F	1.8	-	-	-	-	CD No 357/2- RCCPipe culvert 1x0.9m at 355/800

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

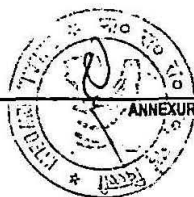
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 20.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 357/000 - 358/000																	
357.000	357.200	Plain	Agricultural	-	10.50	BT	7.00	G	ER	1.30	F	1.70	-	357/100	To Periya pattil on RHS	3.75	Hard Rock available on RHS, H. curve on LHS 357/200 - 357/400
357.200	357.400	Plain	Agricultural	-	11.20	BT	7.00	G	ER	1.35	P	1.75	-	-	-	-	CD No 358/1- RCC slab culvert 1x3.75m at 357/300
357.400	357.600	Plain	Agricultural	-	11.20	BT	7.00	G	ER	1.35	P	0.70	-	-	-	-	H. curve on LHS 357/450 - 357/550 pipe culvert at 357/500
357.600	357.800	Plain	Agricultural	-	10.95	BT	6.90	G	ER	1.25	F	0.60	-	357/820	To Udiyapattil on RHS	3.50	Burial ground on LHS 357/600, H. curve on RHS 357/600 - 357/850
357.800	358.000	Plain	Built up area	Muthupudayan pattil	11.20	BT	6.80	G	ER	1.10	F	0.70	-	357/950	Muthupudayan pattil	3.75	-

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earth
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 20.06.05



1	2	3	4	5	6	Carriageway			Shoulder			13	14	Details of Cross Roads			18
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 358/000 - 359/000																	
358.000	358.200	Plain	Build up area	Muthuppudayan patti	11.20	BT	6.85	G	ER	1.20	F	0.75	-	-	-	-	H. curve on L/Hs 358/000 - 358/175 & on RHS 358/200 - 358/400
358.200	358.400	Plain	Agricultural	-	11.50	BT	6.90	G	ER	1.10	F	1.50	-	-	-	-	CD No 359/1- RCC slab culvert 1x3.75m at 358/390
358.400	358.600	Plain	Agricultural	-	11.20	BT	7.00	F	ER	1.20	F	1.60	-	-	-	-	Earthen drain on both side
358.600	358.800	Plain	Agricultural	-	11.80	BT	7.00	F	ER	1.00	F	1.60	-	358/700	To Rajaligoundam patti on RHS	3.75	CD No 359/2- RCC slab culvert 1x2m at 358/800, Water logged area
358.800	359.000	Plain	Agricultural	-	11.2	BT	6.90	F	ER	1.00	F	1.5	-	-	-	-	Jothi micro cast (p) Ltd on RHS

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 20.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 359/000 - 360/000																	
359.000	359.200	Plain	Agricultural	-	11.60	BT	6.90	F	ER	1.30	F	2.75	-	359/000	Muthupudayan pattil	3.00	Hard Rock available on both side
359.200	359.400	Plain	Agricultural	-	11.10	BT	6.90	F	ER	1.25	F	2.50	-	-	-	-	School zone, H. curve on LHS 359/400 - 359/600
359.400	359.600	Plain	Agricultural	-	11.30	BT	7.10	F	ER	1.25	F	1.20	-	-	-	-	CD No 360/1- RCC pipe culvert 1x0.9m dia at 359/475
359.600	359.800	Plain	Built area	Ambumedu	11.25	BT	6.80	F	ER	1.30	F	1.00	-	359/710	To Ambu medu on LHS	3.00	Sikkandar Thavidu mill on RHS
359.800	360.000	Plain	Partially Built area	-	11.50	BT	6.80	F	ER	1.20	F	2.50	-	-	-	-	CD No 360/2- RCC slab culvert 1x0.5m at 359/820

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

Annexure - A2

A-69

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 20.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri/ Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/G/ER)	Width (m)	Condition** (G/F/P/V)	Type* (BT/CC/G/ER)	Width (m)	Condition** (G/F/P/V)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 360/000 - 361/000																	
360.000	360.200	Plain	Barren	Andar Kovil	11.30	BT	7.00	G	ER	1.25	F	1.20	-	-	-	-	Newly relaid With SDBC, CD 361/1/ RCC slab culvert 1 x 2 m at 360/050
360.200	360.400	Plain	Partially Built area	Andar Kovil	12.10	BT	7.00	G	ER	1.50	G	0.80	-	360/300	To Musiri SH - 71 on RHS	7.00	H. curve on LHS 360/200 360/600
360.400	360.600	Plain	Agricultural land	Andar Kovil	12.70	BT	7.00	G	ER	1.30	G	0.80	-	-	-	-	CD no 361/2 pipe culvert 1x 0.9 m di am at 360/500
360.600	360.800	Plain	Agricultural land	Andar Kovil	12.10	BT	7.00	G	ER	1.50	G	1.00	-	-	-	-	RCC Slab Major bridge 9 span of 8.72 m at 360/700 Across Mumundi River
360.800	361.000	Plain	River area	Mamundi River	12.80	BT	7.00	G	-	1.40	-	0.30	-	-	-	-	Cd no 361/4 slab culvert 1x 2 m

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

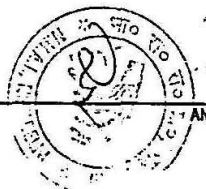
Road No. : NH-45
Road Classification: National Highways
Date of Survey : 20.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 361/000 - 362/000																	
361.000	361.200	Plain	Built up area	Pothamettupatti	13.70	BT	6.70	G	BT	1.50	F	-	-	361/100	To Therkulam & Poosari patti on LHS	3.75	H. Curve on RHS 361/900 - 362/300, School zone
361.200	361.400	Plain	Built up area	Pothamettupatti	12.50	BT	6.70	G	BT	1.30	G	-	-	-	-	-	Heavy Built up area Manapparai, BT surface Newly relaid With SDBC
361.400	361.600	Plain	Built up area	Pothamettupatti	12.50	BT	6.70	G	BT	1.50	F	-	-	-	-	-	Accident Zone
361.600	361.800	Plain	Built up area	Manapparai bye pass	13.00	BT	6.80	G	BT	1.50	F	-	-	361/600	Way to Manapparai city on LHS	7.00	H. Curve on RHS 361/500 - 361/800
361.800	362.000	Plain	Built up area	Manapparai bye pass	13.50	BT	6.80	G	BT	1.60	G	-	-	-	-	-	CD no 362/1 RCC pipe culvert 1x0.9 m dia at 361/900

Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;

Annexure - A2



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
 Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
 Road Classification: National Highways
 Date of Survey : 20.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 362/000 - 363/000																	
362.000	362.200	Plain	Built up area	Manapparai bye pass	15.65	BT	6.80	G	BT	1.40	G	0.30	-	-	-	-	Heavy builtup area Manapparai, H. curve on RHS 362/200 - 362/400
362.200	362.400	Plain	Built up area	Manapparai bye pass	15.20	BT	6.80	F	BT	1.45	F	0.50	-	362/400	To Veerappur on RHS, To Manapparai on LHS	3.5 3.5	Vetrier weekly market on LHS, RCC Pipe culvert at 362/300, and 362/350
362.400	362.600	Plain	Built up area	Manapparai bye pass	14.65	BT	6.75	P	BT	1.50	P	0.50	-	-	-	-	RCC Pipe & slab culvert at 362/420, and 362/500
362.600	362.800	Plain	Barren	Manapparai bye pass	14.30	BT	6.80	F	BT	1.40	F	0.70	-	-	-	-	CD No 363/5 RCC slab 1 x 3 m at 362/600
362.800	363.000	Plain	Partially Built up area	Manapparai bye pass	14.40	BT	6.80	F	BT	1.50	F	0.70	-	-	-	-	RCC Pipe culvert at 362/880, 362/950, 362/980

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
 Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

ANNEXURE A2 : ROAD INVENTORY

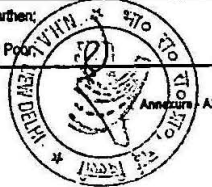
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

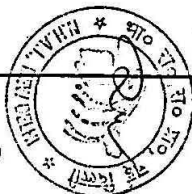
Road No. : NH-45
Road Classification: National Highways
Date of Survey : 20.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 364/000 - 365/000																	
364.000	364.200	Plain	Partially Build up area	Manapperal Bye pass road	13.00	BT	6.70	G	BT	1.30	F	1.70	-	364/200	To Manapperal Town on LHS ("Y" Junction)	7.00	CD 365/1 RCC minor bridge 2 span of 5.7 m 364/100
364.200	364.400	Plain	Build up area (RHS), Agricultural land (LHS)	Nochi medu	13.30	BT	6.70	G	BT	1.50	F	1.50	-	364/380	To Nochi medu on RHS	3.50	H. curve on LHS 364/200 - 364/450, Burial ground on LHS
364.400	364.600	Plain	Build up area (RHS), Agricultural land (LHS)	Nochi medu	13.85	BT	6.65	G	BT	1.60	F	0.70	-	-	-	-	Newly relaid with SDBC
364.600	364.800	Plain	Build up area (RHS), Agricultural land (LHS)	Nochi medu	13.80	BT	6.70	G	BT	1.35	G	0.50	-	-	-	-	Newly relaid with SDBC
364.800	365.000	Plain	Build up area (RHS), Agricultural land (LHS)	Nochi medu	13.3	BT	6.65	G	BT	1.5	G	0.3	-	364/900	To Keerampatti on LHS	3.50	Burial ground on RHS

Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor





ANNEXURE A2: ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 20.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 365/000 - 366/000																	
365.000	365.200	Plain	Built up area	Manjam pattil	16.30	BT	6.75	G	BT	1.50	G	-	-	365/100	To Manjam pattil on RHS	3.75	School zone
365.200	365.400	Plain	Built up area	Manjam pattil	13.50	BT	6.90	G	BT	1.60	G	0.30	-	-	-	-	CD 366/1 RCC pipe culvert 1 x 0.9 m dia. 365/225, School zone
365.400	365.600	Plain	Built up area	Manjam pattil (Boys Town)	14.20	BT	7.00	G	ER	1.40	F	0.75	-	-	-	-	H. curve on RHS 365/350 - 365/450, School zone
365.600	365.800	Plain	Partially Built up area	Manjam pattil (Boys Town)	13.80	BT	6.80	G	ER	1.30	F	1.75	-	-	-	-	Eathem drain on both side
365.800	366.000	Plain	Barren	-	13.80	BT	6.80	G	ER	1.30	F	2.20	-	-	-	-	Burial ground on RHS, Damaged old NH on RHS
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

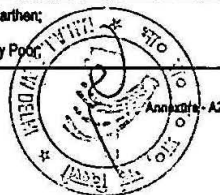
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

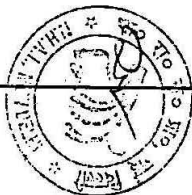
Road No. : NH-45
Road Classification: National Highways
Date of Survey : 21.06.05

From (Km)	To (Km)	Terrain / Rolling / Hilly	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 366/000 - 367/000																	
366.000	366.200	Plain	Partially Built up area	Annai Therasa nagar	13.20	BT	6.80	G	ER	1.25	G	1.30	-	366/090	Kalyappattayan patli	3.50	Newhwy relaid with SDBC
366.200	366.400	Plain	Built up area	Annai Therasa nagar	11.90	BT	6.80	G	ER	1.10	G	0.75	-	-	-	-	H. curve on LHS 366/400 - 366/600
366.400	366.600	Plain	Agricultural	-	11.50	BT	6.80	G	ER	1.20	F	0.80	-	-	-	-	CD 367/1 RCC pipe culvert 2 x 0.9 m dia 366/550
366.600	366.800	Plain	Agricultural	-	11.80	BT	6.90	G	ER	1.30	F	1.70	-	366/720	To Manjam patli on RHS	3.50	CD 367/2 RCC slab culvert 1 x 2 m 366/700, H. curve on RHS 366/800 - 367/000
366.800	367.000	Plain	Agricultural	Malayadi petti	11.20	BT	6.90	G	ER	1.20	F	1.30	-	366/950	To Malayadi patli on LHS	3.50	CD no 367/3 RCC pipe culvert 1 x 0.9 m dia 366/900

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;





ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 21.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 367/000 - 368/000																	
367.000	367.200	Plain	Agricultural	-	14.20	BT	7.00	F	ER	1.30	F	1.20	-	-	-	-	CD No 368/1 RCC pipe culvert 1 x 0.9 m dia 367/000
367.200	367.400	Plain	Agricultural	-	14.30	BT	7.00	F	ER	1.10	F	1.70	-	-	-	-	H. curve on RHS 367/200 - 367/400, Burial ground on LHS
367.400	367.600	Plain	Agricultural	-	10.50	BT	7.00	F	ER	1.25	F	2.70	-	-	-	-	Dompachi River Major bridge 5 span of 13.2m
367.600	367.800	Plain	Agricultural	-	10.30	BT	7.00	F	ER	1.00	F	1.00	-	367/660	To Pommampatti on LHS	3.50	H. curve on LHS 367/550 - 367/900
367.800	368.000	Plain	Agricultural	-	11.20	BT	7.00	F	ER	1.25	F	0.70	-	-	-	-	-
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 21.06.05

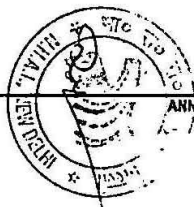
From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agril / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 368/000 - 369/000																	
368.000	368.200	Plain	Agricultural	-	12.80	BT	7.00	G	ER	1.30	F	1.30	-	-	-	-	Newly relaid with SDBC
368.200	368.400	Plain	Agricultural	-	12.10	BT	7.00	G	ER	1.20	F	0.70	-	-	-	-	H. curve on RHS 368/150 - 368/300
368.400	368.600	Plain	Built up area	Kurunji Engineering college	12.10	BT	7.00	G	ER	-	F	0.80	-	-	-	-	Kurunji Engineering college on RHS
368.600	368.800	Plain	Built up area	Kurunji Engineering college	12.30	BT	7.00	G	ER	-	F	0.80	-	-	-	-	H. curve on LHS 368/500 - 368/700
368.800	369.000	Plain	Partially Built up area	Karatupatti	11.90	BT	7.00	G	ER	1.20	F	1.20	-	-	-	-	H. Curve on RHs 368/900 - 369/100

Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor

Annexure - A2

A-78



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km): Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 21.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 369/000 - 370/000																	
369.000	369.200	Plain	Built up area	Karattupatti	13.00	BT	7.20	F	ER	1.00	F	-	-	369/100	Puthur	3.00	CD no 370/1 RCC pipe culvert 1 x 0.9 m dia 369/075
369.200	369.400	Plain	Agricultural	-	11.80	BT	7.00	F	ER	1.20	F	-	-	-	-	-	Earthen drain on both side
369.400	369.600	Plain	Agricultural	-	11.50	BT	7.00	F	ER	0.80	F	0.85	-	-	-	-	Mulippadi & Avaram patti Village on RHS
369.600	369.800	Plain	Built up area	Mulippadi	12.00	BT	7.00	F	ER	0.90	F	2.50	-	-	-	-	Hard Rock Available
369.800	370.000	Plain	Built up area	Mulippadi	12.60	BT	7.00	F	ER	1.00	F	2.2 (L)	-	-	-	-	CD no 370/2 RCC pipe culvert 2 x 0.9 m dia 369/850

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

ANNEXURE A2 : ROAD INVENTORY

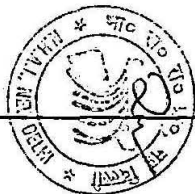
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH 45
Road Classification : National Highways
Date of Survey : 21.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 370/000 - 371/000																	
370.000	370.200	Plain	Partially built up area	Avaram patti	13.00	BT	6.80	F	ER	1.00	F	0.30	-	-	-	-	Earthen drain on both side
370.200	370.400	Plain	Agricultural	Avaram patti	12.00	BT	6.40	F	ER	0.90	F	0.60	-	-	-	-	CD no 371/1 R/C pipe culvert 2 x 0.9 m dia 370/325
370.400	370.600	Plain	Agricultural	Avaram patti	11.85	BT	6.40	F	ER	1.20	F	0.70	-	370/500	To Avaram patti on RHS	3.75	-
370.600	370.800	Plain	Agricultural	-	12.20	BT	6.60	F	ER	1.30	F	1.30	-	-	-	-	H. Curve on LHS 370/675 - 370/900
370.800	371.000	Plain	Partially built up area	Alanthur	12.10	BT	6.70	F	ER	1.10	F	0.50	-	-	-	-	Small Built up area Alanthur Village

Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor.



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 21.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 371/000 - 372/000																	
371.000	371.200	Plain	Built up area	Alanthur	12.00	BT	6.85	F	ER	1.00	F	1.70	-	371/060 371/100	To Kala Goundam Patt on RHS To Chetti patt on LHS	3.50	CD no 372/1 RCC pipe culvert 1 x 0.9 m dia 371/025
371.200	371.400	Plain	Agricultural	-	11.20	BT	6.80	F	ER	1.20	F	2.20	-	371/200	To Dhumbal patt on RHS	3.50	CD no 372/1 RCC pipe culvert 3 x 0.9 m dia 371/300
371.400	371.600	Plain	Agricultural	-	11.60	BT	6.90	F	ER	0.90	F	1.20	-	-	-	-	H. curve on LHS 371/400 - 371/600, CD no 372/2 RCC pipe 1 x 0.9 m dia
371.600	371.800	Plain	Agricultural	-	11.90	BT	6.80	F	ER	1.25	F	0.85	-	-	-	-	-
371.800	372.000	Plain	Built up area	Thamas nagar	11.30	BT	6.90	F	ER	1.20	F	0.50	-	372/000	To Thamas Nagar on RHS	3.50	Small Built up area Thamas nagar
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

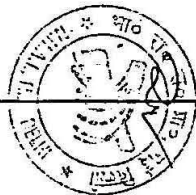
Road Name : Trichy to Dindigul
Section (From Km): Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 21.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 372/000 - 373/000																	
372.000	372.200	Plain	Partially built up area	Thomcs nagar	11.40	BT	7.00	F	ER	1.25	F	1.70	-	-	-	-	H. curve on RHS 372/100 372/600, Accident Zone
372.200	372.400	Plain	Agricultural	-	10.50	BT	6.80	F	ER	1.30	F	3.85	-	-	-	-	CD no 373/1 RCC pipe culvert 2 x 0.9 m dia 372/200
372.400	372.600	Plain	Agricultural	-	11.00	BT	6.80	F	ER	1.00	F	3.25	-	-	-	-	Embankment Retaining wall available on LHS
372.600	372.800	Plain	Agricultural	-	11.50	BT	6.90	F	ER	1.25	F	2.00	-	-	-	-	Embankment Retaining wall available on LHS
373.000	373.000	Plain	Agricultural	-	11.80	BT	6.90	F	ER	1.25	F	2.20	-	-	-	-	H. curve on LHS 372/850 - 373/000

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor





ANNEXURE A2: ROAD INVENTORY



Road Name : Trichy to Dindigul
 Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
 Road Classification: National Highways
 Date of Survey : 21.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 373/000 - 374/000																	
373.000	373.200	Plain	Agricultural	-	11.00	BT	6.80	F	ER	1.20	F	1.30	-	-	-	-	Earthen drain on both side
373.200	373.400	Plain	Agricultural	-	12.00	BT	6.80	F	ER	1.00	F	0.75	-	-	-	-	H. curve on RHS 373/300 - 373/500
373.400	373.600	Plain	Agricultural	-	12.50	BT	6.80	F	ER	1.00	F	2.50	-	-	-	-	CD no 374/2 RCC pipe culvert 1 x 0.9 m dia 373/500
373.600	373.800	Plain	Agricultural	-	11.20	BT	6.80	F	ER	0.90	F	1.30	-	-	-	-	Hard Rock Available on RHS
373.800	374.000	Plain	Agricultural	-	12.80	BT	6.80	F	ER	0.85	F	1.20	-	-	-	-	H. Curve on RHS 373/900 374/150
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

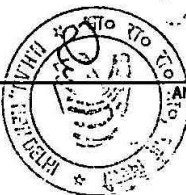
Road No. : NH-45
Road Classification: National Highways
Date of Survey : 21.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agr / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 374/000 - 375/000																	
374.000	374.200	Plain	Built up area	Ashath Road	13.80	BT	6.90	G	ER	1.30	F	0.50	-	374/050 374/100 374/100	To Uthupatti on LHS To Elanga kuruchi on LHS To Muram Patti on RHS	3.2 3.5 3.5	CD no 375/1 RCC pipe culvert 1 x 0.9 m dia 374/075
374.200	374.400	Plain	Built up area	Ashath Road	13.10	BT	6.80	G	ER	1.30	F	0.30	-	-	-	-	H curve on LHS 374/300 - 374/600
374.400	374.600	Plain	Agricultural	-	12.30	BT	6.70	F	ER	1.20	F	-	-	374/500	To Pulampatti on RHS	3.60	Burial ground on RHS
374.600	374.800	Plain	Agricultural	-	13.20	BT	6.70	F	ER	1.00	F	1.20	-	-	-	-	CD no 375/1 RCC pipe culvert 1 x 0.9 m dia 374/800
374.800	375.000	Plain	Agricultural	-	13.50	-BT-	6.70	F	ER	1.00	F	0.50	-	-	-	-	CD no 375/2 RCC pipe culvert 1 x 0.9 m dia 374/850

Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;

Annexure - A2



ANNEXURE A2 : ROAD INVENTORY

Road Name :
From (Km) :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 22.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 375/000 - 376/000																	
375.000	375.200	Plain	Agricultural	-	13.30	BT	6.80	F	ER	1.30	F	0.60	-	-	-	-	H. curve on LHS 374/900 - 375/100
375.200	375.400	Plain	Agricultural	-	11.60	BT	6.80	F	ER	1.25	F	0.50	-	-	-	-	H. Curve on RHS 375/300 - 375/900
375.400	375.600	Plain	Partially Built up area	Kalikothanur Branch	12.00	BT	6.85	F	ER	1.25	F	0.70	-	375/550	To Kalikothanur on RHS	3.50	Hard Rock Available on RHS
375.600	375.800	Plain	Agricultural	-	12.00	BT	7.10	F	ER	1.00	F	0.5(L&R) & 2.00 (L.), 1.00 (R.)	-	-	-	-	Hard Rock Available on RHS
375.800	376.000	Plain	Agricultural	-	11.00	BT	7.00	F	ER	1.00	F	3.50	-	375/900	To Karungulam on RHS	3.60	CD No 376/1 RCC pipe culvert 1x 0.9 m dia 375/850
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition** = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

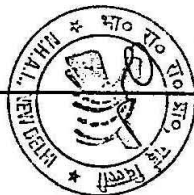
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km): Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 22.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hill)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 376/000 - 377/000																	
376.000	376.200	Plain	Agricultural	-	11.50	BT	7.10	F	ER	1.00	F	2.50	-	-	-	-	Hard Rock available on both side
376.200	376.400	Plain	Partially Built up area & Agricultural	NesamPatti	11.80	BT	7.00	F	ER	0.90	F	-	-	-	-	-	H. Curve on LHs 376/300 - 376/500
376.400	376.600	Plain	Partially Built up area & Agricultural	NesamPatti	12.10	BT	7.00	F	ER	1.30	F	1.20	-	-	-	-	CD no 377/1 RCC pipe culvert 1 x 0.9 m dia 376/450
376.600	376.800	Plain	Partially Built up area & Agricultural	NesamPatti	11.80	BT	7.00	F	ER	1.70	F	1.50	-	-	-	-	H. curve on RHS 376/700 - 377/100
376.800	377.000	Plain	Partially Built up area	Valyam patti	13.50	BT	7.00	F	ER	1.40	F	1.20	-	-	-	-	

Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 22.06.05



1	2	3	4	5	6	Carriageway			Shoulder			13	14	Details of Cross Roads			18
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
Km: 377/000 - 378/000																	
377.000	377.200	Plain	Partially Built up area	Vaiyam pattil	12.50	BT	6.80	F	ER	1.00	F	1.20	-	-	-	-	Burial ground on LHS and Theater on RHS
377.200	377.400	Plain	Heavy Built up area	Vaiyam pattil	12.10	BT	6.80	F	ER	1.50	F	-	-	-	-	-	Vaiyam pattil Municipality office on RHS
377.400	377.600	Plain	Heavy Built up area	Vaiyam pattil	14.00	BT	6.90	F	BT	1.35	F	-	-	377/550	To Ilanga kurchi on LHS To Kanur on RHS	3.5 3.5	CD no 378/1 RCC pipe culvert 2 x 0.9m dia 377/450
377.600	377.800	Plain	Heavy Built up area	Vaiyam pattil	15.80	BT	6.90	F	BT	1.40	F	-	-	-	-	-	Heavy Built up area, paved shoulder Fully damaged
377.800	378.000	Plain	Built up area	Vaiyam pattil	17.00	BT	6.90	F	BT	1.20	F	-	-	-	-	-	H. Curve on RHS 377/900 - 378/000
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2: ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 22.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 378/000 - 379/000																	
378.000	378.200	Plain	Built up area	Valyam petti	15.00	BT	7.10	G	ER	1.25	F	1.20	-	378/100	To Valyam petti on RHS	3.75	CD no 379/1 RCC slab Culvert 1 x 5 m 378/175
378.200	378.400	Plain	Partially Built up area & Agricultural	Valyam petti	11.20	BT	7.00	G	ER	1.00	F	1.70	-	-	-	-	H. curve on LHS 378/000 - 378/300
378.400	378.600	Plain	Partially Built up area & Agricultural	Ganthi Nagar	11.20	BT	7.00	G	ER	1.60	F	1.60	-	-	-	-	School Zone at 378/600
378.600	378.800	Plain	Partially Built up area & Agricultural	Ganthi Nagar	12.50	BT	7.00	G	ER	1(R.) 2(L.)	F	1.00	-	-	-	-	H. curve on RHS 378/600 - 378/900
378.800	379.000	Plain	Partially Built up area & Agricultural	Ganthi Nagar	12.30	BT	7.00	G	ER	1.00	F	1.00	-	375/940	Elamanam	3.00	Partially Built up area Gandhi nagar on RHS

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor



ANNEXURE A2 : ROAD INVENTORY

Route Name :
From Km) :

Trichy to Dindigul
Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 22.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 379/000 - 380/000																	
379.000	379.200	Plain	Partially Built up area & Agricultural	Ganthi Nagar	13.30	BT	7.00	G	ER	1.00	F	1.00	-	379/050	To Ganthi nagar on RHS	3.50	H. curve on LHS 379/100 - 379/250
379.200	379.400	Plain	Partially Built up area & Agricultural	Ganthi Nagar	11.25	BT	7.00	G	ER	1.20	F	1.20	-	-	-	-	CD no 380/1 RCC pipe culvert 2 x 0.9 m dia 379/300
379.400	379.600	Plain	Partially Built up area & Agricultural	Thekkamalai	10.85	BT	7.00	G	ER	1.20	F	1.70	-	-	-	-	H. curve on RHS 379/400 - 379/700, Accident Zone, School zone
379.600	379.800	Plain	Partially Built up area & Agricultural	Thekkamalai	9.85	BT	7.10	G	ER	0.90	F	3.80	-	379/725	To Semmalai on RHS	3.00	CD no 380/2 RCC Slab Culvert 1 x 4 m at 379/700, Embankment stone pitching are available
379.800	380.000	Plain	Agricultural	-	10.50	BT	7.00	G	ER	1.00	F	3.50	-	-	-	-	CD no 380/3 RCC Slab culvert 1 x 2.5 m
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 22.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 380/000 - 381/000																	
380.000	380.200	Plain	Agricultural	-	10.60	BT	7.10	G	ER	1.25	F	3.30	-	380/100	To North ammanpatti on LHS	3.30	CD no 381/1 RCC slab culvert 1 x 6 m at 380/150
380.200	380.400	Plain	Agricultural	-	10.90	BT	7.10	G	ER	-	-	3.20	-	-	-	-	CD no 381/2 RCC slab culvert 1 x 4 m at 380/275
380.400	380.600	Plain	Agricultural	-	11.20	BT	7.20	G	ER	-	-	2.80	-	-	-	-	Earthen drain on both side
380.600	380.800	Plain	Agricultural	-	10.90	BT	7.20	G	ER	1.15	F	1.30	-	379/720	-	3.00	H. Curve on RHS 380/600 - 380/700
380.800	381.000	Plain	Agricultural	-	11.30	BT	7.10	G	ER	1.20	F	1.70	-	-	-	-	CD no 381/3 RCC pipe culvert 2 x 0.9 m dia at 380/900

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor.



ANNEXURE A2 : ROAD INVENTORY



Road Name : Trichy to Dindigul
From (From Km) : Km 333.000 to Km 421.800

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 22.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 381/000 - 382/000																	
381.000	381.200	Plain	Built up area	Therlampatti	11.70	BT	7.00	G	ER	1.10	F	2.60	-	-	-	-	CD no 382/1 RCC slab culvert 1 x 4 m at 381/125
381.200	381.400	Plain	Partially Built up area	Therlampatti	11.80	BT	7.00	G	ER	1.30	F	1.60	-	-	-	-	Shoulder high undulation
381.400	381.600	Plain	Agricultural	Therlampatti	11.20	BT	7.00	G	ER	0.90	F	1.40	-	-	-	-	CD no 382/2 RCC slab culvert 1 x 4 m at 381/600
381.600	381.800	Plain	Partially Built up area	Sesalur	11.30	BT	7.00	G	ER	1.30	F	2.85	-	-	-	-	Earthen drain on both side
381.800	382.000	Plain	Partially Built up area	Sesalur	11.00	BT	7.00	G	ER	1.10	F	1.70	-	-	-	-	Earthen drain on both side

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

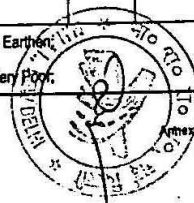
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 22.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 382/000 - 383/000																	
382.000	382.200	Plain	Built up area	Sesalur	11.00	BT	6.90	F	ER	1.30	F	1.20	-	-	-	-	Earthen drain on both side
382.200	382.400	Plain	Agricultural	Sesalur	11.20	BT	6.90	F	ER	1.40	F	1.90	-	-	-	-	CD no 383/1 Minor bridge 1 span of 8.3 m at 382/240
382.400	382.600	Plain	Built up area	Palappatti	11.30	BT	6.60	F	ER	0.98	F	0.30	-	-	-	-	H. Curve on LHS 382/500 - 382/700
382.600	382.800	Plain	Built up area	Palappatti	10.95	BT	6.60	F	ER	1.00	F	0.30	-	-	-	-	Existing BT surface Fair Condition
382.800	383.000	Plain	Agricultural	Palappatti	13.10	BT	6.80	F	ER	1.30	F	0.50	-	-	-	-	Red Gravel soil Available

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor.



Annexure - A2



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 22.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 383/000 - 384/000																	
383.000	383.200	Plain	Partially Built up area	Ponnam palampatti	14.20	BT	7.00	G	ER	1.10	F	0.90	-	-	-	-	School Zone, Earthen drain on both sides
383.200	383.400	Plain	Built up area	Ponnam palampatti	11.80	BT	6.90	G	ER	1.20	F	1.30	-	-	-	-	CD no 384/1 RCC slab Culvert 1 x 4 m at 383/250
383.400	383.600	Plain	Agricultural	Ponnam palampatti	11.60	BT	6.80	G	ER	0.90	F	1.80	-	-	-	-	H. Curve on LHS 383/550 - 383/650
383.600	383.800	Plain	Agricultural	Ponnam palampatti	11.60	BT	6.80	G	ER	1.50	F	1.60	-	383/610	To Thulakkampatti on LHS	3.50	CD no 384/2 RCC pipe Culvert 2 x 0.9 m dia at 383/775
383.800	384.000	Plain	Agricultural	Ponnam palampatti	11.50	BT	6.80	G	ER	1.60	F	1.30	-	-	-	-	H. curve on RHS 383/900 - 384/000, CD no 384/3 RCC slab Culvert 1 x 2 m at 383/900

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

ANNEXURE A2 : ROAD INVENTORY

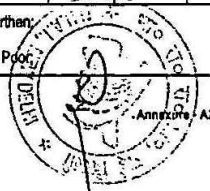
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH -45
Road Classification: National Highways
Date of Survey : 23.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 384/000 - 385/000																	
384.000	384.200	Plain	Agricultural	Sekkampatti	12.00	BT	6.90	G	ER	1.00	F	1.30	-	-	-	-	CD no 385/1 RCC slab Culvert 1 x 3 m at 384/150
384.200	384.400	Plain	Agricultural	Sekkampatti	11.80	BT	7.00	G	ER	1.20	F	1.40	-	-	-	-	BT surface newly relaid with SDBC
384.400	384.600	Plain	Built up area	Sekkampatti	11.10	BT	7.00	G	ER	1.20	F	1.60	-	-	-	-	Earthen drain on both side CD no 385/2 RCC pipe culvert 1 x 0.9m dia @ 384/750
384.600	384.800	Plain	Agricultural	Sekkampatti	11.80	BT	7.00	G	ER	1.20	F	0.50	-	-	-	-	H. curve on RHS 384/600 to 384/900
385.000	385.000	Plain	Agricultural	Sekkampatti	11.50	BT	7.00	G	ER	1.40	F	0.60	-	-	-	-	CD no 385/2 RCC slab Culvert 1 x 3 m at 384/990

Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen

Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor



A-54



Tiruchirappalli to Dindigul
Km 333.000 to Km 421.600

Road No. :
Section :
From Km :

ANNEXURE A2 : ROAD INVENTORY

Road No. : NH-45
Road Classification : National Highways
Date of Survey : 23.06.05

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
From (km)	To (km)	Terrain (Plain/ Rolling / Hilly)	Land use (Built up/ Agri/ Forest/ Industrial/ Barren)	Name of Village / Town	Formation width (m)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V/P)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V/P)	Embankment Height (m)	Submergence (cm)	Location (km)	Road No. (km)	Carriageway width (m)	Remarks
Details of Cross Roads																	
Shoulder																	

Km. 385/000 - 386/000

385,000	385,200	385,400	385,600	385,800	386,000	BT	7.10	G	ER	1.40	F	135.00	-	-	-	-	BT surface newly relaid with SDBC CD no 386/1 RCC slab Culvert 1 x 3 m at 385/175
385,200	385,400	385,600	385,800	386,000	386,200	BT	7.00	G	ER	1.10	F	1.70	-	-	-	-	H. curve on RHS 385/150 to 385/400 School Zone
385,400	385,600	385,800	386,000	386,200	386,400	BT	7.00	G	ER	1.20	F	1.25	-	-	-	-	TNEB 230 KV substation on RHS
385,600	385,800	386,000	386,200	386,400	386,600	BT	7.00	F	ER	1.00	F	0.75	-	-	-	-	CD no 386/2 RCC slab Culvert 1 x 5.5m at 386/700
385,800	386,000	386,200	386,400	386,600	386,800	BT	7.00	F	ER	1.30	F	0.70	-	-	-	-	Horizontal curve on LHS 386/850 to 386/250 Accident zone

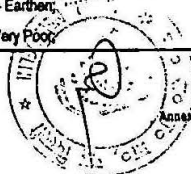
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

ANNEXURE A2 : ROAD INVENTORY

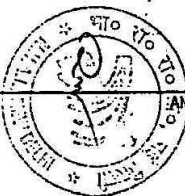
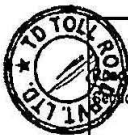
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH -45
Road Classification: National Highways
Date of Survey : 23.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (Km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 386/000 - 387/000																	
386.000	386.200	Plain	Agricultural	Nadupatti	10.20	BT	7.00	G	ER	1.10	F	1.70	-	-	-	-	BT surface newly relaid with SDBC CD no 387/1 RCC slab Culvert 1 x 4m at 386/160 School zone
386.200	386.400	Plain	Partially Built up area	Nadupatti	9.30	BT	7.00	G	ER	1.30	F	3.00	-	-	-	-	CD no 387/2 RCC minor bridge 2 x 6.5m at 386/380
386.400	386.600	Plain	Agricultural	Nadupatti	9.80	BT	7.00	G	ER	1.20	F	2.10	-	-	-	-	H ⁺ curve on RHS 386/450 to 386/600
386.600	386.800	Plain	Agricultural	Nadupatti	10.80	BT	6.80	F	ER	1.10	F	0.80	-	-	-	-	Hard rock available on LHS
386.800	387.000	Plain	Agricultural	Nadupatti	10.50	BT	6.90	F	ER	1.40	F	0.30	-	-	-	-	-
Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor																	



Annexure - A2



ANNEXURE A2 : ROAD INVENTORY

Name :
Section (From Km) :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 23.06.05

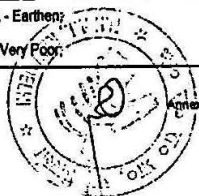
From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 387/000 - 388/000																	
387.000	387.200	Plain	Agricultural	Nadupatti	9.30	BT	7.00	F	ER	0.85	P	2.20	-	-	-	-	H curve on RHS 386/950 to 387/400, Accident Zone.
387.200	387.400	Plain	Agricultural	Nadupatti	9.80	BT	7.00	P	ER	0.30	P	2.1 & 0.5	-	-	-	-	Hard rock available on both side
387.400	387.600	Plain	Built up area	Nadupatti	10.50	BT	6.95	P	ER	1.20	P	0.60	-	-	-	-	CD no 388/1 RCC pipe Culvert 1 x 0.9m at 387/560
387.600	387.800	Plain	Agricultural	Kallupatti	10.90	BT	6.90	P	ER	0.90	P	1.20	-	-	-	-	CD no 388/2 RCC pipe Culvert 1 x 0.9m at 387/900
387.800	388.000	Plain	Barren	Kallupatti	10.90	BT	6.90	P	ER	1.00	P	1.50	-	387/970	Seempatti on RHS	3.60	CD no 388/3 RCC slab Culvert 1 x 6m at 387/950 - 'H' curve on LHS 387/700 to 388/100, Accident zone.
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

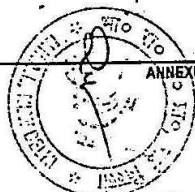
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 23.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 388/000 - 389/000																	
388.000	388.200	Plain	Built up area	Kalluppatti	9.50	BT	7.00	F	ER	1.10	F	-	-	-	-	-	Horizontal curve at LHS
388.200	388.400	Plain	Built up area	Kalluppatti	10.20	BT	7.00	F	ER	0.85	F	0.25	-	-	-	-	RCC slab culvert at 388/230
388.400	388.600	Plain	Barren	Kalluppatti	10.80	BT	7.00	F	ER	1.20	F	1.20	-	-	-	-	Vertical curve single span of 10m minor bridge at 388/450
388.600	388.800	Plain	Built up area	Kalluppatti	10.50	BT	7.00	F	ER	1.00	F	0.50	-	-	-	-	Natural drainage on both sides
388.800	389.000	Plain	Barren	Kalluppatti	11.00	BT	6.90	F	ER	1.25	F	0.75	-	387/970	Pallivadal	3.00	Old NH damaged at RHS, RCC pipe culvert at 388/880
Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor																	



Annexure - A2



ANNEXURE A2 : ROAD INVENTORY

Road Name :
Section (From Km) :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 23.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 389/000 - 390/000																	
389.000	389.200	Plain	Agricultural	Kalluppatti	11.20	BT	6.90	F	ER	1.20	F	1.40	-	-	-	-	Natural drainage on both sides, RCC pipe culvert on 389/100
389.200	389.400	Plain	Agricultural	Kalluppatti	11.30	BT	7.00	F	ER	1.30	F	1.50	-	381/390	K. Purukkattai	3.00	Horizontal curve on RHS, RCC pipe culvert at 389/240
389.400	389.600	Plain	Agricultural	Kalluppatti	10.80	BT	7.00	F	ER	1.00	F	1.75	-	-	-	-	Horizontal curve on RHS, Vertical curve
389.600	389.800	Plain	Barren	-	12.50	BT	7.00	F	ER	1.25	F	2.25	-	-	-	-	Natural drainage on both sides
389.800	390.000	Plain	Barren	-	12.50	BT	7.00	F	ER	1.35	F	1.80	-	-	Pattiyadai	3.00	Natural drainage on both sides
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

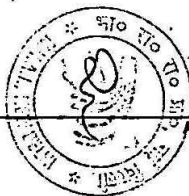
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 23.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 390/000 - 391/000																	
390.000	390.200	Plain	Barren	-	12.60	BT	6.90	F	ER	1.25	F	1.30	-	-	-	-	Horizontal on LHS
390.200	390.400	Plain	Built up area	Keeranur	12.30	BT	6.90	F	ER	1.30	F	0.60	-	-	-	-	Old NH damaged at LHS
390.400	390.600	Plain	Agricultural	-	11.30	BT	6.90	F	ER	1.25	F	1.70	-	-	-	-	Horizontal on LHS, Old NH on LHS
390.600	390.800	Plain	Agricultural	-	10.60	BT	6.70	F	ER	1.00	F	1.85	-	-	-	-	Natural drainage on both sides
391.000	391.000	Plain	Agricultural	-	10.80	BT	6.70	F	ER	1.10	F	1.85	-	-	-	-	Natural drainage on both sides

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor.



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 25.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 391/000 - 392/000																	
391.000	391.200	Plain	Barren	-	11.30	BT	7.00	F	ER	1.25	F	1.70	-	-	-	-	RCC slab culvert 391/190
391.200	391.400	Plain	Agricultural	-	11.50	BT	6.90	F	ER	1.25	F	1.50	-	-	-	-	Natural drainage on both sides
391.400	391.600	Plain	Agricultural	-	10.70	BT	6.90		ER	1.20	F	1.50	-	-	-	-	Natural drainage on both sides
391.600	391.800	Plain	Barren	-	11.20	BT	6.80	F	ER	1.45	F	1.50	-	-	-	-	Horizontal curve on RHS
391.800	392.000	Plain	Barren	-	11.50	BT	6.60	F	ER	1.40	F	1.65	-	-	-	-	Natural drainage on both sides
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Tichy to Dindigul
Section (from km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 25.06.05

From (km)	To (km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway		Shoulder		Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks		
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V/P)	Type* (BT/CC/GR/ER)			Width (m)	Condition** (G/F/P/V/P)	Location (km)		Road No. (km)	Carriageway width (m)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km. 392.000 - 393.000																	
392.000	392.200	Plain	Barren	-	11.80	BT	7.00	F	ER	1.20	F	0.70	-	-	-	-	Natural drainage on both sides
392.200	392.400	Plain	Barren	-	11.50	BT	7.00	F	ER	1.35	F	0.85	-	-	-	-	Horizontal curve on LHS
392.400	392.600	Plain	Agricultural	Thangamapatti	11.50	BT	7.00	F	ER	1.30	F	1.20	-	-	-	-	Natural drainage on both sides
392.600	392.800	Plain	Built up area	Thangamapatti	10.50	BT	7.00	F	ER	1.25	F	1.20	-	-	-	-	Vertical curve
392.800	393.000	Plain	Agricultural	Thangamapatti	11.00	BT	7.00	F	ER	1.25	F	1.50	-	-	-	-	Natural drainage on both sides

ROAD NO. 10

10

10

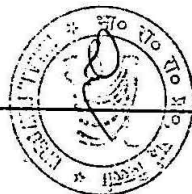
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Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthment;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor.

Note: Type* = BT - Bituminous, CC - Cement Concrete, GR - Gravel, ER - Earthment
Condition** = G - Good, F - Fair, P - Poor, VP - Very Poor

Measure - A2

Area



ANNEXURE A2 : ROAD INVENTORY

Road Name :
Section (From Km) :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 25.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 393/000 - 394/000																	
393.000	393.200	Plain	Agricultural	Thangamapatti	11.30	BT	7.10	G	ER	1.30	F	0.80	-	-	-	-	Natural drainage on both sides
393.200	393.400	Plain	Agricultural	Thangamapatti	11.20	BT	7.00	G	ER	1.40	F	1.30	-	-	-	-	Natural drainage on both sides
393.400	393.600	Plain	Agricultural	Thangamapatti	11.80	BT	7.00	G	ER	1.25	F	1.50	-	-	-	-	Horizontal curve on RHS
393.600	393.800	Plain	Agricultural	Thangamapatti	10.95	BT	7.00	G	ER	1.25	F	2.20	-	-	-	-	Natural drainage on both sides
393.800	394.000	Plain	Agricultural	Thangamapatti	11.40	BT	7.00	G	ER	1.25	F	2.20	-	-	-	-	Natural drainage on both sides
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

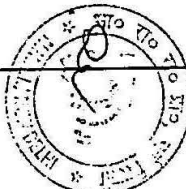
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 25.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 394/000 - 395/000																	
394.000	394.200	Plain	Barren	-	10.30	BT	7.00	F	ER	1.10	F	1.85	-	-	-	-	Horizontal curve on RHS, Railway Track on LHS
394.200	394.400	Plain	Barren	-	13.10	BT	7.00	F	ER	1.20	F	1.90	-	-	-	-	Vertical curve, Railway Track on LHS
394.400	394.600	Plain	Barren	-	12.50	BT	7.00	F	ER	1.20	F	2.00	-	-	-	-	RCC slab culvert on 394/590
394.600	394.800	Plain	Barren	-	12.80	BT	7.00	F	ER	1.30	F	0.70	-	394/700	Chinnasamy material health centre	3.25	Natural drainage on both sides
394.800	395.000	Plain	Built up area	Pachanayakkanur	11.60	BT	7.00	F	ER	1.30	F	0.40	-	-	-	-	Natural drainage on both sides

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor.



