



Government of Tamil Nadu, Highways and Minor Ports Department



REQUEST FOR PROPOSAL

(International Competitive Bidding)

Volume-III: Schedules

PROJECT

Development of Chennai Outer Ring Road Phase II, from Nemilicheri in NH 205 to Minjur in Thiruvottiyur-Ponneri-Panchetti (TPP) Road on Design, Build, Finance, Operate and Transfer (DBFOT) Annuity basis at Chennai, in the state of Tamil Nadu, India

Tamil Nadu Road Development Company Ltd.
Sindhur Panthion Plaza, 2nd Floor,
346, Pantheon Road, Egmore
Chennai – 600 008, Tamil Nadu

Phone: 91-44-2819 4800 /4900
Fax: 91-44-28195800
E-mail: tenders@tnrdc.com
Web: www.tnrdc.com

Managing Associate

TNRDC

Tamil Nadu Road Development Company Ltd.

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SCHEDULE – A

(See Clause 10.1)

SITE OF THE PROJECT

1 The Site

- 1.1** Site of the **Project - Six Lane Project Highway with Service Roads** shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.
- 1.2** An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Concessionaire, and such inventory shall form part of the memorandum referred to in Clause 10.3.1 of the Concession Agreement.
- 1.3** Additional land, if required, for grade separators, flyovers, underpasses, grade junctions, traffic aid posts, medical aid posts, vehicle rescue posts and other structures / components if any, or for construction of works specified in Change of Scope Order shall be acquired in accordance with the provisions of this Agreement. Upon acquisition, such land shall form part of the Site and vest in the Authority.
- 1.4 Site of Six Lane divided Highway with Service Roads and Rights of The Concessionaire and the Authority**

Notwithstanding anything to the contrary contained in this Agreement; the Site of Six Lane divided Highway with Service Roads includes two strips of 25 m each for Highways mode of transport (Main Carriage Way with Service Road) and Public Transportation Corridor of 22m width. The rights shall be as stated:

- 1) The Concessionaire shall have exclusive rights for two strips of 25m each for development of the Project Highway. The right of utilization and development of the remaining ROW (**Total 72m; comprising 50m Future Development Corridor and 22m PTC**), at any point during the Concession Period, shall vest with the the Authority.
- 2) The Public Transportation Corridor of 22m width: The Concessionaire shall be provided access to 22m PTC till the Authority undertakes Development of PTC. All the rights of PTC remain with the Authority throughout the Concession Period. Such access to PTC shall be provided to the Concessionaire to the extent to facilitate in discharging its obligation of maintaining effective drainage for both 25m highway development strips, protection of PTC from encroachments and its removal, project development works for Cross movements of Vehicles and Pedestrians and

accommodating of road embankment slopes but not for the slopes of high embankment locations at approaches to structures (i.e. underpasses, RoBs, grade separators, major/minor bridges). At any point of time, during the entire Concession Period, the Concessionaire shall not undertake any development in PTC beyond stipulations of the Concession Agreement, unless directed by the Authority.

Annex-I

(SCHEDULE – A)

1.1 The Site

Authority as part of its plan has proposed development of Outer Ring road (ORR) Phase II along the periphery of Chennai Metropolitan Area (CMA) in Thiruvallur District of TamilNadu with the objective of relieving congestion within the city and also for catalysing the even dispersal of urban growth. The ORR shall provide orbital linkages to the major radials as well as decongest the traffic flow on the existing major roads including the Inner ring Road (IRR) and disperse the Urban growth over a large area. The proposed ORR phase II connects NH 205(Chennai – Thiruthani High Road) ,NH5 (Grand Northern Trunk Road) and Thiruvottiyur-Ponneri-Panchetti (TPP) Road. The entire stretch is divided into two segments and proposed to be implemented in two phases.

Phase II

Segment I – NH 205 to NH 5 Ch. Km. 0.000 to Km.18+420

Segment II – NH 5 to TPP Road Ch. Km. 18+420 to Km.30+500

Segments I and II (Approx. Length of 30.500Km) connecting NH-205 near Nemilichery village and TPP road near Minjur are proposed to be taken up for implementation in this second phase, and hereinafter referred to as the “Project Highway”. The Project highway is proposed to be developed as a six lane divided carriageway with service roads.

1.2 Disclaimer

The data presented in this schedule is for an initial understanding and guidance of the concessionaire. Authority or TNRDC will not be responsible for any inaccuracy in the information provided and shall not be liable for or be bound by the data in the information provide and shall not be liable for or be bound by the data used by the Concessionaire in evaluating the project viability. The concessionaire will carry out his own independent surveys for assessing actual position of the project 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 Authority. The concessionaire acknowledges and accepts the difficulties, risks and hazards likely to arise during the course of performance of his obligations hereunder.

1.3 Description of the Project Highway

The index map and location of the Project Highway is given in Figure A-1. The alignment proposed passes through agriculture lands and small built up areas.

1.3.1 Linear Chainage Referencing System

“Design Chainages” given the lists are to be used as reference for the entire length of the Project Highway. Using these as references, the Concessionaire shall, establish the “Design Chainage” for the Project Highway based on detailed topographic surveys.

1.3.2 Start and End of Project Highway

The approximate length of the Project Highway is 30.5 kms. The Project Highway starts at Nemilicheri in National Highway – 205 i at the end of Chennai ORR Phase 1 and ends near Minjur in TPP road.

1.3.3 Latitudes & Longitudes

The Project Highway lies between latitude 8°50’ and longitude 12°50’ and latitude 8°20’ and longitude 13°20’