ANNEXURE A2 : ROAD INVENTORY

Road Name :
Section (From Km) :

Trichy to Dindigul
Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 25.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agrt / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 395/000 - 396/000																	
395.000	395.200	Plain	Agricultural	-	10.90	BT	6.95	F	ER	1.40	F	1.30	-	-	-	-	RCC slab culvert on 395/180, Horizontal curve on LHS
395.200	395.400	Plain	Agricultural	-	12.60	BT	7.00	F	ER	1.50	F	1.45	-	-	-	-	Natural drainage on both sides
395.400	395.600	Plain	Barren	-	12.30	BT	7.00	F	ER	1.45	F	1.50	-	395/510	Bala viduthi Aranmanal petti	3.25	RCC slab culvert 395/500
395.600	395.800	Plain	Built up area	Ayyalur	12.10	BT	7.00	F	ER	1.50	F	1.30	-	-	-	-	Chinna samy Mahalet 395/880
395.800	396.000	Plain	Built up area	Ayyalur	12.10	BT	7.00	F	ER	1.60	F	0.70	-	-	-	-	Natural drainage on both sides
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

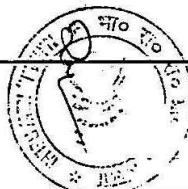
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
 Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
 Road Classification: National Highways
 Date of Survey : 25.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 396/000 - 397/000																	
396.000	396.200	Plain	Built up area	Ayyalur	13.00	BT	7.00	G	BT	1.60	G	0.30	-	-	-	-	RCC slab culvert at 396/100, Horizontal curve on RHS
396.200	396.400	Plain	Built up area	Ayyalur	13.30	BT	7.00	G	BT	1.55	G	0.25	-	396/200	Vedasandur	3.5	Natural drainage on both sides
396.400	396.600	Plain	Built up area	Ayyalur	14.80	BT	7.00	G	BT	1.50	G	0.50	-	-	-	-	Natural drainage on both sides
396.600	396.800	Plain	Built up area	Ayyalur	16.00	BT	7.00	G	BT	1.55	G	0.35	-	-	-	-	Horizontal curve on LHS
396.800	397.000	Plain	Agricultural	Ayyalur	16.20	BT	7.00	G	BT	1.45	G	0.40	-	-	-	-	Natural drainage on both sides

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
 Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor.



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
 Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
 Road Classification: National Highways
 Date of Survey : 25.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 397/000 - 398/000																	
397.000	397.200	Plain	Barren	-	13.30	BT	7.00	F	BT	1.30	F	1.40	-	-	-	-	RCC slab culvert at 397/100
397.200	397.400	Plain	Barren	-	11.30	BT	7.00	F	ER	1.20	F	1.50	-	-	-	-	Horizontal curve on LHS
397.400	397.600	Plain	Barren	-	11.30	BT	7.00	F	ER	1.40	F	1.25	-	-	-	-	Horizontal curve on RHS
397.600	397.800	Plain	Barren	-	11.50	BT	7.00	F	ER	1.15	F	1.25	-	397/620	Kakayankulathu path	3.25	RCC slab culvert at 397/640
397.800	398.000	Plain	Barren	-	11.70	BT	7.00	F	ER	1.25	F	1.25	-	-	-	-	Vertical curve, Horizontal curve on LHS; 4 span of 8 m minor bridge
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

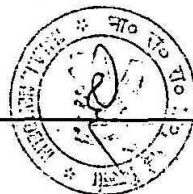
ANNEXURE A2: ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 25.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 398/000 - 399/000																	
398.000	398.200	Plain	Barren	-	10.70	BT	7.00	G	ER	1.30	F	2.80	-	-	-	-	Single span of 8m minor bridge at 398/080, Vertical curve, Horizontal curve on LHS
398.200	398.400	Plain	Barren	-	10.50	BT	6.90	F	ER	1.25	F	0.50	-	-	-	-	Vertical curve, Horizontal curve on LHS
398.400	398.600	Plain	Built up area	Mookarapillyar Koll	11.20	BT	6.95	F	ER	1.25	F	0.30	-	398/480	Kurumapalli	3.3	Horizontal curve on RHS
398.600	398.800	Plain	Agricultural	-	11.30	BT	6.90	F	ER	1.20	F	0.75	-	-	-	-	Horizontal curve on LHS
398.800	399.000	Plain	Agricultural	-	11.50	BT	7.00	F	ER	1.20	F	2.80	-	-	-	-	Natural drainage on both sides

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor



ANNEXURE A2 : ROAD INVENTORY

Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH -45
Road Classification: National Highways
Date of Survey : 25.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri/ Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 399/000 - 400/000																	
399.000	399.200	Plain	Agricultural	A. Puthur	9.30	BT	7.00	F	ER	1.35	F	2.80	-	-	-	-	2 span of 9 m minor bridge at 399/020, Horizontal curve on RHS
399.200	399.400	Plain	Built up area	A. Puthur	-	BT	7.00	F	ER	1.25	F	1.25	-	-	-	-	Horizontal curve on RHS
399.400	399.600	Plain	Barren	-	-	BT	7.00	F	ER	1.25	F	1.40	-	-	-	-	Horizontal curve on RHS
399.600	399.800	Plain	Barren	-	11.80	BT	6.90	F	ER	1.20	F	1.85	-	-	-	-	Horizontal curve on LHS
399.800	400.000	Plain	Barren	-	11.20	BT	6.90	F	ER	1.20	F	1.35	-	-	-	-	Natural drainage on both sides
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

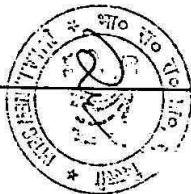
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/P)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/P)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 400/000 - 401/000																	
400.000	400.200	Plain	Agricultural	Kollappatti Branch	11.60	BT	7.10	G	ER	1.20	F	0.50	-	400/010	To Kollappatti Branch on LHS	3.75	Newly relaid with SDBC
400.200	400.400	Plain	Agricultural	Kollappatti Branch	11.70	BT	7.00	G	ER	1.25	F	0.60	-	400/450	To Oppampatti Branch	3.5	H.curve on LHS 400/200 to 400/400
400.400	400.600	Plain	Agricultural	-	11.60	BT	7.00	G	ER	1.40	F	1.20	-				Newly relaid with SDBC
400.600	400.800	Plain	Agricultural	-	11.80	BT	7.00	G	ER	1.20	F	0.90	-				Newly relaid with SDBC
	401.000	Plain	Agricultural	-	12.20	BT	7.00	G	ER	1.20	F	1.70	-				Newly relaid with SDBC

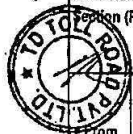
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; V - Very Poor;



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
 Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
 Road Classification: National Highways
 Date of Survey : 26.06.05



From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 401/000 - 402/000																	
401.000	401.200	Plain	Agricultural	-	13.30	BT	7.00	G	ER	1.40	G	1.50	-	-	-	-	H. Curve on RHS 401/050 - 401/200
401.200	401.400	Plain	Agricultural	-	11.70	BT	7.00	G	ER	1.30	F	2.20	-	-	-	-	Newly relaid with SDBC
401.400	401.600	Plain	Agricultural	-	11.20	BT	7.00	G	ER	0.90	F	2.20	-	-	-	-	H. Curve on RHS 401/400 - 401/600
401.600	401.800	Plain	Agricultural	-	12.20	BT	7.00	G	ER	0.90	F	1.40	-	-	-	-	CD. No 402/1 RCC slab culvert 1x 4 m at 401/700
401.800	402.000	Plain	Agricultural	-	12.00	BT	7.00	G	ER	1.20	G	1.30	-	-	-	-	H. Curve on LHS 401/850 - 402/150
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

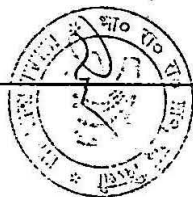
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km): Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 402/000 - 403/000																	
402.000	402.200	Plain	Built up area	More patil	12.30	BT	7.00	F	ER	1.00	F	1.50	-	402/030	To Chitharapatti on RHS	3.6	CD . No 403/1 RCC slab culvert 1x 2 m at 402/050
402.200	402.400	Plain	Barren	-	12.10	BT	7.00	F	ER	1.10	F	1.30	-	402/350	To Heritage foods india on LHS	5.5	H. Curve on RHS 402/300 - 402/450
402.400	402.600	Plain	Industrials	-	10.80	BT	7.00	F	ER	1.20	F	1.40	-	-	-	-	CD . No 403/2 RCC slab culvert 1x 4 m at 402/500
402.600	402.800	Plain	Industrials	-	11.20	BT	7.00	F	ER	1.00	F	1.40	-	402/750	To Kallanur Branch on LHS	3.75	CD . No 403/3 RCC slab culvert 1x 2 m at 402/725
402.800	403.000	Plain	Industrials	-	13.80	BT	7.00	F	ER	1.00	F	1.00	-	-	-	-	H. (S) Curve on 402/600 - 402/900

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor



ANNEXURE A2 : ROAD INVENTORY

Road No. :
Section (From Km) :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 403/000 - 404/000																	
403.000	403.200	Plain	Agricultural	-	11.60	BT	7.10	F	ER	1.10	F	1.40	-	403/050	To Ettiyapatti on RHS	3.2	Natural drain both side
403.200	403.400	Plain	Agricultural	-	11.00	BT	7.00	F	ER	1.20	F	1.40	-	-	-	-	H. Curve on RHS 403/200 - 403/400, CD . No 404/1 RCC slab culvert 1x 1.5 m at 403/225
403.400	403.600	Plain	Agricultural	Vadamadurai bye pass	12.30	BT	7.00	F	ER	1.00	F	1.60	-	403/400	Vada madurai bye pass	7	CD . No 404/2 RCC Pipe culvert 1x 0.9 m dia at 403/500
403.600	403.800	Plain	Agricultural	Vadamadurai bye pass	11.30	BT	6.80	F	ER	1.00	F	0.75	-	-	-	-	CD . No 404/3 RCC Pipe culvert 1x 0.9 m dia at 403.625
403.800	404.000	Plain	Built up area	Vadamadurai bye pass	11.10	BT	6.80	F	ER	1.20	F	0.50	-	-	-	-	Arboriculture developed on both side

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;

ANNEXURE A2 : ROAD INVENTORY

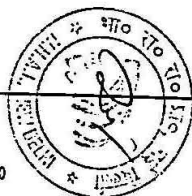
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (km)	To (km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agrl / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 404/000 - 405/000																	
404.000	404.200	Plain	Built up area	Vadamadurai bye pass	11.80	BT	7.00	F	ER	1.00	F	0.80	-	404/070	To Vada madurai on LHS To vadachantur on RHS	5.5 5.5	CD . No 405/1 RCC Pipe culvert 1x 0.9 m dia at 404/025
404.200	404.400	Plain	Built up area	Vadamadurai bye pass	11.60	BT	7.00	F	ER	1.10	F	0.20	-	-	-	-	H. Curve on LHS 404/200 - 404/400
404.400	404.600	Plain	Built up area	Vadamadurai bye pass	11.30	BT	7.00	F	ER	1.00	F	0.20	-	-	-	-	BT surface are Fair condition
404.600	404.800	Plain	Built up area	Vadamadurai bye pass	12.30	BT	7.00	F	ER	1.30	F	1.00	-	404/650	To Vada madurai on LHS To Kurumkund on RHS	3.5 3.5	CD . No 405/2 RCC slab culvert 1x1.2 m at 404/660
404.800	405.000	Plain	Built up area	Vadamadurai bye pass	11.10	BT	7.00	F	ER	1.50	F	0.30	-	-	-	-	230 KV TNEB sub-station Vadamadurai

Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;

Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;



ANNEXURE A2 : ROAD INVENTORY



Trichy to Dindigul
Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain / Rolling / Hilly	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/V)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 405/000 - 406/000																	
405.000	405.200	Plain	Built up area	Vadamadurai bye pass	11.20	BT	7.00	G	ER	1.00	G	1.00	-	405/050	Vada madurai Road	7	H. Curve on RHS 405/00 - 405/200
405.200	405.400	Plain	Partially Built up area	Vadamadurai	11.80	BT	7.00	G	ER	1.10	G	1.74	-	-	-	-	CD . No 406/1 RCC slab culvert 1x1.5 m at 405/360
405.400	405.600	Plain	Partially Built up area & industrial area	Vadamadurai	12.00	BT	7.10	G	ER	1.10	G	-	-	-	-	-	Newly relaid with SDBC
405.600	405.800	Plain	Partially Built up area	Vadamadurai	11.80	BT	7.00	G	ER	1.00	G	1.30	-	405/625	To Sikalipatti on RHS	3.75	CD . No 406/2 RCC slab culvert 1x1.5 m at 405/780
405.800	406.000	Plain	Partially Built up area	Vadamadurai	11.80	BT	7.00	G	ER	0.95	G	1.30	-	405/975	To Senkalathu patti	3.6	Newly relaid with SDBC

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;

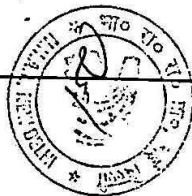
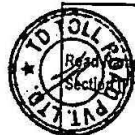
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/P)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/P)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 406/000 - 407/000																	
406.000	406.200	Plain	Built up area	Andiyamman Nagar	15.50	BT	7.00	G	ER	1.00	G	-	-	-	-	-	H. Curve on LHS 406/150 - 406/300
406.200	406.400	Plain	Built up area	Andiyamman Nagar	13.80	BT	7.00	G	ER	1.20	G	0.50	-	406/360	To Vellapomman pattu on RHS	3.7	Newly retaid with SDBC
406.400	406.600	Plain	Barren	-	13.20	BT	7.00	G	ER	1.00	G	-	-	-	-	-	H. Curve on RHS 406/400 - 406/700
406.600	406.800	Plain	Industrial	-	11.80	BT	7.00	G	ER	1.00	G	-	-	-	-	-	Newly retaid with SDBC
407.000	407.000	Plain	Industrial	-	11.50	BT	6.90	G	ER	1.30	G	0.40	-	-	-	-	CD. No 407/1 RCC slab culvert 1x1.5 m at 406/995

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; V - Very Poor;



ANNEXURE A2 : ROAD INVENTORY

Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

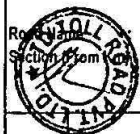
From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 407/000 - 408/000																	
407.000	407.200	Plain	Agricultural	-	12.00	BT	7.10	G	ER	1.30	G	0.50	-	407/100	To Kanapadi on LHs	3.5	Newly relaid with SDBC
407.200	407.400	Plain	Agricultural	-	12.00	BT	7.00	G	ER	1.40	G	0.75	-	-	-	-	CD. No 408/1 RCC slab culvert 1x1.5 m at 407/260
407.400	407.600	Plain	Agricultural	-	12.30	BT	7.00	G	ER	1.00	G	0.60	-	-	-	-	Newly relaid with SDBC
407.600	407.800	Plain	Industrial	-	11.80	BT	7.00	G	ER	1.20	G	0.55	-	-	-	-	To Gas cotton mills on RHS at 407/600
407.800	408.000	Plain	Industrial	Velvarkottai	11.80	BT	7.00	G	ER	1.30	G	0.60	-	-	-	-	Arasan mills on LHS
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

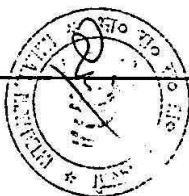
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 408/000 - 409/000																	
408.000	408.200	Plain	Barren	-	12.10	BT	7.00	P	ER	1.30	F	0.70	-	408/175	To Vellapomman patti on RHS	3.6	BT surface very poor condition
408.200	408.400	Plain	Barren	-	12.50	BT	7.00	P	ER	1.30	F	0.80	-	-	-	-	CD . No 409/1 RCC slab culvert 1x1.5 m at 408/380
408.400	408.600	Plain	Barren	-	12.10	BT	7.05	P	ER	1.20	F	1.10	-	-	-	-	H. Curve on RHS 408/552 - 408/650
	408.800	Plain	Barren	-	11.60	BT	7.00	P	ER	1.20	F	1.3	-	-	-	-	H. Curve on RHS 408/700 - 408/900
	409.000	Plain	Barren	-	11.80	BT	7.00	P	ER	1.30	F	1.50	-	-	-	-	CD . No 409/2 RCC slab culvert 1x1.5 m at 408/950
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;																	



Trichy to Dindigul
Km 333.000 to Km 421.600



ANNEXURE A2 : ROAD INVENTORY

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain/ Rolling / Hilly)	Land use (Built up/ Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 409/000 - 410/000																	
409.000	409.200	Plain	Industrial area	Indra nagar	13.10	BT	7.10	F	ER	1.75	G	-	-	-	-	-	H. Curve on RHS 409/050 - 409/200
409.200	409.400	Plain	Agricultural & builtup area	Indra nagar	13.30	BT	7.00	F	ER	1.50	G	1.50	-	409/250	To Velvar kottai puthur on LHS	3.75	CD . No 410/1 RCC slab culvert 1x2 m at 409/350
409.400	409.600	Plain	Industrial area &Agricultural	-	13.10	BT	7.00	F	ER	1.60	G	1.20	-	-	-	-	H. Curve on RHS 409/400 - 409/700
409.600	409.800	Plain	Agricultural	-	11.20	BT	7.00	F	ER	1.10	G	0.75	-	409/675	To Industrial area on RHS	3.6	Venkatasub lex mills on RHS 409/500
409.800	410.000	Plain	Agricultural & builtup area	Mooandi patti	11.80	BT	7.00	F	ER	1.20	G	0.75	-	409/850	To Industrial area un RHS	3.4	CD . No 410/2 RCC slab culvert 1x2 m at 409/925
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

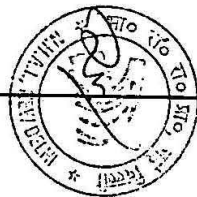
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km): Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 410/000 - 411/000																	
410.000	410.200	Plain	Built up area	Mooandipatti	13.10	BT	7.10	G	ER	1.20	F	1.20	-	-	-	-	Earthed drain on both sides
410.200	410.400	Plain	Agricultural	Mooandipatti	13.20	BT	7.00	G	ER	1.30	F	1.3(L)	-	-	-	-	H curve on RHS 410/200 to 410/450
410.400	410.600	Plain	Barren	-	11.80	BT	7.05	G	ER	1.30	F	1.5(L)	-	-	-	-	Hard rock available on LHS
410.600	410.800	Plain	Barren	-	12.10	BT	7.00	G	ER	1	F	1.6	-	-	-	-	H curve on RHS 410/450 to 410/850
410.800	411.000	Plain	Built up area	Paralpatti Patti	11.10	BT	7.00	G	ER	1.20	F	1.3	-	410/800	To Paralpatti on RHS	3.5	Hard rock available on LHS

Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;



ANNEXURE A2 : ROAD INVENTORY

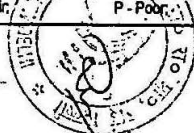
Road Name : Section (From Km) :		Trichy to Dindigul Km 333.000 to Km 421.600				Road No. : Road Classification : Date of Survey :		NH-45 National Highways 26.06.05									
From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 411/000 - 412/000																	
411.000	411.200	Plain	Agricultural	Salaiyur	11.30	BT	7.00	G	ER	1.0(L)	F	1.70	-	-	-	-	H curve on RHS 411/000 to 411/100 & on LHS 411/250 to 411/400 (A.Z)
411.200	411.400	Plain	Agricultural	Salaiyur	11.50	BT	7.00	G	ER	1.00	F	1.5 & 3	-	-	-	-	CD No 412/1 RCC slab culvert 1x4.0m at 411/200
411.400	411.600	Plain	Agricultural	Salaiyur	11.40	BT	7.00	G	ER	1.00	F	1.5 & 0.7	-	-	-	-	CD No 412/2 6 span 8 m minor bridge across Kallaru river
411.600	411.800	Plain	Agricultural	Salaiyur	9.80	BT	7.00	G	ER	1.20	F	1.2	-	-	-	-	H curve on RHS 411/450 to 411/750 (A.Z)
411.800	412.000	Plain	Built up area	Kalluthu patti	11.50	BT	7.00	G	ER	1.40	F	0.30	-	411/950	Kalluthu patti Branch	3.6	CD No 412/3 RCC slab culvert 1x2m at 411/675
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

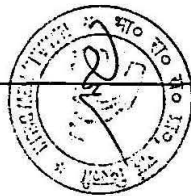
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 412/000 - 413/000																	
412.000	412.200	Plain	Built up area	Kalluthu patti	12.20	BT	7.00	G	ER	1.25	G	0.50	-	-	-	-	CD No 413/1 RCC slab culvert 1x1.5m at 412/175. Burial ground on RHS at 412/100
412.200	412.400	Plain	Agricultural	Kalluthu patti	12.30	BT	7.00	G	ER	1.20	G	1.50	-	-	-	-	CD No 413/2 RCC pipe culvert at 412/205
412.400	412.600	Plain	Built up area	Thamaralpaddi	12.10	BT	7.00	F	ER	1.50	F	-	-	412/450	To Kalluthu patti Branch on RHS	3	H curve on LHS at 412/200 to 412/350 & RHS 412/500 to 412/650
412.600	412.800	Plain	Built up area	Thamaralpaddi	12.10	BT	7.00	F	ER	1.75	F	-	-	412/750	To Railway station Road on LHS	3.7	CD No 413/3 RCC slab culvert 1x2m at 412/775
412.800	413.000	Plain	Built up area	Thamaralpaddi	12.50	BT	7.00	F	ER	1.50	F	-	-	411/980	-	-	-
Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	





ANNEXURE A2 : ROAD INVENTORY

Road Name :
Section : From Km :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 413/000 - 414/000																	
413.000	413.200	Plain	Agricultural	Thamaraipaddi	12.10	BT	7.00	G	ER	1.20	G	1.30	-	-	-	-	Earthen drain on both sides
413.200	413.400	Plain	Agricultural	Thamaraipaddi	11.80	BT	6.90	G	ER	1.30	G	1.3 (Right)	-	413/300	Chetti patti	3.5	H curve(S) 413/400 to 413/500
413.400	413.600	Plain	Agricultural	Thamaraipaddi	11.50	BT	6.90	G	ER	1.50	G	1.20	-	-	-	-	CD No 414/1 RCC slab culvert 1x4m at 413/500
413.600	413.800	Plain	Agricultural	Thamaraipaddi	11.50	BT	6.40	G	ER	1.50	G	0.5	-	-	-	-	H curve on LHS 413/700 to 414/100
413.800	414.000	Plain	Agricultural	Thamaraipaddi	11.60	BT	6.80	G	ER	1.30	G	1.5 & 0.3	-	413/830	Chetti patti	3	CD No 414/2 RCC slab culvert 1x2m at 413/825
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

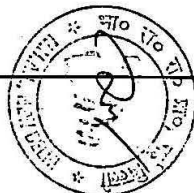
ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 414/000 - 415/000																	
414.000	414.200	Plain	Built up area	Mullipadi	12.00	BT	7.00	G	ER	1.00	F	-	-	414/190	To Paddur on RHS	3	Newly relaid with SDBC
414.200	414.400	Plain	Built up area	Mullipadi	12.50	BT	6.80	G	ER	1.00	F	3.50	-	-	-	-	6 span of 6.7m Major bridge at 414/284
414.400	414.600	Plain	Agricultural	Mullipadi	12.80	BT	6.80	G	ER	1.00	F	3.50	-	-	-	-	CD No 415/2 RCC slab culvert 1x2m at 414/575
414.600	414.800	Plain	Agricultural	Mullipadi	12.50	BT	6.80	G	ER	1.20	F	0.3	-	414/800	To Burial ground on RHS	3	H. Curve on RHS 414/500 - 414/700 & on RHS 414/850 - 415/000
415.000	415.000	Plain	Agricultural	Mullipadi	12.60	BT	6.90	G	ER	1.20	F	2.20	-	-	-	-	CD No 415/3 RCC pipe culvert 1x0.9m dia at 414/850

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor.



ANNEXURE A2: ROAD INVENTORY

Road Name :
Section (From Km) :Trichy to Dindigul
Km 333.000 to Km 421.600Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

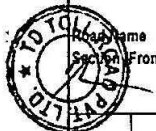
From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 415/000 - 416/000																	
415.000	415.200	Plain	Agricultural	Arockiya samy nagar	11.20	BT	7.00	F	BT	1.25	G	2.50	-	-	-	-	H. Curve on LHS 415/100
415.200	415.400	Plain	Agricultural	Arockiya samy nagar	11.60	BT	7.00	F	BT	1.50	G	2 & 0.5	-	415/300	To Pauliyur On RHS	3	CD no 416/1 RCC slab culvert 1x4 m 415/100
415.400	415.600	Plain	Built up area	Arockiya samy nagar	11.80	BT	7.00	F	BT	1.40	G	-	-	-	-	-	Pavet shoulder on both side
415.600	415.800	Plain	Built up area	Arockiya samy nagar	11.90	BT	7.00	F	BT	1.50	G	0.6	-	415/775	To Kovilur on LHS	5.5	H. Curve on RHS 415/650 - 415/900
415.800	416.000	Plain	Partially Built up area	Kovilur branch	12.20	BT	7.00	F	BT	1.40	G	1.5 (R.) & 0.6 (L)	-	-	-	-	CD no 416/3 RCC slab culvert 1x2 m 415/825
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification : National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 416/000 - 417/000																	
416.000	416.200	Plain	Built up area	Mahadham nagar	13.60	BT	7.00	G	BT	1.50	G	0.50	-	-	-	-	H. Curve on LHS 415/900 - 416/150
416.200	416.400	Plain	Agricultural	Mahadham nagar	13.20	BT	7.00	G	BT	1.60	G	0.30	-	-	-	-	Newly relaid with SDBC
416.400	416.600	Plain	Built up area	Seelapadi	12.80	BT	7.00	G	BT	1.40	G	0.40	-	-	-	-	CD no 417/2 RCC pipe culvert 1x 0.9 m dia 4416/565
416.600	416.800	Plain	Built up area	Seelapadi	13.10	BT	7.00	G	BT	1.60	G	-	-	-	-	-	H. Curve on RHS 416/900 417/000
416.800	417.000	Plain	Built up area	Ayuthappadai Police Quarters	13.10	BT	7.00	G	BT	1.60	G	0.60	-	416/820	To Police Quarters on LHS	3	CD no 417/3 RCC slab culvert 1x2 m 416/950
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;																	



ANNEXURE A2 : ROAD INVENTORY

Road Name :
Section (From Km) :

Trichy to Dindigul
Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 417/000 - 418/000																	
417.000	417.200	Plain	Built up area	Seelapadi	13.50	BT	7.00	G	BT	1.50	G	-	-	417/050	To Armed Reserve office of Deputy Sup. Police on RHS	3	Newly relaid with SDBC
417.200	417.400	Plain	Built up area	Seelapadi	13.30	BT	7.00	G	BT	1.60	G	-	-	417/380	To Way to Dindigul Town on LHS	7	
417.400	417.600	Plain	Built up area	Seelapadi	13.50	BT	7.00	G	BT	1.55	G	1.00	-	417/400	To Seelapadi on RHS	5.5	CD no 41/1 RCC pipe culvert 2x0.9 m dia 417/550, H. curve on RHS 417/400 - 417/300
417.600	417.800	Plain	Built up area	Dindigul Bye pass road	14.00	BT	7.00	G	BT	1.50	G	1.2	-				RUB at 417/750
417.800	418.000	Plain	Barren	Dindigul Bye pass road	13.80	BT	7.00	G	BT	1.60	G	1.50	-				CD no 418/2 RCC pipe culvert 2x0.9 m dia 417/995
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V/P)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/V/P)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 418/000 - 419/000																	
418.000	418.200	Plain	Barren	Dindigul Bye pass road	12.70	BT	7.00	G	BT	1.75	G	2.30	-	-	-	-	CD no 419/1 RCC slab culvert 1x6 m dia 418/050
418.200	418.400	Plain	Barren	Dindigul Bye pass road	12.30	BT	7.00	G	BT	1.50	G	2.30	-	-	-	-	H.curve on RHS 418/200 - 418/300
418.400	418.600	Plain	Barren	Dindigul Bye pass road	13.00	BT	7.00	G	BT	1.60	G	2.80	-	-	-	-	CD no 419/2 RCC pipe culvert 1x0.9 m dia 418/580
418.600	418.800	Plain	Built up area	Dindigul Bye pass road	13.80	BT	7.00	G	BT	1.70	G	2	-	418/790 418/790	To Dindigul Town on LHS To Kanur road on RHS	7.2 7.2	CD no 419/3 RCC pipe culvert 2x0.9 m dia 418/600
418.800	419.000	Plain	Built up area	Dindigul Bye pass road	13.90	BT	7.00	G	BT	1.60	G	0.40	-	-	-	-	CD no 419/4 RCC pipe culvert 1x0.9 m dia 418/750

Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen;
Condition* = G - Good; F - Fair; R - Poor; VP - Very Poor;



ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads		Remarks	
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/P/VP)			Location (km)	Road No. (km)		Carriageway width (m)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 419/000 - 420/000																	
419.000	419.200	Plain	Built up area	Dindigul Bye pass road	14.00	BT	7.00	G	BT	1.50	G	0.80	-	419/020	Villavan Colony	3	H. curve on RHS 419/200 419/350
419.200	419.400	Plain	Barren	Dindigul Bye pass road	13.30	BT	7.00	G	BT	1.60	G	0.80	-	-	-	-	CD no 420/1 RCC pipe culvert 1x0.9 m dia 419/490
419.400	419.600	Plain	Barren	Dindigul Bye pass road	13.50	BT	7.00	G	BT	1.50	G	2.00	-	-	-	-	CD no 420/2 RCC pipe culvert 2x0.9 m dia 419/625
419.600	419.800	Plain	Barren	Dindigul Bye pass road	12.80	BT	7.00	G	BT	1.55	G	2.2	-	419/650	Tamil nadu Govt, Transport Corporation office Dindigul	3.5	H. curve on RHS 419/550 - 419/600
419.800	420.000	Plain	Built up area	Pennamal Nagar	12.90	BT	7.00	G	BT	1.60	G	1.85	-	-	-	-	CD no 420/3 RCC slab culvert 1x5 m 419/775
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

ANNEXURE A2 : ROAD INVENTORY

Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition* (G/F/P/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 420/000 - 421/000																	
420.000	420.200	Plain	Built up area	EB colony	13.00	BT	7.00	G	BT	1.70	G	1.80	-	420/180	Chettinayakkampatti/ Dindigul road	3	H. curve on RHS 420/200 - 420/300
420.200	420.400	Plain	Built up area	EB colony	13.30	BT	7.00	G	BT	1.50	G	1.30	-	-	-	-	-
420.400	420.600	Plain	Barren	EB colony	13.10	BT	7.00	G	BT	1.60	G	1.30	-	-	-	-	-
420.600	420.800	Plain	Barren	EB colony	13.50	BT	7.00	G	BT	1.50	G	1.7	-	-	-	-	-
420.800	421.000	Plain	Built up area	Rajakkappatti	13.90	BT	7.00	G	BT	1.50	G	1.70	-	-	-	-	H. curve on RHS 420/800 - 421/000
Note: Type* = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition* = G - Good; F - Fair; P - Poor; VP - Very Poor;																	



ANNEXURE A2 : ROAD INVENTORY

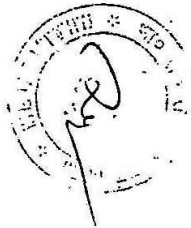
Road Name : Trichy to Dindigul
Section (From Km) : Km 333.000 to Km 421.600

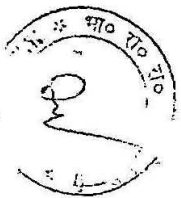
Road No. : NH-45
Road Classification: National Highways
Date of Survey : 26.06.05

From (Km)	To (Km)	Terrain (Plain / Rolling / Hilly)	Land use (Built up / Agri / Forest / Industrial / Barren)	Name of Village / Town	Formation width (m)	Carriageway			Shoulder			Embankment Height (m)	Submergence (cm)	Details of Cross Roads			Remarks
						Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/VP)	Type* (BT/CC/GR/ER)	Width (m)	Condition** (G/F/VP)			Location (km)	Road No. (km)	Carriageway width (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Km: 421/000 - 421/500																	
421.000	421.200	Plain	Built up area	Rajakkappatti	14.30	BT	7.00	G	BT	1.50	G	0.70	-	421/010	Chettinayakkampatti	3	-
421.200	421.400	Plain	Barren	Rajakkappatti	14.00	BT	7.00	G	BT	1.50	G	1.70	-	-	-	-	CD no 422/1 RCC pipe culvert 2x0.9 m dia 421/350
421.400	421.600	Plain	Built up area	Dindigul & Kanur Bye pass road	16.50	BT	7.00	G	BT	1.50	G	0.50	-	-	-	-	H. curve on LHS 421/250 - 421/600
Note: Type * = BT - Bituminous; CC - Cement Concrete; GR - Gravel; ER - Earthen; Condition * = G - Good; F - Fair; P - Poor; VP - Very Poor;																	

Annexure A3 : Average Annual Daily Traffic at Count Stations

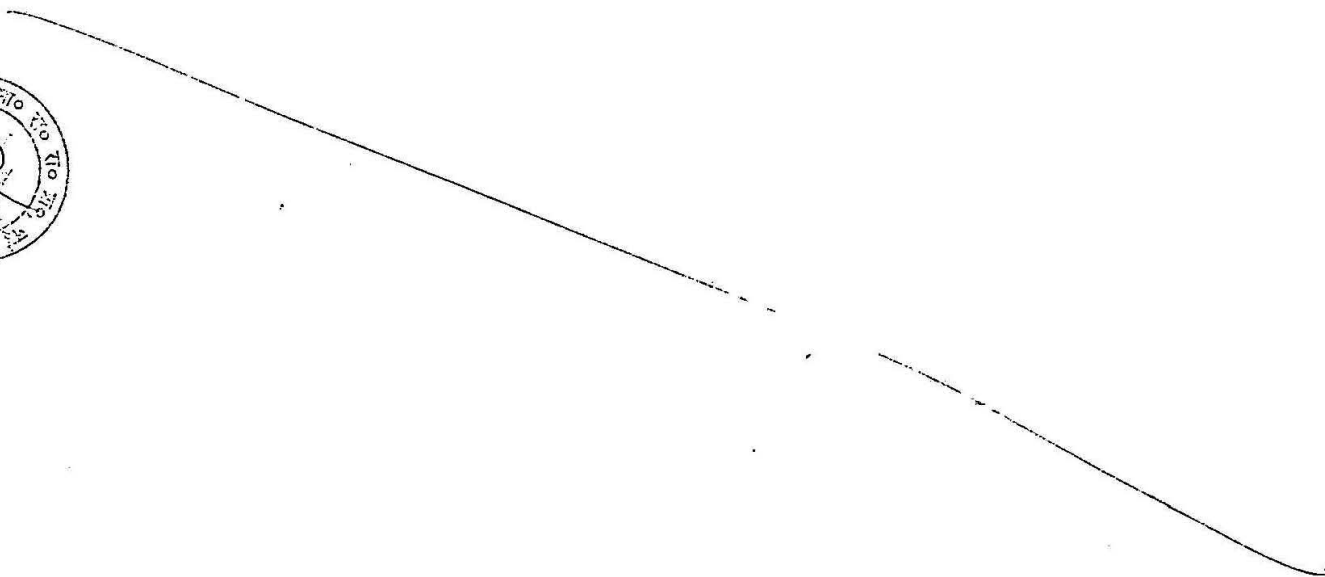
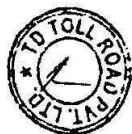
Count Station	Motorised Passenger Vehicles					Motorised Goods Vehicles						Non Motorised Vehicles			Total Per Day	
	Two Wheeler	Three Wheeler	Car	MiniBus	Standard Bus	LCV	Truck-2Axle	Truck-3Axle	Truck-Multi Axle	Tractor	Tractor Trailer	Animal Cart	Cycle	Cycle Rickshaw	Vehicles	PCUs
km 338/400	1119	156	1475	137	833	477	863	212	96	7	13	3	279	3	5673	9818
km 360/400	2187	189	1407	78	722	455	984	232	106	12	39	8	1461	6	7886	11112
km 378/000	1852	133	1315	67	618	425	840	200	91	16	39	3	1877	4	7480	9960
km 406/200	1459	297	1449	65	712	468	854	206	87	11	21	1	935	2	6567	9880





Day	Date (9.00 Am to 9.00 Am)	Direction From - To	MOTORISED VEHICLE												NON MOTORISED VEHICLE								
			2 Wheeler	3 Wheeler	Car	LCV	Bus		Truck			Agri. Tractor		Total MV	Bicycle	Cycle Rickshaw	Animal drawn vehicle		Total NMV	Total Vehicle	Total PCU		
							Mini	Full	2 Axle	3 Axle	Multi Axle	With Trallor	Without Trallor				Bullock Cart	Horse					
Thursday to Friday	26.5.05 to 27.5.05	Trichy - Dindigul	498	101	711	237	169	387	401	121	45	5	4	2678	124	0	1	0	126	2804	4874		
		Dindigul - Trichy	505	68	686	229	61	434	339	113	38	4	2	2479	124	5	3	0	132	2611	4550		
		Total Traffic (Day 1)	1003	169	1397	466	230	821	740	234	82	9	6	5157	248	5	4	0	258	5415	9424		
Friday to Saturday	27.5.05 to 28.5.05	Trichy - Dindigul	553	148	676	225	105	438	392	139	44	9	3	2731	138	2	3	0	143	2874	5041		
		Dindigul - Trichy	508	64	753	251	94	438	455	140	51	3	0	2757	151	0	0	0	152	2909	5215		
		Total Traffic (Day 2)	1061	212	1429	476	199	876	847	279	94	12	3	5488	289	2	3	0	295	5783	10257		
Saturday to Sunday	28.5.05 to 29.5.05	Trichy - Dindigul	475	88	765	255	112	418	339	131	38	9	4	2634	85	3	0	0	88	2722	4767		
		Dindigul - Trichy	492	78	726	242	71	439	369	97	41	13	10	2578	114	1	0	0	116	2694	4697		
		Total Traffic (Day 3)	967	166	1491	497	183	857	708	228	79	22	14	5212	199	4	0	0	204	5416	9464		
Sunday to Monday	29.5.05 to 30.5.05	Trichy - Dindigul	660	55	859	286	54	459	384	107	43	2	3	2912	125	0	2	0	127	3039	5046		
		Dindigul - Trichy	678	51	960	320	69	508	327	122	36	4	1	3075	138	3	4	0	146	3222	5268		
		Total Traffic (Day 4)	1338	106	1819	606	123	967	711	229	79	6	4	5988	263	3	6	0	273	6261	10314		
Monday to Tuesday	30.5.05 to 31.5.05	Trichy - Dindigul	577	94	689	230	72	437	411	116	46	10	1	2683	99	2	1	0	102	2785	4903		
		Dindigul - Trichy	666	82	750	250	77	420	440	100	49	9	5	2848	147	0	1	0	149	2997	5033		
		Total Traffic (Day 5)	1243	176	1439	480	149	857	851	216	95	19	6	5531	246	2	2	0	251	5782	9936		
Tuesday to Wednesday	31.5.05 to 1.6.05	Trichy - Dindigul	465	75	644	215	23	423	589	116	65	1	0	2616	166	0	0	0	166	2782	5247		
		Dindigul - Trichy	532	73	731	244	25	450	602	114	67	20	9	2867	152	0	4	0	157	3024	5647		
		Total Traffic (Day 6)	997	148	1376	459	48	873	1191	230	132	21	9	5483	318	0	4	0	323	5806	10894		
Wednesday to Thursday	1.6.05 to 2.6.05	Trichy - Dindigul	720	74	782	261	40	457	674	38	75	3	8	3131	187	0	0	0	187	3318	5687		
		Dindigul - Trichy	675	64	805	268	33	433	633	110	70	4	1	3096	203	2	4	0	210	3306	5816		
		Total Traffic (Day 7)	1395	138	1586	529	73	890	1307	148	145	7	9	6227	390	2	4	0	397	6624	11502		
Total weekly		Trichy - Dindigul	3948	635	5126	1709	575	3019	3190	768	354	39	23	19385	924	7	7	0	939	20324	35564		
		Dindigul - Trichy	4056	480	5411	1804	430	3122	3165	796	352	57	28	19701	1029	11	16	0	1062	20763	36227		
Daily traffic		Trichy - Dindigul	564	91	732	244	82	431	456	110	51	6	3	2769	132	1	1	0	134	2903	5081		
		Dindigul - Trichy	579	69	773	258	61	446	452	114	50	8	4	2814	147	2	2	0	152	2966	5175		
Average Daily Traffic		vehicle	1142	159	1505	502	144	877	908	223	101	14	7	5582	279	3	3	0	286	5868			
		%	19	3	26	9	2	15	15	4	2	0	0	95	5	0	0	0	5	100			
		PCU'S	571	159	1505	753	215	2632	2724	1005	454	62	11	10091	140	6	24	0	170		10260		
		%	6	2	15	8	2	26	27	10	5	1	0	99	1	0	0	0	1		100		
AADT		vehicle	0.98	0.98	0.98	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95										
		Average composition (%)	1119	156	1475	477	137	833	863	212	96	13	7	5389	279	3	3	0	286	5673			
		PCU'S	20	3	26	8	2	15	15	4	2	0	0	95	5	0	0	0	5	100			
			560	156	1475	715	206	2500	2589	955	431	59	10	9656	140	6	18	0	164		9818		

4-Laning of Trichy -Dindigul Section
(km 333/000 to km 421/273) of NH 45 in Tamilnadu



Day	Date (9.00 Am to 9.00 Am)	Direction From - To	MOTORISED VEHICLE												NON MOTORISED VEHICLE							
			2 Wheeler	3 Wheeler	Car	LCV	Bus		Truck			Agri. Tractor		Total MV	Bicycle	Cycle Richshaw	Animal drawn vehicle		Total NMV	Total Vehicle	Total PCU	
							Mini	Full	2 Axle	3 Axle	Multi Axle	With Tractor	Without Tractor				Bullock Cart	Horse				
Thursday to Friday	26.5.05 to 27.5.05	Trichy - Dindigul	863	71	633	211	32	294	476	101	53	20	4	2758	124	0	1	0	126	2884	4456	
		Dindigul - Trichy	1291	114	716	239	42	480	567	108	63	17	1	3637	124	5	3	0	132	3769	5736	
Friday to Saturday	27.5.05 to 28.5.05	Total Traffic (Day 1)	2154	185	1349	450	74	774	1043	209	116	37	5	6395	248	5	4	0	258	6653	10192	
		Trichy - Dindigul	934	57	742	247	46	308	472	120	52	31	6	3015	138	2	3	0	143	3158	4812	
		Dindigul - Trichy	1265	94	758	253	53	453	640	134	71	15	1	3737	151	0	0	0	152	3889	6037	
Saturday to Sunday	28.5.05 to 29.5.05	Total Traffic (Day 2)	2199	151	1500	500	99	761	1112	254	124	46	7	6752	289	2	3	0	295	7047	10849	
		Trichy - Dindigul	960	72	751	250	32	321	432	121	48	16	11	3014	85	3	0	0	88	3102	4632	
		Dindigul - Trichy	1280	129	751	250	26	454	553	131	61	23	1	3659	114	1	0	0	116	3775	5733	
Sunday to Monday	29.5.05 to 30.5.05	Total Traffic (Day 3)	2240	201	1502	501	58	775	985	252	109	39	12	6673	199	4	0	0	204	6877	10366	
		Trichy - Dindigul	999	62	746	249	50	339	398	122	44	15	7	3030	125	0	2	0	127	3157	4617	
		Dindigul - Trichy	1329	96	974	325	52	454	498	155	55	19	4	3961	138	3	4	0	146	4107	5967	
Monday to Tuesday	30.5.05 to 31.5.05	Total Traffic (Day 4)	2328	158	1720	573	102	793	896	277	100	34	11	6991	263	3	6	0	273	7264	10584	
		Trichy - Dindigul	995	81	704	235	38	311	437	126	49	31	13	3019	99	2	1	0	102	3121	4706	
		Dindigul - Trichy	1229	130	836	279	42	389	522	111	58	20	7	3623	147	0	1	0	149	3772	5457	
Tuesday to Wednesday	31.5.05 to 1.6.05	Total Traffic (Day 5)	2224	211	1540	513	80	700	959	237	107	51	20	6642	246	2	2	0	251	6893	10162	
		Trichy - Dindigul	1022	65	477	159	26	318	476	105	53	15	17	2733	166	0	0	0	166	2899	4440	
		Dindigul - Trichy	1161	140	725	242	70	470	578	145	64	17	12	3623	152	0	4	0	157	3780	5950	
Wednesday to Thursday	1.6.05 to 2.6.05	Total Traffic (Day 6)	2183	205	1202	401	96	788	1054	250	117	32	29	6356	318	0	4	0	323	6679	10390	
		Trichy - Dindigul	881	75	491	164	22	288	521	101	58	19	5	2625	187	0	0	0	187	2812	4450	
		Dindigul - Trichy	1416	163	753	251	44	444	677	126	75	27	3	3979	203	2	4	0	210	4189	6339	
Total weekly		Total Traffic (Day 7)	2297	238	1244	415	66	732	1198	227	133	46	8	6604	390	2	4	0	397	7001	10789	
		Trichy - Dindigul	6654	483	4543	1514	246	2179	3212	796	357	147	63	20194	924	7	7	0	939	21133	32114	
		Dindigul - Trichy	8971	866	5513	1838	329	3144	4034	910	448	138	29	26219	1029	11	16	0	1062	27281	41219	
Daily traffic		Trichy - Dindigul	951	69	649	216	35	311	459	114	51	21	9	2885	132	1	1	0	134	3019	4588	
		Dindigul - Trichy	1282	124	788	263	47	449	576	130	64	20	4	3746	147	2	2	0	152	3897	5888	
		vehicle	2232	193	1436	479	82	760	1035	244	115	41	13	6630	279	3	3	0	286	6916		
Average Daily Traffic		%	32	3	21	7	1	11	15	4	2	1	0	96	4	0	0	0	4	100		
		PCU'S	1116	193	1436	718	123	2281	3105	1097	518	183	20	10791	140	6	20	0	165	10956		
		%	10	2	13	7	1	21	28	10	5	2	0	98	1	0	0	0	2		100	
SF			0.98	0.98	0.98	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95									
		vehicle	2187	189	1407	455	78	722	984	232	106	39	12	6411	1461	6	8	0	1475	7886		
		Average composition (%)	28	2	18	5	1	9	12	3	1	0	0	81	19	0	0	0	19	100		
		PCU'S	1094	189	1407	682	117	2167	2952	1042	477	174	19	10320	731	12	48	0	791	11112		

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4-Laning of Trichy - Dindigul Section

(k 333 210 1421 7310 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1



	Date (9.00 Am to 9.00 Am)	Direction From - To	MOTORISED VEHICLE											NON MOTORISED VEHICLE							
			Wheeler	Wheeler 3	Bus				Truck			Agri. Tractor		Total MV	Bicycle	Cycle Rickshaw	Animal drawn vehicle		Total NMV	Total Vehicle	Total PCU
					Car	LCV	Mini	Full	2 Axle	3 Axle	Multi Axle	With Trailer	Without Trailer				Bullock Cart	Horse			
Thursday to Friday	26.5.05 to 27.5.05	Trichy - Dindigul	863	80	633	211	32	294	476	101	53	22	4	2769	377	1	0	0	879	3648	5057
		Dindigul - Trichy	940	66	635	212	26	343	477	91	53	17	3	2862	966	1	0	0	967	3829	5201
		Total Traffic (Day 1)	1803	146	1268	423	58	637	953	192	106	39	7	5631	1843	2	0	0	1846	7477	10258
Friday to Saturday	27.5.05 to 28.5.05	Trichy - Dindigul	944	57	742	247	47	318	472	120	52	31	6	3038	1010	2	1	0	1013	4049	5520
		Dindigul - Trichy	991	55	764	255	26	314	485	104	54	34	3	3084	999	0	1	0	1001	4085	5506
		Total Traffic (Day 2)	1935	112	1505	502	73	632	957	224	106	65	9	6120	2009	2	2	0	2014	8134	11026
Saturday to Sunday	28.5.05 to 29.5.05	Trichy - Dindigul	916	72	708	236	32	331	432	131	48	16	11	2933	930	1	2	0	935	3868	5302
		Dindigul - Trichy	984	86	695	232	38	297	395	91	44	13	16	2890	926	1	2	0	930	3820	4920
		Total Traffic (Day 3)	1900	158	1403	468	70	628	827	222	92	29	27	5823	1856	2	4	0	1865	7688	10222
Sunday to Monday	29.5.05 to 30.5.05	Trichy - Dindigul	999	62	770	257	56	339	383	123	43	15	7	3053	967	3	1	0	971	4024	5284
		Dindigul - Trichy	1001	65	1067	356	80	404	340	98	38	13	6	3468	1024	5	1	0	1030	4498	5726
		Total Traffic (Day 4)	2000	127	1838	613	136	743	723	221	80	28	13	6521	1991	8	2	0	2001	8522	11009
Monday to Tuesday	30.5.05 to 31.5.05	Trichy - Dindigul	940	81	518	173	38	311	446	126	50	31	9	2723	884	3	1	0	888	3611	5055
		Dindigul - Trichy	957	79	711	237	24	366	410	71	46	30	12	2943	1064	1	3	0	1068	4011	5219
		Total Traffic (Day 5)	1897	160	1229	410	62	677	857	197	95	61	21	5666	1948	4	4	0	1956	7622	10274
Tuesday to Wednesday	31.5.05 to 1.6.05	Trichy - Dindigul	1022	63	477	159	26	303	476	105	53	15	17	2716	995	1	6	0	1002	3718	5005
		Dindigul - Trichy	881	44	598	199	22	356	381	101	42	20	8	2652	934	1	3	0	939	3591	4858
		Total Traffic (Day 6)	1903	107	1075	358	48	659	857	206	95	35	25	5368	1929	2	9	0	1941	7309	9863
Wednesday to Thursday	1.6.05 to 2.6.05	Trichy - Dindigul	881	75	491	164	22	288	521	101	58	14	5	2820	843	2	0	0	845	3465	4924
		Dindigul - Trichy	908	67	586	195	30	295	491	106	55	15	9	2757	718	5	2	0	725	3482	4989
		Total Traffic (Day 7)	1789	142	1077	359	52	583	1013	207	113	29	14	5377	1561	7	2	0	1570	6947	9912
Total weekly		Trichy - Dindigul	6665	490	4340	1447	253	2184	3206	807	355	144	59	19850	6506	13	11	0	6533	26383	36147
		Dindigul - Trichy	6662	462	5054	1685	246	2375	2980	662	331	142	57	20656	6631	14	12	0	6660	27316	36417
Daily traffic		Trichy - Dindigul	938	70	620	207	36	312	458	115	51	21	8	2836	929	2	2	0	933	3769	5164
		Dindigul - Trichy	952	66	722	241	35	339	426	95	47	20	8	2951	947	2	2	0	951	3902	5202
Average Daily Traffic		vehicle	1890	136	1342	447	71	651	884	210	98	41	17	5787	1877	4	3	0	1885	7671	
		%	25	2	17	6	1	8	12	3	1	1	0	75	24	0	0	0	25	100	
		PCU'S	945	136	1342	671	107	1954	2651	944	442	184	25	9400	938	8	26	0	972		10373
		%	9	1	13	6	1	19	26	9	4	2	0	91	9	0	0	0	9	0	100
SF			0.98	0.98	0.98	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95								
AADT		vehicle	1852	133	1315	425	67	618	840	200	91	39	16	5596	1877	4	3	0	1884	7480	
		Average composition (%)	25	2	18	6	1	8	11	3	1	1	0	75	25	0	0	0	25	100	
		PCU'S	926	133	1315	637	101	1854	2520	900	410	175	24	8994	939	8	18	0	965		9960

4-Laning of Trichy - Dindigul Section
(km 333/000 to km 421/273) of NH 45 in Tamilnadu

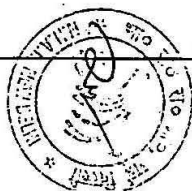
4-152-3

Day	Date (9.00 Am to 9.00 Am)	Direction From - To	MOTORISED VEHICLE											NON MOTORISED VEHICLE								
			2 Wheeler	3 Wheeler	Car	LCV	Bus		Truck			Agrl. Tractor		Total MV	Bicycle	Cycle Richshaw	Animal drawn vehicle		Total NMV	Total Vehicle	Total PCU	
							Mini	Full	2 Axle	3 Axle	Multi Axle	With Trailer	Without Trailer				Bullock Cart	Horse				
Thursday to Friday	26.5.05 to 27.5.05	Trichy - Dindigul	779	126	800	267	36	391	473	151	60	10	0	3093	410	0	0	0	0	411	3503.8	5561
		Dindigul - Trichy	757	120	730	243	32	394	464	81	32	10	5	2868	425	0	0	0	0	425	3293.2	4989
		Total Traffic (Day 1)	1536	246	1530	510	68	785	937	232	92	20	5	5961	835	0	0	0	0	836	6797	10550
Friday to Saturday	27.5.05 to 28.5.05	Trichy - Dindigul	768	110	807	269	59	388	447	117	57	7	3	3032	393	0	0	0	0	393	3425.2	5314
		Dindigul - Trichy	747	98	755	252	34	383	482	111	38	5	5	2908	493	0	0	0	0	493	3401.3	5194
		Total Traffic (Day 2)	1515	208	1562	521	93	771	929	228	95	12	8	5940.4	886	0	0	0	0	886	6826.4	10507
Saturday to Sunday	28.5.05 to 29.5.05	Trichy - Dindigul	829	150	770	257	66	409	381	119	45	9	2	3037	511	1	2	0	0	516	3552.9	5240
		Dindigul - Trichy	740	95	736	245	24	395	399	95	49	8	5	2791	531	0	1	0	0	532	3322.9	4949
		Total Traffic (Day 3)	1569	245	1506	502	90	804	779	214	94	17	7	5827.7	1042	1	3	0	0	1048	6875.7	10189
Sunday to Monday	29.5.05 to 30.5.05	Trichy - Dindigul	635	81	746	249	26	403	430	102	39	10	10	2731	399	1	0	0	0	401	3132.1	4952
		Dindigul - Trichy	729	97	1071	357	48	429	365	99	33	21	9	3259	450	4	0	0	0	454	3712.7	5460
		Total Traffic (Day 4)	1364	178	1817	606	74	832	796	201	72	31	19	5989.8	849	5	0	0	0	855	6844.8	10412
Monday to Tuesday	30.5.05 to 31.5.05	Trichy - Dindigul	759	83	623	208	39	355	397	138	55	16	2	2675	460	3	1	0	0	464	3139	4897
		Dindigul - Trichy	684	76	665	222	25	338	373	113	42	15	9	2560	397	2	0	0	0	399	2959.3	4564
		Total Traffic (Day 5)	1443	159	1288	429	64	693	770	251	97	31	11	5235.3	857	5	1	0	0	863	6098.3	9461
Tuesday to Wednesday	31.5.05 to 1.6.05	Trichy - Dindigul	685	828	681	227	25	290	567	138	45	10	9	3506	461	0	0	0	0	461	3966.5	5915
		Dindigul - Trichy	666	67	637	212	27	355	452	72	39	8	3	2538	474	0	0	0	0	474	3011.9	4593
		Total Traffic (Day 6)	1351	895	1318	439	52	645	1019	210	85	18	12	6043.4	935	0	0	0	0	935	6978.4	10509
Wednesday to Thursday	1.6.05 to 2.6.05	Trichy - Dindigul	823	100	670	223	18	358	545	98	57	12	11	2916	559	2	1	0	0	562	3477.7	5312
		Dindigul - Trichy	821	87	665	222	18	354	517	85	52	11	10	2840	582	0	1	1	1	584	3424.3	5114
		Total Traffic (Day 7)	1644	187	1334	445	36	712	1062	183	109	23	21	5756	1141	2	2	1	1	1146	6902	10426
Total weekly		Trichy - Dindigul	5278	1478	5098	1699	269	2594	3240	863	359	74	37	20989	3193	7	4	0	0	3208	24197	37191
		Dindigul - Trichy	5144	640	5257	1752	208	2648	3051	656	285	78	46	19765	3352	6	2	1	1	3361	23126	34862
Daily traffic		Trichy - Dindigul	754	211	728	243	38	371	463	123	51	11	5	2998	456	1	1	0	0	458	3457	5313
		Dindigul - Trichy	735	91	751	250	30	378	436	94	41	11	7	2824	475	1	0	0	0	480	3304	4980
Average Daily Traffic		vehicle	1489	303	1479	493	68	749	899	217	92	22	12	5822	935	2	1	0	0	938	6760	
		%	22	4	22	7	1	11	13	3	1	0	0	86	14	0	0	0	0	14	100	
		PCU'S	744	303	1479	740	102	2247	2696	977	414	98	18	9816	468	4	5	0	0	476		10293
		%	7	3	14	7	1	22	26	9	4	1	0	95	5	0	0	0	0	5		100
SF			0.98	0.98	0.98	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95									
AADT		vehicle	1459	297	1449	468	65	712	854	206	87	21	11	5629	935	2	1	0	0	938	6567	
		Average composition (%)	22	4	22	7	1	11	13	3	1	0	0	86	14	0	0	0	0	14	100	
		PCU'S	739	297	1449	703	97	2136	2561	928	393	93	17	9403	468	4	6	0	0	478		9880

4-Laning of Trichy - Dindigul Section
(km 333/000 to km 421/273) of NH 45 in Tamilnadu

A-132-4

A-132-4



ANNEXURE A-4 : PAVEMENT CONDITION SURVEY

From : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 18.06.05
Weather :

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Failed)			Speed (km/hr)	Cracking (%)	Ravelling (%)	Potholing (No. and % 100m)**	Rut (None/Moderate/Severe)				
Km 333/000 to 334/000																	
000	100	Surface	BT	180	Earthen Shoulder	F	60	F	-	-	-	-	40.643	-	-	PF	Both side shoulder not present
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	-	-	-	-	40.38	-	-	PF	Cholan Nagar Builtup area
200	300	Base	WBM	200	Earthen Shoulder	F	60	F	0.928	-	-	-	1/0.063	-	G	PF	Cholan Nagar Builtup area
300	400	Sub-base	Gravel	300	Earthen Shoulder	F	60	F	1.071	-	-	-	-	-	G	PF	Cholan Nagar Builtup area
400	500	Sub-grade		-	Earthen Shoulder	F	60	F	0.428	-	-	-	1/0.14	-	G	PF	Cholan Nagar Builtup area
500	600	Surface	BT	240	Earthen Shoulder	F	60	F	1.071	-	-	-	-	-	G	PF	Cholan Nagar Builtup area
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	2.628	10	4/5	M	3/1.97	-	G	PF	Paved surface are Fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	1.714	10	5/4	M	5/8.3	75	G	PF	Paved surface are Fair Condition
800	900	Sub-base	Gravel	350	Earthen Shoulder	F	60	F	0.342	-	1/0.3	-	5/6.3	90	G	PF	Paved surface are Fair Condition
900	1000	Sub-grade		-	Earthen Shoulder	F	60	F	0.428	-	3/2	-	5/10.84	-	G	PF	Paved surface are Fair Condition

Note:

- * : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDG = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; ET** = Bituminous Top
** : No. and % 100m = Total no. of Pot holing / Patching and % age area of Pot holing / Patching 100m of length of road
*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 16.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F) **	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holling (No. and % 100m) **	Rut (Non/Moderate/Severe)	Patching (No. and % 100m) **				
Km 334/000 to 335/000																	
000	100	Surface	BT	240	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC
100	200	Binder	Bitumen	-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC
200	300	Base	WBM	200	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC
	400	Sub-base	Gravel	300	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC
400	500	Sub-grade		-	Earthen Shoulder	F	80	G	2.3	-	-	-	-	-	G	PF	Newly relaid with SDBC
500	600	Surface	BT	220	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC
600	700	Binder	Bitumen	-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC
700	800	Base	WBM	200	Earthen Shoulder	F	80	G	-	-	-	-	1/0.85	-	G	PF	Newly relaid with SDBC
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	80	G	-	-	-	-	1/0.64	-	G	PF	Newly relaid with SDBC
900	1000	Sub-grade		-	Earthen Shoulder	F	80	G	-	-	-	-	3/1.464	-	G	PF	Newly relaid with SDBC

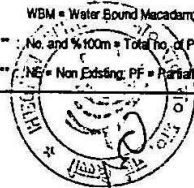
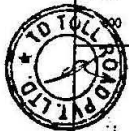
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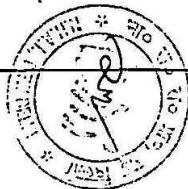
* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total No. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 17.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/fair/ Poor)	Road side drain (NE/PFF)**	Remarks	
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Speed (km/hr)	Quality (G/P/P/P)	Cracking (%)	Ravelling (%)	Pot hollng (No. and % 100m)**					Rut (None/Moderate /Severe)
Km 335/000 to 336/000 *																		
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	1.142	-	-	-	-	4/4.4	-	G	PF	Vannan Kovil Built up area
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	-	-	-	-	-	4/6.1	-	-	PF	Vannan Kovil Built up area
200	300	Base	WBM	120	Earthen Shoulder	F	40	G	-	-	-	-	-	-	-	-	PF	Vannan Kovil Built up area
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	40	G	-	-	-	-	-	-	-	-	PF	Vannan Kovil Built up area
400	500	Sub-grade		-	Earthen Shoulder	F	40	G	-	-	-	-	-	-	-	G	PF	Vannan Kovil Built up area
500	600	Surface	BT	180	Earthen Shoulder	F	40	G	-	-	-	-	-	-	-	G	PF	Vannan Kovil Built up area
600	700	Binder	Bitumen	-	Earthen Shoulder	F	80	G	0.94	-	-	-	-	-	-	G	PF	Vannan Kovil Built up area
700	800	Base	WBM	200	Earthen Shoulder	F	80	G	-	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	300	Earthen Shoulder	F	80	G	-	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade		-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	-	G	PF	Agricultural College on RHS

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** - No. and % 100m = Total no. of Pot holl / Patching and % age area of Pot holl / Patching 100m of length of road

*** NE = Non Existing; PF = Partially Functional; F = Functional.

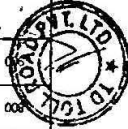
ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

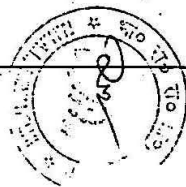
Road Name : Trichy to Dindigul
 Section (from) : Km 333.000 to Km 421.500
 District (from) : Trichy
 Road No : NH - 45
 Date of Survey : 17.05.05
 Weather : Normal

From (m)	To (m)	Km 336/000 to 337/000														
		Pavement composition			Shoulder		Riding	Quality		Pavement Condition						
Composition			Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)	Speed (km/h)	Quality (C/FF/PP)	Cracking (%)	Ravelling (%)	Pot holeing (No. and % 100m)**	Rut (Non/Moderate/Severe)	Patching (No. and % 100m)**	Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Remarks
000	100	Surface	BT	250	Earthen Shoulder	F	60	F	4.985	10	-	M	3/1.36	50	G	
100	200	Binder	Blumen	-	Earthen Shoulder	F	40	P	2.285	5	-	M	5/3.8	50	G	Paved surface fair Condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	0.671	-	-	-	2/35	-	G	Paved surface fair Condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	0.828	2	-	-	6/16	-	G	Paved surface fair Condition
400	500	Sub-grade		-	Earthen Shoulder	F	60	F	1.642	-	-	-	8/30	-	G	Paved surface fair Condition
500	600	Surface	BT	200	Earthen Shoulder	F	60	F	0.80	-	-	-	4/3.2	-	G	Paved surface fair Condition
600	700	Binder	Blumen	-	Earthen Shoulder	F	60	F	0.785	-	-	-	5/11.8	-	G	Paved surface fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	0.536	-	-	-	6/28.03	-	G	Paved surface fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	0.928	-	-	-	4/2.28	-	G	Paved surface fair Condition
900	1000	Sub-grade		-	Earthen Shoulder	F	60	F	1.37	-	-	-	3/0.57	-	G	Paved surface fair Condition

NE = Non Existing, PF = Partially Functional.
No. and % 100m = Total No. of Pot holeing / Patching and % area of Pot holeing / Patching 100m of length of road
WBM = Water Bound Macadam, DBM = Dense Bituminous Macadam, BS = Brick Soling, SS = Stone soling, BT** = Bituminous Top
BUSG = Built up spray Grout, AC = Asphaltic Concrete, SDC = Semi Dense Concrete, PC = Premix Carpet, MSS = Mix Seal Surfacing, BT* = Black Top

Note:
 * : BUSG = Built up Spray Grout, AC = Asphaltic Concrete, SDC = Semi Dense Concrete, PC = Premix Carpet, MSS = M&S Seal Surfacing, BT = Black Top
 WBM = Water Bound Macadam, DBM = Dense Bituminous Macadam, BLM = Bituminous Macadam, BS = Brick Soling, SS = Stone Soling, BT = Bituminous Top
 ** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m length of road
 *** : NE = Not Existing, PF = Partially Functional, F = Functional





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 17.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition						Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate / Severe)	Patching (No. and % 100m)**					
Km 337/000 to 338/000																		
000	100	Surface	BT	150	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	
100	200	Binder	Bitumen	-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	
200	300	Base	WBM	150	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	
400	500	Sub-grade		-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	
500	600	Surface	BT	150	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	
600	700	Binder	Bitumen	-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	
700	800	Base	WBM	150	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	
900	1000	Sub-grade		-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC	

Note:

BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 338.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 17.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEP/FF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Fair Poor/ Good)			Cracking (%)	Ravelling (%)	Pot hollng (No. and % 100m)**	Rut (Non/Moderate/ Severe)	Patching (No. and % 100m)**				
Km 338.000 to 339.000,																	
000	100	Surface	BT	150	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Shoulder - high undulation
100	200	Binder	Bitumen	-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Good condition - Shoulder - high undulation
200	300	Base	WBM	150	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Good conditio - Shoulder - high undulation
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Good condition - Shoulder - high undulation
400	500	Sub-grade		-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Good condition - Shoulder - high undulation
500	600	Surface	BT	200	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Good condition - Shoulder - high undulation
600	700	Binder	Bitumen	-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Good condition - Shoulder - high undulation
700	800	Base	WBM	150	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	-PF	Good condition - Shoulder - high undulation
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Good condition - Shoulder - high undulation
900	1000	Sub-grade		-	Earthen Shoulder	F	80	G	-	-	-	-	-	-	G	PF	Good condition - Shoulder - high undulation

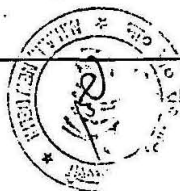
Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SOC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Project Name : Trichy to Dindigul
 Section (From) : Km 339.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 17.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/hr)	Quality (GIR/PAV)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Ravelling (%)	Pot holling (No. and % 100m)**	Rut (Non/moderate/ Severe)	Patching (No. and % 100m)**				
Km 339.000 to 340.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	1.50	-	-	-	3/0.1	-	G	PF	-
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	2.285	-	-	-	2/0.1	-	G	PF	-
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	1.285	-	-	-	-	-	G	PF	Shoulder - high undulation
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	-	-	-	-	2/0.074	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	-	-	-	-	3/1.07	-	G	PF	Shoulder - high undulation
500	600	Surface	BT	100	Earthen Shoulder	F	60	F	1.785	-	-	-	-	-	G	PF	Shoulder - high undulation
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	2.285	-	-	-	-	-	G	PF	Fair condition
700	800	Base	WBM	200	Earthen Shoulder	F	60	F	4.385	-	-	-	-	-	G	PF	Shoulder - high undulation
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	-	-	-	-	-	50	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	-	-	-	-	-	50	G	PF	Good condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holing / Patching and % age area of Pot holing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 17.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/h)	Quality Quality (G/F/P/V/P)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/FF/FP)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (Non/moderate Severe)	Patching (No. and % 100m)**				
Km 340.000 to 341.000																	
000	100	Surface	BT	120	Earthen Shoulder	F	60	F	4.285	2.25	20.5	-	20.018	40	G	PF	Shoulder - high undulation
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	3.428	5.1	20.4	-	20.18	35	G	PF	340/200 way to Podangolathupatti
200	300	Base	WBM	200	Earthen Shoulder	F	60	F	3.00	2.38	-	-	10.5	50	G	PF	Fair condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	6.85	1.05	-	-	-	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	2.285	-	-	-	20.25	-	G	PF	Good condition , Shoulder - high undulation
500	600	Surface	BT	200	Earthen Shoulder	F	60	F	7.71	1.75	-	-	-	-	G	PF	Shoulder - High undulation
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	16.85	1.30	-	-	-	30	G	PF	Fair condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	4.20	1.55	-	-	-	-	G	PF	Shoulder - high undulation
800	900	Sub-base	Gravel	150	Earthen Shoulder	F	60	F	2.14	-	-	-	-	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	2.57	-	-	-	10.02	50	G	PF	Fair condition

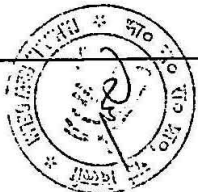
Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 17.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)---	Remarks
		Composition	Type	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate Severe)	Patching (No. and % 100m)**				
Km 341.000 to 342.000.																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	3.428	2.50	20.5	-	20.86	55	G	PF	341/000 Marhal Temple RHS curve started
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	1.714	4.23	-	-	30.64	-	G	PF	Fair condition
200	300	Base	WBM	200	Earthen Shoulder	F	60	F	6.428	-	3/1	-	30.43	35	G	PF	Fair condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	7.71	2.56	3/1	M	30.9	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	10.28	2.1	-	M	30.71	-	Level	PF	Fair condition
500	600	Surface	BT	200	Earthen Shoulder	F	60	F	7.428	2.50	-	-	-	-	Level	PF	RHS JJ college of Engineering at 341/500
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	7.85	2.21	-	-	20.43	-	G	PF	Fair condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	4.28	-	-	-	-	-	G	PF	Fair condition
800	900	Sub-base	Gravel	300	Earthen Shoulder	F	60	F	1.714	-	-	-	-	25	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	1.07	-	-	-	-	-	G	PF	Fair condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** . No. and %100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 17.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/PF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Ravelling (%)	Pot holling (No. and % 100m)**	Rut (None/moderate/severe)	Patching (No. and % 100m)**				
Km 342.000 to 343.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	8.571	-	-	-	20.5	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	11.21	6.36	-	-	10.32	40	G	PF	JJ college boundary closed at 200, RHS way to Seetha pati
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	15.63	4.75	-	-	20.14	-	G	PF	Fair condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	2.85	-	-	-	-	-	G	PF	Madrastul Hasamine Fee Jamia Yaseen Arabic collage
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	4.21	-	-	-	40.6	25	G	PF	Shoulder - high undulation
500	600	Surface	BT	240	Earthen Shoulder	F	60	F	3.63	-	-	-	82.96	-	G	PF	343/1 RCC pipe culvert at 550
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	11.36	3.16	4/1	M	-	-	G	PF	Water pumping station at 200 LHS
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	5.35	2.15	-	-	-	-	G	PF	Shoulder - high undulation
800	900	Sub-base	Gravel	300	Earthen Shoulder	F	60	F	4.71	-	-	-	20.48	50	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	0.75	-	-	-	-	-	G	PF	343/2 RCC pipe culvert at 950

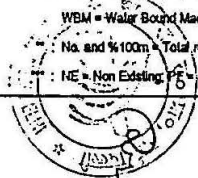
Note.

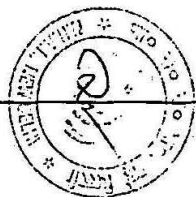
* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

NE = Non Existing; PE = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 17.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (Non/moderate/severe)	Patching (No. and % 100m)**				
Km 343.000 to 344.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	0.714	-	-	-	-	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	1.714	-	-	-	-	-	G	PF	Fair condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	1.071	-	-	-	-	-	G	PF	Site for Balaji Catering college at 300 RHS
300	400	Sub-base	Gravel	300	Earthen Shoulder	F	60	F	1.857	-	-	-	-	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	2.285	-	-	-	-	-	G	PF	Fair condition
500	600	Surface	BT	150	Earthen Shoulder	F	60	F	-	-	-	-	-	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	3.714	-	20.3	-	57.4	45	G	PF	Fair condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	12.36	-	-	-	3/1.5	20	G	PF	Fair condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	11.00	5.38	-	-	-	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	2.28	-	-	-	-	-	G	PF	Jhark minerals PVT LTD at 910 LHS, Samathuvapuram at 950 RHS

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 19.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/h)	Quality (GIRPAV)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate/ Severe)	Patching (No. and % 100m)**				
From 344.000 to 345.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	2	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	1.5	-	-	-	-	2/0.5	G	PF	BT Surface Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	3.4	-	-	-	-	3/1.5	G	PF	BT Surface Fair Condition
500	600	Surface	BT	150	Earthen Shoulder	F	70	G	2.73	-	-	-	-	5/3.8	G	PF	BT Surface Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	G	1.56	-	-	-	-	5/7.4	G	PF	BT Surface Fair Condition
700	800	Base	WBM	170	Earthen Shoulder	F	60	G	13.6	-	-	-	-	3/1.5	G	PF	BT Surface Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	G	15.27	-	-	-	-	2/2.1	G	PF	BT Surface Fair Condition, IOCL Plant on LHS
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	2.3	-	-	-	-	-	G	PF	BT Surface Fair Condition, IOCL Plant on LHS

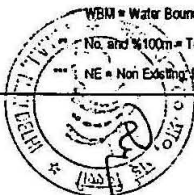
Note.

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WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 19.06.06
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/hr)	Quality (GIR/FVP)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Releving (%)	Pot holing (No. and % 100m)**	Rut (None/Moderate Severe)	Patching (No. and % 100m)**				
Km 345.000 to 346.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	G	7.45	-	-	-	6/1.93	-	G	PF	BT Surface Good Condition, IOCL Plant on LHS
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	G	8.11	-	-	-	5/10.18	-	G	PF	BT Surface Good Condition, IOCL Plant on LHS
200	300	Base	WBM	150	Earthen Shoulder	F	60	G	4.76	-	-	-	5/2.21	-	G	PF	BT surface good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	G	11.31	-	-	-	2/1.5	-	G	PF	BT surface good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	G	3.74	-	-	-	3/3.9	-	G	PF	BT surface good condition
500	600	Surface	BT	150	Earthen Shoulder	F	60	G	6.15	-	-	-	-	-	G	PF	BT surface good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	G	2.11	-	-	-	3/1.4	-	G	PF	BT surface good condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	G	1.63	-	-	-	-	-	G	PF	All India Radio on RHS
800	900	Sub-base	Gravel	150	Earthen Shoulder	F	60	G	2.41	-	-	-	4/12.2	-	G	PF	All India Radio on RHS
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	G	1.1	-	-	-	-	-	G	PF	BT Surface good condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 19.06.06
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F) **	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m) **	Rut (None/Moderate/Severe)	Patching (No. and % 100m) **				
Km 346.000 to 347.000																	
000	100	Surface	BT	200	Earthen Shoulder	F	70	G	5.12	-	-	-	-		G	PF	BT Surface Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-		G	PF	BT Surface Fair Condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	1.5	-	-	-	-		G	PF	BT Surface Fair Condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-		G	PF	BT Surface Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-		G	PF	BT Surface Fair Condition
500	600	Surface	BT	200	Earthen Shoulder	F	70	G	1.08	-	-	-	3/1.42		G	PF	BT Surface Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	2.71	-	-	-	5/1.6		G	PF	BT Surface Fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	70	G	0.96	-	-	-	20.68		G	PF	BT Surface Fair Condition
800	900	Sub-base	Gravel	150	Earthen Shoulder	F	70	G	-	-	-	-	10/3.13		G	PF	BT Surface Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	7/7.55		G	PF	BT Surface Fair Condition

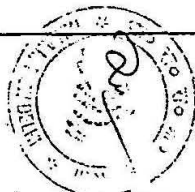
Note:

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WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 19.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition						Pavement edge drop (mm)	Enbankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**					
Km 347.000 to 348.000																		
000	100	Surface	BT	150	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	
100	200	Binder	Bitumen	-	Earthen Shoulder	G	70	G	-	-	-	-	20.4	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	
200	300	Base	WBM	150	Earthen Shoulder	G	70	G	-	-	-	-	4/1.43	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	
300	400	Sub-base	Gravel	200	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	
400	500	Sub-grade	-	-	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	
500	600	Surface	BT	150	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	
600	700	Binder	Bitumen	-	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	
700	800	Base	WBM	150	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	
800	900	Sub-base	Gravel	250	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	
900	1000	Sub-grade	-	-	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	BT Surface Good Condition, Allampatti Pudur Village	

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DSM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 19.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEPF/PE)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate /Severe)	Patching (No. and % 100m)**				
Km 348.000 to 349.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	G	10.31	-	-	-	8/4.6	-	G	PF	BT Surface Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	G	4.81	-	-	-	9/3.87	-	G	PF	BT Surface Fair Condition
200	300	Base	WBM	200	Earthen Shoulder	F	60	G	9.63	-	-	-	8/2	-	G	PF	BT Surface Fair Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	G	4.71	-	-	-	5/2.9	-	G	PF	BT Surface Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	G	3.24	-	-	-	52.03	-	G	PF	BT Surface Fair Condition
500	600	Surface	BT	250	Earthen Shoulder	F	60	G	-	-	-	-	-	-	G	PF	BT Surface Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	G	3.33	-	-	-	3/3.3	-	G	PF	BT Surface Fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	G	2.41	-	-	-	4/3.3	-	G	PF	BT Surface Fair Condition
800	900	Sub-base	Gravel	150	Earthen Shoulder	F	60	G	4.74	-	-	-	8/3.25	-	G	PF	BT Surface Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	G	2.61	-	-	-	7/5.25	-	G	PF	BT Surface Fair Condition

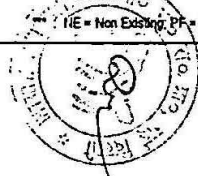
Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

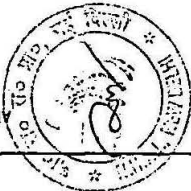
No. and % 100m = Total no. of Pot holes / Patching and % area of Pot holes / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional





Road Name : Tricity to Dindigul
Section (From) : Km 333,000 to Km 421,600
District (From) : Tricity



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road No : NH- 45
Date of Survey : 19.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder			Riding	Quality	Pavement Condition					Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)	Speed (km/h)			Cracking (%)	Ravelling (%)	Pol. holes (No. and % 10cm)*	Rut (Non/Moderate/Severe)	Patching (No. and % 10cm)**	
000	100	Surface	BT	250	Earthen Shoulder	F	60	G	7.16	-	-	-	-	96.4	BT Surface Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	G	4.36	-	-	-	-	72.687	BT Surface Fair Condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	G	5.21	-	-	-	-	41.64	BT Surface Fair Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	G	1.65	-	-	-	-	-	BT Surface Fair Condition
400	600	Sub-grade	-	-	Earthen Shoulder	F	60	G	4.31	-	-	-	-	20.18	BT Surface Fair Condition
500	600	Surface	BT	270	Earthen Shoulder	F	60	G	-	-	-	-	-	21.5	BT Surface Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	50	G	3.41	-	-	-	-	20.78	BT Surface Fair Condition
700	800	Base	WBM	200	Earthen Shoulder	F	60	G	-	-	-	-	-	-	BT Surface Fair Condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	G	4.1	-	-	-	-	56.1	BT Surface Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	G	1.65	-	-	-	-	-	BT Surface Fair Condition

Note: : BUSG = Built up Spray Gout, AC = Asphaltic Concrete, SDC = Semi Dense Concrete, PC = Premix Carpet, MSS = M/S Seal Surfacing, BT* = Black Top
WBM = Water Bound Macadam, DBM = Dense Bituminous Macadam, BHM = Bituminous Macadam, BS = Brick Soling, SS = Stone soling, BT** = Bituminous Top
* : No. and % 10cm = Total no. of Pol holes / Patching and % age area of Pol holes / Patching 10cm of length of road
** : NE = Non Existing, PF = Partially Functional, F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 19.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)***	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate/ Severe)	Patching (No. and % 100m)**				
Km 350.000 to 351.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	G	3.51	-	-	-	20.893	-	G	PF	BT Surface Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	50	G	7.36	-	-	-	60.59	-	G	PF	BT Surface Fair Condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	G	5.5	-	-	-	31.714	-	G	PF	BT Surface Fair Condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	G	4.71	-	-	-	64.71	-	G	PF	BT Surface Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	G	3.8	-	-	-	42.78	-	G	PF	BT Surface Fair Condition
500	600	Surface	BT	200	Earthen Shoulder	F	60	G	-	-	-	-	-	-	G	PF	Ariyar Bridge 10 Span of 12.5m
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	G	3.71	-	-	-	26.875	-	G	PF	Ariyar Bridge 10 Span of 12.5m
700	800	Base	WBM	150	Earthen Shoulder	F	60	G	5.12	-	-	-	35.9	-	G	PF	Ariyar Bridge 10 Span of 12.5m
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	G	4.67	-	-	-	42.36	-	G	PF	Ariyar Bridge 10 Span of 12.5m
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	G	5.36	-	-	-	31.714	-	G	PF	Ariyar Bridge 10 Span of 12.5m

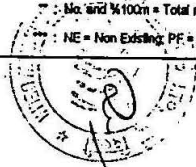
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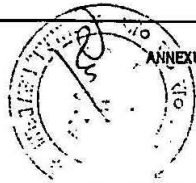
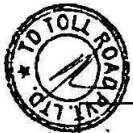
BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Siding; SS = Stone siding; BT** = Bituminous Top

No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 46
Date of Survey : 19.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Speed (km/h)	Quality (G/F/P/N?)	Cracking (%)	Ravelling (%)	Pot holeing (No. and % 100m) **				
Km 351.000 to 352.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	60	G	3.78	-	-	-	4/3.78	-	G	PF	BT Surface Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	G	4.56	-	-	-	7/2.24	40	G	PF	BT Surface Fair Condition
200	300	Base	WBM	220	Earthen Shoulder	F	60	G	10.23	-	-	-	4/18	-	G	PF	BT Surface Fair Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	G	5.78	-	2/1.1	-	6/7.8	-	G	PF	BT Surface Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	G	4.78	-	-	-	3/4.28	35	G	PF	BT Surface Fair Condition
500	600	Surface	BT	100	Earthen Shoulder	F	60	G	5.31	-	-	-	3/5.71	-	G	PF	BT Surface Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	G	6.16	-	-	-	4/6.3	-	G	PF	BT Surface Fair Condition
700	800	Base	WBM	250	Earthen Shoulder	F	60	G	3.78	-	-	-	2/2.85	-	G	PF	BT Surface Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	G	4.16	-	-	-	4/3.86	30	G	PF	BT Surface Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	G	5.31	-	-	-	4/3.15	-	G	PF	BT Surface Fair Condition

Note:

* : BUSG = Built up Spray Grouit; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

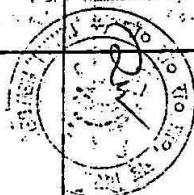
ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 19.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/hr)	Quality Quality (G/P/F/P)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Ravelling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**				
Km 352,000 to 353,000																	
000	100	Surface	BT	180	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village
100	200	Binder	Bitumen	-	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village
200	300	Base	WBM	220	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village
300	400	Sub-base	Gravel	250	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village
400	500	Sub-grade	-	-	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village
500	600	Surface	BT	150	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village
600	700	Binder	Bitumen	-	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village
700	800	Base	WBM	180	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village
800	900	Sub-base	Gravel	200	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village
900	1000	Sub-grade	-	-	Earthen Shoulder	G	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SDBC Maravanur Village

Note : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
 WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top
 No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road
 NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 353.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 19.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition						Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PP/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Ravelling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**					
Km 353.000 to 354.000																		
000	100	Surface	BT	180	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
200	300	Base	WBM	210	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition , Newly over laid	
300	400	Sub-base	Gravel	350	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition ,	
500	600	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
700	800	Base	WBM	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT* = Bituminous Top

** : No. and %100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 19.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Enbankment condition (Good/Fair/ Poor)	Road side drain (NE/FF/)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (Non/Moderate /Severe)	Patching (No. and % 100m)**				
Km 354.000 to 355.000																	
000	100	Surface	BT	150	Earthm Shoulder	F	60	F	6.428	7.25	-	M	5/1.8	40	G	PF	354/300 LHS way to padampatti
100	200	Binder	Bitumen	-	Earthm Shoulder	F	60	F	5.35	-	-	-	2/0.214	30	G	PF	Fair Condition
200	300	Base	WBM	240	Earthm Shoulder	F	60	F	5.14	-	-	-	1/1.714	35	G	PF	Fair Condition
300	400	Sub-base	Gravel	200	Earthm Shoulder	F	60	F	4.714	-	-	-	-	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthm Shoulder	F	60	F	1.657	-	-	-	-	-	G	PF	Fair Condition
500	600	Surface	BT	160	Earthm Shoulder	F	60	F	1.714	-	-	-	-	-	G	PF	Fair Condition
600	700	Binder	Bitumen	-	Earthm Shoulder	F	60	F	3.643	-	-	-	1/0.036	40	G	PF	Fair Condition
700	800	Base	WBM	220	Earthm Shoulder	F	60	F	7.42	3.21	-	-	2/1.23	45	G	PF	Fair Condition
800	900	Sub-base	Gravel	250	Earthm Shoulder	F	60	F	4.714	-	-	-	45%	-	G	PF	- Fair Condition
900	1000	Sub-grade	-	-	Earthm Shoulder	F	60	F	4.285	-	-	-	25%	-	G	PF	Fair Condition

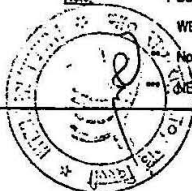
Note

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Siding; SS = Stone siding; BT* = Bituminous Top

No. and %100m = Total no. of Pot holing / Patching and % area of Pot holing / Patching 100m of length of road

ME = Non Existing; PF = Partially Functional; F = Functional





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 353.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 19.05.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition						Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Speed (km/hr)	Quality (G/F/P/F)	Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m) **	Rut (Non/Moderate/Severe)				
Km 353.000 to 358.000																		
000	100	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	Newly relaid with SDBC
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	Good condition
200	300	Base	WBM	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	Good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	Good condition
500	600	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	Good condition
700	800	Base	WBM	300	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	355/700 LHS Canal
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-		G	PF	Good condition

Note:

* : BUSG = Built up Spray Grouit; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

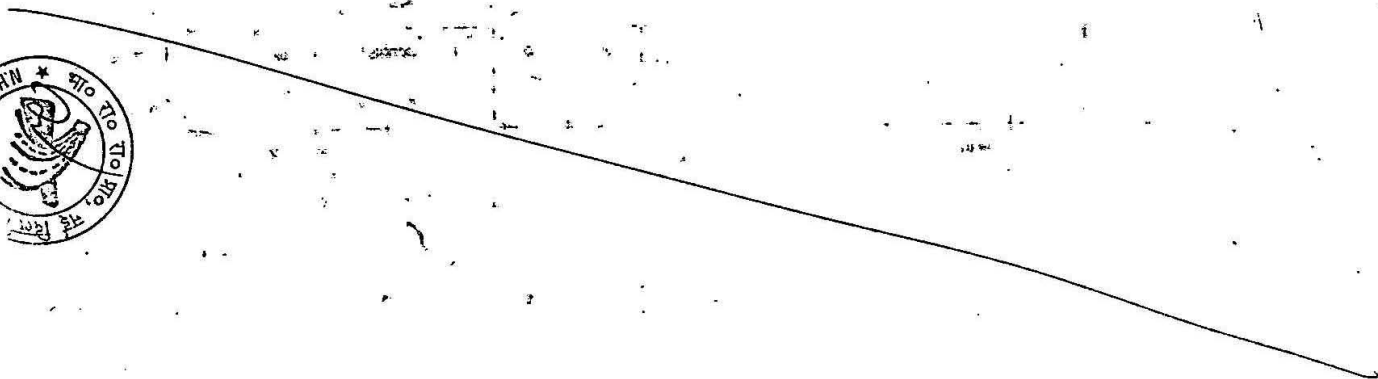
ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 19.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/SE/PF/None)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Good/Poor)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rein (Nonultraconcrete severe)	Patching (No. and % 100m)**				
Km 356,000 to 357,000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	4.285	5.21	-	-	25%	-	G	PF	Fair Condition
100	200	Blinder	Bitumen	-	Earthen Shoulder	F	60	F	5.00	-	-	-	5%	-	G	PF	Fair Condition
200	300	Base	WBM	200	Earthen Shoulder	F	60	F	5.57	-	-	-	60.0214	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	2.285	-	-	-	20.46	-	G	PF	356/400 LHS Canal , 356/350 LHS Cross gravel road
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	-	-	-	-	-	-	G	PF	Fair Condition
500	600	Surface	BT	150	Earthen Shoulder	F	60	F	1.214	3.61	-	-	-	-	G	PF	Fair Condition
600	700	Blinder	Bitumen	-	Earthen Shoulder	F	60	F	0.857	-	-	-	5/30%	-	G	PF	Fair Condition
700	800	Base	WBM	250	Earthen Shoulder	F	60	F	1.428	1.72	-	-	8/20%	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	2.142	-	-	-	20.018	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	-	-	-	-	-	-	G	PF	Fair Condition

Note: 1. BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT = Black Top
 WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone Soling; BTM = Bituminous Top
 1. No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road
 2. N = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 20.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEP/F/F)***	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)	Speed (km/h)	Quality (G/F/P/W)	Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate/ Severe)	Patching (No. and % 100m)**				
Km 357,000 to 358,000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	1.828	-	-	-	30.43	-	G	PF	357/060 way to Pariyapatti
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	1.143	-	-	-	-	-	G	PF	Fair Condition
200	300	Base	WBM	220	Earthen Shoulder	F	60	F	-	-	-	-	-	-	G	PF	RCC Slab culvert at 357/300
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	2.642	-	-	-	20.86	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	2.143	-	-	-	-	-	G	PF	Fair Condition
500	600	Surface	BT	150	Earthen Shoulder	F	60	F	3.64	3.25	-	-	8/6.2	-	G	PF	RCC Pipe culvert 357/510
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	2.05	3.75	-	-	4/1.8	-	G	PF	Fair Condition
700	800	Base	WBM	200	Earthen Shoulder	F	60	F	2.285	-	-	-	4/2.5	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	4.714	-	-	-	8/20%	-	G	PF	357/820 RHS way to Udaiyapatti
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	2.05	-	-	-	11/40%	-	G	PF	357/850 Village name Muthapudaiyapatti

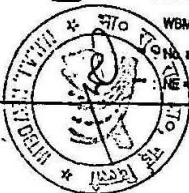
Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone Soling; BT* = Bituminous Top

No. and % 100m = Total no. of Pol. holes / Patching and % age area of Pol. holes / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 353.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 20.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PP/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m)**	Rut (Non/Moderate /Severe)	Patching (No. and % 100m)**				
Km 358.000 to 359.000																	
000	100	Surface	BT	200	Earthen Shoulder	F	60	F	1.428	-	-	-	14%	-	G	PF	Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	3.714	-	3-0.8	-	6%	-	G	PF	353/200 R/Hs curve started
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	1.143	-	-	-	32.4	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	150	Earthen Shoulder	F	60	F	-	-	-	-	-	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	-	-	-	-	-	-	G	PF	Fair Condition
500	600	Surface	BT	120	Earthen Shoulder	F	60	F	1.857	-	-	-	-	-	G	PF	Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	1.071	-	-	-	6/10%	-	G	PF	358/700 R/Hs way to Rajalgaudani palli
700	800	Base	WBM	200	Earthen Shoulder	F	60	F	1.571	-	-	-	11/15%	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	150	Earthen Shoulder	F	60	F	1.142	-	-	-	8/6%	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	1.857	-	-	-	5/4%	-	G	PF	359/915 R/Hs Jothi Mirco cost Ltd

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 20.05.05
 Weather : Normal

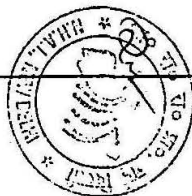
From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEPF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Speed (km/hr)	Quality (G/F/P/V)	Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**				
Km 359.000 to 360.000																	
000	100	Surface	BT	120	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Fair Condition
200	300	Base	WBM	180	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Fair Condition
500	600	Surface	BT	120	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Ambumedu Village, Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Ambumedu Village, Fair condition
700	800	Base	WBM	180	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Fair Condition

Note: BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone Soling; BT = Bituminous Top

No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 20.08.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PE/PF)***	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**				
Km 360.000 to 361.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Newly relaid with SBC
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	1/0.7	-	G	PF	Good Condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	2/1.2	-	G	PF	360/380 RHS way to Musiri SH 71
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	1/0.018	-	G	PF	Good Condition
500	600	Surface	BT	120	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition
700	800	Base	WBM	180	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	360/800 RCC slab major bridge across mamund River
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	360/875 RCC slab culvert 361/4
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mbt Seal Surfacing; BT = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT = Bituminous Top

** : No. and %100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 20.05.05
 Weather : Normal

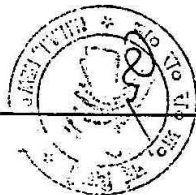
From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m) **	Rut (None/Moderate /Severe)	Patching (No. and % 100m) **				
Km 361.000 to 362.000																	
000	100	Surface	BT	150	Paved & Earthen Shoulder	F	70	G	-	-	-	-	20.5	-	Level	NE	361/000 Manaparai town started
100	200	Binder	Bitumen	-	Paved & Earthen Shoulder	F	60	F	-	-	-	-	2/1.6	-	Level	NE	Good Condition
200	300	Base	WBM	150	Paved & Earthen Shoulder	F	70	G	-	-	-	-	2/1.3	-	G	NE	Heavy built up area Good condition
300	400	Sub-base	Gravel	200	Paved & Earthen Shoulder	F	70	G	-	-	-	-	20.3	-	G	NE	Heavy built up area Good condition
400	500	Sub-grade	-	-	Paved & Earthen Shoulder	F	70	F	-	-	-	-	20.017	-	G	NE	Heavy built up area Good condition
500	600	Surface	BT	270	Paved & Earthen Shoulder	F	70	F	3.72	-	-	-	63.3	-	G	NE	361/580 LHS way to Manaparai town
600	700	Binder	Bitumen	-	Paved & Earthen Shoulder	F	70	F	4.51	-	-	-	3/0.8	-	G	NE	
700	800	Base	WBM	150	Paved & Earthen Shoulder	F	70	F	-	-	-	-	20.5	-	G	NE	Manaparai Bye pass Fair Condition
800	900	Sub-base	Gravel	200	Paved & Earthen Shoulder	F	70	F	-	-	-	-	-	-	G	NE	Manaparai Bye pass Fair Condition
900	1000 *	Sub-grade	-	-	Paved & Earthen Shoulder	F	70	F	-	-	-	-	10.018	-	G	NE	Heavy built up area Manaparai

* BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 20.07.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)***	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holing (No. and % 100m)**	Rut (None/Moderate/ Severe)	Patching (No. and % 100m)**				
Km 362.000 to 363.000																	
000	100	Surface	BT	150	Paved Shoulder	F	60	F	-	-	-	-	-	-	G	NE	Heavy Bridge Manaparai Bye pass
100	200	Binder	Bitumen	-	Paved Shoulder	F	60	F	-	-	-	-	-	-	G	NE	Fair Condition, Manaparai
200	300	Base	WBM	120	Paved Shoulder	F	60	F	-	-	-	-	-	-	G	NE	Fair Condition
300	400	Sub-base	Gravel	250	Paved Shoulder	F	60	F	-	-	4-1	-	5/1.05	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Paved Shoulder	F	60	F	-	-	4-1.5	-	5/1.2	-	G	PF	Fair Condition
500	600	Surface	BT	75	Paved Shoulder	F	60	F	-	-	3-1	-	6/2.05	-	G	PF	362/580 LHS way to Manaparai
600	700	Binder	Bitumen	-	Paved Shoulder	F	60	F	-	-	4-2	-	4/1.2	-	G	PF	Existing pavement surface Fair Condition
700	800	Base	WBM	120	Paved Shoulder	F	60	F	-	-	-	-	6/1.3	-	G	PF	Existing pavement surface Fair Condition
800	900	Sub-base	Gravel	180	Paved Shoulder	F	60	F	-	-	-	-	3/0.8	-	G	PF	Existing pavement surface Fair Condition
900	1000	Sub-grade	-	-	Paved Shoulder	F	60	F	-	-	-	-	6/1.02	-	G	PF	Existing pavement surface Fair Condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holing / Patching and % age area of Pot holing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 20.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEPF/?)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (Non/moderate/ Severe)	Patching (No. and % 100m)**				
Km 363.000 to 364.000																	
000	100	Surface	BT	75	BT	F	70	G	-	-	-	-	-	-	G	PF	BT surface Newly relaid with SDBC
100	200	Binder	Bitumen	-	BT	F	70	G	-	-	-	-	20.008	-	G	PF	
200	300	Base	WBM	130	BT	F	70	G	-	-	-	-	-	-	G	PF	363/220 Minor Bridge 8 span of 4.2 m
300	400	Sub-base	Gravel	200	BT	F	70	G	-	-	-	-	-	-	G	PF	Earthen shoulder
400	500	Sub-grade	-	-	BT	F	70	G	-	-	-	-	-	-	G	PF	BT surface Newly relaid with SDBC
500	600	Surface	BT	50	BT	F	70	G	-	-	-	-	-	-	G	PF	BT surface Newly relaid with SDBC
600	700	Binder	Bitumen	-	BT	F	70	G	-	-	-	-	-	-	G	PF	BT surface Newly relaid with SDBC
700	800	Base	WBM	150	BT	F	70	G	-	-	-	-	-	-	G	PF	BT surface Newly relaid with SDBC
800	900	Sub-base	Gravel	150	BT	F	70	G	-	-	-	-	20.05	-	G	PF	BT surface Newly relaid with SDBC
900	1000	Sub-grade	-	-	BT	F	70	G	-	-	-	-	20.07	-	G	PF	Manaparai Bye pass Road end

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
 WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT* = Bituminous Top
 No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road
 NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333,000 to Km 421,600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 20.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/hr)	Quality Quality (GIRPVP)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEFF/FF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holing (No. and % 100m)**	Rut (None/Moderate /Severe)	Patching (No. and % 100m)**				
Km 384.000 to 385.000																	
000	100	Surface	BT	50	Paved Shoulder	F	60	G	3.40	-	-	-	1/0.018	-	G	PF	Fair Condition
100	200	Binder	Bitumen	-	Paved Shoulder	F	60	G	2.28	-	-	-	1/0.071	-	G	PF	BT surface retained Fair condition
200	300	Base	WBM	150	Paved Shoulder	F	60	G	7.43	9.25	2-0.3	-	2/0.0214	-	G	PF	364/180 minor bridge across stream of 2 span of 5.10m
300	400	Sub-base	Gravel	200	Paved Shoulder	F	60	G	8.57	-	1-0.1	-	1/0.0714	-	G	PF	Manapal Bye pass end
400	500	Sub-grade	-	-	Paved Shoulder	F	60	G	-	-	-	-	-	-	G	PF	Fair Condition
500	600	Surface	BT	50	Paved Shoulder	F	60	G	-	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	Paved Shoulder	F	60	G	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	100	Paved Shoulder	F	60	G	-	-	-	-	1/0.0214	-	G	PF	Good condition
800	900	Sub-base	Gravel	200	Paved Shoulder	F	60	G	2.85	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Paved Shoulder	F	60	G	-	-	-	-	-	-	G	PF	Good condition

Note: * : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
 WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone Soling; BT** = Bituminous Top
 ** : No. and % 100m = Total no. of Pot holing / Patching and % age area of Pot holing / Patching 100m of length of road
 *** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 20.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/FP/?)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m) ¹	Rut (None/Moderate/Severe)	Patching (No. and % 100m) ²				
Km 365.000 to 366.000																	
365.000	366.000	Surface	BT	100	Paved Shoulder	F	60	F	5.14	-	-	-	-	-	Level	NE	365/100 RHS monfort matriculation school
366.000	367.000	Binder	Bitumen	-	Paved Shoulder	F	60	F	6.28	-	-	-	-	-	G	PF	Good condition
367.000	368.000	Base	WBM	100	Paved Shoulder	F	60	F	7.14	-	-	-	-	-	G	PF	365/110 RHS st Johns Industrial training school
368.000	369.000	Sub-base	Gravel	250	Paved Shoulder	F	60	F	8.05	-	-	-	-	-	G	PF	365/220 Roo pipe culvert 365/2
369.000	370.000	Sub-grade	-	-	Earthen Shoulder	F	60	F	8.14	-	5.1	-	20.03	-	G	PF	365/320 365/320 st antony's primary school
370.000	371.000	Surface	BT	120	Earthen Shoulder	F	60	F	6.42	-	-	-	-	-	G	PF	Existing BT surface Fair condition
371.000	372.000	Binder	Bitumen	-	Earthen Shoulder	F	60	F	3.57	-	6.0.2	-	-	-	G	PF	Existing BT surface Fair condition
372.000	373.000	Base	WBM	150	Earthen Shoulder	F	60	F	-	-	-	-	-	-	G	PF	Existing BT surface Fair condition
373.000	374.000	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	2.14	-	-	-	-	-	G	PF	Existing BT surface Fair condition
374.000	375.000	Sub-grade	-	-	Earthen Shoulder	F	60	F	2.22	-	-	-	20.06	-	G	PF	Existing BT surface Fair condition

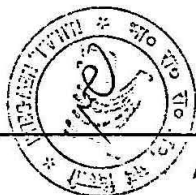
Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH 45
 Date of Survey : 21.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEP/F) **	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor (Good))			Cracking (%)	Ravelling (%)	Pot holeing (No. and % 100m) **	Ride (None/Moderate/ Severe)	Patching (No. and % 100m) **				
Km 366,000 to 367,000																	
000	100	Surface	BT	250	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	BT surface Newly relaid with Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	2-0.9	-	-	-	G	PF	BT surface Newly relaid with Good condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	2-0.9	-	-	-	G	PF	BT surface Newly relaid with Good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	2-0.9	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	2-0.9	-	-	-	G	PF	Good condition
500	600	Surface	BT	160	Earthen Shoulder	F	70	G	-	-	2-0.9	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	2-0.9	-	-	-	G	PF	Good condition
700	800	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	2-0.9	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	2-0.9	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	2-0.9	-	-	-	G	PF	Good condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 21.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NEFFT)	Remarks
		Composition	Type*	Thickness (mm)	Composition	Condition (Fair/Poor/Road)			Speed (km/h)	Quality (GFRP/P)	Cracking (%)	Ravelling (%)	Pot holling (No. and % 100m)**				
Km 367.000 to 368.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	5.14	-	-	-	30.24	-	G	PF	367/000 RCC pipe culvert
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	4.285	-	-	-	10.018	-	G	PF	Fair Condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	5.25	-	-	-	10.018	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	11.14	-	-	-	90.32	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	8.57	-	-	-	-	-	G	PF	Major bridge at 367/420
500	600	Surface	BT	150	Earthen Shoulder	F	60	F	5.14	-	-	-	-	-	G	PF	Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	4.285	-	-	-	-	-	G	PF	367/680 RHS way to Vengalunichi
700	800	Base	WBM	200	Earthen Shoulder	F	60	F	5.14	-	-	-	-	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	7.14	-	-	-	-	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	5.714	-	-	-	20.28	-	G	PF	Fair Condition

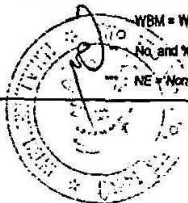
Note:

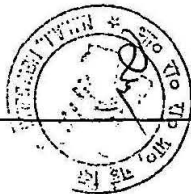
* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

** : NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4: PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 21.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (Non/Moderate/Severe)	Patching (No. and % 100m)**				
Km 368.000 to 369.000																	
000	100	Surface	BT	140	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Earthen shoulder fully damaged
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	BT surface Newly relaid with SDBC
200	300	Base	WBM	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	368/380 Kurunji college campus started
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	175	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	368/700 Kurunji college Entrance
700	800	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	BT surface Newly relaid with SDBC
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 21.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEFF/FF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Speed (km/hr)	Quality (G/F/P/V)	Cracking (%)	Raveling (%)	Pot holing (No. and % 100m)**				
Km 369.000 to 370.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	60	F	7.714	2.3	-	-	40.18	-	G	PF	Karattupatti Village
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	8.285	3.2	-	-	6/1.46	-	G	PF	369/100 Karattupatti Village
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	7.14	1.72	-	-	10/5.1	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	5.14	-	-	-	80.5	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	4.85	-	-	-	30.95	-	G	PF	Fair Condition
500	600	Surface	BT	100	Earthen Shoulder	F	60	F	6.57	-	-	-	10/0.02	-	G	PF	Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	4.51	-	-	-	4/1.6	-	G	PF	Fair Condition
700	800	Base	WBM	100	Earthen Shoulder	F	60	F	6.57	-	-	-	6/1.2	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	2.43	-	-	-	3/0.5	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	5.42	-	-	-	10/1.8	-	G	PF	Fair Condition

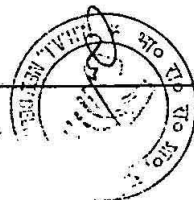
Note

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone Soling; BT** = Bituminous Top

No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 21.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PPF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m) **	Rut (None/Moderate/ Severe)	Patching (No. and % 100m) **				
Km 370.00 to 371.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	60	F	6.57	5	-	-	60.8	-	Level	PF	BT surface Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	10.57	-	-	-	30.97	-	Level	PF	Fair Condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	12.08	-	-	-	5/1.107	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	6.05	-	1-0.3	-	3/1.46	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	4.285	-	-	-	3/4.6	-	G	PF	Fair Condition
500	600	Surface	BT	200	Earthen Shoulder	F	60	F	9.14	-	-	-	-	-	G	PF	Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	1.711	-	-	-	-	-	G	PF	Fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	1.857	-	-	-	-	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	3.214	-	2-0.9	-	-	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	1.214	-	-	-	2/1.314	-	G	PF	Fair Condition

Note.

: BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333,000 to Km 421,600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 21.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/FP/FP+)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holling (No. and % 100m)**	Rut (None/Moderate/ Severe)	Patching (No. and % 100m)**				
Km 371.00 to 372.000																	
000	100	Surface	BT	120	Earthen Shoulder	F	60	F	11.57	-	-	-	60.98	-	G	PF	pipe culvert at 371/020
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	18.85	-	-	-	42.6	-	G	PF	Fair Condition
200	300	Base	WBM	100	Earthen Shoulder	F	60	F	10.285	-	-	-	6/4.2	-	G	PF	Roc pipe culvert at 367/300
300	400	Sub-base	Gravel	300	Earthen Shoulder	F	50	F	12.85	-	-	-	1/0.042	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	18.10	-	-	-	7/0.5	-	G	PF	Roc pipe culvert at 371/480
500	600	Surface	BT	100	Earthen Shoulder	F	60	F	10.225	-	-	-	8/4.7	-	G	PF	Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	6.285	-	-	-	9/2.93	-	G	PF	Fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	10.71	-	1-0.2	-	1/0.43	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	6.857	-	-	-	-	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	5.10	-	-	-	1/2.3	-	G	PF	371/870 village thoras nagar

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 373.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 21.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drains (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m)**	Rut (Non/Moderate Severe)	Patching (No. and % 100m)**				
Km 372.00 to 373.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	19.28	-	-	-	5/9.1	-	G	PF	Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	10.57	-	-	-	-	-	G	PF	Fair Condition
200	300	Base	WBM	180	Earthen Shoulder	F	60	F	20.57	-	-	-	4/0.41	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	18.10	-	-	-	1/1.43	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	8.87	-	-	-	-	-	G	PF	Fair Condition
500	600	Surface	BT	100	Earthen Shoulder	F	60	F	9.71	-	1-0.2	-	50.5	-	G	PF	Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	10.57	-	-	-	7/3.2	-	G	PF	Fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	6.285	-	-	-	8/2.1	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	12.10	-	-	-	6/2.43	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	10.57	-	8-1	-	30.43	-	G	PF	Fair Condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 21.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (N/E/P/F/S)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (Non/moderate/severe)	Patching (No. and % 100m)**				
Km 373.00 to 374.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	60	F	4.714	-	5-0.7	-	52.93	-	G	PF	BT surface Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	6.42	-	-	-	43.04	-	G	PF	Fair Condition
200	300	Base	WBM	180	Earthen Shoulder	F	60	F	4.265	-	-	-	30.78	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	5.14	-	-	-	40.71	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	12.14	-	1-0.2	-	50.714	-	G	PF	Fair Condition
500	600	Surface	BT	100	Earthen Shoulder	F	60	F	7.428	-	1-0.15	-	107.18	-	G	PF	RCC Pipe culvert at 373/595
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	9.714	-	1-0.15	-	67.7	-	G	PF	Fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	7.714	-	1-0.15	-	3/2.25	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	-	-	1-0.15	-	-	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	3.19	-	2-0.4	-	-	-	G	PF	Fair Condition

Note : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
 WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone Soling; BT** = Bituminous Top
 No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road
 SDC = Non Existing; PF = Parity Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 21.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/fair/ Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holing (No. and % 100m)**	Rut (None/Moderate /Severe)	Patching (No. and % 100m)**				
Km 374.00 to 375.000																	
000	100	Surface	BT	200	Earthen Shoulder	F	60	F	4.285	-	-	-	-	-	G	NE	Abstract road village
100	200	Blinder	Bitumen	-	Earthen Shoulder	F	60	F	3.14	-	-	-	-	-	G	NE	Fair Condition
200	300	Base	WBM	100	Earthen Shoulder	F	60	F	4.285	-	-	-	-	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	300	Earthen Shoulder	F	60	F	4.857	-	-	-	-	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	6.28	-	-	-	7/5.25	25	G	PF	Fair Condition
500	600	Surface	BT	200	Earthen Shoulder	F	60	F	5.57	-	-	-	11/2.9	-	G	PF	Fair Condition
600	700	Blinder	Bitumen	-	Earthen Shoulder	F	60	F	16.21	-	-	-	6/2.07	50	G	PF	Fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	4.71	-	-	-	13/6.5	50	G	PF	Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	4.28	-	-	-	4/3.6	55	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	6.42	-	-	-	10/1.642	45	G	PF	Fair Condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 22.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holing (No. and % 100m)**	Rut (None/Moderate Severe)	Patching (No. and % 100m)**				
Km 375.00 to 376.000																	
000	100	Surface	BT	200	Earthen Shoulder	F	60	F	11.57	5	-	-	99.1	-	G	PF	Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	6.857	-	-	-	-	-	G	PI	Fair Condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	6.288	-	-	-	4/3	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	6.57	-	-	-	5/2.5	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	4.85	-	-	-	4/25	-	G	PF	Fair Condition
500	600	Surface	BT	100	Earthen Shoulder	F	60	F	9.14	-	-	-	5/30	-	G	PF	Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	5.14	-	-	-	40.78	-	G	PF	Fair Condition
700	800	Base	WBM	120	Earthen Shoulder	F	60	F	4.28	-	-	-	-	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	300	Earthen Shoulder	F	60	F	4.57	-	-	-	-	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	3.714	-	-	-	-	-	G	PF	Fair Condition

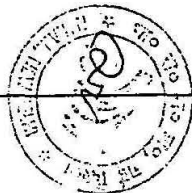
Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 22.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**				
Km 375.00 to 377.000																	
000	100	Surface	BT	120	Earthen Shoulder	F	60	F	3.714	-	-	-	-	-	G	PF	Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	6.657	-	-	-	3/5.2	-	G	PF	Fair Condition
200	300	Base	WBM	200	Earthen Shoulder	F	60	F	8.67	-	-	-	6/3.7	-	G	PF	Fair Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	9.19	-	-	-	4/1.32	-	G	PF	Fair Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	4.85	-	-	-	-	-	G	PF	Fair Condition
500	600	Surface	BT	220	Earthen Shoulder	F	60	F	2.28	-	-	-	1/3.5	-	G	PF	Fair Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	5.21	-	-	-	-	-	G	PF	Fair Condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	6.32	-	-	-	1/0.5	-	G	PF	Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	6.25	-	-	-	1/2	-	G	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	5.67	-	-	-	1/0.3	-	G	PF	Fair Condition

Note

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 22.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEP/FF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m)**	Rut (Non/Moderate Severe)	Patching (No. and % 100m)**				
Km 377.00 to 378.000																	
000	100	Surface	BT	300	Earthen Shoulder	F	60	F	3.57	-	-	-	-	-	G	PF	Built up area Vayampatti BT surface Fair Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	4.92	-	-	-	-	-	Level	PF	Fair Condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	6.85	-	-	-	-	-	Level	PF	Fair Condition
300	400	Sub-base	Gravel	300	Earthen Shoulder	F	60	F	5.36	-	-	-	3/2.14	25	Level	PF	Fair Condition, Vayampatti
400	500	Sub-grade	-	-	Paved & Earthen Shoulder	P	40	F	7.43	-	-	-	3/0.5	20	Level	PF	Fair Condition
500	600	Surface	BT	75	Paved & Earthen Shoulder	P	40	F	10.00	-	-	-	-	-	Level	PF	Fair Condition
600	700	Binder	Bitumen	-	Paved & Earthen Shoulder	P	40	F	7.428	-	-	-	-	-	Level	PF	Fair Condition
700	800	Base	WBM	100	Paved & Earthen Shoulder	P	40	F	5.71	-	-	-	8/4.6	-	Level	PF	Fair Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	40	F	7.28	-	-	-	6/0.4	-	Level	PF	Fair Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	40	F	7.71	-	-	-	4/4.07	-	Level	PF	Fair Condition

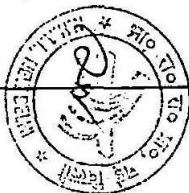
Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing, PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 22.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (Non/Moderate/Severe)	Patching (No. and % 100m)**				
Km 378.00 to 379.000																	
000	100	Surface	BT	75	Earthen Shoulder	F	70	G	-	-	-	-	-	40	G	PF	Good condition Newly raised with SDBC
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	3.71	-	-	-	-	-	G	PI	Good condition
200	300	Base	WBM	100	Earthen Shoulder	F	70	G	-	-	-	-	-	45	G	PF	Good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	4.75	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	120	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	180	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition

Note:

** BUSG = Built up Spray Groat; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mtx Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot hole / Patching and % area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.500
District (From) : Trichy

Road No : NH - 45
Date of Survey : 22.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition						Pavement edge drop (mm)	Embankment condition (Good/fair/ Poor)	Road side drain (NEFF/FF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Revealing (%)	Pot holing (No. and % 100m)**	Rut (None/Moderate/ Severe)	Patching (No. and % 100m)**					
Km 373.00 to 380.000																		
000	100	Surface	BT	70	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Surface newly retold with SDBC Good condition	
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	35	G	PI	Good condition	
200	300	Base	WBM	100	Earthen Shoulder	F	70	G	-	-	-	-	-	40	G	PF	Good condition	
300	400	Sub-base	Gravel	300	Earthen Shoulder	F	70	G	-	-	-	-	-	45	G	PF	Good condition	
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
500	600	Surface	BT	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
700	800	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	

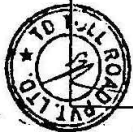
Note.

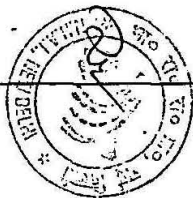
* : BUSG = Built up, Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holing / Patching and % area of Pot holing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 22.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (Non/Moderate/Severe)	Patching (No. and % 100m)**				
Km 380.00 to 381.000																	
000	100	Surface	BT	120	Earthen Shoulder	F	70	G	3.56	-	-	-	-	-	G	PF	Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	180	Earthen Shoulder	F	70	G	-	-	1-0.3	-	1/0.2	-	G	PF	Good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	2.85	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	80	Earthen Shoulder	F	70	G	2.71	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	175	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	1-0.2	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; SS = Stone Siding; BT** = Bituminous Top

** No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m stretch

*** NE = Non Existing; PF = Partially Functional; F = Functional

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 22.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)---	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (Non/Moderate /Severe)	Patching (No. and % 100m)**				
Km 381.00 to 382.000																	
000	100	Surface	BT	75	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	BT surface newly relaid Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
300	400	Sub-base	Gravel	300	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	75	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	100	Earthen Shoulder	F	70	G	-	-	3-0.3	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone Soling; BT** = Bituminous Top

** No. and % 100m = Total no. of Pot holeing / Patching and % area of Pot holeing / Patching 100m of length of road

NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.000
District (From) : Trichy

Road No : NH - 45
Date of Survey : 22.08.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition				Patching (No. and % 100m)**	Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	* Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate /Severe)					
Km 382.00 to 383.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	G	8.57	-	-	-	-	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	G	4.85	-	-	-	-	-	G	PI	Fair condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	G	6.85	-	3-0.4	-	-	-	G	PF	Fair condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	G	5.71	-	-	-	-	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	G	8.10	7.52	3-0.5	-	-	-	G	PF	Fair condition
500	600	Surface	BT	200	Earthen Shoulder	F	60	G	3.43	8.15	2-1	M	-	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	G	8.57	9.32	5-2	M	-	-	G	PF	Fair condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	G	6.28	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	G	-	-	-	-	-	-	G	PF	Good condition

Note.

* BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT* = Bituminous Top

** No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** NE = Non Existing; PF = Partially Functional; F = Functional

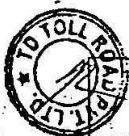
ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 22.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/h)	Quality (GIR/PPV)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate/ Severe)	Patching (No. and % 100m)**				
Km 383.00 to 384.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	65	F	-	-	-	-	-	G	PF	Good condition	
100	200	Binder	Bitumen	-	Earthen Shoulder	F	65	F	-	-	-	-	-	G	PI	Good condition	
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	3.48	-	3-0.4	-	-	G	PF	BT Surface Fair condition	
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	-	-	-	-	-	G	PF	Fair condition	
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	1.50	-	-	-	-	G	PF	Fair condition	
500	600	Surface	BT	150	Earthen Shoulder	F	60	F	2.14	-	-	-	-	G	PF	Fair condition	
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	0.57	-	-	-	-	G	PF	Fair condition	
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	0.36	-	-	-	-	G	PF	Good condition	
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	0.85	-	-	-	-	G	PF	Good condition	
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	1.37	-	-	-	-	G	PF	Good condition	

Note: BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
 WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top
 No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road
 NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 23.08.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEP/FF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate/ Severe)	Patching (No. and % 100m)**				
Km 384.00 to 385.000																	
000	100	Surface	BT	120	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	BT surface newly re-laid with SDBC Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PI	Good condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	40	G	PF	Good condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	80	Earthen Shoulder	F	70	G	-	-	-	-	30.75	35	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	3/1.3	-	G	PF	Good condition
700	800	Base	WBM	100	Earthen Shoulder	F	70	G	-	-	-	-	4/1.14	-	G	PF	Good condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition

Note.

* BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** No. and %100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 23.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEP/FF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holing (No. and % 100m)**	Rut (Non/mild/moderate Severe)	Patching (No. and % 100m)**				
Km 385.00 to 386.000																	
000	100	Surface	BT	75	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	3/1.5	-	G	PF	Good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	75	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Nadu patti Village Good condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	G	3.78	-	-	-	30.8	-	G	PF	Nadu patti Village Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	G	5.23	-	-	-	40.14	-	G	PF	Nadu patti Village Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	G	4.15	-	-	-	-	-	G	PF	Nadu patti village Fair condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holing / Patching and % age area of Pot holing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 23.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition [Good/Fair/Poor]	Road side drain [NE/PF/F]	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition [Fair/Poor/Good]			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Flt (None/Moderate/Severe)	Patching (No. and % 100m)**				
Km 386.00 to 387.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	2/0.214	-	G	PF	Nadu pati Village BT surface newly relaid with SDDC Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	1/0.036	-	G	PI	Nadu pati village Good condition
200	300	Base	WBM	200	Earthen Shoulder	F	70	G	-	-	-	-	1/0.036	-	G	PF	BT surface newly relaid with SDDC Good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	2-0.8	-	1/0.0714	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	1/0.43	-	G	PF	Good condition
500	600	Surface	BT	100	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : 14-45
 Date of Survey : 23.05.06
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PFF)***	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holling (No. and % 100m)**	Rut (None/Moderate /Severe)	Patching (No. and % 100m)**				
Km 387.00 to 388.000																	
000	100	Surface	BT	250	Earthen Shoulder	F	60	F	8.57	-	-	-	-	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	32.14	7.35	4.2	-	30/607	-	G	P1	Fair condition
200	300	Base	WBM	130	Earthen Shoulder	F	60	F	51.42	8.15	3-1	-	8/5	-	G	PF	Fair condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	P	40	VP	65.71	4.50	10-5	S	26/30	-	G	PF	Poor Condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	40	VP	71.42	3.28	5-5	S	15/35	45	G	PF	Poor Condition
500	600	Surface	BT	120	Earthen Shoulder	P	40	VP	51.43	4.3	5-6	S	10/25	-	G	PF	Poor Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	F	13.93	-	-	-	-	-	G	PF	Fair condition
700	800	Base	WBM	150	Earthen Shoulder	P	60	F	17.14	2.71	4.2	-	6/2.25	55	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	15.71	1.85	-	-	8/1.7	55	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	57.14	3.10	3-2	M	8/3.5	-	G	PF	Fair condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Survey Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 23.08.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/hr)	Quality (GIR/PPV)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PPF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holling (No. and % 100m)**	Rut (None/Moderate /Severe)	Patching (No. and % 100m)**				
Km 388.00 to 389.000																	
000	100	Surface	BT	60	Earthen Shoulder	F	60	F	-	-	-	-	-	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	10.285	-	-	-	10/13.28	-	G	PF	Fair condition
200	300	Base	WBM	100	Earthen Shoulder	F	60	F	8.57	-	-	-	-	-	G	PF	Fair condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	12.85	-	-	-	-	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	F	6.85	10	-	-	-	-	G	PF	Minor Bridge at 388/480
500	600	Surface	BT	150	Earthen Shoulder	P	60	F	11.14	5	2-1	-	-	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	F	11.14	-	-	-	-	-	G	PF	Fair condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	14.50	-	-	-	-	-	G	PF	Fair condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	P	60	F	7.71	-	-	-	-	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	2.14	-	-	-	-	-	G	PF	Fair condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road No : JNH - 45
Date of Survey : 23.06.05
Weather : Normal

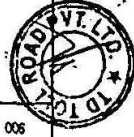
Road Name : Tichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Tichy

From (km)	To (km)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition							Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor Road)	Quality (G/F/P/V)	Cracking (%)	Raveling (%)	Pot holeing (No. and % (10km)*)	Rut (mm/10km/Severe)	Patching (No. and % (10km)*)	Pavement edge drop (mm)	Enhancement condition (Good/Fair/Poor)	Road side drain (NE/FP)***	
000	100	Surface	BT	150	Earthen Shoulder	F	G	5	-	-	-	-	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	G	10	-	-	-	-	-	G	PF	Good Condition
200	300	Base	WBM	120	Earthen Shoulder	F	G	5	-	-	-	-	-	G	PF	Good Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	P	G	5	-	-	-	-	-	G	PF	Good Condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	G	-	-	-	-	-	-	G	PF	Good Condition
500	600	Surface	BT	250	Earthen Shoulder	P	G	-	-	-	-	-	-	G	PF	Good Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	G	-	-	-	-	-	-	G	PF	Good Condition
700	800	Base	WBM	150	Earthen Shoulder	P	G	-	-	-	-	-	-	G	PF	Good Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	G	-	-	-	-	-	-	G	PF	Good Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	G	-	-	-	-	-	-	G	PF	Good Condition

Note : BUSG = Built up Surry Grout, AC = Asphaltic Concrete, SDC = Semi Dense Concrete, PC = Premix Carpet, MSS = Mix Seal Surfacing, BT = Black Top

WBM = Water Bound Macadam, DBM = Dense Bituminous Macadam, BHM = Bituminous Macadam, BS = Brick Soling, SS = Stone soling, BT = Bituminous Top

*** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 23.08.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/KS00g)			Cracking (%)	Ravelling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**				
Km 390.00 to 391.000																	
000	100	Surface	BT	200	Earthen Shoulder	F	60	G	2.75	-	-	-	-	20	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	G	3.15	-	-	-	-	50	G	PI	Fair condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	G	4.3	-	-	-	-	-	G	PF	Fair condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	P	60	G	1.80	-	-	-	-	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	G	2.15	-	-	-	-	-	G	PF	Fair condition
500	600	Surface	ST	150	Earthen Shoulder	P	60	G	3.15	-	-	-	2/1.2	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	G	-	-	-	-	-	-	G	PF	Fair condition
700	800	Base	WBM	150	Earthen Shoulder	P	60	G	-	-	-	-	3/0.086	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	G	-	-	-	-	-	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	G	-	-	-	-	1/0.43	-	G	PF	Fair condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 25.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/FF/ **)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m) **	Rut (Non/moderate /Severe)	Patching (No. and % 100m) **				
Km 391.00 to 392.000																	
000	100	Surface	BT	120	Earthen Shoulder	F	60	F	15	-	3-1	-	30.143	20	G	PF	BT Surface Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	18	-	4-1	-	20.18	40	G	PF	Fair condition
200	300	Base	WBM	180	Earthen Shoulder	F	60	F	8.57	-	2-0.8	-	30.678	-	G	PF	Fair condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	4.57	-	6-1.5	-	52.14	50	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	2.86	-	6-1.5	-	70.607	-	G	PF	Fair condition
500	600	Surface	BT	150	Earthen Shoulder	F	60	F	7.43	-	2-0.5	-	61.93	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	8.57	-	-	-	30.107	35	G	PF	Fair condition
700	800	Base	WBM	100	Earthen Shoulder	F	60	F	6.85	-	-	-	50.46	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	11.43	-	1-0.3	-	50.5	25	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	4.28	-	1-0.3	-	30.5	-	G	PF	Fair condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 25.08.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/FF/FP)**	Remarks
		Composition	Type*	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (Non/moderate/severe)	Patching (No. and % 100m)**				
Km 392.00 to 393.000																	
000	100	Surface	BT	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition ¹
100	200	Blinder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	RCC pipe culvert at 392/207
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
600	700	Blinder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	392/700 Thangannampatti village
700	800	Base	WBM	180	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	RCC Slab culvert at 392/770
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition

Note.

* : BUSG = Built up Spray Groat; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 25.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEP/FD)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Good/AsGood)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**				
Km 393.00 to 394.000																	
000	100	Surface	BT	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	BT Surface Newly relaid with SDBC Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	180	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
300	400	Sub-base	Gravel	300	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 25.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)	Speed (km/hr)	Quality (G/F/P/NP)	Cracking (%)	Raveling (%)	Pot holes (No. and % 100m) **	Rut (None/Moderat /Severe)	Patching (No. and % 100m) **				
Km 394.00 to 395.000																	
000	100	Surface	BT	200	Earthen Shoulder	F	70	G	-	-	-	-	20.3	-	G	PF	Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	1/1.1	-	G	PF	Good condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	20.5	-	G	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	180	Earthen Shoulder	F	60	F	18.23	-	-	-	4/1.9	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	9.85	-	-	-	-	-	G	PF	Fair condition
700	800	Base	WBM	150	Earthen Shoulder	F	60	F	12.00	-	-	-	20.53	-	G	PF	Fair condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	9.14	1-0.2	-	-	40.107	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	11.42	1-0.3	-	-	7/1.0	-	G	PF	Fair condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** No. and %100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** NE = Non Existing; PF = Partially Functional; F = Functional

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333,000 to Km 421,600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 25.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition						Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type*	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Speed (km/hr)	Quality (GIRPVV)	Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderat /Severe)				
Km 395.00 to 396.000																		
000	100	Surface	BT	300	Earthen Shoulder	F	70	G	-	-	-	-	1/0.036	-	G	PF	BT Surface Newly relaid with SDBC Good condition	
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	RCC slab culvert at 395/170	
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	1/0.57	-	G	PF	Good condition	
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
600	600	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	RCC slab culvert at 395/500	
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
700	800	Base	WBM	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good condition	

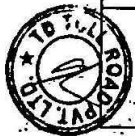
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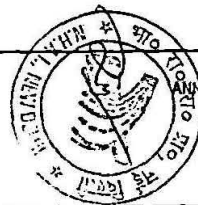
* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot Holes / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road No : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 25.06.06
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/FF/PP)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/poor /Good)			Speed (km/hr)	Quality (G/FF/PP)	Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)				
Km 398.00 to 397.000																	
000	100	Surface	BT	50	B	F	70	G	-	-	-	-	-	-	G	PF	BT surface newly relaid with SDBC Good condition
100	200	Binder	Bitumen	-	B	F	70	G	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	100	B	F	50	G	-	-	-	-	-	-	G	PF	RCC slab culvert at 399/265
300	400	Sub-base	Gravel	200	B	F	50	G	-	-	-	-	-	-	G	PF	Good condition, Built up area
400	500	Sub-grade	-	-	B	F	50	G	-	-	-	-	-	-	G	PF	Good condition, Built up area
500	600	Surface	BT	100	B	F	50	G	-	-	-	-	-	-	G	PF	Good condition, Built up area
600	700	Binder	Bitumen	-	B	F	50	G	-	-	-	-	10.2	-	G	PF	Good condition, Built up area
700	800	Base	WBM	150	B	F	70	G	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	200	B	F	70	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	B	F	70	G	-	-	-	-	-	-	G	PF	Good condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : 124 - 45
 Date of Survey : 25.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/hr)	Quality (GIR/MPV)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEP/FF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor Good)			Cracking (%)	Revetting (%)	Pot holes (No. and % 100m)**	Rut (Non/Mod/Severe)	Patching (No. and % 100m)**				
Km 397.00 to 398.000																	
000	100	Surface	BT	150	B	F	60	F	5.34	-	-	-	-	-	G	PF	RCC slab Culvert at 397/100
100	200	Blinder	Bitumen	-	B	F	60	F	7.37	-	-	-	20.25	-	G	PF	Fair condition
200	300	Base	WBM	180	Earthen Shoulder	F	60	F	8.54	-	-	-	-	40	G	PF	Fair condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	7.60	-	-	-	-	55	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	6.51	-	-	-	-	-	G	PF	Fair condition
500	600	Surface	BT	180	Earthen Shoulder	F	60	F	4.35	-	-	-	20.107	-	G	PF	Fair condition
600	700	Blinder	Bitumen	-	Earthen Shoulder	F	60	F	3.28	-	20.5	-	30.5	-	G	PF	RCC slab culvert at 397/610
700	800	Base	WBM	200	Earthen Shoulder	F	60	F	5.71	-	-	-	10.43	-	G	PF	Fair condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	4.75	-	-	-	110.57	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	4.00	-	10.4	-	30.89	-	G	PF	Mallatur Bridge at 397/900

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 25.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holing (No. and % 100m)**	Rut (Non/Moderat /Severe)	Patching (No. and % 100m)**				
Km 398.00 to 399.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	2.14	-	-	-	10/1.02	-	G	PF	Minor bridge at 398/100
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	1.428	-	3-1	-	1/0.2	-	G	PF	Fair condition
200	300	Base	WBM	200	Earthen Shoulder	F	60	F	1.53	-	1-0.7	-	-	-	G	PF	Fair condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	1.71	-	6-2	-	8/1.5	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	1.72	-	-	-	3/0.5	-	G	PF	Fair condition
500	600	Surface	BT	150	Earthen Shoulder	F	60	F	1.45	-	-	-	-	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	0.35	-	-	-	-	-	G	PF	Fair condition
700	800	Base	WBM	200	Earthen Shoulder	F	60	F	0.43	-	2-0.3	-	-	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	0.56	-	-	-	-	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	1.00	2	-	-	1/0.006	-	G	PF	Fair condition

Note: * : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top
** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road
*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

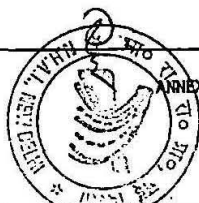
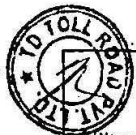
Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 25.06.06
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate /Severe)	Patching (No. and % 100m)**				
Km 399.00 to 400.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	60	F	11.14	-	4.2	-	9/1.2	-	G	PF	399/000 RCC minor bridge
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	4.285	-	1-0.3	-	1/0.214	-	G	PF	Fair condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	5.14	-	1-0.3	-	8/1.03	-	G	PF	Fair condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	6.71	-	-	-	20.0714	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	6.57	-	-	-	50.43	-	G	PF	Fair condition
500	600	Surface	BT	150	Earthen Shoulder	F	60	F	4.57	-	-	-	30.25	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	4.71	-	3-0.4	-	5/2.03	-	G	PF	Fair condition
700	800	Base	WBM	200	Earthen Shoulder	F	60	F	3.85	-	-	-	-	50	G	PF	Fair condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	60	F	4.57	-	-	-	3/0.107	45	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	6.43	-	1-0.2	-	8/0.48	-	G	PF	Fair condition

Note:

- * : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
- WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top
- ** : No. and %100m = Total no. of Pot holes/Patching and % age area of Pot holes / Patching 100m of length of road
- ** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 25.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition						Pavement edge drop (mm)	Embankment condition (Good/fair/ Poor)	Road side drain (NE/PF/F) **	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Ravelling (%)	Pot holes (No. and % 100m) **	Rut (Non/moderate/ Severe)	Patching (No. and % 100m) **					
Km 400.00 to 401.000																		
000	100	Surface	BT	180	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	BT Surface newly relaid with SDBC Good Condition	
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition	
200	300	Base	WBM	160	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition	
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition	
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition	
500	600	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	35	G	PF	Good Condition	
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	40	G	PF	Good Condition	
700	800	Base	WBM	200	Earthen Shoulder	F	70	G	-	-	-	-	-	50	G	PF	Good Condition	
800	900	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	-	40	G	PF	Good Condition	
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	30	G	PF	Good Condition	

Note: * : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top
** : No. and %100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road
*** : NE = Non Existing, PF = Partially Functional, F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 25.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/hr)	Quality (GIR/FIR/P)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderat /Severe)	Patching (No. and % 100m)**				
Km 401.00 to 402.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	20	G	PF	BT Surface newly relaid with SDBC Good Condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition
200	300	Base	WBM	180	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	-	55	G	PF	Good Condition
500	600	Surface	BT	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	40	G	PF	Good Condition
700	800	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	35	G	PF	Good Condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PF	Good Condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	70	G	-	-	-	-	2/1.14	-	G	PF	Good Condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 26.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF)**	Remarks
		Composition	Type	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (Non/Moderate /Severe)	Patching (No. and % 100m)**				
Km 402.00 to 403.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	40	P	21.45	10.78	1-2	M	18/35.0	40	G	PF	RCC slab culvert at 402/010
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	11.43	11.56	-	-	2/25.0	-	G	PF	Fair condition
200	300	Base	WBM	160	Earthen Shoulder	F	60	F	10.28	5.78	3-1	-	10/15.0	-	G	PF	Fair condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	20.57	6.13	3-2	M	13/25.0	25	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	F	20.05	7.15	-	M	10/27.0	55	G	PF	Fair condition
500	600	Surface	BT	120	Earthen Shoulder	P	60	F	14.86	3.25	-	M	18/13.0	40	G	PF	RCC slab Culvert at 402/600
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	F	14.14	4.50	-	M	10/20.0	-	G	PF	Fair condition
700	800	Base	WBM	180	Earthen Shoulder	P	60	F	8.25	3.25	-	-	7/10.0	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	13.00	4.10	-	-	8/10.0	-	G	PF	402/830 LHS Bannari amman Spining mills
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	17.14	5.1	-	M	10/20.0	-	G	PF	Fair condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333,000 to Km 421,600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 26.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Ravelling (%)	Pot hole (No. and % 100m)	Rut (Non/moderate/severe)	Patching (No. and % 100m)				
Km 403.00 to 404.000																	
000	100	Surface	BT	120	Earthen Shoulder	F	60	F	16.71	7.5	-	-	-	50	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	15.10	4.80	3-1.5	-	12/0.6	-	G	PI	Fair condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	10.28	-	-	-	4/1.3	-	G	PF	RCC slab culvert at 403/240-
300	400	Sub-base	Gravel	250	Earthen Shoulder	P	60	F	6.85	-	1-0.3	-	-	45	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	F	9.14	-	-	-	4/0.3	-	G	PF	403/410 LHS way to to Vadamadurai
500	600	Surface	BT	150	Earthen Shoulder	P	60	F	7.43	-	3-2	-	7/0.5	30	G	PF	RCC slab culvert at 403/500
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	F	5.14	-	-	-	8/0.28	45	G	PF	RCC pipe culvert at 403/530
700	800	Base	WBM	180	Earthen Shoulder	P	60	F	6.28	-	-	-	20/0.14	-	G	PF	Fair condition
800	900	Sub-base	Gravel	250	Earthen Shoulder	P	60	F	8.00	-	-	-	50/43	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	11.43	5.20	-	-	100/607	40	G	PF	Fair condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SOC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DEM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 26.06.06
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding Speed (km/h)	Quality (GIR/PPV)	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/ Good)			Cracking (%)	Revealing (%)	Pot holling (No. and % 100m)**	Rut (None/Moderat /Severe)	Patching (No. and % 100m)**				
Km 404.00 to 405.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	17.14	3.20	-	M	10/25.0	-	G	PF	RCC pipe culvert at 404/060
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	50.00	3.60	-	M	15/45	-	G	PF	Poor condition
200	300	Base	WBM	180	Earthen Shoulder	F	60	F	24.00	2.15	-	M	4/7.0	-	G	PF	Fair condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	P	60	F	21.14	3.00	3-1.5	M	4/13.0	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	F	22.86	3.25	-	M	7/18.0	-	G	PF	Fair condition
500	600	Surface	BT	100	Earthen Shoulder	P	60	F	20.00	4.10	-	M	6/12.0	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	F	20.00	5.10	-	M	6/3.07	-	G	PF	RCC Slab Culvert at 404/700
700	800	Base	WBM	150	Earthen Shoulder	P	60	F	9.71	-	-	-	-	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	21.00	-	-	-	-	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	15	5.30	3-1	-	40/143	-	G	PF	Fair condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % area of Pot holeing / Patching 100m of length of road

*** NE = Non Existing; PF = Partially Functional; F = Functional

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 26.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair / Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (Non/moderate / Severe)	Patching (No. and % 100m)**				
Km 403.00 to 406.000																	
000	100	Surface	BT	120	Earthen Shoulder	F	70	G	-	-	1-1.5	-	1/1.0	55	G	PF	Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	-	G	PI	Good condition
200	300	Base	WBM	170	Earthen Shoulder	F	70	G	-	-	1-1.5	-	1/0.75	40	G	PF	Good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	P	70	G	-	-	-	-	-	-	G	PF	RCC slab Culvert at 405/370
400	500	Sub-grade	-	-	Earthen Shoulder	P	70	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	150	Earthen Shoulder	P	70	G	-	-	-	-	1/0.43	45	G	PF	Good condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	70	G	-	-	-	-	1/0.2	40	G	PF	Good condition
700	800	Base	WBM	150	Earthen Shoulder	P	70	G	-	-	-	-	-	-	G	PF	RCC Slab Culvert at 405/780
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	70	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	70	G	-	-	3-1	-	-	-	G	PF	Good condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone Soling; BT* = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 28.08.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type*	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Speed (km/h)	Quality (G/R/P/N/P)	Cracking (%)	Ravelling (%)	Pot holeing (No. and % 100m)**				
Km 408.00 to 407.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	70	G	-	-	-	-	-	40	Level	PF	406 LHS Bharath petrol bunk
100	200	Blinder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	45	Level	PF	Good condition
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	-	Level	PF	Good condition
300	400	Sub-base	Gravel	150	Earthen Shoulder	P	70	G	-	-	-	-	-	-	Level	PF	Good condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	70	G	-	-	-	-	-	-	Level	PF	Good condition
500	600	Surface	BT	150	Earthen Shoulder	P	70	G	-	-	-	-	-	-	Level	PF	Good condition
600	700	Blinder	Bitumen	-	Earthen Shoulder	P	70	G	-	-	-	-	-	35	Level	PF	Good condition
700	800	Base	WBM	180	Earthen Shoulder	P	70	G	-	-	-	-	-	-	Level	PF	406/760 Sri Mooganiga spinning mill
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	70	G	-	-	-	-	-	-	Level	PF	Good condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	70	G	-	-	-	-	-	-	Level	PF	RCC slab culvert at 406/990

Note

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

Black Top

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 26.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/Fair)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holing (No. and % 100m)**	Rut (None/Moderal /Severe)	Patching (No. and % 100m)**				
Km 407.00 to 408.000																	
000	100	Surface	BT	170	Earthen Shoulder	F	70	G	-	-	-	-	-	G	PF	Good condition	
100	200	Binder	Bitumen	-	Earthen Shoulder	F	70	G	-	-	-	-	-	G	PI	Good condition	
200	300	Base	WBM	150	Earthen Shoulder	F	70	G	-	-	-	-	-	G	PF	RCC slab culvert at 407/260	
300	400	Sub-base	Gravel	200	Earthen Shoulder	P	70	G	-	-	-	-	-	G	PF	Good condition	
400	500	Sub-grade	-	-	Earthen Shoulder	P	70	G	-	-	-	-	-	G	PF	Good condition	
500	600	Surface	BT	180	Earthen Shoulder	P	70	G	-	-	-	-	-	G	PF	Good condition	
600	700	Binder	Bitumen	-	Earthen Shoulder	P	70	G	-	-	-	-	-	G	PF	Good condition	
700	800	Base	WBM	150	Earthen Shoulder	P	70	G	-	-	-	-	-	G	PF	Good condition	
800	900	Sub-base	Gravel	250	Earthen Shoulder	P	70	G	-	-	-	-	-	G	PF	Good condition	
900	1000	Sub-grade	-	-	Earthen Shoulder	P	70	G	-	-	-	-	-	G	PF	Good condition	

Note:

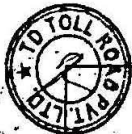
* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 26.08.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)***	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Ravelling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate /Severe)	Patching (No. and % 100m)**				
Km 408.00 to 409.000																	
000	100	Surface	BT	220	Earthen Shoulder	F	60	F	80	20	-	M	12/40.0	-	G	PF	Fair condition
100	200	Blinder	Bitumen	-	Earthen Shoulder	F	60	F	90	20	-	M	10/30.0	-	G	PI	Fair condition
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	70	10	-	-	8/10.0	-	G	PF	Fair condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	P	60	F	80	30	1-0.3	M	5/5.0	-	G	PF	RCC slab culvert at 408/380
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	F	60	5	-	-	6/1.86	-	G	PF	Fair condition
500	600	Surface	BT	150	Earthen Shoulder	P	60	F	40	-	-	-	1/0.43	-	G	PF	Fair condition
600	700	Blinder	Bitumen	-	Earthen Shoulder	P	60	F	40	-	-	-	7/10.0	-	G	PF	Fair condition
700	800	Base	WBM	180	Earthen Shoulder	P	60	F	60	-	-	-	15/20.0	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	40	-	-	-	4/18.0	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	50	-	1-0.3	-	12/22.0	-	G	PF	RCC Slab culvert at 408/970

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT* = Bituminous Top

** : No. and %100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 26.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Fair Poor/Poor)			Cracking (%)	Ravelling (%)	Pot holeing (No. and % 100m)**	Rut (Non/Moderate/Severe)	Patching (No. and % 100m)**				
Km 409.00 to 410.000																	
000	100	Surface	BT	180	Earthen Shoulder	F	60	F	20	-	-	-	80.8	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	30	-	-	-	101.64	-	G	PF	Fair condition
200	300	Base	WBM	180	Earthen Shoulder	F	60	F	40	-	4.2	-	123.5	-	G	PF	Fair condition
300	400	Sub-base	Gravel	250	Earthen Shoulder	P	60	F	30	-	1-0.2	-	94.5	-	G	PF	RCC slab culvert at 409/350
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	F	30	-	2-0.5	-	60.214	-	G	PF	Fair condition
500	600	Surface	BT	180	Earthen Shoulder	P	60	F	20	-	-	-	30.46	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	F	20	-	-	-	40.143	-	G	PF	Fair condition
700	800	Base	WBM	180	Earthen Shoulder	P	60	F	20	-	-	-	60.5	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	20	-	-	-	80.8	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	30	-	-	-	43.3	-	G	PF	RCC Slab culvert at 409/950

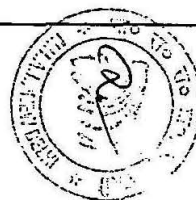
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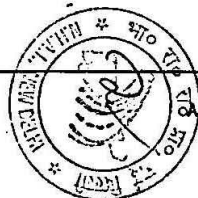
* : BUSG = Bulk up Spray Grou; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Pre-mix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone Soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.





ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.500
District (From) : Trichy

Road No : NH - 45
Date of Survey : 26.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (Nonallcoated /Severe)	Patching (No. and % 100m)**				
Km 410.00 to 411.000																	
000	100	Surface	BT	170	Earthen Shoulder	F	60	F	20	5	-	-	4/2.3	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	20	5	-	-	3/0.57	-	G	PI	Fair condition
200	300	Base	WBM	200	Earthen Shoulder	F	60	F	10	-	-	-	2/0.0764	-	G	PF	Fair condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	F	60	F	10	-	1-0.3	-	2/1.107	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	F	60	F	10	-	-	-	-	-	G	PF	Fair condition
500	600	Surface	BT	120	Earthen Shoulder	F	60	F	5	-	-	-	-	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	F	60	F	10	-	-	-	-	-	G	PF	Fair condition
700	800	Base	WBM	100	Earthen Shoulder	F	60	F	10	-	-	-	-	-	G	PF	Fair condition
800	900	Sub-base	Gravel	150	Earthen Shoulder	F	60	F	10	-	-	-	-	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	F	60	F	10	-	-	-	7/1.25	-	G	PF	Fair condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 26.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Ravelling (%)	Pot holling (No. and % 100m)**	Rut (Non/moderate/severe)	Patching (No. and % 100m)**				
Km 411.00 to 412.000																	
000	100	Surface	BT	200	Earthen Shoulder	F	60	F	10	-	-	-	40.96	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	10	-	-	-	-	-	G	PI	RCC slab culvert at 411 v200
200	300	Base	WBM	150	Earthen Shoulder	F	60	F	15	-	-	-	-	-	G	PF	Fair condition
300	400	Sub-base	Gravel	150	Earthen Shoulder	P	60	F	15	-	-	-	5/2.5	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	F	20	-	-	-	40.86	-	G	PF	Fair condition
500	600	Surface	BT	170	Earthen Shoulder	P	60	F	10	-	-	-	-	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	F	5	-	-	-	-	-	G	PF	Fair condition
700	800	Base	WBM	150	Earthen Shoulder	P	60	F	5	-	-	-	10/2	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	5	-	-	-	-	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	5	-	-	-	40.93	-	G	PF	Fair condition

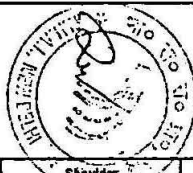
Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and %100m = Total no. of Pot holling / Patching and % age area of Pot holling / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 27.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PE/PF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate /Severe)	Patching (No. and % 100m)**				
Km 412.00 to 413.000																	
000	100	Surface	BT	150	Earthen Shoulder	F	60	F	20	-	-	-	8/0.82	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	5	-	1-0.2	-	30/214	-	G	PI	RCC slab culvert at 412/150
200	300	Base	WBM	100	Earthen Shoulder	F	60	F	5	-	-	-	30/107	-	G	PF	RCC pipe culvert at 412/205
300	400	Sub-base	Gravel	150	Earthen Shoulder	P	60	F	10	-	1-0.3	-	12/1.2	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	F	50	20	2-0.5	M	15/35	-	G	PF	Fair condition
500	600	Surface	BT	120	Earthen Shoulder	P	60	F	60	30	-	M	14/35	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	F	60	20	-	M	20/2.9	-	G	PF	Fair condition
700	800	Base	WBM	100	Earthen Shoulder	P	60	F	60	10	-	-	10/1.2	-	G	PF	RCC Slab culvert at 412/750
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	30	-	-	-	60/53	-	G	PF	Fair condition
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	10	-	-	-	30/27	-	G	PF	Fair condition

Notes

* : BUSG = Built up Spray Grouit; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 27.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/FD)***	Remarks
		Composition	Type*	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate /Severe)	Patching (No. and % 100m)**				
Km 413.00 to 414.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	60	F	5	-	-	-	30.17	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	F	5	-	-	-	30.285	-	G	PF	Fair condition
200	300	Base	WBM	100	Earthen Shoulder	F	60	F	5	-	-	-	40.143	-	G	PF	Fair condition
300	400	Sub-base	Gravel	300	Earthen Shoulder	P	60	F	5	-	-	-	10.036	-	G	PF	Fair condition
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	F	5	-	-	-	6/8.71	-	G	PF	RCC Slab culvert at 413/460
500	600	Surface	BT	75	Earthen Shoulder	P	60	F	5	-	1-0.2	-	10.214	-	G	PF	Fair condition
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	F	-	-	-	-	4/1.8	-	G	PF	Fair condition
700	800	Base	WBM	100	Earthen Shoulder	P	60	F	-	-	-	-	30.285	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	F	10	-	-	-	6/1.142	-	G	PF	RCC slab culvert at 413/810
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	F	10	-	-	-	20/2.3	-	G	PF	Fair condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional



Annexure A-4



ANNEXURE - A4: PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 233.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 27.06.06
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Speed (km/hr)	Quality (G/P/F)	Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**				
Km 414.000 to 415.000																	
000	100	Surface	BT	100	Earthen Shoulder	F	60	G	-	-	-	-	3/3.25	-	G	PF	Good condition
100	200	Binder	Bitumen	-	Earthen Shoulder	F	60	G	-	-	-	-	1/2.0	-	G	PF	Good condition
200	300	Base	WBM	100	Earthen Shoulder	F	60	G	-	-	-	-	-	-	G	PF	Good condition
300	400	Sub-base	Gravel	200	Earthen Shoulder	P	60	G	-	-	-	-	1/0.75	-	G	PF	Major bridge at 414/310
400	500	Sub-grade	-	-	Earthen Shoulder	P	60	G	-	-	-	-	1/1.5	-	G	PF	Fair condition
500	600	Surface	BT	200	Earthen Shoulder	P	60	G	-	-	-	-	4/7.25	-	G	PF	RCC slab culvert at 414/550
600	700	Binder	Bitumen	-	Earthen Shoulder	P	60	G	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	100	Earthen Shoulder	P	60	G	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	200	Earthen Shoulder	P	60	G	-	-	-	-	-	-	G	PF	RCC pipe culvert at 414/815
900	1000	Sub-grade	-	-	Earthen Shoulder	P	60	G	-	-	-	-	-	-	G	PF	Good condition

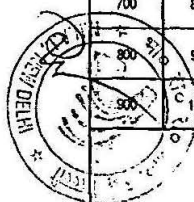
Notes:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 27.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)	Speed (km/h)	Quality (SUFF/PV7)	Cracking (%)	Revealing (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**				
Km 415.00 to 416.000																	
000	100	Surface	BT	200	B/E	F	60	F	10	-	-	-	7/1.18	-	G	PF	RCC slab culvert at 415/080
100	200	Blinder	Bitumen	-	B/E	F	60	F	10	-	-	-	3/2.5	-	G	PF	RCC slab culvert at 415/190
200	300	Base	WBM	100	B/E	F	60	F	10	-	-	-	4/0.93	-	G	PF	Fair condition
300	400	Sub-base	Gravel	200	B/E	P	60	F	5	-	-	-	3/3.6	-	G	PF	Fair condition
400	500	Sub-grade	-	-	B/E	P	60	F	5	-	-	-	4/16.3	-	G	PF	Fair condition
500	600	Surface	BT	70	B/E	P	60	F	5	-	-	-	4/3.6	-	G	PF	Fair condition
600	700	Blinder	Bitumen	-	B	P	60	F	5	-	-	-	10/6.07	-	G	PF	Fair condition
700	800	Base	WBM	100	B	P	60	F	20	-	1-0.3	-	-	-	G	PF	Fair condition
800	900	Sub-base	Gravel	200	B	P	60	F	5	-	-	-	2/1.25	-	G	PF	RCC slab culvert at 415/810
900	1000	Sub-grade	-	-	B	P	60	F	-	-	-	-	-	-	G	PF	Fair condition

Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional

Annexure A-4

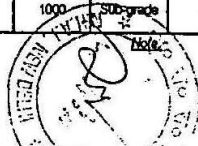
A.215



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 27.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)	Speed (km/h)	* Quality (G/F/P/F)	Cracking (%)	Ravelling (%)	Pot holling (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**				
Km 416.00 to 417.000																	
000	100	Surface	BT	100	B	F	60	G	-	-	-	-	-	-	G	PF	Fair condition
100	200	Binder	Bitumen	-	B	F	60	G	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	150	B	F	60	G	-	-	-	-	-	-	G	PF	Good condition
300	400	Sub-base	Gravel	250	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	70	B	P	60	G	-	-	-	-	-	-	G	PF	RCC pipe culvert at 416/560
600	700	Binder	Bitumen	-	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	150	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	250	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	B	P	60	G	-	-	-	-	-	-	G	PF	RCC slab culvert at 416/970
<div><div></div><div><p>* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top ** : No. and % 100m = Total no. of Pot holling / Patching and % age area of Pot holling / Patching 100m of length of road *** : NE = Non Existing; PF = Partially Functional; F = Functional.</p></div></div>																	

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333,000 to Km 421,600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 27.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F) ***	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)	Speed (km/hr)	Quality (G/F/P/NP)	Cracking (%)	Ravelling (%)	Pot holing (No. and % 100m) **	Rut (Non/moderate /severe)	Patching (No. and % 100m) **				
Km 417.00 to 418.000																	
000	100	Surface	BT	100	B	F	60	G	-	-	-	-	3/1.64	-	Level	PF	Good condition
100	200	Binder	Bitumen	-	B	F	60	G	-	-	-	-	-	-	Level	PF	Good condition
200	300	Base	WBM	150	B	F	60	G	-	-	-	-	-	-	G	PF	Good condition
300	400	Sub-base	Gravel	250	B	P	60	G	-	-	-	-	-	-	G	PF	417/380 LHS way to Dindigul
400	500	Sub-grade	-	-	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	110	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	B	P	60	G	-	-	-	-	1/0.2	-	G	PF	Good condition
700	800	Base	WBM	100	B	P	60	G	-	-	-	-	20.07/14	-	G	PF	Good condition
800	900	Sub-base	Gravel	200	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition

Note.

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holes / Patching and % age area of Pot holes / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

Road No : NH - 45
Date of Survey : 27.08.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NEPFI) **	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)	Speed (km/h)	Quality (GIR/PAVP)	Cracking (%)	Raveling (%)	Pot hollng (No. and % 100m) **	Rut (None/Moderate /Severe)	Patching (No. and % 100m) **				
Km 418.00 to 419.000																	
000	100	Surface	BT	150	B	F	60	F	-	-	-	-	30.678	-	G	PF	Good condition
100	200	Binder	Bitumen	-	B	F	60	F	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	150	B	F	60	F	-	-	-	-	-	-	G	PF	Good condition
300	400	Sub-base	Gravel	200	B	P	60	F	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	B	P	60	F	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	140	B	P	60	F	-	-	-	-	32.8	-	G	PF	Good condition
600	700	Binder	Bitumen	-	B	P	60	F	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	100	B	P	60	F	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	250	B	P	60	F	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	B	P	60	F	-	-	-	-	-	-	G	PF	Good condition

* : BUSG = Built up Spray Grouit; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot holeing / Patching and % age area of Pot holeing / Patching 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.

ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road Name : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No : NH - 45
 Date of Survey : 27.06.05
 Weather : Normal

District (From) : Trichy

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition						Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/FF/PF)**	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holes (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**					
Km 418.00 to 420.000																		
000	100	Surface	BT	100	B	F	60	G	-	-	-	-	-	-	-	G	PF	Good condition
100	200	Binder	Bitumen	-	B	F	60	G	-	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	150	B	F	60	G	-	-	-	-	-	10.2	-	G	PF	Good condition
300	400	Sub-base	Gravel	200	B	P	60	G	-	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	B	P	60	G	-	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	100	B	P	60	G	-	-	-	-	-	-	-	G	PF	Good condition
600	700	Binder	Bitumen	-	B	P	60	G	-	-	-	-	-	-	-	G	PF	Good condition
700	800	Base	WBM	120	B	P	60	G	-	-	-	-	-	-	-	G	PF	Good condition
800	900	Sub-base	Gravel	300	B	P	60	G	-	-	-	-	-	-	-	G	PF	Good condition
900	1000	Sub-grade	-	-	B	P	60	G	-	-	-	-	-	-	-	G	PF	Good condition

PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

Note.

- * : BUSG = Built up Spray Grouit; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
 WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top
 ** : No. and % 100m = Total no. of Pot holes / Patching and % area of Pot holes / Patching 100m of length of road
 *** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

Road No. : Trichy to Dindigul
 Section (From) : Km 333.000 to Km 421.600
 District (From) : Trichy

Road No. : NH - 45
 Date of Survey : 27.06.05
 Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition						Pavement edge drop (mm)	Embankment condition (Good/Fair/ Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type *	Thickness (mm)	Composition	Condition (Fair/Poor /Good)			Cracking (%)	Revealing (%)	Pot holeing (No. and % 100m)**	Rut (None/Moderate/ Severe)	Patching (No. and % 100m)**					
Km 420.00 to 421.000																		
000	100	Surface	BT	150	B	F	60	G	-	-	-	-	-	-	G	PF	Good condition	
100	200	Binder	Bitumen	-	B	F	60	G	-	-	-	-	1/0.214	-	G	PF	Good condition	
200	300	Base	WBM	150	B	F	60	G	-	-	-	-	1/0.2	-	G	PF	Good condition	
300	400	Sub-base	Gravel	250	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition	
400	500	Sub-grade	-	-	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition	
500	600	Surface	BT	120	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition	
600	700	Binder	Bitumen	-	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition	
700	800	Base	WBM	150	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition	
800	900	Sub-base	Gravel	200	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition	
900	1000	Sub-grade	-	-	B	P	60	G	-	-	-	-	-	-	G	PF	Good condition	

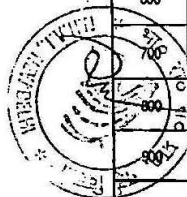
Note:

* : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDG = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top

WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top

** : No. and % 100m = Total no. of Pot hole / Patching and % age area of Pot hole / Patching; 100m of length of road

*** : NE = Non Existing; PF = Partially Functional; F = Functional.



ANNEXURE - A4 : PAVEMENT CONDITION SURVEY

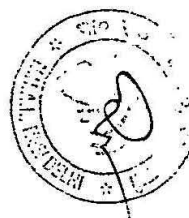
Road Name : Trichy to Dindigul
Section (From) : Km 333.000 to Km 421.600
District (From) : Trichy

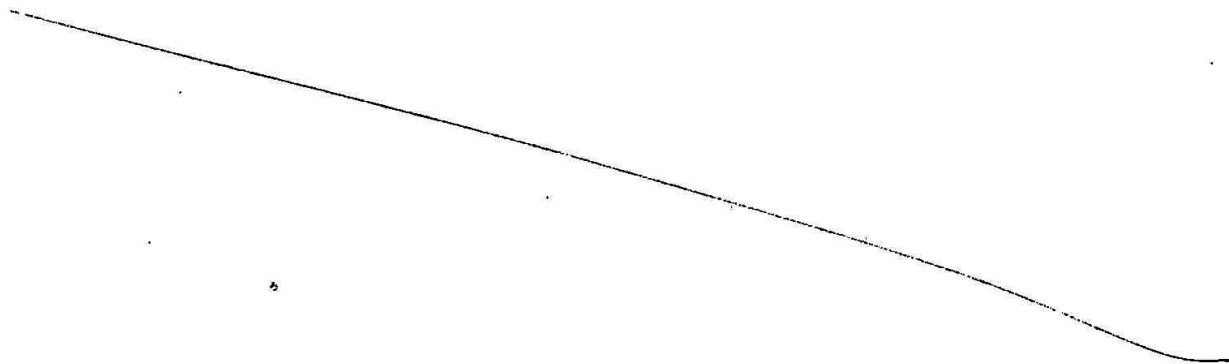
Road No : SH-45
Date of Survey : 27.06.05
Weather : Normal

From (m)	To (m)	Pavement composition			Shoulder		Riding	Quality	Pavement Condition					Pavement edge drop (mm)	Embankment condition (Good/Fair/Poor)	Road side drain (NE/PF/F)	Remarks
		Composition	Type*	Thickness (mm)	Composition	Condition (Fair/Poor/Good)			Cracking (%)	Raveling (%)	Pot holling (No. and % 100m)**	Rut (None/Moderate/Severe)	Patching (No. and % 100m)**				
Km 421.00 to 421.500																	
000	100	Surface	BT	400	B	F	60	G	-	-	-	-	-	-	G	PF	Good condition
100	200	Blinder	Blumen	-	B	F	60	G	-	-	-	-	-	-	G	PF	Good condition
200	300	Base	WBM	150	B	F	60	G	-	-	-	-	-	-	G	PF	Good condition
300	400	Sub-base	Gravel	200	B	F	60	G	-	-	-	-	-	-	G	PF	Good condition
400	500	Sub-grade	-	-	B	F	60	G	-	-	-	-	-	-	G	PF	Good condition
500	600	Surface	BT	-	B	F	60	G	-	-	-	-	3/2.6	-	G	PF	Good condition
<div>Note: * : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Sand Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing ; BT* = Black Top WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top ** : No. and %100m = Total no. of Pot holling / Patching and % age area of Pot holling / Patching 100m of length of road *** : NE = Non Existing; PF = Partially Functional; F = Functional.</div>																	

Note:

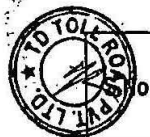
- * : BUSG = Built up Spray Grout; AC = Asphaltic Concrete; SDC = Semi Dense Concrete; PC = Premix Carpet; MSS = Mix Seal Surfacing; BT* = Black Top
WBM = Water Bound Macadam; DBM = Dense Bituminous Macadam; BM = Bituminous Macadam; BS = Brick Soling; SS = Stone soling; BT** = Bituminous Top
** : No. and %100m = Total no. of Pot holeing / Patching and % area area of Pot holeing / Patching 100m of length of road
*** : NE = Non Existing; PF = Partially Functional; F = Functional.



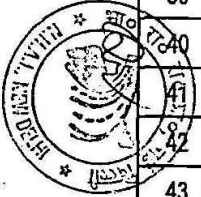



ANNEXURE A-5 : DETAILS OF CORRECTED CHARACTERISTIC DEFLECTION FOR PAVEMENT TEMPERATURE AND SUBGRADE MOISTURE

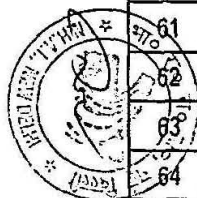
S.No	Chainage (Km)	Mean Deflection (\bar{x})	Standard Deviation (s)	Temperature Correction Factor	Season Correction Factor	Characteristics Deflection.mm ($\bar{x} + 2s$)	After Temperature Correction	Corrected Characteristic Deflection, (Dc)
1	333-334	0.60	0.24	-0.01	1.45	1.09	1.08	1.55
2	334-335	1.18	0.41	-0.03	1.45	1.99	1.96	2.85
3	335-336	0.999	0.437	-0.02	1.45	1.872	1.85	2.68
4	336-337	1.00	0.34	-0.01	1.35	1.67	1.66	2.24
5	337-338	1.11	0.29	-0.01	1.30	1.69	1.68	2.18
6	338-339	0.97	0.42	-0.02	1.29	1.80	1.78	2.30
7	339-340	1.16	0.30	0.00	1.42	1.76	1.76	2.49
8	340-341	0.88	0.35	-0.06	1.44	1.57	1.51	2.17
9	341-342	0.77	0.39	-0.06	1.25	1.55	1.49	1.86
10	342-343	0.89	0.43	-0.05	1.31	1.76	1.72	2.24
11	343-344	0.81	0.26	-0.05	1.34	1.33	1.29	1.72
12	344-345	0.77	0.38	-0.04	1.41	1.53	1.49	2.09
13	345-346	0.76	0.46	-0.04	1.33	1.69	1.65	2.18
14	346-347	0.75	0.48	-0.04	1.40	1.72	1.68	2.34
15	347-348	0.73	0.34	-0.03	1.43	1.41	1.38	1.98
16	348-349	0.66	0.31	-0.03	1.29	1.27	1.24	1.59
17	349-350	0.79	0.31	-0.04	1.44	1.42	1.38	1.99



	Chainage (Km)	Mean Deflection (\bar{x})	Standard Deviation (s)	Temperature Correction Factor	Season Correction Factor	Characteristics Deflection.mm ($\bar{x} + 2s$)	After Temperature Correction	Corrected Characteristic Deflection, (Dc)
18	350-351	0.65	0.22	-0.03	1.40	1.09	1.07	1.49
19	351-352	0.93	0.26	-0.03	1.45	1.46	1.43	2.07
20	352-353	0.80	0.30	-0.03	1.36	1.40	1.37	1.86
21	353-354	0.83	0.39	-0.03	1.48	1.61	1.58	2.34
22	354-355	0.67	0.23	-0.04	1.19	1.13	1.10	1.31
23	355-356	0.90	0.30	-0.04	1.50	1.51	1.47	2.19
24	356-357	0.76	0.28	-0.03	1.42	1.31	1.28	1.82
25	357-358	0.82	0.24	-0.03	1.45	1.30	1.27	1.84
26	358-359	0.74	0.34	-0.03	1.36	1.42	1.40	1.89
27	359-360	0.61	0.33	-0.02	1.38	1.26	1.24	1.72
28	360-361	0.80	0.38	-0.02	1.30	1.55	1.54	1.99
29	361-362	0.80	0.27	-0.01	1.47	1.34	1.33	1.95
30	362-363	0.96	0.30	-0.02	1.43	1.55	1.54	2.20
31	363-364	1.00	0.27	0.01	1.31	1.54	1.55	2.03
32	364-365	1.10	0.19	-0.01	1.36	1.48	1.47	1.99
33	365-366	1.18	0.35	0.06	1.31	1.88	1.94	2.54
34	366-367	1.19	0.26	0.04	1.47	1.70	1.74	2.56
35	367-368	1.03	0.31	0.03	1.30	1.64	1.66	2.16

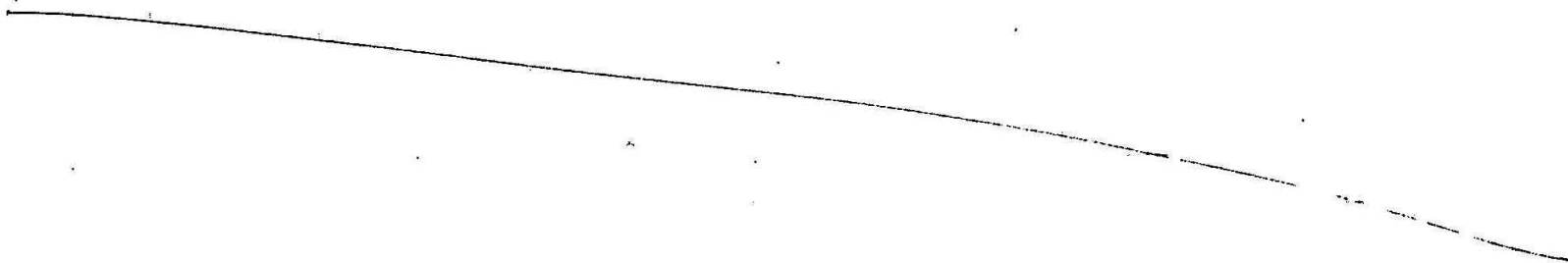



S.No	Chainage (Km)	Mean Deflection (\bar{x})	Standard Deviation (s)	Temperature Correction Factor	Season Correction Factor	Characteristics Deflection.mm ($\bar{x} + 2s$)	After Temperature Correction	Corrected Characteristic Deflection, (Dc)
36	368-369	0.80	0.25	0.04	1.26	1.29	1.33	1.67
37	369-370	0.86	0.23	0.02	1.19	1.33	1.34	1.59
38	370-371	0.74	0.42	0.01	1.44	1.57	1.58	2.28
39	371-372	0.56	0.27	-0.01	1.40	1.11	1.10	1.54
40	372-373	0.53	0.35	-0.01	1.44	1.22	1.21	1.75
41	373-374	0.99	0.27	-0.03	1.38	1.54	1.51	2.07
42	374-375	1.07	0.22	-0.04	1.48	1.51	1.47	2.17
43	375-376	1.26	0.18	-0.04	1.32	1.62	1.58	2.08
44	376-377	0.79	0.39	-0.04	1.40	1.57	1.53	2.13
45	377-378	1.08	0.28	-0.03	1.36	1.63	1.60	2.17
46	378-379	1.16	0.25	-0.03	1.26	1.65	1.62	2.04
47	379-380	0.84	0.35	-0.05	1.53	1.55	1.50	2.28
48	380-381	1.15	0.25	-0.06	1.32	1.65	1.60	2.10
49	381-382	0.75	0.38	-0.05	1.49	1.51	1.46	2.17
50	382-383	1.24	0.20	-0.05	1.33	1.63	1.58	2.10
51	383-384	0.46	0.34	-0.05	1.41	1.14	1.09	1.54
52	384-385	0.63	0.32	-0.04	1.50	1.28	1.24	1.85
53	385-386	0.72	0.25	-0.04	1.55	1.23	1.19	1.84



No	Chainage (Km)	Mean Deflection (\bar{x})	Standard Deviation (s)	Temperature Correction Factor	Season Correction Factor	Characteristics Deflection.mm ($\bar{x} + 2s$)	After Temperature Correction	Corrected Characteristic Deflection, (Dc)
54	386-387	0.74	0.27	-0.04	1.42	1.29	1.25	1.78
55	387-388	0.70	0.35	-0.05	1.44	1.39	1.35	1.93
56	388-389	0.77	0.31	-0.05	1.36	1.39	1.34	1.82
57	389-390	0.52	0.20	-0.05	1.31	0.92	-0.88	1.15
58	390-391	0.57	0.34	-0.05	1.36	1.24	1.19	1.62
59	391-392	0.56	0.21	-0.02	1.09	0.97	0.95	1.03
60	392-393	0.81	0.39	-0.03	1.35	1.58	1.56	2.10
61	393-394	0.67	0.25	0.00	1.44	1.17	1.17	1.68
62	394-395	0.57	0.23	0.01	1.39	1.03	1.04	1.44
63	395-396	0.54	0.28	-0.01	1.39	1.09	1.08	1.50
64	396-397	0.67	0.22	0.02	1.32	1.10	1.12	1.48
65	397-398	0.77	0.27	-0.01	1.39	1.31	1.30	1.81
66	398-399	0.87	0.28	0.00	1.30	1.44	1.44	1.87
67	399-400	1.11	0.28	-0.02	1.54	1.67	1.65	2.54
68	400-401	0.79	0.27	-0.04	1.40	1.33	1.29	1.80
69	401-402	0.68	0.31	-0.06	1.57	1.29	1.24	1.94
70	402-403	0.60	0.22	-0.07	1.37	1.05	0.98	1.34
71	403-404	1.00	0.16	-0.05	1.25	1.33	1.28	1.60

S.No	Chainage (Km)	Mean Deflection (\bar{x})	Standard Deviation (s)	Temperature Correction Factor	Season Correction Factor	Characteristics Deflection.mm ($\bar{x} + 2s$)	After Temperature Correction	Corrected Characteristic Deflection, (Dc)
72	404-405	0.93	0.23	-0.06	1.45	1.39	1.34	1.93
73	405-406	0.84	0.25	-0.05	1.37	1.34	1.29	1.77
74	406-407	1.20	0.22	-0.03	1.49	1.64	1.61	2.39
75	407-408	0.95	0.38	0.00	1.53	1.70	1.70	2.59
76	408-409	1.01	0.40	0.00	1.50	1.80	1.80	2.70
77	409-410	0.96	0.30	-0.01	1.46	1.57	1.56	2.27
78	410-411	0.72	0.31	0.00	1.35	1.35	1.35	1.82
79	411-412	0.88	0.35	-0.02	1.45	1.57	1.55	2.25
80	412-413	0.86	0.28	-0.04	1.26	1.41	1.37	1.72
81	413-414	0.64	0.32	-0.05	1.40	1.29	1.25	1.74
82	414-415	0.72	0.24	-0.04	1.31	1.20	1.16	1.51
83	415-416	1.05	0.35	-0.03	1.50	1.75	1.72	2.57
84	416-417	0.80	0.35	-0.01	1.28	1.49	1.48	1.89
85	417-418	0.70	0.18	0.01	1.35	1.07	1.08	1.45
86	418-419	0.58	0.25	0.00	1.18	1.08	1.08	1.27
87	419-420	0.74	0.20	0.00	1.51	1.13	1.13	1.70
88	420-421	0.67	0.22	0.00	1.46	1.11	1.11	1.62
89	421-422	0.60	0.16	-0.03	1.53	0.92	0.89	1.36

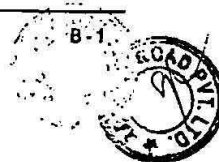
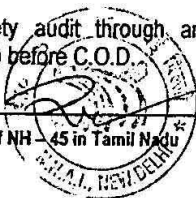


SCHEDULE - B**SCOPE OF THE PROJECT****1. General**

The following section of this Schedule briefly highlight the scope of the work of the Project. The description of the requirements for the various elements of the Project Highway given herein under are the bare minimum requirements of the Project. The "Project" has the same meaning as defined in para 1.1 of draft 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 measures and standards, executing procedures, including inspection procedures and highway patrols, and engaging and managing contractors, agents and employees) as will:

- a. enable the NHAI to provide an acceptably safe highway in respect of its condition (structural safety) and use (road safety) and
- b. enable the NHAI to fulfil its statutory and common law obligations; and
- c. enable the NHAI to provide a congestion free uninterrupted flow of traffic on the Project Highway;
- d. enable the NHAI to provide a level of highway service to the public not inferior to that provided on the trunk road during construction or improvement works;
- e. enable the police, local authorities, and others with statutory duties or functions in relation to the Project Highway or adjoining roads to fulfil those duties and functions;
- f. minimise the risk of damage, destruction or disturbance to third party property
- g. ensure that members of the public are treated with all due courtesy and consideration;
- h. provide a safe, clear and informative system of road signs;
- i. comply with any specified programme requirements, including for the completion of the new road;
- j. enable standards of reliability, durability, accessibility, maintainability, quality control and assurance, and fitness for purpose appropriate to a highway of the character of the Project Highway to be achieved throughout the Contract Period;
- k. ensure adequate off-street parking facilities for both passenger and goods vehicles;
- l. provide adequate bus bays for stopping of buses and bus shelters for commuters to wait under protection; and
- m. Achieve a high standard in the appearance and aesthetic quality of the Project Highway and achieve integration of the Project Highway with the character of the surrounding landscape through both sensitive design and sensitive management of all visible elements including those on the existing road.
- n. Undertake proper safety audit through an appropriate consultant (i.e. apart from the Independent Consultant) before C.O.D.



- o. Carry out accident recording and reporting (to IC & NHAI) by type on regular basis.
- p. Ensure adequate safety of the Project Workers on the work site.
- q. Minimize the occurrence and adverse effects of accidents and ensure that all accidents and emergencies are responded to as quickly as possible.

2.0 Project Highway (Length : 88.273 Km)

Notwithstanding the base alignment plans enclosed with this schedule, 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 upgradation 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 prior to execution.

2.1(a) Cross Sections

The Project Highway having length of 88.273 km shall be widened to have a 4 lane dual carriageway facility. The alignment plan and profile of the Project Highway is given in Drawing Volume. The typical cross section of four laning with dual carriageway shall be followed as per the minimum design criterion, mentioned below for the development of the Project Highway. The typical cross sections are presented in Drawing Volume: CS I – CS VIIIB. Table B1 indicates the proposed schedule of typical cross sections to be followed along the Project Highway.

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 fiber 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/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 accordance with schedule 'D'. 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.

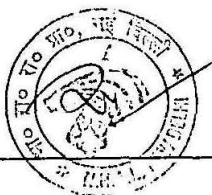


Table B1: Proposed Cross Section Schedule

S.No	Design Chainage (km)	Length in km	Widening Option	Cross Section Type
1.	333/000 - 334/375	1.375	Concentric widening with service road on both sides (Grade Separator with RE wall)	Type - VIIA
2.	334/375 - 335/700	1.325	Left side widening	Type - I
3.	335/700 - 336/613	0.913	Reconstruction	Type - III
4.	336/613 - 338/515	1.902	Right side widening	Type - II
5.	338/515 - 338/710	0.195	Reconstruction	Type - III
6.	338/710 - 344/440	5.730	Left side widening	Type - I
7.	344/440 - 344/627	0.187	Reconstruction	Type - III
8.	344/627 - 345/075	0.448	Right side widening	Type - II
9.	345/075 - 345/506	0.431	Reconstruction	Type - III
10.	345/506 - 347/200	1.694	Left side widening	Type - I
11.	347/200 - 347/450	0.250	Concentric widening with service road on both sides	Type - V
12.	347/450 - 348/050	0.600	Concentric widening with service road on both sides (underpass portion with Toe wall)	Type - VIIIA
13.	348/050 - 348/250	0.200	Concentric widening with service road on both sides	Type - V
14.	348/250 - 350/221	1.971	Left side widening	Type - I
15.	350/221 - 351/410	1.189	New construction (Minor Realignment)	Type - IV
16.	351/410 - 353/200	1.790	Left side widening	Type - I
17.	353/200 - 354/200	1.000	Reconstruction	Type - III
18.	354/200 - 355/650	1.450	Left side widening	Type - I
19.	355/650 - 356/793	1.143	New construction (Minor Realignment)	Type - IV
20.	356/793 - 360/950	4.157	Left side widening	Type - I
21.	360/950 - 361/300	0.350	Concentric widening with service road on both sides	Type - V

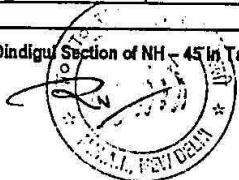
4-laning of Trichy - Dindigul Section of NH - 45 in Tamil Nadu



S.No	Design Chainage (km)	Length in km	Widening Option	Cross Section Type
22.	361/300 - 361/925	0.625	Concentric widening with service road on both sides (underpass portion with RE wall)	Type - VIIA
23.	361/925 - 362/400	0.475	Concentric widening with service road on both sides	Type - V
24.	362/400 - 364/800	2.400	Left side widening	Type - I
25.	364/800 - 365/000	0.200	Reconstruction	Type - III
26.	365/000 - 365/450	0.450	Eccentric Widening (Underpass portion with toe wall)	Type - VIIIB
27.	365/450 - 365/900	0.450	Reconstruction	Type - III
28.	365/900 - 366/800	0.900	Left side widening	Type - I
29.	366/800 - 367/965	1.165	New construction (Minor Realignment)	Type - IV
30.	367/965 - 376/425	8.460	Left side widening	Type - I
31.	376/425 - 376/791	0.366	Reconstruction	Type - III
32.	376/791 - 377/225	0.434	Concentric widening with service road on both sides	Type - V
33.	377/225 - 377/650	0.425	Concentric widening with service road on both sides (Underpass portion with RE wall)	Type - VIIA
34.	377/650 - 378/147	0.497	Concentric widening with service road on both sides	Type - V
35.	378/147 - 378/922	0.775	Left side widening	Type - I
36.	378/922 - 379/162	0.240	Reconstruction	Type - III
37.	379/162 - 382/125	2.963	Right side widening	Type - II
38.	382/125 - 382/925	0.800	Left side widening with Reconstruction	Type - III
39.	382/925 - 385/000	2.075	Left side widening	Type - I
40.	385/000 - 385/225	0.225	Reconstruction	Type - III
41.	385/225 - 385/600	0.375	Eccentric widening (Underpass portion with Toe wall)	Type - VIIIB
42.	385/600 - 385/900	0.300	Reconstruction	Type - III

S.No	Design Chainage (km)	Length in km	Widening Option	Cross Section Type
43.	385/900 - 386/000	0.100	Left side widening	Type - I
44.	386/000 - 386/452	0.452	Reconstruction	Type - III
45.	386/452 - 386/829	0.377	Right side widening	Type - II
46.	386/829 - 387/278	0.449	Reconstruction	Type - III
47.	387/278 - 387/542	0.264	Left side widening	Type - I
48.	387/542 - 388/167	0.625	Left side widening with separated carriageway	Type - VI
49.	388/167 - 388/766	0.599	Left side widening	Type - I
50.	388/766 - 388/942	0.176	Reconstruction	Type - III
51.	388/942 - 389/850	0.908	Right side widening	Type - II
52.	389/850 - 390/150	0.300	Reconstruction	Type - III
53.	390/150 - 391/650	1.500	Right side widening	Type - II
54.	391/650 - 391/850	0.200	Reconstruction	Type - III
55.	391/850 - 392/471	0.621	Right side widening	Type - II
56.	392/471 - 392/683	0.212	Reconstruction	Type - III
57.	392/683 - 393/852	1.169	Right side widening	Type - II
58.	393/852 - 395/700	1.848	New construction	Type - IV
59.	395/700 - 395/875	0.175	Concentric widening with service road on both sides	Type - V
60.	395/875 - 396/050	0.175	Concentric widening with service road on both sides (Underpass portion with RC retaining wall)	Type - VIIB
61.	396/050 - 396/650	0.600	Concentric widening with service road on both sides (Underpass portion with RE wall)	Type - VIIA
62.	396/650 - 396/750	0.100	Concentric widening with service road on both sides	Type - V
63.	396/750 - 401/847	5.097	Left side widening	Type - I
64.	401/847 - 402/537	0.690	Reconstruction	Type - III

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S.No	Design Chainage (km)	Length in km	Widening Option	Cross Section Type
65.	402/537 - 405/350	2.813	Right side widening	Type - II
66.	405/350 - 405/750	0.400	Reconstruction	Type - III
67.	405/750 - 409/840	4.090	Right side widening	Type - II
68.	409/840 - 410/075	0.235	Reconstruction	Type - III
69.	410/075 - 411/750	1.675	New construction (Minor Realignment)	Type - IV
70.	411/750 - 413/500	1.750	Left side widening	Type - I
71.	413/500 - 413/900	0.400	Reconstruction	Type - III
72.	413/900 - 414/150	0.250	Left side widening	Type - I
73.	414/150 - 415/300	1.150	Reconstruction	Type - III
74.	415/300 - 416/450	1.150	Left side widening	Type - I
75.	416/450 - 416/953	0.503	Reconstruction	Type - III
76.	416/953 - 417/800	0.847	Right side widening	Type - II
77.	417/800 - 417/900	0.100	Reconstruction	Type - III
78.	417/900 - 418/600	0.700	Eccentric widening (Underpass portion with toe wall)	Type - VIII- B
79.	418/600 - 418/850	0.250	Reconstruction	Type - III
80.	418/850 - 421/000	2.150	Right side widening	Type - II
81.	421/000 - 421/273	0.273	Reconstruction	Type - III

2.1(b) Longitudinal Section

As a minimum, the concessionaire shall achieve the finished road level (FRL) as given in the alignment plan and profile given in Drawing Volume.

2.2 Service Road

The service road shall be provided 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 CS V, VIIA, VIIB & VIIIA in Drawing Volume. The service road shall be provided at the locations, given below in Table B-2 and the width of service road shall be 7 m.



Table B2: Details of service roads

S.No	Name of Town	Design Chainage (km)	Length in km	LHS / RHS	Total Length in km
1.	Cholan Nagar	333/000 – 334/375	1.375	Both Sides	2.750
2.	Alampatti Pudur	347/200 – 348/250	1.050	Both Sides	2.100
3.	Manaparai Bypass	360/950 – 362/400	1.450	Both Sides	2.900
4.	Vaiyampatti Town	376/791 – 378/147	1.356	Both Sides	2.712
5.	Ayyalur	395/700 – 396/750	1.050	Both Sides	2.100
				Total	12.562

3.0 Pavement composition

3.1 Pavement type to be provided shall be flexible for the existing 2-lane road, Service Roads, bus bays and cross roads upto Right of Way (ROW). Rigid type pavement shall be provided at Toll Plaza location as shown in the drawings (Refer Drawing Volume). For providing new carriageway, the Concessionaire can have the option to go for flexible or rigid type pavement.

3.2 Pavement Design shall be based on the following parameters:

- a) The Concessionaire shall provide pavement thickness considering 50 MSA as design traffic for the main carriageway. The Service Roads and bus bays shall be provided considering design traffic of 10 MSA.
- b) Design Life: i) Flexible Pavement for 15 years
ii) Rigid Pavement for 30 years
- c) Flexible Pavement
 - i) New Carriageway

The flexible pavement for new carriageway shall be designed for 50 msa as per the IRC: 37-2001. Selected subgrade of 500mm thick having 10% CBR value at 97% Maximum Dry Density (MDD) as tested in accordance with IS: 2720 Part VIII (Heavy Proctor) shall be provided prior to laying the pavement layers.

For the main carriageway, the Concessionaire should however satisfy himself in this regard and should consider higher traffic for design purposes in case required as per projected traffic considering 15 years period.

The finished pavement profile for the total project length shall be designed so that the bottom level of the subgrade always remain above the Highest Flood Level (HFL).



ii) Strengthening of the existing carriageway

Strengthening of the existing flexible pavement shall be done with bituminous overlay designed in accordance with IRC: 81-1981.

The following minimum requirements of profile, both longitudinal and cross shall have to be achieved while providing overlay for strengthening the existing carriageway.

Cross profile : Camber of 2.5%; super elevation as per geometric design.

Longitudinal profile: Vertical curves as per geometric design requirements and straight length between two curves shall be minimum 30m.

If the Concessionaire desires to use geo synthetics, geo-nets, etc., as part of the strengthening of the existing carriageway, the same shall be finalized in consultation with the Independent Consultant, before execution of work.

Profile Corrective Course (PCC):

The composition of Profile Corrective Course (PCC) shall be as follows. If the level difference between the underside of the overlay thickness and existing line level is:

Upto 150mm	:	Bituminous Macadam shall be provided as profile corrective course
More than 150mm and upto 300mm	:	Scarify the existing bituminous course and provide 75mm DBM and the rest with WMM as PCC

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. Selected subgrade of 500mm thick having 10% CBR value at 97% Maximum Dry Density (MDD) as tested in accordance with IS:2720 Part VIII (Heavy Proctor) shall be provided prior to laying the pavement layers.

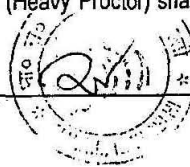
iv) Service roads:

The flexible pavement for new carriageway shall be designed for 10 msa as per the IRC: 37-2001. Selected subgrade of 500mm thick having 10% CBR value at 97% Maximum Dry Density (MDD) as tested in accordance with IS:2720 Part VIII (Heavy Proctor) shall be provided prior to laying the pavement layers.

d) Rigid Pavement

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

Selected subgrade of 500mm thick having 10% CBR value at 97% Maximum Dry Density (MDD) as tested in accordance with IS:2720 Part VIII (Heavy Proctor) shall be provided prior to laying the pavement layers.



ii)- Paved shoulders adjoining the Rigid Pavement

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

4.0 Intersections/ Junctions (At Grade)

- (i) Adequately designed junctions with channelisations shall be provided at major junctions and it will be ensured that right turn and left turn (acceleration and deceleration) lanes (auxiliary) are adequate for safe and smooth movement of traffic.
- (ii) Auxiliary acceleration and deceleration lanes shall be provided for left turning traffic at entrances to major roadside facilities such as Wayside Amenities, Service Area and truck Lay-byes.
- (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 land could not be made available to accommodate proposed intersection layout, the proposed intersection layout shall be followed upto available land boundary and therefore suitable tapering shall be provided for the cross road.

The improvement measures for the 11 nos. of major intersections are given below in Table B-3. For the intersection at Km 421.273, the improvement measures shall match the Major Junction Improvement X, which is being adopted for North South Corridor Project. Improvement measures for minor intersection shall be carried out as given in Table B-4 below. The type designs of minor intersection improvement are given in Type I to Type VIII in Drawing Volume. All the intersections shall be designed individually in accordance with standards mentioned in Schedule-D.

Table B3: Improvement Proposals for Major Intersections

S.No	Existing Chainage (km / m)	Design Chainage (Km / m)	Status of Cross Road	No.of arms	Width of Cross Road (m)	Intersection Improvement
1	333/888	333/882	Intersection with NH 67 bypass	4 arms	10.00	Grade separator (refer clause 2.4.3)
2	360/300	360/252	SH 71	3 arms	7.20	I
3	361/600	361/525	MDR	3 arms	7.00	II
4	364/200	363/955	MDR	3 arms	7.00	III
5	377/550	377/459	ODR	4 arms	3.70	IV
6	396/200	396/120	MDR	4 arms	3.60	V
7	403/400	403/055	MDR	3 arms	7.00	VI

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S.No	Existing Chainage (km / m)	Design Chainage (Km / m)	Status of Cross Road	No. of arms	Width of Cross Road (m)	Intersection Improvement
8	405/050	404/563	MDR	3 arms	7.20	VII
9	417/380	417/225	MDR	3 arms	7.00	VIII
10	418/790	418/328	SH 74	4 arms	7.20	IX
11	421/600	421/273	NH-7	4 arms	7.50	X

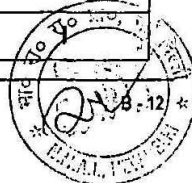
Table B4: Improvement Proposals for Minor Intersections

S.No	Existing Chainage (km / m)	Proposed Chainage (Kml)	Name of Road	Type Design of Intersection Improvement
1	333/220	333/221	Village road	IV
2	333/575	333/576	Village road	I
3	334/550	334/543	Village road	I
4	335/130	335/157	Village road	III
5	335/300	335/290	Village road	I
6	335/610	335/612	Village road	I
7	336/450	336/150	Village road	I
8	336/800	336/781	Village road	II
9	337/975	337/985	Village road	IV
10	338/175	338/205	Village road	I
11	338/575	338/548	Village road	I
12	339/200	339/214	Village road	V
13	339/450	339/345	Village road	I
14	340/200	340/235	Village road	III
15	341/000	341/068	Village road	II
16	341/450	341/509	ODR	IV
17	341/450	341/519	Village road	V
18	342/100	342/265	Village road	III
19	342/780	342/849	Village road	III

S.No	Existing Chainage (km / m)	Proposed Chainage (Kml)	Name of Road	Type Design of Intersection Improvement
20	344/720	344/824	Village road	III
21	345/820	345/933	ODR	VI
22	347/650	347/736	ODR	VI
23	348/170	348/274	Village road	I
24	348/800	348/925	Village road	VI
25	349/350	349/470	Village road	V
26	350/175	350/350	Village road	IV
27	350/800	350/950	Village road	II
28	351/980	352/131	Village road	I
29	352/380	352/579	Village road	I
30	352/600	352/851	Village road	IV
31	353/900	354/105	Village road	I
32	354/010	354/214	ODR	I
33	354/375	354/576	Village road	III
34	354/590	354/787	Village road	IV
35	355/790	355/953	Village road	V
36	356/350	356/401	Village road	I
37	357/100	357/134	Village road	II
38	357/820	357/869	Village road	I
39	357/950	358/014	ODR	IV
40	358/700	358/743	Village road	III
41	359/000	359/030	ODR	V
42	359/710	359/760	Village road	I
43	361/100	361/055	Village road	VIII
44	361/108	361/063	Village road	VIII
45	362/400	362/300	Village road	VI
46	363/200	363/082	ODR	IV

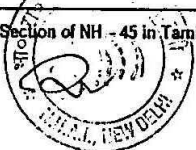


S.No	Existing Chainage (km / m)	Proposed Chainage (Km)	Name of Road	Type Design of Intersection Improvement
47	363/212	363/094	Village road	III
48	364/380	364/299	Village road	II
49	364/900	364/994	Village road	III
50	365/100	365/029	Village road	III
51	366/090	366/206	Village road	II
52	366/720	366/617	Village road	II
53	366/950	366/856	Village road	V
54	367/660	367/663	Village road	I
55	369/100	369/101	Village road	I
56	370/500	370/442	Village road	II
57	371/060	370/950	Village road	II
58	371/100	370/990	Village road	II
59	371/200	371/108	Village road	III
60	372/000	371/892	Village road	IV
61	374/050	373/962	Village road	IV
62	374/100	374/042	ODR	I
63	374/116	374/058	Village road	I
64	374/500	374/412	Village road	I
65	375/550	375/432	Village road	II
66	375/900	375/808	Village road	III
67	378/100	377/968	ODR	VII
68	378/940	378/821	Village road	I
69	379/050	378/942	Village road	I
70	379/725	379/630	Village road	I
71	380/090	379/991	Village road	I
72	383/400	383/392	Village road	V
73	383/610	383/534	Village road	



S.No	Existing Chainage (km / m)	Proposed Chainage (Km/)	Name of Road	Type Design of Intersection Improvement
74	387/005	386/945	Village road	III
75	387/930	387/829	Village road	I
76	388/970	388/680	Village road	I
77	389/390	389/264	Village road	IV
78	395/571	395/380	Village road	II
79	397/620	397/275	Village road	I
80	398/500	398/140	Village road	VI
81	400/010	399/680	Village road	I
82	400/450	400/091	Village road	III
83	402/030	401/691	Village road	II
84	402/725	402/360	Village road	IV
85	403/050	402/723	Village road	III
86	404/070	403/716	ODR	VI
87	404/675	404/240	ODR	IV
88	404/682	404/252	Village road	III
89	405/625	405/198	Village road	I
90	405/975	405/533	Village road	IV
91	406/370	405/953	Village road	III
92	407/100	406/581	Village road	I
93	408/175	406/696	Village road	I
94	409/250	408/832	Village road	IV
95	409/675	409/252	Village road	II
96	409/850	409/434	Village road	II
97	410/800	410/359	Village road	II
98	411/950	411/548	Village road	II
99	412/450	412/084	Village road	I
100	412/750	412/346	ODR	I

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S.No	Existing Chainage (km / m)	Proposed Chainage (Kml)	Name of Road	Type Design of Intersection Improvement
101	413/300	412/948	Village road	V
102	413/830	413/546	Village road	V
103	414/190	413/869	Village road	I
104	415/300	415/007	Village road	II
105	415/750	415/425	Village road	II
106	415/775	415/450	Village road	IV
107	416/820	416/503	Village road	IV
108	417/050	416/723	Village road	IV
109	417/400	417/083	Village road	II
110	418/808	418/467	Village road	III
111	419/114	418/787	Village road	I
112	419/800	419/480	Village road	I
113	420/215	419/760	Village road	I
114	420/575	419/895	Village road	VI
115	421/018	420/674	Village road	II
116	421/017	420/672	Village road	V
117	421/164	420/819	Village road	I
118	421/358	421/015	Village road	VI
119	421/436	421/094	Village road	I

5.0 Structures

5.1 Cross Drainage Structures (Bridges & Culverts)

Existing and new culverts and bridges shall be provided wide enough to accommodate the adjacent road cross section. All the cross drainage structures and other structures shall be designed in accordance with the design standard, set forth in Schedule D. General Arrangement drawings (GAD) of bridges are given in Drawing Volume.

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.

- II The existing culverts shall be widened 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.
- 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, as not to affect the foundations of existing bridge.
- VII For drainage purpose, the new/to be reconstructed pipe culverts of minimum 1.20m dia. shall be provided. The existing Pipe culvert of 0.9m or more dia shall be extended to the new carriageway using the same diameter pipe, but all the existing pipe culvert of less than 0.9m dia shall be reconstructed.

The cross drainage plan of the highway shall be finalized in consultation with IC & NHAI and if required additional culverts shall be provided.

The scope of work for culverts includes widening the retained culverts, demolishing and reconstruction of weak / narrow culverts and provision of new culverts, wherever required. The length of all culverts when completed shall be corresponding to the requirements of 4-laning.

The scope of work for bridges includes provision of additional 2-lane bridges (14 nos.) and provision of new/to be reconstructed to 4-lane bridge (1 no.) The proposed improvement scheme for culverts including four additional culverts is given in Table B5 and that for bridges is given at Table B6 which shall be provided by the Concessionaire under this contract.

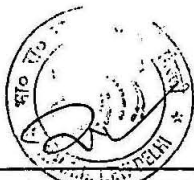




Table B5 : Improvement Proposals for Culverts

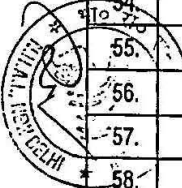
S.No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
1.	334/1	333/842	333/835	One row RCC pipe	1 x 0.90	Reconstruction	12.95	Two row RCC pipe	2 x 1.20
2.	335/1	334/033	334/037	One row RCC pipe	1 x 0.90	Reconstruction	12.95	Two row RCC pipe	2 x 1.20
3.	336/1	335/553	335/554	One row RCC pipe	1 x 0.90	Reconstruction	12.60	Two row RCC pipe	2 x 1.20
4.	336/3	335/766	335/756	Three row RCC Pipe	3 x 0.90	Reconstruction	12.80	RCC slab	1 x 4.00
5.	337/1	336/267	336/272	Three row RCC Pipe	3 x 0.90	Reconstruction	12.95	RCC slab	1 x 4.00
6.	338/1	337/175	337/191	Two row RCC pipe	2 x 0.90	Reconstruction	12.90	Two row RCC pipe	2 x 1.20
7.	338/2	337/913	337/914	Single row RCC Pipe	1 x 0.90	Reconstruction	12.90	RCC slab	1 x 4.00
8.	339/1	338/500	338/527	One row RCC pipe	1 x 0.90	Reconstruction	12.20	Two row RCC pipe	2 x 1.20
9.	339/2	338/595	338/623	RCC Slab	1 x 3.00	Reconstruction	12.00	RCC slab	1 x 3.00
10.	339/3	338/889	338/901	Cut Stone	2 x 1.20	Reconstruction	14.80	RCC slab	1 x 3.00
11.	340/1	339/081	339/107	RCC Slab	1 x 2.00	Reconstruction	12.75	RCC slab	1 x 2.00
12.	341/1	340/623	340/667	One row RCC pipe	1 x 0.90	Reconstruction	12.70	Two row pipe	2 x 1.20
13.	342/1	341/815	341/871	Two row RCC pipe	2 x 0.90	Reconstruction	12.55	Two row pipe	2 x 1.20
14.	343/1	342/556	342/613	Single row pipe	1 x 0.90	Widening	12.3	One row RCC pipe	1 x 0.90
15.	343/2	342/932	342/998	Two row RCC pipe	2 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
16.	344/1	343/561	343/615	One row RCC pipe	1 x 0.90	Reconstruction	12.20	Two row RCC pipe	2 x 1.20
17.	344/2	343/834	343/905	One row RCC pipe	1 x 0.90	Reconstruction	12.25	Two row RCC pipe	2 x 1.20





S.No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
18.	345/1 & 345/2	344/574 & 344/583	344/655	Cut Stone	1 x 0.90	Reconstruction	12.55	RCC slab	1 x 4.00
19.	346/1	345/398	345/489	RCC Slab	1 x 2.00	Widening	12.1	RCC slab	1 x 2.00
20.	347/1	346/658	346/746	Two row RCC pipe	2 x 0.90	Reconstruction	12.55	Two row RCC pipe	2 x 1.20
21.	347/2	347/013	347/100	Cut Stone	1 x 1.50	Reconstruction	11.70	RCC slab	1 x 3.00
22.	348/1	347/045	347/130	One row RCC pipe	1 x 0.90	Reconstruction	12.20	Two row RCC pipe	2 x 1.20
23.	348/2	347/693	347/780	One row RCC pipe	1 x 0.90	Reconstruction	12.15	Two row RCC pipe	2 x 1.20
24.	348/3	347/953	348/039	One row RCC pipe	1 x 0.90	Reconstruction	12.40	Two row RCC pipe	2 x 1.20
25.	349/1A	348/050	348/159	One row RCC pipe	1 x 0.30	Reconstruction	12.20	Two row RCC pipe	2 x 1.20
26.	349/1	348/689	348/795	One row RCC pipe	1 x 0.90	Widening	12.2	One row RCC pipe	1 x 0.90
27.	349/2	348/809	348/918	One row RCC pipe	1 x 0.90	Reconstruction	14.95	Two row RCC pipe	2 x 1.20
28.	350/1	349/239	349/351	One row RCC pipe	1 x 0.90	Reconstruction	12.25	Two row RCC pipe	2 x 1.20
29.	350/2	349/420	349/531	RCC Slab	1 x 3.00	Widening	12.1	RCC slab	1 x 3.00
30.	350/3	349/609	349/694	Cut Stone	3 x 0.95	Reconstruction	12.85	RCC slab	1 x 3.00
31.	350/4	349/793	349/879	One row RCC pipe	1 x 0.90	Reconstruction	12.20	Two row RCC pipe	2 x 1.20
32.	350/5	349/914	350/025	One row RCC pipe	1 x 0.90	Widening	12.3	One row RCC pipe	1 x 0.90
33.	352/1	351/077	351/248	One row RCC pipe	1 x 0.90	Reconstruction	17.0	Two row RCC pipe	2 x 1.20
34.	352/2	351/242	351/416	RCC Slab	1 x 3.00	Widening	12.45	RCC slab	1 x 3.00
35.	352/3	351/495	351/667	One row RCC pipe	1 x 0.90	Widening	15.9	One row RCC pipe	1 x 0.90


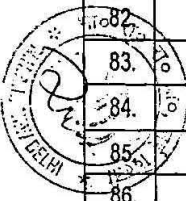


No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
36.	352/4	351/609	351/779	One row RCC pipe	1 x 0.90	Reconstruction	14.20	Two row RCC pipe	2 x 1.20
37.	352/5	351/804	351/974	One row RCC pipe	1 x 0.90	Reconstruction	13.90	Two row RCC pipe	2 x 1.20
38.	353/1	352/415	352/613	One row RCC pipe	1 x 0.90	Reconstruction	12.35	Two row RCC pipe	2 x 1.20
39.	353/1A	352/552	352/750	One row RCC pipe	1 x 0.90	Reconstruction	12.40	Two row RCC pipe	2 x 1.20
40.	353/2	352/700	352/889	One row RCC pipe	1 x 0.90	Reconstruction	12.25	Two row RCC pipe	2 x 1.20
41.	353/3	352/918	353/111	One row RCC pipe	1 x 0.90	Widening	12.2	One row RCC pipe	1 x 0.90
42.	354/1	353/197	353/394	RCC Slab	1 x 2.00	Reconstruction	12.80	RCC slab	1 x 2.0
43.	354/2	353/735	353/936	Two row RCC pipe	2 x 0.90	Widening	12.25	Two row RCC pipe	2 x 0.90
44.	355/1	354/493	354/691	RCC Slab	1 x 6.00	Widening	12	RCC slab	1 x 6.00
45.	355/2	354/971	355/169	One row RCC pipe	1 x 0.90	Widening	12.45	One row RCC pipe	1 x 0.90
46.	356/1A	355/222	355/422	One row RCC pipe	1 x 0.90	Reconstruction	14.60	Two row RCC pipe	2 x 1.20
47.	356/1	355/478	355/678	One row RCC pipe	1 x 0.90	Reconstruction	12.3	Two row RCC pipe	2 x 1.20
48.	356/2	355/848	356/040	RCC Slab	1 x 3.00	Reconstruction	12.20	RCC slab	1 x 3.00
49.	356/ Add	-	356/400	-	-	Additional	-	RCC slab	1 x 4.00
50.	357/1	356/719	356/784	RCC Slab	1 x 3.00	Reconstruction	12.00	RCC slab	1 x 3.00
51.	357/2	356/799	356/864	One row RCC pipe	1 x 0.90	Widening	12.2	One row RCC pipe	1 x 0.90
52.	358/1	357/315	357/359	RCC Slab	1 x 5.00	Widening	12.2	- RCC slab	1 x 5.00
53.	358/2	357/508	357/553	One row RCC Pipe	1 x 0.90	Widening	12.1	One row RCC pipe	1 x 0.90



S.No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
54.	359/1	358/390	358/440	RCC Slab	1 x 4.50	Widening	12	RCC slab	1 x 4.50
55.	359/2	358/776	358/826	RCC Slab	1 x 2.00	Widening	12.1	RCC slab	1 x 2.00
56.	360/1	359/466	359/526	One row RCC pipe	1 x 0.90	Widening	21.9	One row RCC pipe	1 x 0.90
57.	360/2	359/847	359/894	RCC Slab	1 x 2.00	Widening	11.9	RCC slab	1 x 2.00
58.	361/1	360/040	360/019	RCC Slab	1 x 2.00	Reconstruction	11.90	RCC slab	1 x 2.00
59.	361/2	360/497	360/472	One row RCC pipe	1 x 0.90	Reconstruction	12.00	Two row RCC pipe	2 x 1.20
60.	361/3A	360/875	360/848	RCC Slab	1 x 2.00	Reconstruction	11.90	RCC slab	1 x 2.00
61.	362/1	361/876	361/812	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
62.	363/1	362/361	362/287	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
63.	363/2	362/388	362/307	Two row RCC pipe	2 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
64.	363/3	362/479	362/405	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
65.	363/4	362/572	362/498	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
66.	363/5	362/700	362/625	RCC Slab	1 x 3.00	Reconstruction	12.30	RCC slab	1 x 3.00
67.	363/6	362/847	362/771	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
68.	363/7	362/941	362/865	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
69.	363/8	362/971	362/894	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
70.	364/1	363/065	362/987	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
71.	364/3	363/710	363/631	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20




S.No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
	364/4	363/750	363/672	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
	364/5	363/982	363/905	One row RCC pipe	1 x 0.90	Widening	17.2	One row RCC pipe	1 x 0.90
	366/1	365/230	365/161	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
75.	367/1	366/543	366/477	Two row RCC pipe	2 x 0.90	Widening	12.4	Two row RCC pipe	2 x 0.90
76.	367/2	366/662	366/594	RCC Slab	1 x 2.00	Widening	12.3	RCC slab	1 x 2.00
77.	367/3	366/895	366/827	One row RCC pipe	1 x 0.90	Reconstruction	12.25	Two row RCC pipe	2 x 1.20
78.	368/1	367/007	366/962	One row RCC pipe	1 x 0.90	Reconstruction	13.9	Two row RCC pipe	2 x 1.20
79.	368/1A	367/388	367/358	Two row RCC pipe	2 x 0.90	Reconstruction	13.3	Two row RCC pipe	2 x 1.20
80.	368/2A	367/812	367/770	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
81.	370/1	369/049	369/021	One row RCC pipe	1 x 0.90	Widening	12.1	One row RCC pipe	1 x 0.90
82.	370/2	369/854	369/820	Two row RCC pipe	2 x 0.90	Widening	12.4	Two row RCC pipe	2 x 0.90
83.	371/1	370/313	370/286	Two row RCC pipe	2 x 0.90	Widening	12.4	Two row RCC pipe	2 x 0.90
84.	372/1	371/029	370/929	One row RCC pipe	1 x 0.90	Reconstruction	12.30	Two row RCC pipe	2 x 1.20
85.	372/1A	371/279	371/180	Three row RCC pipe	3 x 0.90	Reconstruction	11.55	RCC slab	1 x 3.00
86.	372/2	371/473	371/375	One row RCC pipe	1 x 0.90	Reconstruction	14.95	Two row RCC pipe	2 x 1.20
87.	373/1	372/220	372/136	Two row RCC pipe	2 x 0.90	Reconstruction	14.95	Two row RCC pipe	2 x 1.20
88.	373/2	372/910	372/831	One row RCC pipe	1 x 0.90	Reconstruction	12.50	Two row RCC pipe	2 x 1.20
89.	374/1	373/592	373/512	One row RCC pipe	1 x 0.90	Reconstruction	12.45	Two row RCC pipe	2 x 1.20

S.No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
90.	375/1	374/078	373/993	One row RCC pipe	1 x 0.90	Widening	12.4	One row RCC pipe	1 x 0.90
91.	375/2	374/763	374/678	One row RCC pipe	1 x 0.90	Widening	22.07	One row RCC pipe	1 x 0.90
92.	375/3	374/857	374/773	One row RCC pipe	1 x 0.90	Widening	17.2	One row RCC pipe	1 x 0.90
93.	376/1	375/830	375/720	Cut stone	1 x 0.90	Reconstruction	22.40	RCC slab	1 x 5.00
94.	377/1	376/454	376/359	One row RCC pipe	1 x 0.90	Widening	12.20	One row RCC pipe	1 x 0.90
95.	378/1	377/453	377/353	One row RCC pipe	1 x 0.90	Reconstruction	12.20	Two row RCC pipe	2 x 1.20
96.	379/1	378/166	378/066	RCC Slab	1 x 4.00	Widening	12.25	RCC slab	1 x 4.00
97.	380/1	379/283	379/183	Two row RCC pipe	2 x 0.90	Widening	13	Two row RCC pipe	2 x 0.90
98.	380/2	379/698	379/591	RCC Slab	1 x 2.80	Widening	12	RCC slab	1 x 2.80
99.	380/3	379/838	379/729	RCC Slab	1 x 2.80	Widening	12.1	RCC slab	1 x 2.80
100.	381/1	380/143	380/038	RCC Slab	1 x 6.00	Widening	12.2	RCC slab	1 x 6.00
101.	381/2	380/339	380/234	RCC Slab	1 x 4.30	Widening	12.2	RCC slab	1 x 4.30
102.	381/3	380/890	380/783	Two row RCC pipe	2 x 0.90	Widening	12.2	Two row RCC pipe	2 x 0.90
103.	382/1	381/137	381/032	RCC Slab	1 x 3.60	Widening	11.65	RCC slab	1 x 3.60
104.	382/2	381/658	381/533	RCC Slab	1 x 6.00	Widening	12.3	RCC slab	1 x 6.00
105.	384/1	383/248	383/141	RCC Slab	1 x 3.90	Widening	11.8	RCC slab	1 x 3.90
106.	384/2	383/763	383/645	Two row RCC pipe	2 x 0.90	Widening	12.1	Two row RCC pipe	2 x 0.90
107.	384/3	383/917	383/810	RCC Slab	1 x 2.00	Reconstruction	12.20	RCC slab	1 x 2.00



S.No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
108.	385/1	384/129	384/019	RCC Slab	1 x 3.00	Widening	12.1	RCC slab	1 x 3.00
109.	385/2	384/758	384/649	One row RCC pipe	1 x 0.90	Reconstruction	12.1	Two row RCC pipe	2 x 1.20
110.	385/3	384/967	384/865	RCC Slab	1 x 3.00	Widening	14.1	RCC slab	1 x 3.00
111.	386/1	385/169	385/060	RCC Slab	1 x 3.00	Widening	12.25	RCC slab	1 x 3.00
112.	386/2	385/721	385/613	RCC Slab	1 x 5.50	Reconstruction	12.0	Box Culvert	6 x 3.00
113.	387/1	386/119	386/003	RCC Slab	1 x 4.00	Widening	12.20	RCC slab	1 x 4.00
114.	388/1	387/560	387/464	One row RCC pipe	1 x 0.90	Widening	12.1	One row RCC pipe	1 x 0.90
115.	388/2	387/747	387/642	One row RCC pipe	1 x 0.90	Reconstruction	12.35	Two row RCC pipe	2 x 1.20
116.	389/1	388/230	388/132	RCC Slab	1 x 2.00	Reconstruction	12.0	RCC slab	1 x 2.00
117.	389/3	388/856	388/763	One row RCC pipe	1 x 0.90	Widening	14.70	One row RCC pipe	1 x 0.90
118.	390/1	389/089	388/962	One row RCC pipe	1 x 0.90	Reconstruction	19.35	Two row RCC pipe	2 x 1.20
119.	390/2	389/251	389/122	One row RCC pipe	1 x 0.90	Widening	19.35	One row RCC pipe	1 x 0.90
120.	390/3	389/297	389/170	RCC Slab	1 x 4.60	Widening	11.75	RCC slab	1 x 4.60
121.	390/4	389/357	389/228	One row RCC pipe	1 x 0.90	Reconstruction	16.8	Two row RCC pipe	2 x 1.20
122.	391/1	390/421	390/260	One row RCC pipe	1 x 0.90	Reconstruction	12.20	Two row RCC pipe	2 x 1.20
123.	391/2	390/693	390/542	RCC Slab	1 x 1.50	Reconstruction	12.30	RCC slab	1 x 5.00
124.	392/1	391/172	391/027	RCC Slab	1 x 3.00	Reconstruction	12.0	RCC slab	1 x 3.00
125.	392/2	391/412	391/263	One row RCC pipe	1 x 0.90	Widening	12.35	One row RCC pipe	1 x 0.90

S.No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
126.	392/Add	391/950	391/775	—	—	Additional	—	Two row RCC pipe	2 x 1.20
127.	393/1	392/209	392/059	One row RCC pipe	1 x 0.90	Widening	12.25	One row RCC pipe	1 x 0.90
128.	393/2	392/769	392/615	RCC Slab	1 x 6.00	Reconstruction	12.00	RCC slab	1 x 6.00
129.	394/1	393/429	393/282	RCC Slab	1 x 4.00	Reconstruction	12.20	RCC slab	1 x 4.00
130.	395/1	394/585	394/445	RCC Slab	1 x 1.50	Widening	11.65	RCC slab	1 x 1.50
131.	396/1	395/147	394/999	RCC Slab	1 x 2.00	Widening	12.20	RCC slab	1 x 2.00
132.	396/2	395/507	395/333	RCC Slab	1 x 1.50	Widening	12.15	RCC slab	1 x 1.50
133.	397/ Add	396/110	395/925	—	—	Additional		Box Culvert	3 x 3.00
134.	397/1	396/133	395/879	RCC Slab	1 x 2.00	Reconstruction	11.95	Box Culvert	3 x 3.00
135.	398/1	397/093	396/751	RCC Slab	1 x 1.50	Reconstruction	11.85	RCC slab	1 x 2.00
136.	398/2	397/621	397/280	RCC Slab	1 x 1.80	Reconstruction	12.30	RCC slab	1 x 2.00
137.	402/1	401/702	401/340	RCC slab	1 x 4.00	Widening	12.05	RCC slab	1 x 4.00
138.	403/1	402/039	401/680	RCC Slab	1 x 2.00	Reconstruction	12.10	RCC slab	1 x 2.00
139.	403/2	402/498	402/138	RCC slab	1 x 4.00	Reconstruction	12.20	RCC slab	1 x 4.00
140.	403/3	402/598	402/237	RCC Slab	1 x 2.00	Reconstruction	12.20	RCC slab	1 x 2.00
141.	404/1	403/237	402/878	RCC Slab	1 x 1.50	Widening	12.05	RCC slab	1 x 1.50
142.	404/2	403/479	403/111	One row RCC pipe	1 x 0.90	Widening	12.55	One row RCC pipe	1 x 0.90
143.	404/3	403/641	403/260	One row RCC pipe	1 x 0.90	Widening	12.30	One row RCC pipe	1 x 0.90



S.No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
	405/1	404/046	403/687	One row RCC pipe	1 x 0.90	Reconstruction	12.25	Two row RCC pipe	2 x 1.20
	405/2	404/113	403/750	Two row RCC pipe	2 x 0.90	Reconstruction	12.25	Two row RCC pipe	2 x 1.20
146.	405/3	404/686	404/267	RCC Slab	1 x 2.00	Widening	12.25	RCC slab	1 x 2.00
147.	406/1	405/340	404/919	RCC Slab	1 x 1.50	Widening	12.60	RCC Slab	1 x 1.50
148.	406/2	405/763	405/338	RCC Slab	1 x 1.50	Widening	12.30	RCC slab	1 x 1.50
149.	407/1	406/994	406/567	RCC Slab	1 x 1.50	Widening	12.10	RCC slab	1 x 1.50
150.	408/1	407/269	406/850	RCC Slab	1 x 1.50	Widening	12.10	RCC slab	1 x 1.50
151.	409/1	408/368	407/942	RCC Slab	1 x 1.50	Widening	12.10	RCC slab	1 x 1.50
152.	409/2	408/958	408/526	RCC Slab	1 x 1.50	Widening	12	RCC slab	1 x 1.50
153.	410/1	409/340	408/906	RCC Slab	1 x 2.00	Widening	11.80	RCC slab	1 x 2.00
154.	410/2	409/906	409/470	RCC Slab	1 x 2.00	Widening	12.0	RCC slab	1 x 2.00
155.	412/1	411/201	410/825	RCC Slab	1 x 4.00	Reconstruction	12.0	RCC slab	1 x 4.00
156.	412/3	411/654	411/258	RCC Slab	1 x 2.00	Reconstruction	12.0	RCC slab	1 x 2.00
157.	413/1	412/140	411/757	RCC Slab	1 x 1.50	Widening	12.2	RCC slab	1 x 1.50
158.	413/2	412/207	411/816	One row RCC pipe	1 x 0.90	Reconstruction	12.20	Two row RCC pipe	2 x 1.20
159.	413/3	412/746	412/360	RCC slab	1 x 2.00	Reconstruction	12.20	RCC slab	1 x 2.00
160.	414/1	413/500	413/124	RCC slab	1 x 4.00	Widening	12.10	RCC slab	1 x 4.00
161.	414/2	413/825	413/408	RCC slab	1 x 2.00	Widening	12.10	RCC slab	1 x 2.00


S.No	CD Nos	Existing Chainage(km)	Design Chainage (km)	Existing Type of Culvert	Existing Span (m)	Type of Proposal	Existing Width of Culvert	Type	Span (m)
162.	415/2	414/542	414/243	RCC slab	1 x 2.00	Reconstruction	12.00	RCC slab	1 x 2.00
163.	415/3	414/858	414/553	One row RCC pipe	1 x 0.90	Reconstruction	12.00	Two row RCC pipe	2 x 1.20
164.	416/1	415/088	414/779	RCC slab	1 x 4.00	Reconstruction	11.70	RCC slab	1 x 4.00
165.	416/2	415/163	414/854	RCC slab	1 x 2.00	Reconstruction	11.95	RCC slab	1 x 2.00
166.	416/Add	415/250	414/917	-	-	Additional	-	Two row RCC pipe	2 x 1.20
167.	416/3	415/814	415/503	RCC slab	1 x 2.00	Widening	18.4	RCC slab	1 x 2.00
168.	417/2	416/563	416/232	One row RCC pipe	1 x 0.90	Reconstruction	12.10	Two row RCC pipe	2 x 1.20
169.	417/3	416/948	416/619	RCC slab	1 x 2.00	Widening	11.95	RCC slab	1 x 2.00
170.	418/1	417/542	417/209	Two row RCC pipe	2 x 0.90	Widening	12.0	Two row RCC pipe	2 x 0.90
171.	418/2	417/558	417/445	Two row RCC pipe	2 x 0.90	Widening	12.0	Two row RCC pipe	2 x 0.90
172.	419/1	418/037	417/693	RCC slab	1 x 6.00	Reconstruction	12.10	RCC slab	1 x 6.00
173.	419/2	418/554	418/202	One row RCC pipe	1 x 0.90	Widening	12.30	One row RCC pipe	1 x 0.90
174.	419/3	418/647	418/303	Two row RCC pipe	2 x 0.90	Widening	12.60	Two row RCC pipe	2 x 0.90
175.	419/4	418/698	418/355	One row RCC pipe	1 x 0.90	Widening	12.10	One row pipe	1 x 0.90
176.	420/1	419/524	419/182	One row RCC pipe	1 x 0.90	Reconstruction	12.10	Two row RCC pipe	2 x 1.20
177.	420/2	419/635	419/292	Two row RCC pipe	2 x 0.90	Widening	12.0	Two row RCC pipe	2 x 0.90
178.	421/1	420/765	420/426	RCC slab	1 x 5.00	Reconstruction	12.10	RCC slab	1 x 5.00
179.	422/1	421/228	420/885	Two row RCC pipe	2 x 0.90	Widening	10.50	Two row RCC pipe	2 x 0.90

Table B-6: Improvements to Structures - Bridges




	Location		Name of River Crossing	Existing span arrangement	Proposed scheme	Proposed span arrangement	Rehabilitation Measures for Existing Bridge
	Existing Chainage (km)	Design Chainage (km)					
1.	335/628	335/621	New Kattalai canal	3 x 4.50	construction of additional 2-lane bridge	3 x 4.50	<ul style="list-style-type: none"> ➤ Existing kerb is to be replaced. ➤ Hand rails to be replaced.
2.	350/529	350/678	Ariyaru	10 x 13.25	construction of additional 2-lane bridge	5 x 26.50	<ul style="list-style-type: none"> ➤ Existing bearings needs to be replaced. ➤ For the buried abutment, the falling apron to be replaced and to be grouted on both sides. ➤ All vents to be cleared. ➤ CC wearing coat to be renewed. ➤ Hand rails and post on both sides to be replaced. ➤ Revetment on 4 sides to be replaced. ➤ Drainage spouts to be replaced.
3.	360/812	360/782	Mamundi	9 x 8.72	construction of additional 2-lane bridge	3 x 26.16	<ul style="list-style-type: none"> ➤ Vent way to be cleared. ➤ Substructure, bed block, pier & abutment are to be repaired by guniting. ➤ In solid slab super structure, bottom reinforcement has to be cleaned and repairs to be done by guniting. ➤ Conical and straight revetment to be replaced

S.No	Location		Name of River Crossing	Existing span arrangement	Proposed scheme	Proposed span arrangement	Rehabilitation Measures for Existing Bridge
	Existing Chainage (km)	Design Chainage (km)					
4.	363/263	363/177	Manaparai Korai River	8 x 4.75	construction of additional 2-lane bridge	2 x 19.00	<ul style="list-style-type: none"> ➤ Broken and damaged Hand Rails to be removed and replaced. ➤ Wearing coat to be renewed. ➤ River training and protection work on all 4 sides approaches to be done.
5.	364/150	364/077	Siru Odai	2 x 5.80	construction of additional 2-lane bridge	1 x 11.60	<ul style="list-style-type: none"> ➤ The exposed reinforcement and spalling of concrete under the solid slab have to be repaired by guniting. ➤ Parapet to be repaired. ➤ Wearing coat to be renewed and protection works i.e., revetment on all 4 sides to be repaired. ➤ Bed protection to be provided.
6.	367/492	367/454	Dompatchi	5 x 13.20	construction of additional 2-lane bridge	5 x 13.20	<ul style="list-style-type: none"> ➤ Foot path and hand rails are to be replaced. ➤ Wearing coat to be renewed. ➤ Drainage spouts to be provided. ➤ Revetment on all 4 sides to be provided suitably. ➤ Bed protection to be provided. ➤ New bearing to be provided.
7.	382/260	382/149	Palapatti Odai	1 x 8.70	construction of additional 2-lane bridge	1 x 8.70	<ul style="list-style-type: none"> ➤ The exposed reinforcement and spalling of concrete under the solid slab have to be repaired by guniting.



No	Location		Name of River Crossing	Existing span arrangement	Proposed scheme	Proposed span arrangement	Rehabilitation Measures for Existing Bridge
	Existing Chainage (km)	Design Chainage (km)					
							<ul style="list-style-type: none"> ➤ Damaged parapet to be replaced. ➤ Revetment to be repaired on all 4 sides.
8.	386/383	386/261	Chetty Odai	2 x 8.25 (Skew 37°)	construction of additional 2-lane bridge	1 x 16.50 (Skew 37°)	<ul style="list-style-type: none"> ➤ Surface cracks in the substructure to be repaired. ➤ Damaged wing wall to be replaced. ➤ Exposed reinforcement in the bottom of deck slab to be repaired by guniting. ➤ Revetment to be replaced. ➤ Wearing coat to be renewed.
9.	387/973	387/841	Kalpatti Odai -1	1 x 7.80 (Skew 27°)	construction of additional 2-lane bridge	1 x 7.80 (Skew 27°)	<ul style="list-style-type: none"> ➤ Parapet to be replaced. ➤ Wearing coat to be renewed.
10.	388/493	388/366	Kalpatti Odai -2	1 x 16.30	construction of additional 2-lane bridge	1 x 16.30	<ul style="list-style-type: none"> ➤ The exposed reinforcement at the bottom of slab are to be repaired by guniting. ➤ Wearing coat to be renewed. ➤ Expansion joint to be provided suitably. ➤ Parapet to be replaced. ➤ Revetment to be repaired on all 4 sides.



S.No	Location		Name of River Crossing	Existing span arrangement	Proposed scheme	Proposed span arrangement	Rehabilitation Measures for Existing Bridge
	Existing Chainage (km)	Design Chainage (km)					
	397/941	397/587	Mallatar River	4 x 10.10 (Skew 32°)	construction of additional 2-lane bridge	2 x 20.20 (Skew 32°)	<ul style="list-style-type: none"> ➤ Bed protection to be provided in bed portion / scoured in vented portion. ➤ Wearing coat to be renewed. ➤ Parapet to be replaced. ➤ Revetment on all 4 sides to be provided.
	398/101	397/747	Malayadipatti Odai - 1	1 x 9.00 (Skew 15°)	Reconstruction	1 x 9.00 (Skew 15°)	
13.	399/017	398/645	Malayadipatti Odai - 2	2 x 6.70	construction of additional 2-lane bridge	1 x 13.40	<ul style="list-style-type: none"> ➤ Minor cracks on the outer surface of abutment, pier and wing to be repaired. ➤ Exposed reinforcement in bottom of deck slab to be repaired by guniting. ➤ Wearing coat to be renewed. ➤ Revetment on all 4 sides to be repaired.
14.	411/454	411/030	Kallar	6 x 10.30 (Skew 38°)	construction of additional 2-lane bridge	3 x 20.60 (Skew 38°)	<ul style="list-style-type: none"> ➤ Kerb, parapet & hand rails are to be replaced. ➤ Drainage spouts to be replaced.
15.	414/395	414/080	Sandhana varthini	8 x 9.00 (Skew 15°)	construction of additional 2-lane bridge	4 x 18.00 (Skew 15°)	<ul style="list-style-type: none"> ➤ Vent way to be cleared. ➤ Guard rails on approaches to be provided. ➤ Hand rails to be replaced.

5.2 Underpasses

Eight nos. of underpasses shall be provided on the Project Highway at locations given in Table B-7 below. All the allied works relevant to the construction of underpasses including revision in the Road Top Level, change in Gradients, construction of retaining walls for the approaches and other associated works shall form the scope of the Project.

Table B-7 : Details of Proposed Underpasses

S.No	Design Chainage (km)	Name of Villages	Type of Underpass	Proposed size
1.	347/750	Alampatti Pudur	Pedestrian Underpass	7.00m x 3.50m
2.	361/524	Manaparai	Vehicular Underpass	10.50m x 5.50m
3.	361/800	Manaparai Cattle Market	Animal Underpass	7.00m x 3.50m
4.	365/250	Manjampatti	Pedestrian Underpass	7.00m x 3.50m
5.	377/459	Vaiyampatti	Vehicular Underpass	10.50m x 5.50m
6.	385/450	Nadupatti	Animal Underpass	7.00m x 3.50m
7.	396/120	Ayyalur	Vehicular Underpass	10.50m x 5.50m
8.	418/328	Dindigul	Vehicular Underpass	10.50m x 5.50m

5.3 Grade Separator

A Grade separator is to be provided at the intersection of NH-45 and proposed bypass for Trichy on NH-67 at design chainage km 333/882 along NH-45 for a span of 40m. General Arrangement Drawing for the grade separator is enclosed in the Drawing Volume.

6.0 Geometric Improvement

- 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 improved/introduced so that the vertical curves meet 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 as far as practical otherwise action to acquire more land shall be resorted to through NHAI.

7.0 Slope Protection and Drainage

The improvements in the drainage and the slope protection shall be made as per the following norms:

7.1 Drainage Measures

Following measures shall be adopted:

- i. Earthen drains of required cross Section on Both Side of carriageway in rural section.
- ii. Lined drains on both sides of the carriageway between service road and main carriageway in built-up sections, wherever service roads are provided.
- iii. RCC 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
- vi. RCC drains underneath the sidewalk of proposed facility (bus bays, truck lay bys etc.)
- vii. Lined drains across the median and separators at super elevated sections.

In addition to the above, 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.

7.2 Slope Protection Measure

Following measures shall be provided as follows:

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

8.0 Traffic Signs and Pavement Markings

The Concessionaire shall provide the required Traffic Signs and Pavement Markings. Traffic signs and pavement markings shall include roadside signs, overhead signs, kerb 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 treatments 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 installation shall be as per relevant clauses of MORTH specifications. Overhead sign shall be installed ahead of major intersections, toll plazas and urban areas as per detailed design requirements.

9.0 Highway Lighting

Lighting shall be provided by the Concessionaire 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 in Built up area

S.No	Existing Chainage	Design Chainage	Remarks
1	347/440 – 347/763	347/530 – 347/850	Alampattipudur
2	361/008 – 362/405	360/950 – 362/330	Manaparai
3	376/883 – 378/250	376/790 – 378/150	Vaiyampatti
4	395/074 – 396/865	395/920 – 396/600	Ayyalur
5	412/487 – 412/888	412/100 – 412/500	Thamaraipadi

- 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 locations of toll plaza, grade separator and major intersections as per the design standards indicated in Schedule 'D'.
- III. Street Lighting shall be provided in the built up areas i.e., Alampattipudur, Manaparai, Vaiyampatti, Ayyalur and Thamaraipadi.
- IV. The design of the lighting system on the project highway for different locality shall be as per the design standards indicated in Schedule 'D'.

10.0 LED

At least 2500 numbers LEDs shall be provided by the Concessionaire at intersections and median openings as per the design standards indicated in Schedule 'D'.

11.0 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'. At least 50 numbers of blinkers signal shall be provided by the concessionaire.

12.0 Blinker at Intersection

Blinkers signal shall be provided by the Concessionaire at all major intersections as per the design standards indicated in Schedule 'D'. At least 50 numbers of blinkers signal shall be provided by the concessionaire.

13.0 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'. At least 12000 numbers of Delineators shall be provided by the concessionaire.

14.0 Studs

Road studs shall 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'. At least 51500 numbers of road studs shall be provided by the concessionaire.

15.0 Guard Rail and Traffic Safety Devices

The following shall be provided by the Concessionaire:

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. At least 6300 Metre length of metal beam crash barrier shall be provided by the concessionaire.
- iii) Safety barrier 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.

16.0 Road Land Boundary

Road land (ROW) boundary shall be demarcated by putting RCC boundary pillars of 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. 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 chainages along the Project Highway shall be done in consultation with Independent Consultant.

17.0 Pre-Construction Activities

17.1 Land Acquisition (LA)

Additional land acquisition has been foreseen in this project. The cost of L.A as intimated by the concerned agencies shall be borne by NHAI. However, the Concessionaire shall be involved proactively 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.

17.2 Utility Shifting and Removal of Trees

The 'project' involves shifting of utilities of certain types including shifting of Weir at km 356/575. The Concessionaire shall be actively involved to accomplish this task. He shall submit the proposals in this regard. The cost towards utility shifting as per the demand note of the concerned Govt./Semi-Govt. agencies shall be borne by NHAI.

17.3 Clearances to be obtained

The Concessionaire shall obtain all necessary clearances required for execution of works covered under the scope of this contract from all the concerned authorities including clearance from Ministry of Environment & Forest required for implementing the project. NHAI shall provide support letters in this regard.

17.4 Encroachment Removal

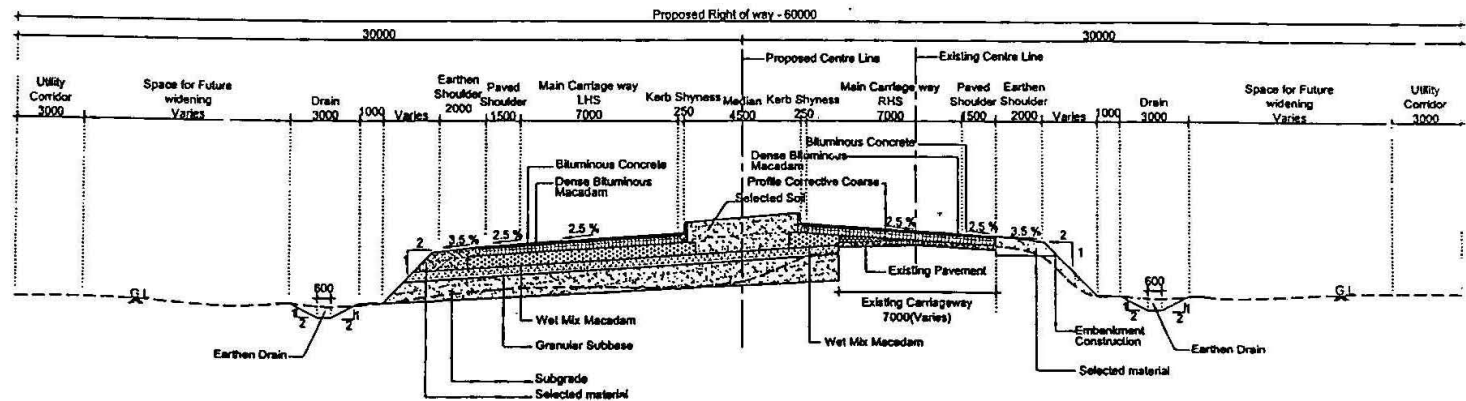
Encroachments shall be removed by the Concessionaire at his own cost. NHAI/ State Government will provide administrative support.

17.5 Compensatory Afforestation and Rehabilitation & Resettlement

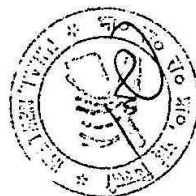
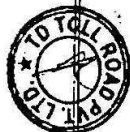
NHAI shall bear cost in this regard. However, Concessionaire shall proactively be involved for all related activities.

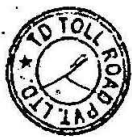


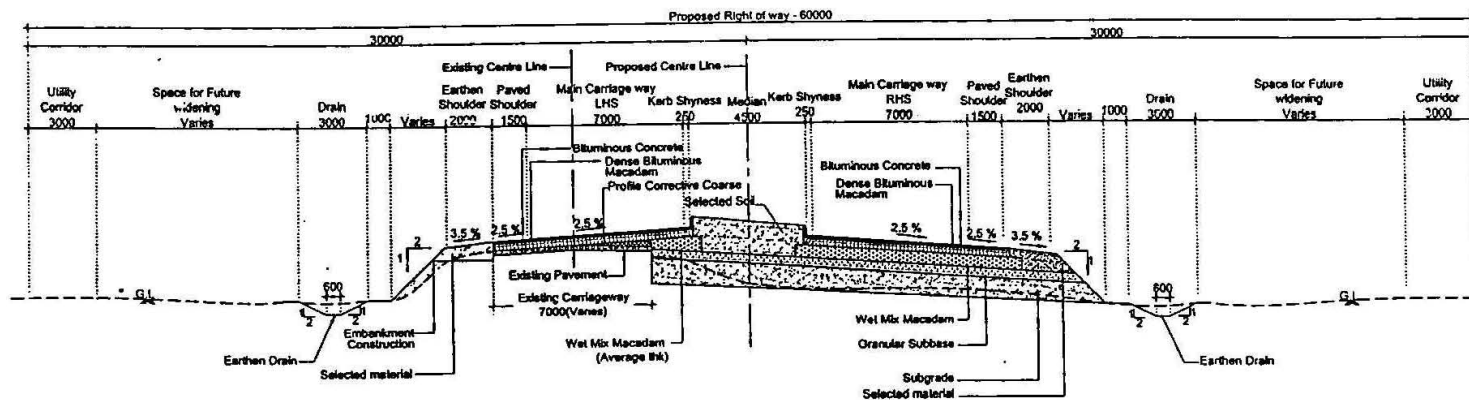




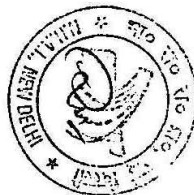
Cross section with pavement details - Left side Widening (Type-I)

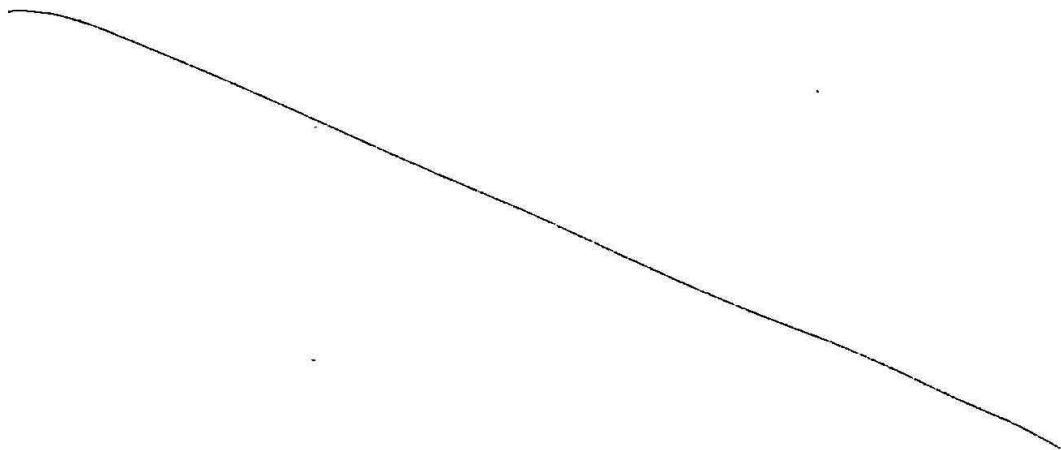
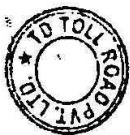


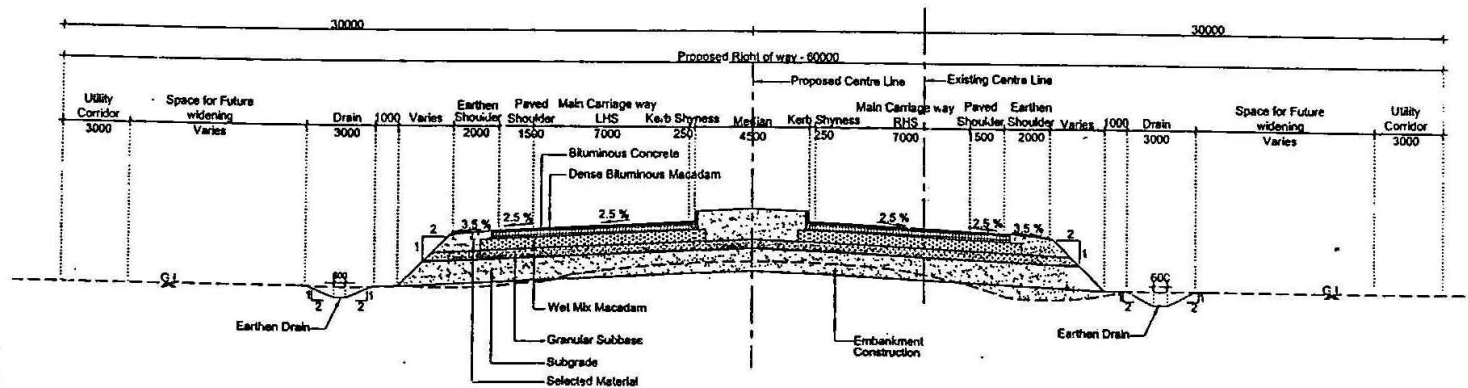




Cross section with pavement details - (Right side Widening) (Type-II)

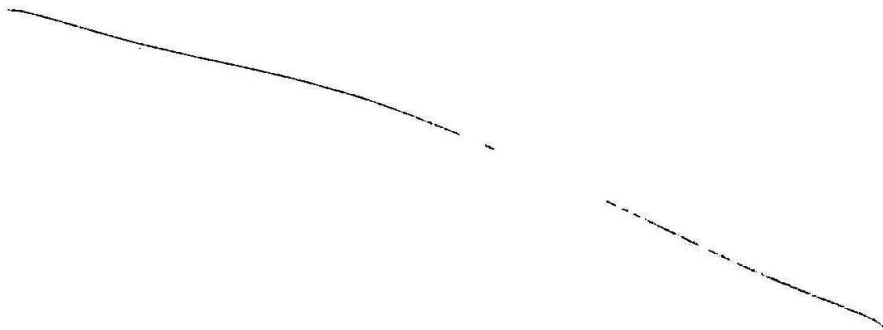


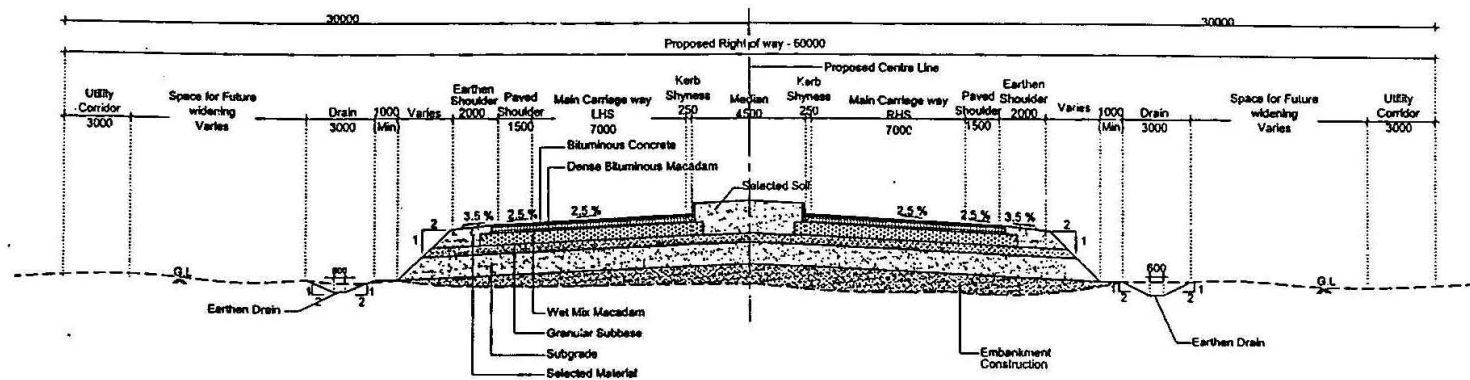




Cross section with pavement details for Reconstruction (Type-III)



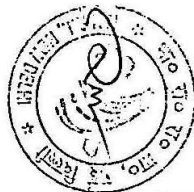


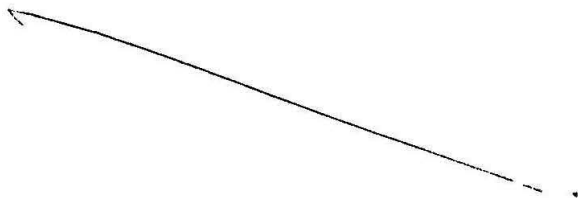


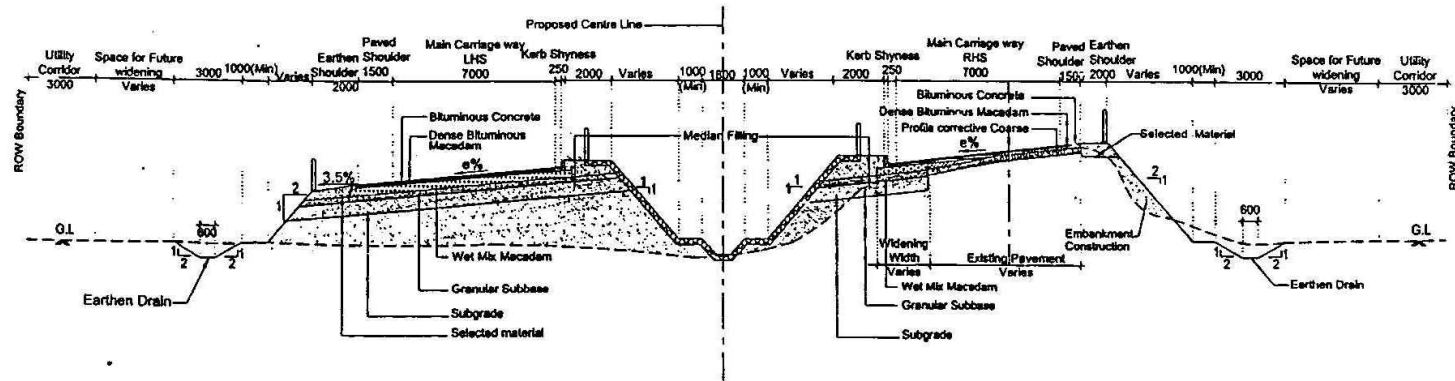
Cross section with pavement details for New Construction (Type-IV)





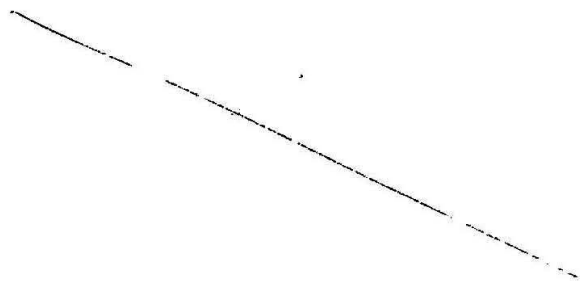


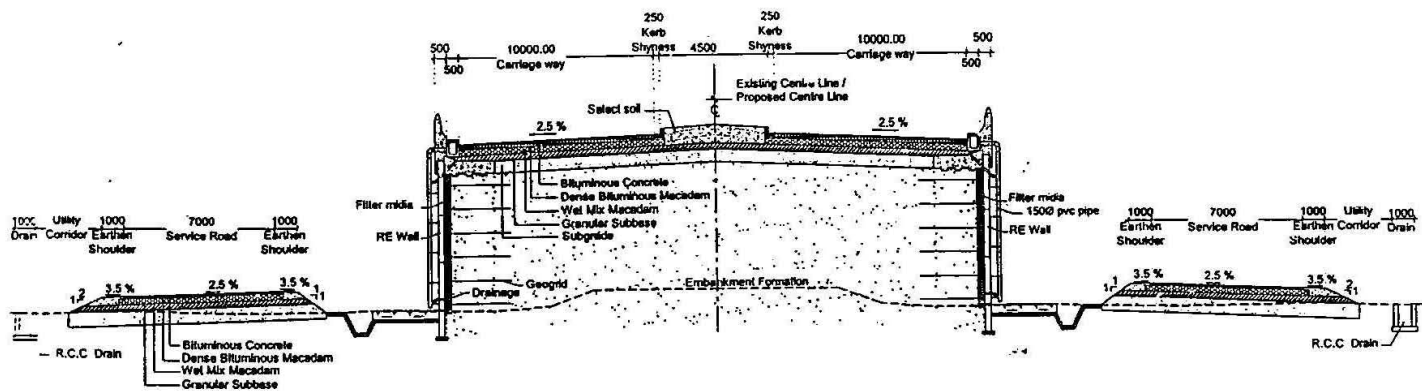




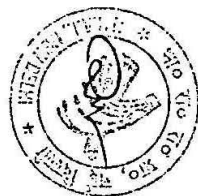
Cross section-Left side Widening with Separated Carriageway (Type-VI)

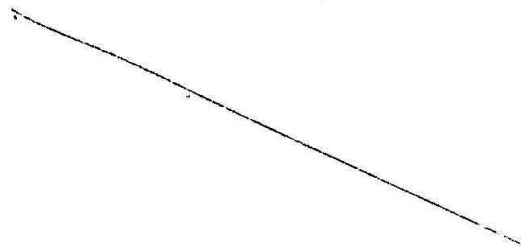


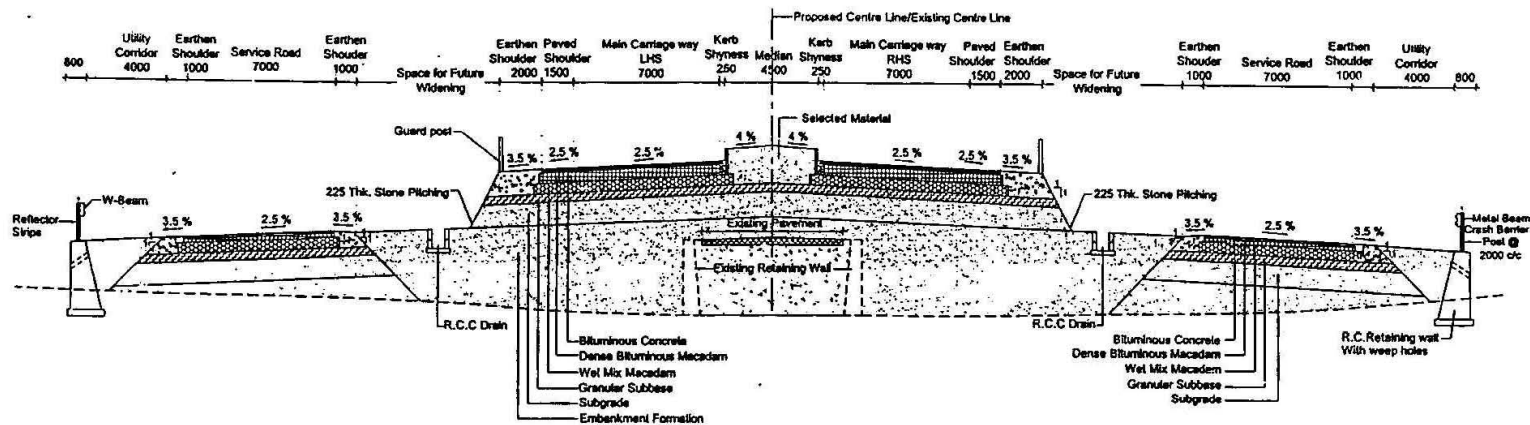




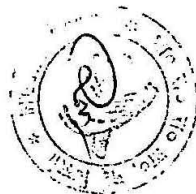
Cross Section with Pavement Details - Concentric Widening with Service Road on Both sides(Underpass portion with RE wall) (Type-VII-A)

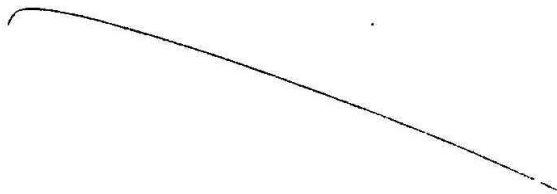


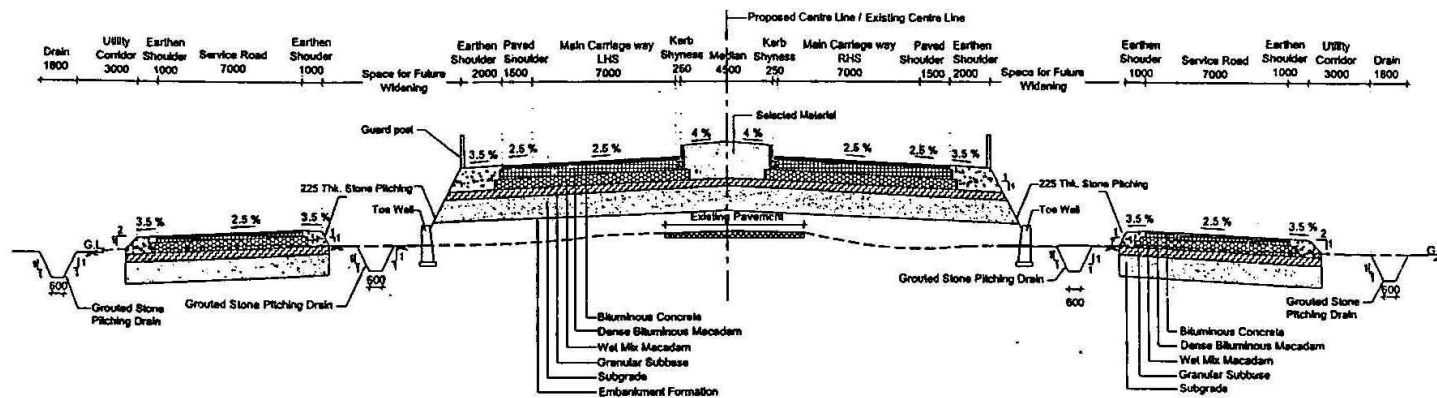




Cross Section with Pavement Details - Concentric Widening with Service Road on Both sides (Underpass with R.C. Retaining wall) Type - VII B



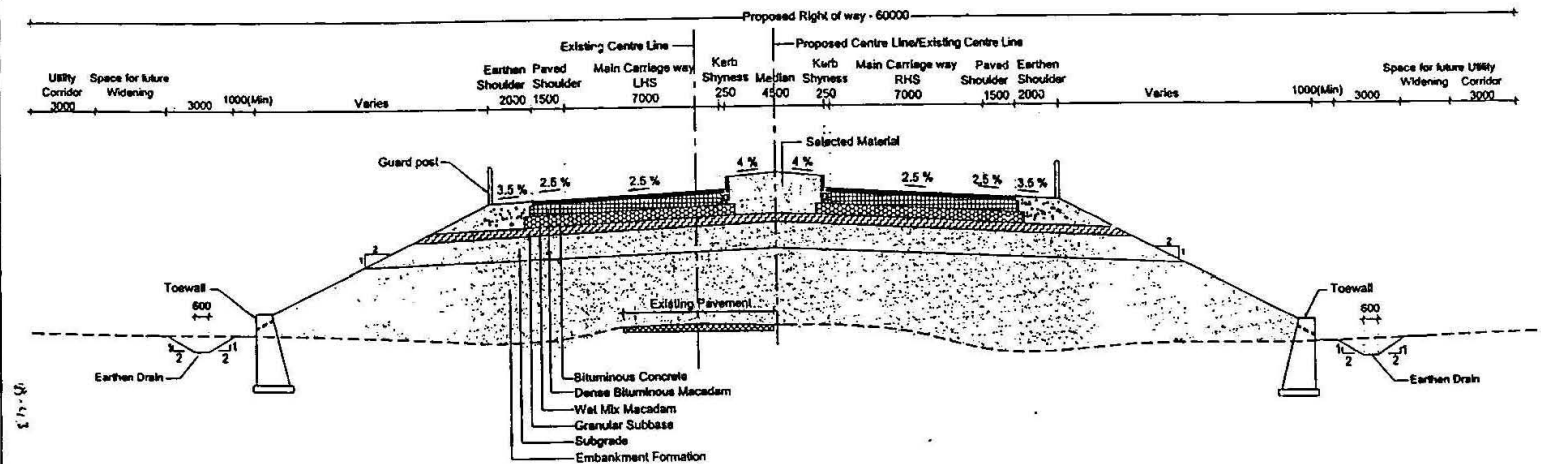




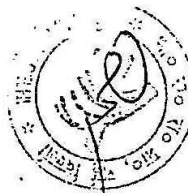
Cross Section with Pavement Details - Concentric Widening with Service Road on Both sides (Underpass with Toe wall) (Type VIII-A)

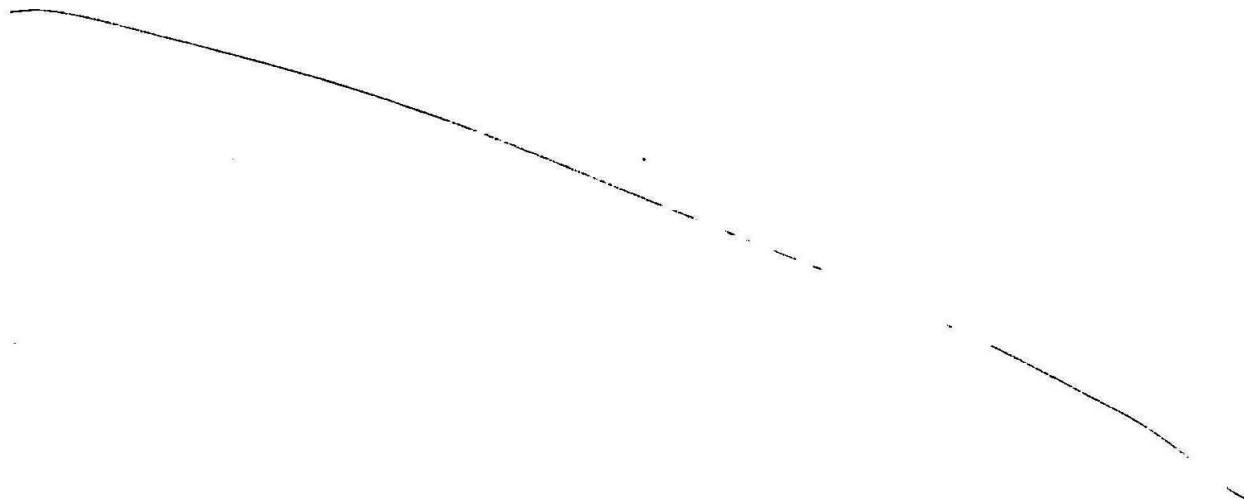






Cross Section with Pavement Details - Eccentric Widening (Underpass with Toe wall) Type VIII-B





PROJECT FACILITIES

1. General

The following sections of this Schedule provide the minimum spatial and functional requirements of the 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

One no. of toll plaza is to be provided by the Concessionaire between Musiri junction (design chainage km 360/265) and start of Manaparai Bypass (design chainage km 361/524) on the Project Highway. The tentative location is km 360/550 near Manaparai, which shall be finalized in consultation with Independent Consultant / NHAI. The typical layout of toll plaza is given in Drawing Volume. "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 including one lane in each side for oversized vehicles 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 in the peak hours during the entire concession period. The design for Toll Plaza shall conform to the standard set out in Schedule 'D' of the Concession Agreement.

3. Truck Parking/Lay bye (1 no.)

The Concessionaire shall provide 1 no. Truck lay bye in consultation with IC & NHAI. At few locations the alignment design has resulted in realignments. At such locations the existing road and available space between the existing road and the proposed road can be used for parking of vehicles depending upon traffic demand as decided by IC & NHAI.

4. Bus Bays

The Concessionaire shall provide at least 20 nos. of Busbays at the locations shown in Table C1. The lay out for Bus bays shall be in accordance with IRC: 80. Adequate drainage shall be provided at bus bays. Bus bays shall be constructed as per the standard specification and they shall be provided on the Project Highway at the locations indicated in Table C1. Typical layout of bus bay conforming to IRC publications are shown in the drawing enclosed. Any changes required in the location and the details of bus bays shall be finalized in consultation with Independent Consultant.

Table C1 : Locations of Bus bays

S.No.	Name of the Village	Design Chainage in km	
		LHS	RHS
1.	Vannan Koil	335/150	335/050
2.	Chatrapatti	338/450	338/350
3.	J.J. Engineering College	341/650	341/750

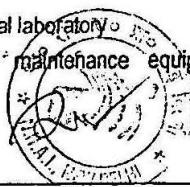


S.No.	Name of the Village	Design Chainage in km	
		LHS	RHS
4.	Alampattipudhur	348/100	348/250
5.	Maravaniur	352/900	353/000
6.	Manickampillai Chatram	355/750	355/850
7.	Muthupadiayanpatti	357/800	357/900
8.	Aandavarkovil	360/050	360/100
9.	Manapalai	361/200	361/300
10.	Manjampatti	365/000	365/100
11.	Kurinji Engineering College	368/250	368/350
12.	Thomas Nagar	371/650	371/750
13.	Vaiyampatti	377/150	377/200
14.	Sesalur	381/800	381/900
15.	Nadupatti	385/650	385/700
16.	Thangammapatti	392/350	392/400
17.	Ayyalur	395/600	395/600
18.	Kollapatty	399/800	399/850
19.	Velvarkottai	406/200	406/300
20.	Munadipatti	410/100	410/200
21.	Kallathurpatti	412/250	412/300
22.	Mullipadi	413/250	413/300
23.	Arockiyasamy Nagar	415/050	415/150

5. 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 location of base camp shall be finalized in consultation with IC, preferably at toll plaza location. The proposed facilities available at base camp are described herein under.

- a) The main administrative, operation and maintenance base camp shall be provided to cater to the requirements of the following services:
- Central Toll Control
 - Central Traffic Control
 - Highway Maintenance including functional laboratory
 - Facilities for storage and repair of maintenance equipments, vehicles and materials
 - Any other requirement



- b) The main base camp shall be housed adjacent to the toll complex. An area of 3000 sqm shall be earmarked for this purpose. 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) In addition the base camps shall have a power substation and supplies room to cater to the power requirements of the camp. The power substation shall house a standby generator to provide the required power in case of failure of normal power.
- e) The camps shall have adequate lighting during dark periods and night.
- f) There shall be underground fuel storage area with delivery facilities at the camp sites to adequately cater to the demands of maintenance and patrolling activities.
- g) 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.
- h) The camps shall be landscaped so as to protect the area from dust and noise from the Project Highway.
- i) 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.
- j) The laboratory facility to be established for testing of various materials related to road construction and maintenance shall be located at the main base camp.

6. Arboriculture & Landscaping

Trees shall be planted in ROW and on either side of the road by the Concessionaire with staggered pitch as per IRC:SP-21. Indicative 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 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.

7. Road Furniture and Facilities on Roadside

Road furniture on the Project Highway shall be provided by the Concessionaire in accordance with the standards set in Schedule 'D'. At least 8400 Metre length M.S. Guard rail shall be provided by the Concessionaire.

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

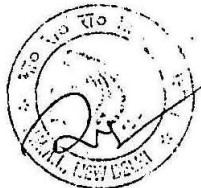


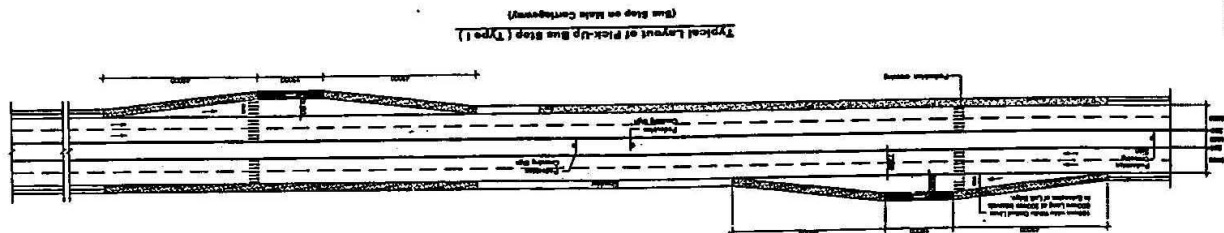
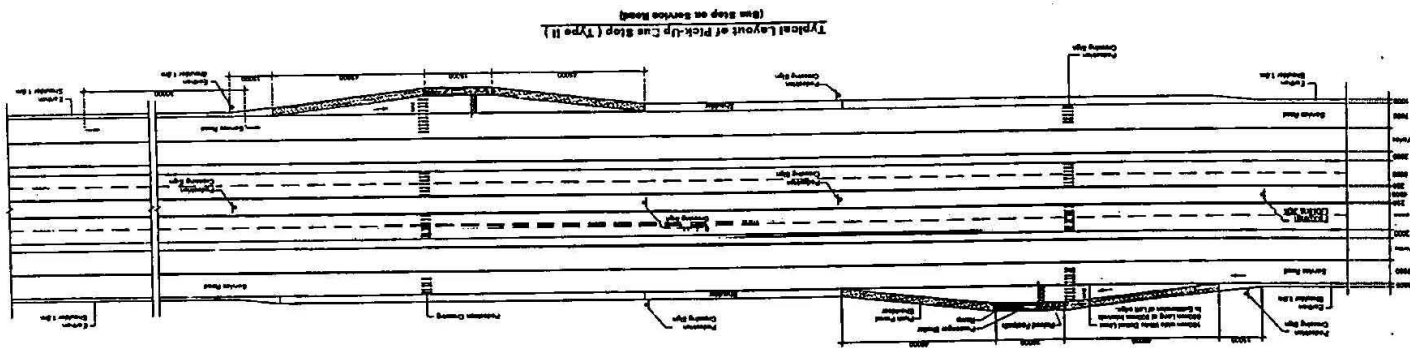
8. Project Vehicle

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 and/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.







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 (NHA) 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 NHA.

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)



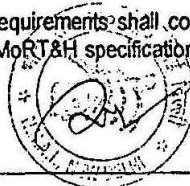
- f). Suitable specification/standard devised by the IC
 - g). Any other standard proposed by the Concessionaire
- 2.3. All items of building works shall conform to Central Public Works Department (CPWD) specifications for Class 1 building works and standards given in the National Building Code (NBC). 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. a. 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 MORTH specifications the latter shall govern and be followed.



4. b. Pavement Design**4.3. 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 shall be assessed by the Concessionaire and approved by IC. However, the following minimum requirements of profile, both longitudinal and cross shall have to be achieved and provided.

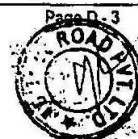
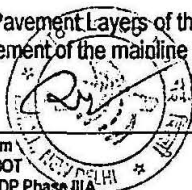
Cross profile : Camber of 2.5% minimum super elevation as per geometric design.

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.

5. Drainage System

- 5.1. An effective surface and sub-surface drainage system of pavement structure shall be designed as stipulated in IRC SP : 42.
- 5.2. 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-by 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.
- 5.3. 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.
- 5.4. 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.
- 5.5. 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.
- 5.6. Drainage channels and pipe shall be installed at crossings with service pipes and utilities ensuring that conflicts do not occur.
- 5.7. Drainage of highway pavements on a highway embankment and steep grade will require designed outlet by means of kerb and gutter and concrete chutes / spilways along the side slope of the embankment in order to prevent its erosion.
- 5.8. Rain water harvesting system shall be provided all along the project highway as per provisions of IRC: SP: 50 – 1999 in consultation with Independent Consultant



6. 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.

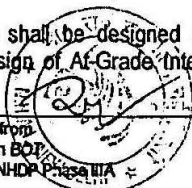
- 6.1. All new major structures shall be 4-lane. Any existing bridge including the ROB or culvert found to be structurally unsafe and/or deficient to carry the IRC design load (based on non-destructive testing including full scale load testing) shall be replaced or rehabilitated.

6.2. 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 constructing 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.

7. At-Grade Intersections

- 7.1. 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.

- 7.2. 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.

8. Interchanges

- 8.1. Geometric design standards for elements of interchanges are given in Appendix D-2
- 8.2. 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.

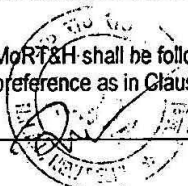
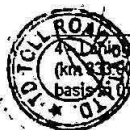
9. Illumination

- 9.1. The average level of illumination at the location of major intersection/ junctions, toll plazas, wayside amenities-service areas, Truck Lay-bys shall be with suitable high mast lighting approved by Independent Consultant/NHAI.
- 9.2. The layout of the lighting system together with type of luminaries for different locations shall be determined in consultation with the Independent Consultant.
- 9.3. Arrangement of lighting installations shall be staggered except on curves.
- 9.4. 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;
- 9.5. 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.
- 9.6. 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)

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

10. Highway Signs

- 10.1. 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.
- 10.2. The road signs erected on the Project Highway shall conform to IRC : 67, Code of Practice for Road Signs.
- 10.3. 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.



- 10.4. 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;
- 10.5. 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;
- 10.6. 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);
- 10.7. Road Delineators shall conform to the recommended practice as per IRC 79(1981)

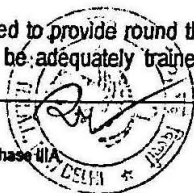
11. Road Markings

- 11.1. 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;
- 11.2. Road markings shall be of hot applied thermoplastic materials with glass reflectorising beads as per relevant clauses of section 803 of MoRT&H specifications;
- 11.3. 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.

12. Traffic Safety Measures

- 12.1. Pedestrian Guard Rail shall be designed to control and guide pedestrian road crossing movement safely at designated location.
- 12.2. Concrete Crash Barriers and/or Steel Beam Guardrails shall be installed mainly at major hazard locations. Concrete / steel Crash Barrier shall be constructed 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.
- 12.3. Both Concrete Crash Barriers and/or Steel Beam Guardrails (W-shaped) installation shall have short transition flared section at the approach ends.
- 12.4. Metallic crash barriers shall be provided along the full length of the ramps (both sides) of Interchanges and at important At-Grade Intersections.
- 12.5. 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.

12.6. 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.

12.7. Ambulances

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

12.8. 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.

12.9. 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.

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.



13. Landscaping

- 13.1. 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.
- 13.2. 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.
- 13.3. 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.
- 13.4. No advertisement / hoarding shall be allowed within the ROW limits of the Project Highway.
- 13.5. Visibility of any signs, signals or any other devices erected for traffic control, traffic guidance and / or information shall not be obstructed by plantation.

14. Ancillary Facilities**14.1. Wayside Amenities – Service Area**

- a. 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 construction 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.
- b. 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.
- c. 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.
- d. 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.
- e. 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;
- f. 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;



14.2. 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, Part 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.

14.3. 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.

14.4. Road Furniture

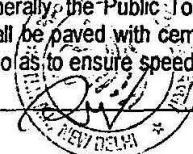
Road furniture such as traffic signs, kilometre posts, hectometre stones, ROW pillar etc on the Project Highway provided as per IRC Codes shall meet requirements of MoRT&H specifications, other codes in the same order of preference as in Clause 2.2 shall be used.

14.5. Roadside Facilities**14.5.1. 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.

14.5.2. 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.



14.5.3. 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.

14.6. 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 in drawing volume which needs to be suitable modified for the required number 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.

14.7. 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 (7 th 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)



APPENDIX-D1

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

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)
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 in 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.

APPENDIX-D1

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

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.
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.

4 – Laning of Trichy to Dindigul section from (km 333.000 to km 421.273) of NH – 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA



APPENDIX-D1

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

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.
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 structural 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).

APPENDIX-D1

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

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
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 speed breakers for control of vehicular speeds on minor roads.



APPENDIX-D1**List of IRC Codes / Standards / Acts for Road/Bridge Works**

- 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

APPENDIX-D1**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 Manual
- IRC: SP: 21 -1979 Landscaping of Road
- IRC: SP: 22 -1980 Recommendations for the Sizes for each Type of Road Making Machinery to



Trichy to Dindigul section from
Km 333.00 to km 421.273) of NH - 45 on BOT
basis in the State of Tamil Nadu Under NHDP Phase IIIA

[Signature]

APPENDIX-D1**List of IRC Codes / Standards / Acts for Road/Bridge Works**
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 Indigenous Manufacturers of Road/Bridge Construction Machinery & 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 Equipment
- 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



APPENDIX-D1**List of IRC Codes / Standards / Acts for Road/Bridge Works**

- 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 Road 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)

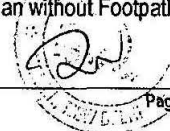
MOST Handbook on Road Construction Machinery, 1985

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, PartI: Complete Bidding Document, Part II: Forms

MOST Computer Aided Design System for High Embankment Problems, 1993

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 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) Code of Practice for Lighting of Public Thoroughfares: Parts 5 Lighting for Grade separated junctions, Bridges and Elevated roads (Group – D).

IS: 1944 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)



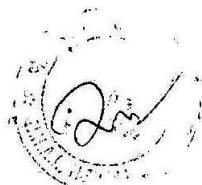
NBC	National Building Code
Part-III, NBC:	Development Control rules and general building requirements.
Part-IV, NBC:	Fire Protection
Part-VI, NBC:	Structural Design
Part-VIII, NBC:	Building Services
Part-IX, NBC:	Plumbing Services

Generic Requirements Permanently lubricated HDPE Telecom Ducts

No.G/CDS-08/01. For use as underground optical fibre cable conduits.

DEC'99

TEC-DoT



Spanning of Nichey to Dindigul section from
(Km 633.000 to Km 421.273) of NH – 45 on BOT
basis in the State of Tamil Nadu Under NHDP Phase IIIA

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		m	5.5/	Each direction
	carriageway			7.0	
	(f) Footpath cum drain		m	1.5	Each direction
	(Urban areas)				
	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



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		
	f) Longitudinal Gradient	M	1 in 30 (max)		

13.	Interchange Loop Ramp				
	a) Design Speed	Km/hr	40		
	b) Carriageway width	M	7.5		
	i) Double Lane				
	c) Shoulder Paved				
	i) Inner	M	1.5		
	ii) Outer	M	1.5		
	d) Minimum Radius	M	100		
	e) Longitudinal Gradient	M	1 in 30 (max)		



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.

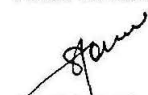


7. The Board Resolution of M/s Reliance Energy Limited confirming investment decision and formation of a SPV indicating names of Directors & Authorized Signatory on behalf of M/s Reliance Energy Limited.
8. List of Directors of the SPV.
9. Project Milestone as per Schedule 'H' duly signed by the authorized signatory of the SPV.
10. An undertaking that the minimum shareholding of M/s Reliance Energy Limited in the SPV shall be as per the provisions of the RFP.

We hope the above information will meet your requirements.

Thanking you,

Yours faithfully,


(Sudhir R. Hoshing)
Authorized Signatory



2 of 2

F-2



यूको बैंक
UCO BANK

LG-1 (C.P.)

Flagship Corporate Branch

A/015409

at the Post

Central

BRANCH : 22020448 / 22884858

Pin : 22518679

450 021

2202 0308

THIS LETTER MUST ACCOMPANY

E-mail : general.mgr@ucobank.co.in

ORIGINAL BANK GUARANTEE ISSUED

To

Ref. SL. No.

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

Date : 10-04-07.....

Dear Sir/s,

Sub : Our Bank Guarantee No. 1908FGBID004507

Dated 10.04.07 for Rs. 17,28,00,000/-

Issued in your favour on account of Reliance Energy Limited



We have pleasure in forwarding herewith our Bank Guarantee No. 1908FGBID004507

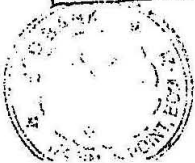
dated 10.04.07 for Rs. 17,28,00,000/-
31.05.2010

valid till ~~xxxx~~ in the account of our Clients Reliance Energy Limited

While entering into any correspondence with regard to the guarantee, please
quote the guarantee no. and also the pre-printed Sl. Number of this letter.

UCO Bank FCC Br. Mumbai
Guarantee No. 1908FGBID 004507

Yours faithfully,
For UCO BANK



Asstt. Manager

Sr. Manager



भारतीय गैर न्यायिक

एक सौ रुपये

रु. 100



सत्यमेव जयते

Rs. 100
ONE
HUNDRED RUPEES

भारत INDIA
INDIA NON JUDICIAL

19 OCT 2006

महाराष्ट्र MAHARASHTRA

बंर्जुला बि. शर्मा परवाना धारक

AC 915803

मार्ग इंस्ट्रुमेंटल सेको नमो,

महाकाली राड, चकाला, अंश 1 (एच) मुंबई-२३,

ब.मंक. UCO Bank

अंश 1 (एच) Uco Building,

बाना नवबिहार मुंबई D. N. Kulkarni

Mumbai - 400023

008158

19 OCT 2006

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हस्ताक्षर विधेतापी वही.

BANK GUARANTEE FOR PERFORMANCE SECURITY

[Contract Package No. NHDP-III/BOT-I/TN/01 under GM (BOT) IA]

From: UCO Bank at Mafatlal Centre, First Floor, Nariman Point,
Mumbai-400 021 and head office at 10, B.T.M. Sarani, Kolkata 700001

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

A. "NHAI vide Letter No. NHAI/BOT/11019/34/2005/804 dated 15th March 2007 issued Letter of Acceptance (LOA) to M/s Reliance Energy Limited (the "Bidder") for Design, Construction, Development, Finance, Improvement, Operation and Maintenance of Existing 2-Lane Road to 4-Lane Dual

UCO Bank FCC Br. Mumbai
Guarantee No. 1908FGB/D



For UCO BANK
Flagship Corporate Branch
Nariman Point, Bombay-400 021

Manager

Manager

S. N. KULKARNI
SENIOR MANAGER
PFM 31446



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B. The Concessionaire is required to give ("NHA") a guarantee by a recognized bank based in India in the sum of **Rs. 17,28,00,000/- (Indian Rupees Seventeen Crores Twenty Eight Lacs only)** as security for compliance with its obligations under the Concession Agreement during the Construction Period.

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

1. We, UCO Bank at Mafatlal Centre, First Floor, Nariman Point, Mumbai-400 021 and head office at 10, B.T.M.Sarani, Kolkata 700001 (the "Guarantor") with its registered office at (Address of Head Office), unconditionally guarantee to pay NHAI upon first written demand and without any deduction any sum claimed by NHAI upto a maximum of Rs. **17,28,00,000/- (Indian Rupees Seventeen Crores Twenty Eight Lacs 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

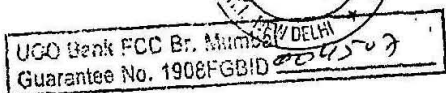
S. N. ...
 SENIOR ...
 PEM 31436

F-5

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 Concessionaire shall be obliged to ensure the replenishment of the existing Guarantee or provide fresh guarantee of the Guaranteed Sum through the Guarantor within the time provided in the Concession Agreement for the same.
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 **31st May 2010 (Date of validity of the Bank Guarantee for Performance Security)** 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



For UCO BANK
Flagship Corporate Branch
Nariman Point, Bombay-400 021

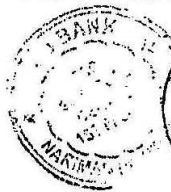
Rodan
Manager



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 non-payment of the Guaranteed Sum.

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.

UCO Bank FCC Br. Mumbai
Guarantee No. 1908FGBID 004507



For UCO BANK
Flagship Corporate Branch
Nariman Point, Bombay-400 021

[Signature]
Manager

[Signature]
Manager

S. N. KULKARNI
SENIOR MANAGER
PFM 31846



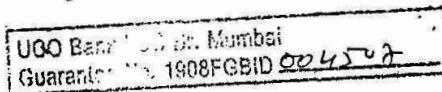
Notwithstanding anything contained hereinabove .

- a) Our liability under the Bank Guarantee shall not exceed Rs **17,28,00,000/-**
(**Indian Rupees Seventeen Crores Twenty Eight Lacs only**)
- b) The Bank Guarantee shall be valid upto **31.05.2010**.
- c) We shall be liable to pay any amount under this Bank Guarantee or part thereof only if you serve upon us a written claim or demand under this guarantee on or before **31.05.2010** at **UCO Bank at Mafatlal Centre, First Floor, Nariman Point, Mumbai-400 021** and head office at 10, B.T.M. Sarani, Kolkata 700 001.

SEAL OF [THE BANK]



NAME OF [THE BANK]



11 0 APR 2007

For UCO BANK
Flagship Corporate Branch
Nariman Point, Bombay-400 021

Radan
Manager

S. N. Mahager
Sr. Mahager

C. P. K. J. M.
1. 11. 11. 11. 11. 11.

S. N. KULKARNI
SENIOR MANAGER
PM 11.11.11





BANK GUARANTEE CONFIRMATION LETTER



TO, _____ Date 21-APR-2007
Beneficiary Name & Address _____ Form Serial No. GTEE/ 061577

Chairman
National Highway Authority of India
C-5 & 6 Sector - 10
Dwarka, New Delhi - 110075

This covering letter is issued to be annexed to the Bank Guarantee No. 0036T02070940007
dated 04-APR-2007 for the amount of Rs. 11,52,00,000/-
*Rupees Eleven Crore Fifty Two Lakh Only
_____) valid till 31-Dec-2007 issued by our branch.

Branch Address. _____
_____ HDFC BANK LTD.
_____ 1st floor, Kailash Building
_____ 20, Keshurba Gandhi Marg,
_____ New Delhi - 110001

This Bank Guarantee is issued on account of our customer stated below.

Applicant's Name & Reliance Energy Limited
Address 11a, New Delhi House,
27, Baxa Khamba Road, New Delhi - 110001

The Bank Guarantee is issued by the above mention branch under the joint signatures of

1. Mr./Ms. _____ <u>ONKARNATH MISHRA</u> Designation : _____ <u>MANAGER</u> P. A. No. _____ <u>B 1857</u>	2. Mr./Ms. _____ <u>G. V. SUBBA RAO</u> Designation : _____ <u>Sr. Manager</u> P. A. No. _____ <u>B-3625</u>
---	--

Confirmation of this guarantee if the same is desired, should be obtained from the above-mentioned branch or from our controlling office at **HDFC Bank Ltd.** Trade finance Department, **26A Narayan Properties, Chandivall Farm Road, Sakl Naka, Andheri (East) Mumbai - 400072.**

For HDFC Bank Ltd.

Authorised Signatory : _____
Name : _____ AMIT ANAND
Designation : _____ Asstt. Manager
_____ C-2625

** This letter forms an integral part of the Bank Guarantee issued. This should be returned along with the Bank Guarantee to the bank in all cases with respect to cancellation or revocation.





दिल्ली DELHI

C 581312

BG No. 003GT02070940007 DATED 04-APR-2007

BANK GUARANTEE FOR PERFORMANCE SECURITY

[Contract Package No. NHDP-III/BOT-I/TN/01 under GM (BOT) IA]

From: HDFC BANK LTD. 1st Floor Kailash Building 26, K.G. Marg, New Delhi-110001

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

- A. "NHAH vide Letter No. NHAH/BOT/11019/34/2005/804 dated 15th March 2007 issued Letter of Acceptance (LOA) to **M/s Reliance Energy Limited** (the "Bidder") for Design, Construction, Development, Finance, Improvement, Operation and Maintenance of Existing 2-Lane Road to 4-Lane dual carriageway from Km 333.000 to Km 421.600 of NH-45 (Trichy-Dindigul Section) in the State of Tamil Nadu on Build, Operate and Transfer (BOT) Basis (the "Project"). **M/s Reliance Energy Limited** has confirmed their acceptance to the said LOA of NHAH vide their Letter No. REL-IR/NHAH/SRH/TN01/07-001 dated 22nd March 2007. **M/s Reliance Energy Limited** has promoted and incorporated a Special Purpose Vehicle in the form of a limited liability company **TD Toll Road Private Limited** (the "Concessionaire") to enter into the Concession Agreement for undertaking, inter alia, the Project and to perform and discharge all its obligations thereunder

Contd....

For HDFC BANK LTD.



Authorised Signatory

B362

For HDFC BANK LTD.

Authorised Signatory



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BG No. 003GT02070940007 DATED 04-APR-2007

- B. The Concessionaire is required to give ("NHAI") a guarantee by a recognized bank based in India in the sum of Rs. **11,52,00,000/- (Indian Rupees Eleven Crores Fifty Two Lacs only)** as security for compliance with its obligations under the Concession Agreement during the Construction Period.
- C. The Guarantor has agreed to give NHAI the abovementioned guarantee on the terms set out herein.

GUARANTEE

1. We, **HDFC BANK LTD. 1st Floor Kailash Building 26,K.G. Marg, New Delhi-110001** with its registered office at HDFC Bank House, Senapati- Bapat Marg, Lower Parel, Mumbai, unconditionally guarantee to pay NHAI upon first written demand and without any deduction any sum claimed by NHAI upto a maximum of Rs. **11,52,00,000/- (Indian Rupees Eleven Crores Fifty Two Lacs 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 Concessionaire shall be obliged to ensure the replenishment of the existing Guarantee or provide fresh guarantee of the Guaranteed Sum through the Guarantor within the time provided in the Concession Agreement for the same.

For HDFC BANK LTD

Authorized Signatory



For HDFC BANK LTD

Authorized Signatory

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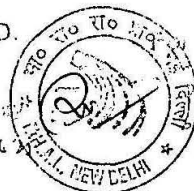
6. No underlying dispute as between NHAI and the Concessionaire nor any pending application for interim relief or arbitration proceedings or other legal proceedings shall constitute any ground for prevention, delay or obstruction for making payment to NHAI by the Guarantor and the existence of any disputes 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 **31st December 2007 (Date of validity of the Bank Guarantee for Performance Security)** 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 non-payment of the Guaranteed Sum.
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.

Contd....

For HDFC BANK LTD.

Authorised Signatory

B36



Statutory



BG No. 003GT02070940007 DATED 04-APR-2007

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.

DATED 04-APR-2007 AT NEW DELHI FOR HDFC BANK LIMITED	
Notwithstanding anything contained herein before (1.) Our liability under this Bank Guarantee shall not exceed to Rs. 11,52,00,000/- (Rs. ELEVEN CRORE FIFTY TWO LAKH only) (2.) This Bank Guarantee shall be valid upto 31-DEC-2007 and (3.) 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 31-DEC-2007	i All Claims under this Guarantee shall be payable at New Delhi ii This Guarantee Will be returned to us as soon as the purpose for which it is issued is fulfilled. iii The BG confirmation No.- GTEE 061577 is an integral part of the BG no.- 003GT02070940007

HDFC BANK LTD.

Authorised Signatory
SBC

For HDFC BANK LTD.
Authorised Signatory

NAME OF THE BANK: - HDFC BANK LTD. 1st Floor Kailash Building 26, K.G. Marg, New Delhi-110001

PHONE NO 011-4169 9437

FAX NO 011-4152 1398





प्रकल्प संचालक (सी. एम.)
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय)

Office of The Project Director (CM)
NATIONAL HIGHWAYS AUTHORITY OF INDIA
(Ministry of Road Transport & Highways)

PWD Campus, Ghodbunder Junction of NH 8, Kashimira, Thane (W)

73-4-D22212
Tele / Fax : 022 - 2845 5500

Cell : 98700 36632

No. NHAI/CM/Ghodbunder/BG-47/2158

Dated: 15/05/2007

To,
Atul Kumar Garg
Manger (Fin - BOT)
National Highways Authority of India
G-5&6, Sector-10, Dwarka,
New Delhi- 110075

Sub: Independent of Bank Guarantee Confirmation

Ref: NHAI/BOT/11019/33/2005/1270 dated: 27/04/2007

Sir

With reference to above the BG No. mentioned below has been got confirmed.

Sr. No.	Name of Consultant	of BG No.	Amount	Period of Validity
1.	M/s Reliance Energy Ltd.	1908 FGBID 004507 dated: 10/04/2007	17,28,00,000/-	31-05-2010

The confirmation from the bank is enclosed.

Thanking You

Your faithfully

C.K. Sinha
for C.K. Sinha
Project Director
NHAI, CMU-Manor

Encl: 1) Original letter of UCO Bank Flagship Corporate Branch, 1st Floor,
Mafatal Centre Nariman Point MUMBAI-400021 Letter no.- UCO: SNK: BG-
BAL.CON:07 Dated: 08/05/07



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HEAD OFFICE :
10 B. T. M. SARANI
KOLKATA - 700001

UCO BANK
FLAGSHIP CORPORATE BRANCH
FOREIGN EXCHANGE DEPARTMENT
MAFATLAL CENTRE, FIRST FLOOR
NARIMAN POINT, MUMBAI-400021

Tel No. : 22026449 / 22026585
Tlx No. : 11-85041 UCFXIN
Fax No. : 00-91-22-2025338
Swift : UCBAINBB 002
E-mail : bo.narimanpt@ucobank.co.in

UCO: SNK: BG-BAL.CON:07.

Dt.08.05.2007.

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

Sir,

**Sub: Confirmation of Bank Guarantee
against NHAI on behalf of M/s. Reliance Energy Ltd.**

We refer to your letter No.NHAI/BOT/11019/33/2005/1266 Dtd. 27.04.07 on the above subject. We confirm the issue of subject extension of Bank Guarantee details given below.

Sr. No.	B.G.No. & Date	Amount	Validity
1.	1908FGBID004507 Dtd.10.04.2007	Rs.17, 28,00,000/-	31.05.2010.

Our authorized signatories Mr.S.N.Kulkarni, (PFM No.31446),
Mr.S.S.Kadam, (PFM No.35943) signs the above Bank Guarantee.


Chief Manager.



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DATE: 31-MAY-2007

HDFC Bank Ltd.,
1st Floor, Kailash Building,
26, K. G. Marg,
New Delhi - 110 001.
Tel. : 41699471 / 475

TO,
NATIONAL HIGHWAY AUTHORITY OF INDIA,
G-5 & 6, SECTOR 10, DWARKA,
NEW DELHI - 110075
INDIA.

Dear Sir,

Attn: Mr Atul Kumar Garg

Subject: Confirmation of Bank Guarantee No 003GT02070940007, vide letter
no :NHAI/BOT/11019/33/2005/1358

We confirm that the above mentioned Bank Guarantee has been Issued / amended by HDFC Bank Ltd., 1st Floor, Kailash Building, 26, K.G.Marg, New Delhi - 110 001, details given below:

BG NO.	Amount	Issue date	Expiry Date
003GT02070940007	Rs 115,200,000	04-APR-2007	31-DEC-2007

The above Guarantee has been issued on account of our customer M/S RELIANCE ENERGY LIMITED.

Thanking You,

For HDFC BANK LTD.

Swal
Authorised Signatory

Name : *Parvati Kewar*
Designation : *Dy. Manager*
POA No. :



Registered office : HDFC Bank House, Senapati Bapat Marg, Lower Parel (West), Mumbai - 400 013. 2022-8-1000

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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 333.000 to 421.600 of the National Highway number 45 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 M/s TD Toll Road Private Limited, 3rd Floor, Reliance Energy Centre, Santa Cruz (East), Mumbai - 400 055 (herein after referred to as the "Concessionaire") for the development of the Trichy - Dindigul stretch from Km 333.000 to Km 421.600 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;

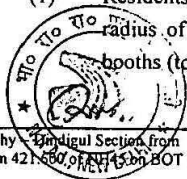
NOW, THEREFORE, in exercise of powers conferred by section 8A of the National Highways Act, 1956 (48 of 1956), read with rule 3 of the National Highways (Collection of Fees by any person for the use of section of National Highways/permanent bridge/temporary bridge on National Highway) Rules, 1997, the Central Government, having regard to the expenditure involved in building, maintenance, management and operation of the said section of the said National Highway No. 45, 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 333.000 to 421.600 of the National Highway number 45 in 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.

4 - Laning of Trichy - Dindigul Section from
Km 333.000 to Km 421.600 of NH 45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



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

- (i) "Actual Fees" means the Fees actually charged on the road users for using Km 333.000 To Km 421.600 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 45 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) Buses:
Deleted
- (c) School Buses:
Monthly Passes for School buses, for school students, crossing the toll plaza at a monthly rate of Rs 1000 (Rupees one thousand) after obtaining written request of the School Principal along with the recognition of the school and the registration of the bus.
- (d) 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 Trichy – Dindigul section from Km 333.000 to 421.600 of the National Highway number 45 in the State 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 45 from km 333.000 to 421.600 in the State of Tamil Nadu, applicable as on 1st July, 1997.

The Fee shall be collected at plazafrom the Commercial Operation Date (COD)

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 2005-06. (WPI for 2005 -06 = 195.6)
(1)	(2)	(3)	(4)
1.	A car, passenger van or jeep	0.40	0.60
2.	Light Commercial Vehicle (LCV)	0.70	1.04
3.	Bus, Truck	1.40	2.08
4.	MAV (>2 Axle)*	2.25	3.34

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

Notes:

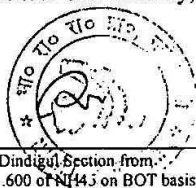
- Actual amount of fee to be charged for a particular year (from 1st September of a year to 31st August of the following year) will be computed as under:
- The aforesaid Fee will be revised once in every year. The revised Fee shall be computed ("Computed Fee") as follows:-

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

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%)

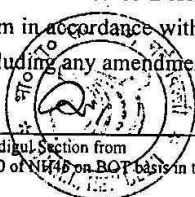
WPI means Wholesale Price Index as released by the Office of the Economic Advisor, Ministry of Commerce and Industry, Government of India or any other index replacing the same.



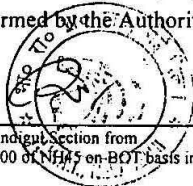
3. When the same vehicle has to cross the said stretch of the National Highway more than once in a day, the user shall have the option to pay the Fee for multiple trips at 1.5 times the rates as given in the Schedule above while crossing the Toll Plaza in the first trip itself. If the vehicle has to 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 Highway from km 333.000 to km 421.273 of NH - 45.	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 333.000 to km 421.273	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.

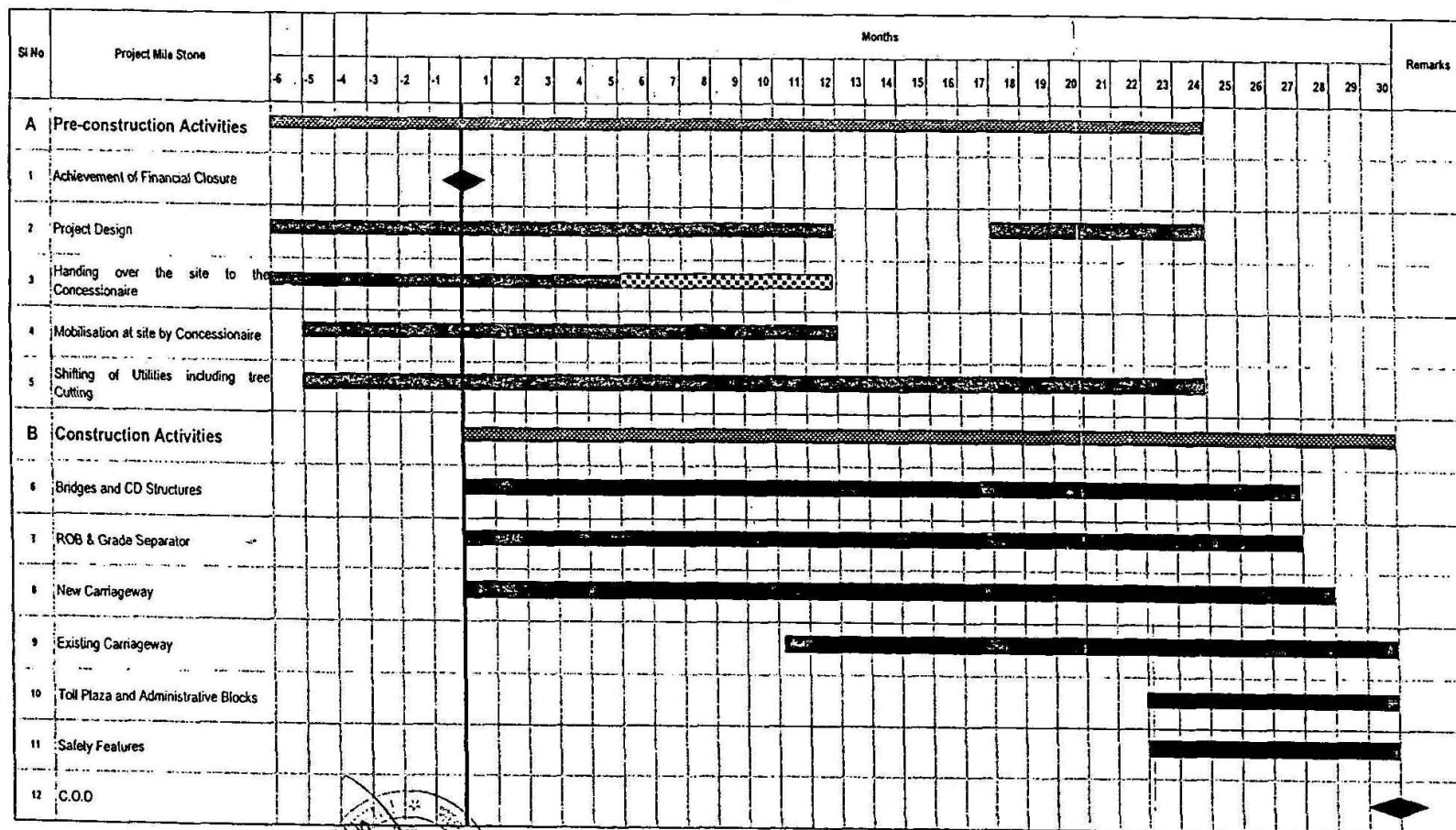


III. PROJECT MILESTONES

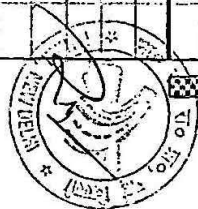
Sl. No.	Project Mile Stone	Months																											
		1	2	3	4	5	6	7	8	9	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Preconstruction Activities																													
1	Achievement of Financial Closure																												
2	Project Design																												
3	Handing Over the site to the Concessionaire																												
4	Mobilisation at site by concessionaire																												
5	Shifting of utilities including tree cutting																												
Construction Activities																													
5	Bridges and CD Structures																												
6	ROB & Grade Separator																												
7	New Carriageway																												
8	Existing Carriageway																												
9	Toll Plaza and Administrative Blocks																												
10	Safety Features																												
11	C.O.D.																												

4 – Laning of Trichy to Dindigul section from
(km 333.000 to km 421.273) of NH – 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA

TRICHY - DINDIGUL SECTION (Km 333.000 to Km 421.600) OF NH-45 IN TAMIL NADU
SCHEDULE - H
III. PROJECT MILESTONES



LEGEND

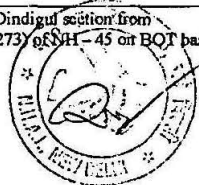


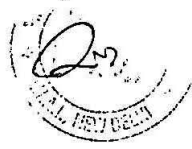
Additional Land wherever required for the Project Highway including Land for Base Camp



SCHEDULE I**DRAWINGS**

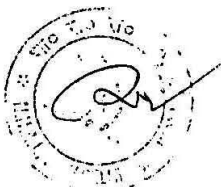
1. The project highway drawings, as defined in clause 1.1, Definitions, Article 1, Definition and Interpretation, Chapter I-Preliminary, of the Concession Agreement shall consist
 - A. Working drawings of all the components/elements of the project as determined by Independent Consultant/NHAI, and
 - 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.



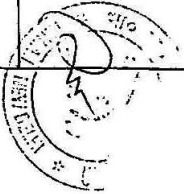
4 – Laning of Trichy to Dindigul section from
(km 333.000 to km 421.273) of NH – 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA



TESTS TO BE CONDUCTED

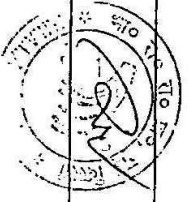



Item	Test	Testing Procedure
Work for embankment, subgrade construction and cut formation		
Embankment and subgrade borrow materials	<p>Quality Audit of the following tests performed during construction for soil type, density, moisture content and CBR as required by Ministry of Surface Transport specifications for Road and Bridge works</p> <ul style="list-style-type: none"> 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	<p>Quality Audit of the following Tests performed during construction as required by MORT&H specifications for Road and Bridge works.</p> <ul style="list-style-type: none"> 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	<p>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.</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <ul style="list-style-type: none"> • 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	<p>Quality audit of sampling and testing of cubes and beams for strength of concrete and quality control tests on aggregates</p> <ul style="list-style-type: none"> • Aggregate Impact Value as per IS : 2386 (Part 4) • Soundness Test as per IS: 2386 (Part 5) • Alkali Aggregate Reactivity IS : 2386 (Part 7) • Strength of Concrete (Tests on Cubes and beams) as per IS : 516 	As per relevant parts of IS 2386, IS 516 and IS1199

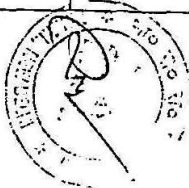



Planing of Trichy to Dindigul section from

(km 333.600 to km 421.273) of NH – 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA

		• Workability of fresh Concrete - Slump Test IS : 1199	
	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/MC
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 functionality 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.

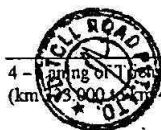
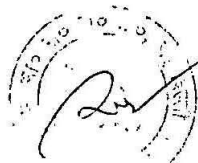
- 2.5 **Cross-section Test:** The cross-sections of the Project Highway shall be checked on a sample basis through physical measurements of their dimensions for determining the conformity thereof with Specifications and Standards. For the road portion, the sample shall consist of one spot to be selected 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 by 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**

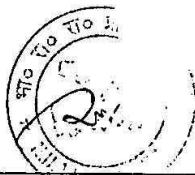
(In case the Completion Certificate is being issued without the Provisional Certificate already being issued.)

I/We, (Name of Independent Consultant) acting as Independent Consultant on the Project "Design, Construction, Development, Finance, Operation and Maintenance of Km 333.000 to Km 421.600, and Improvement, Operations and Maintenance of Km 333.000 to Km 421.600 of Trichy - Dindigul section of NH-45 in the State of Tamil Nadu, India on BOT basis" through the Concessionaire, M/s TD Toll Road Private 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 NHA. 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 333.000 to Km 421.600, and Improvement, Operations and Maintenance of Km 333.000 to Km 421.600 of Trichy - Dindigul section of NH-45 in the State of Tamil Nadu, India on BOT basis" through the Concessionaire, M/s TD Toll Road Private 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 oncompleted 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 – K₁

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 333.000 to Km 421.600, and Improvement, Operations and Maintenance of Km 333.000 to Km 421.600 of Trichy – Dindigul Section of NH-45 in the State of Tamil Nadu, India on BOT basis" through the Concessionaire, M/s TD Toll Road Private 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;

- 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 laybys, 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 indicators 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

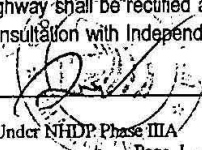
- a) The crash barriers should require minimum maintenance except in case of damage due to impact.
- b) Concrete Posts and Steel Beam crash barriers will require repairs or replacement from low to medium impact damage caused by vehicles. Periodic painting will also be required.

(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

Sl. No.	Service Factor	Level 1 (Desirable)	Level 2 (Acceptable)
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%	(+ or -) 0.15% variation from

		variation from the Camber as per Design Requirements	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



Rutting

Corrugations and Shoving

Settlement of Grade Depressions

Upheaval or swell

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 5^m 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 homogeneous 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.

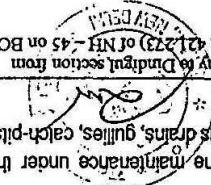
For maintenance it shall be ensured that no earth is borrowed from roadside land. All borrowing operation shall be as per IRC: 10-1961.

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 gullies, side drains and median drainage etc.



4 - Laying of Trichy to Pondicherry section from (km 333.000 to km 421.223) of NH - 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase III.

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 desilting 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; Hedges shall be kept trimmed not to overhang carriageways.
- Turfing shall 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).



Richy to Dindigul section from

km 421.273) of NH – 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA

- (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 ASTM D 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 off 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) At 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 and 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/NHA 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.



Trichy to Dindigul section from
km 421.273) of NH – 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA

- 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 median 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 spots 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 incorporate 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

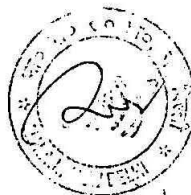
4 - Laying of Trench to Dundigul section from
(km 333.000 to km 421.273) of NH - 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase III



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

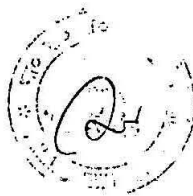
The concessionaire shall maintain the Project Highway, Project area, Project Assets, Ancillary Facilities on the Project Highway in working and orderly condition at all times during the Concession Period or any extension thereof.

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 NHA.



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.



4 – Laying of Trenches to Dindigul section from
(km 329.000 to 334.273) of NH-45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA

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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 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

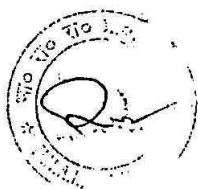
Sufficiency Rating System

1. Load Performance
2. Safety Performance
3. Remaining Life

4 – Laning of Trichy to Dindigul section from _____
(km 333.000 to km 421.273) of NH – 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA

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SCHEDULE M

MONTHLY FEE COLLECTION STATEMENT

1. Name of Work: Trichy - Dindigul section of NH - 45 from km 333.000 to km 421.600 in the State of Tamil Nadu
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 Tolloed Traffic, Local Tolloed Traffic and Total Tolloed 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 requirements
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 :

$$\text{Financial Score of 'X'} = \{100 \times \text{Bid price of lowest bidder}\} / \{\text{Bid price of 'X'}\}$$

The weightage given to the technical proposal	:	80%
The weightage given to financial proposal	:	20%

$$\text{Combined score of bidder 'X'} = 0.20\{\text{Financial score of bidder 'X'}\} + 0.80\{\text{Technical score of bidder 'X'}\}$$

5. Negotiation and Selection of Independent Consultants

4. Laning of Trichy - Dindigul Section from
Km 333.000 to Km 421.600 of NH45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



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.



4 - Lining of Trichy - Dindigul Section from
Km 333.000 to Km 421.600 of NH45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



SCHEDULE O**INDEPENDENT CONSULTANT'S SERVICES****LETTER OF INVITATION**

Re: 4-laning of Trichy-Dindigul section of NH-45 in the State of Tamil Nadu 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

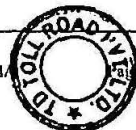
- 3.2 You are expected to examine all terms and conditions included in the documents. Failure to provide all requested information will be at your own risk and may result in rejection of your proposal.
- 3.3 During preparation of the technical proposal you may give particular attention to the following :
- 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.



- 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 manmonths for the assignment is 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



- 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 interlineation 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.



- 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 scores, 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: $Sf = 100 \times Fm/F$ (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.

$$ST = Wt \cdot St + Wf \cdot Sf$$

- 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]*



4 - Laning of Trichy - Dindigul Section from
Km 333.000 to Km 421.600 of NH45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



DATA SHEET
(As Mentioned in LoI)

Sub clause No. in LoI

- 1.1 The name of the Assignment is: Independent Consultancy services for 4-laning of Trichy-Dindigul section of NH-45 in the state of Tamil Nadu 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 **4-laning of Trichy-Dindigul section of NH-45 in the state of Tamil Nadu 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 Venture 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:

(i) Relevant experience for the assignment

POINTS

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



INDEPENDENT CONSULTANTS' SERVICES TERMS OF REFERENCE

1. PROJECT BACKGROUND

The Government of India, National Highways Authority of India (NHAI) has taken up **4-laning of Trichy-Dindigul section of NH-45 in the state of Tamil Nadu, India** and its Operation and Maintenance on 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 **4-laning of Trichy-Dindigul section of NH-45 in the state of Tamil Nadu, 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.

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

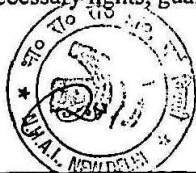
- i) Review the adequacy of the geotechnical and sub-soil investigations for road, bridge and other structures and building works, hydrological investigation and the topographical survey.
- ii) Review the Design and working drawings prepared for the construction of various components of the highway, 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 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 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 set forth 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 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.

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.



4 – Laning of Trichy – Bidugul Section from

Km 333.000 to Km 421.600 of NH45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



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*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 PERSONNEL AND 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	88	25
			TOTAL
			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.

Assignment Name :		Country :
Location within Country :		Professional Staff Provided by Your Firm:
Name of Client :		No. of Staff :
Start Date (Month/Year)	Completion Date (Month/Year)	No. of Staff-Months :
		Approx. Value of Services (in Current INR)
Name of Associated Consultants, if any:		No. of Months of Professional Staff. Provided by Associated Consultants :
Name of Senior Staff involved :		
Narrative Description of Project :		
Description of Actual Services Provided by Your Staff :		

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**



4 - Laning of Trichy - Dindigul Section from

Km 333.000 to Km 421.600 of NH45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



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.]



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) [1 st , 2 nd , etc. are months from the start of assignment]												Number of Months
			1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th and subsequent months	
1															Subtotal (1)
2															Subtotal (2)
3															Subtotal (3)
4															Subtotal (4)
-															-
-															-



APPENDIX I-7 : ACTIVITY (WORKS) SCHEDULE**A. Activity Schedule**

Sl. No.	Item of Activity (Works)	Monthwise Program (in form of Bar Chart)											
		[1 st , 2 nd , etc. are months from the start of assignment]											
		1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th
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
.....
.....

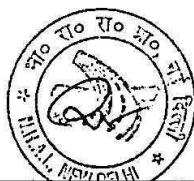
We understand you are not bound to accept any proposal you receive.

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 :	
	<u>Total Cost Net of Tax</u>	
Taxes and Duties		
	TOTAL COSTS (Including Tax)	



4 - Laning of Trichy - Dindigul Section from

Km 333.000 to Km 421.600 of NH45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



APPENDIX II-3 : BREAKDOWN OF COSTS**REMUNERATION FOR STAFF**

N o.	Positi on	Nam e	Year 1			Year 2			Year 3			Year 4		
			Rate	S M	Amo unt	Rate	SM	Amo unt	Rat e	S M	Amo unt	Ra te	SM	Amo unt
	Profes sional Staff													
1.														
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														
	Sub - Total													
	Techn ical Suppo rt Staff													
1.		TBN												
2.		TBN												
3.		TBN												
4.		TBN												
5.		TBN												
6.		TBN												
7.		TBN												



N o.	Positi on	Nam e	Year 1			Year 2			Year 3			Year 4		
			Rate	S M	Amo unt	Rate	SM	Amo unt	Rat e	S M	Amo unt	Ra te	SM	Amo unt
8.		TBN												
9.		TBN												
10.		TBN												
	Sub- Total													
	TOTAL													

SM = Staff Month

TBN = To be Named



4 - Laning of Trichy - Dindigul Section from

Km 333.000 to Km 421.600 of NH45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



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 _____

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)

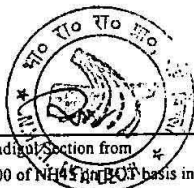
No.	Description (*)	Unit	Quantity	Rate ()	Amount ()
1	Office Furniture (Purchase)				
2					
3					
4					
5					
6					
7					
8					
9					
10					
1	Office Equipment (Purchase)				
2					
3					
4					



No.	Description (*)	Unit	Quantity	Rate ()	Amount ()
5					
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 telemetry 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.

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-Classifer 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.



4 - Laning of Trichy-Dindigul Section from
Km 333.000 to Km 421.600 of NH45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



SCHEDULE Q

DRAFT ESCROW ACCOUNT AGREEMENT

Among

TD TOLL ROAD PRIVATE 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:

TD TOLL ROAD PRIVATE LIMITED a Concessionaire incorporated in India whose registered office is at 3rd Floor, Reliance Energy Centre, Santa Cruz (East), Mumbai - 400 055, 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 the project for **"Trichy-Dindigul section of NH-45 in the state of Tamil Nadu, India 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 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:

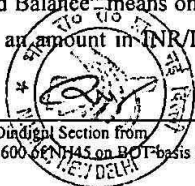
4 - Laning of Trichy - Dindigul Section from
Km 333.000 to Km 421.600 of NH45 on BOT basis in the State of Tamil Nadu under NHDP Phase IIIA



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;
- "Authorised Investment" means any authorised 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;
- "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 clause 3.3.1;
- "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;
- 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 organisation shall be deemed to include a reference to any successor to such public organisation or any organisation or entity which has taken over the functions or responsibilities of such public organisation;
- 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.
- 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.

The NHAI agrees, confirms and undertakes that it shall deposit and/or credit the Escrow Account with:

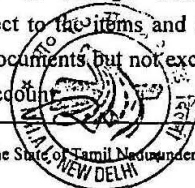
- (i) all Fees collected by NHAI in exercise of its rights under Concession Agreement;
- (ii) Revenue Shortfall Loan;
- (iii) Grant, termination payments and other monies paid or disbursed in accordance with the provisions of the Concession Agreement and/or the Substitution Agreement..

3.2.2 The Escrow Agent shall ensure that all interest, if any, on the balances of the Escrow Accounts and interest on Authorised 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 1 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 terms 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 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 Notwithstanding 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 favour 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 notwithstanding 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. Authorised Investments

4.1 Power to Invest

The Escrow Agent shall invest the amounts standing to the credit of any of the Sub-Accounts in Authorised 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 Authorised Investments shall be made and/or realised 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 Authorised Investments made out of any Escrow Account will be held in the custody of the Escrow Agent.

4.3 Realisations

Upon the realisation of any investment made under this Clause, the proceeds of realisation shall immediately be credited to the relevant Sub-Account by the Escrow Agent or immediately invested in another Authorised Investment in accordance with the Concessionaire's instructions as approved by the Lenders Representative.

4.4 Mandatory Realisations

In the event that the Concessionaire becomes aware that any Authorised Investment has ceased to be an Authorised Investment, the Concessionaire shall immediately instruct the Escrow Agent on a best efforts basis to realise such Authorised 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 Authorised



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 realise the Authorised 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 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

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;
 - (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.

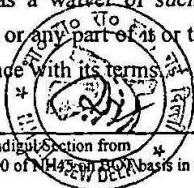
8.4 Notices

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 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 authorised 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, NHA and the Lenders Representative have caused the said triplicate to be executed by the hand of an authorised official.

SIGNED AND DELIVERED BY)

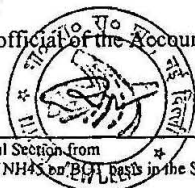
..... within named Escrow Agent)

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:.....

THE COMMON SEAL OF)
 has pursuant to the Resolution)
 of its Board of Directors passed in)
 that behalf on the day of200)
 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

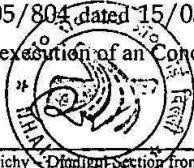
- 1 THE GOVERNOR OF THE STATE OF TAMIL NADU through the Secretary, Ministry of _____, Government of Tamil Nadu, (hereinafter referred to as "GOTN" which expression shall unless repugnant to the context or meaning thereof include its successors and assigns),
- 2 National Highways Authority of India, Government 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 TD Toll Road Private Limited, a company incorporated under the provisions of the Companies Act, 1956 and having its registered office at 3rd Floor, Reliance Energy Centre, Santa Cruz (East), Mumbai - 400 055 (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 Trichy - Dindigul section of NH - 45 from km 333.000 to km 421.600 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.
- D. After evaluation of the bids so received, NHAI had accepted the bid of the Consortium and issued its Letter of Acceptance No. NHAI/BOT/11019/34/2005/804 dated 15/03/2007 (the "LOA") to the Consortium requiring, inter alia, the execution of a Concession Agreement pursuant thereto.



- E. 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.
- F. 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.
- G. 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:

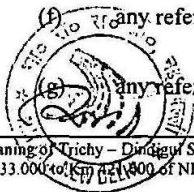
1. DEFINITIONS AND INTERPRETATIONS

- 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 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.
 - (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 duly 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 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, Trichy - Dindigul section of NH - 45 from km 333.000 to km 421.600 in the State of Tamil Nadu (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

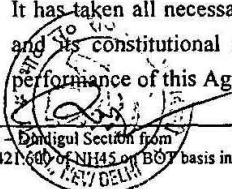
4.1 Concessionaire agrees and undertakes to perform, observe and comply with the following :

- (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

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.

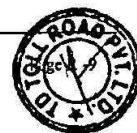
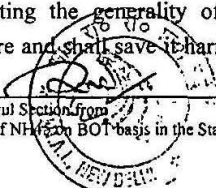
7.3 Any such compensation payable shall be paid to the Concessionaire, in one lumpsum within 90 (ninety) days of receiving MOSRTH's determination of compensation.

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.

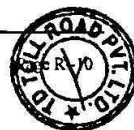
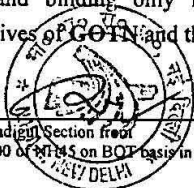
9. GOVERNING LAW AND DISPUTE SETTLEMENT

- 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.

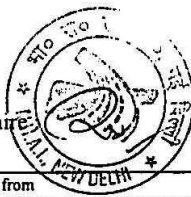
IF to the NHAI

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 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 TD TOLL ROAD PRIVATE
LIMITED**

BY : _____

Name : _____

Title: _____

FOR NHAI

BY : _____

Name : _____

Title: _____

FOR GOVT. OF Tamil Nadu

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

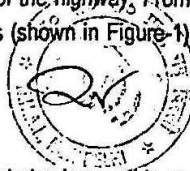
- (i) warning to the drivers unambiguously and sufficiently in advance of the situation on the highway;
- (ii) providing clear demarcation for movement of vehicles;
- (iii) providing devices to guide the drivers and their movements through construction zones/lane closures/traffic diversions etc.
- (iv) 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

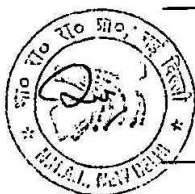
The transition sub-zone is the area in which the traffic is steered and guided into and out of the diverted path around the work sub-zone. This is the most crucial sub-zone from safety point of view since most of the movements are turning movements. The traffic in this sub-zone is mostly taken across 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

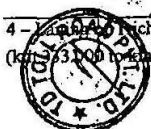
Average Speed (kph)	Length of Advance Warning Sub-Zone (m)	Length of Transition Sub-Zone (m)	Length of Work Sub-zone (m)
50	100	50	
51-80	100-300	50-100	Varies
81-100	300-500	100-200	
Over 100	1000	200-300	



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

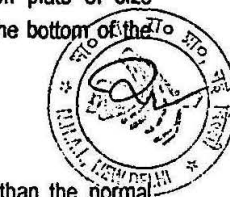
Regulatory signs mean legal restrictions on the traffic. They shall be used only in consultation with the local police and/or authorities. The most common types for use in construction zones are "Do not Enter", "Road Closed", "Give Way to Pedestrians", "Speed limit" etc.

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 informative 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



Trichy to Dindigul section from

km 331.000 to km 421.273) of NH – 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA

"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 close 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.

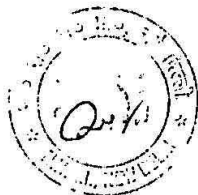
2.7 Safety of Project workmen at Site

- 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.



Laning of Trichy to Dindigul section from

(km 33.000 to km 421.273) of NH – 45 on BOT basis in the State of Tamil Nadu Under NHDP Phase IIIA

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 shortlisted 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-45) 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 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. **TD TOLL ROAD PRIVATE LIMITED**, a company incorporated under the provisions of the Companies Act, 1956 and having its Registered Office at 3rd Floor, Reliance Energy Centre, Santa Cruz (East), Mumbai - 400 055 (hereinafter referred to as the "Concessionaire" which expression shall unless repugnant to the context or meaning thereof include its 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 **Trichy-Dindigul section of NH-45 in the State of Tamil Nadu, India** on Build, Operate and Transfer (BOT) basis subject to and on the terms, conditions and covenants set forth 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 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.

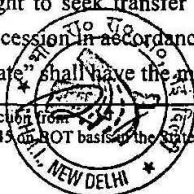
NOW THEREFORE THE PARTIES HITHERTO HEREBY AGREE AND THIS

AGREEMENT WITNESSES AS FOLLOWS:

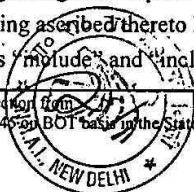


ARTICLE 1 DEFINITIONS

- 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 set forth in the Concession Agreement.
- 1.1.2 "Concession Agreement" means the Concession Agreement dated entered into between NHA 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 instalments, 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 as set forth 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 set forth 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 :
- 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;
 - 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, organisations or other entities (whether or not having a separate legal entity);
 - 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;
 - terms beginning with capital letters and defined in this Agreement shall have the meaning ascribed thereto herein;
 - the words "include" and "including" are to be construed without limitation;

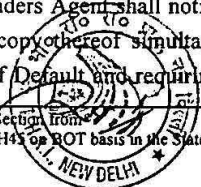


- f) any reference to a "day" shall mean reference to a calendar day;
- g) any reference to "month" shall mean reference to a calendar month;
- h) the Schedules to this Agreement form an integral part of this Agreement and will be in full force and effect as though they were expressly set out in the 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 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, authorisation, 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 network, 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 favour 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

- 3.1 The following modalities shall be applicable to any substitution of the Concessionaire by the Selectee pursuant to this Agreement :
- (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
 - (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



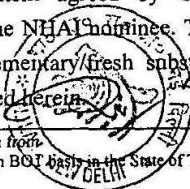
approval or otherwise of such Proposal, including of Selectee, in its sole discretion within 60 (sixty) days of (a) the date of receipt of the Proposal by NHAI, or (b) the date when last of further and other information and such clarifications in respect of any data, particulars or information comprised 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 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 set forth 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 favour 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 challenge 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.
- 3.2 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 atleast 2 months prior to the anticipated date of substitution as aforesaid for the residual period of the Concession.
- 3.3 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.
- 3.4 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 (NHA 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 NHA nominee to the extent agreed by the Lenders Agent while substituting the Concessionaire by the NHA nominee. The NHA nominee shall similarly be bound to execute a supplementary/fresh substitution agreement on the same terms and conditions as provided herein.



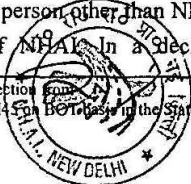
- (ii) Notwithstanding anything contained in Clause 3.4 and this Clause 3.5, NHAI shall not be required to take over, upon Termination of the Concession Agreement including the Concession, the liabilities representing the Lender's Dues save and except to the extent of Termination Payments due and payable 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.

- 3.5.1 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

- 4.1 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

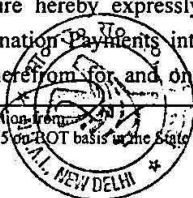
TERMINATION OF THE CONCESSION BY THE NHAI

- 5.1 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 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.
- 5.2 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

- 6.1 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.
- 6.2 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.
- 6.3 The Concessionaire hereby expressly authorises 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

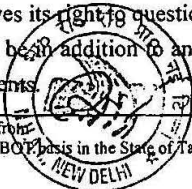


notwithstanding the pendency of any dispute or objection or claim that the Concessionaire may have against the Senior Lenders and/or NHAI. The deposit by NHAI into the Escrow Account and payment to the Senior Lenders directly or through the Lenders Agent in accordance with this Agreement, made or caused 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

- 7.1 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.
- 7.2 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.
- 7.3 The expressions "NHA", the "Concessionaire", the "Senior Lenders" and the "Lenders Agent" herein used shall unless there be anything repugnant to the subject or context include their respective successors, legal representatives, administrators and permitted assigns.
- 7.4 This Agreement shall not be affected by reorganisation 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.
- 7.5 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.
- 7.6 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.
- 7.7 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.
- 7.8 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.
- 7.9 This Agreement shall be in addition to and shall not be in derogation of the terms of the Financing Documents.



7.10 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.

7.11 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.

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
TD TOLL ROAD PRIVATE 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 CERTIFICATE

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:

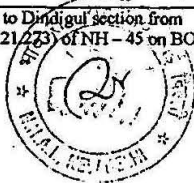
Name:

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 INTRODUCTION**

The reporting and records requirements spelt out hereunder 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**

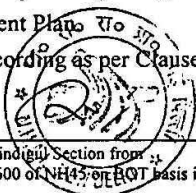
From the date of the Concession Agreement until the end of the Concession Period, the Concessionaire shall prepare and submit to the NHAI and Independent Consultant 1 copy each of the following reports/ Documents/ Drawings else otherwise stated in the Concession Agreement.

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 post-construction activities such as utility relocation and other obstructions.



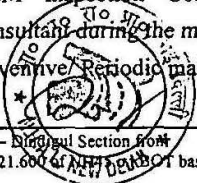
- Concessionaire' compliance with the Inspection Report during the month ended, if any.
 - Construction Constraints.
 - Progress data with 'S' curves, if applicable; Project Data with contract detail and sectional completion details.
 - Tests carried out during the month ended, if any; results of these 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.



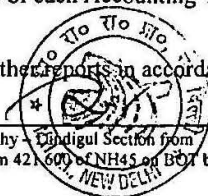
- 5 Monthly Escrow Account Report: With in 5 Days of end of each month which falls within the Operations Period, the Concessionaire shall provide to the NHAI and the Independent Consultant a copy of the report containing the summary of the receipts in and payments from the Escrow Account for the month 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. Operation Phase

- 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:
 - 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 NHAH 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 NHAH 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 NHAH 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.



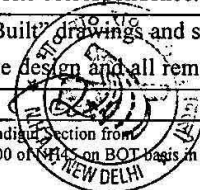
8. Such other reports as may be reasonably required by NHAI/ Independent Consultant.
9. Additional Reports: The Concessionaire shall supply to the NHAI/Independent Consultant free of charge copies of all information, records and test results (including any interpretation of such test results) resulting 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	Till handover to NHAI at Termination of the Concession



	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.	
2.4	Full set of Tests results	Till handover to NHAI at Termination of the Concession
2.5	The appropriate proprietary rights, licenses, agreements and permissions for materials, methods, processes and systems used or incorporated into the Project Highway.	Till handover to NHAI at 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.

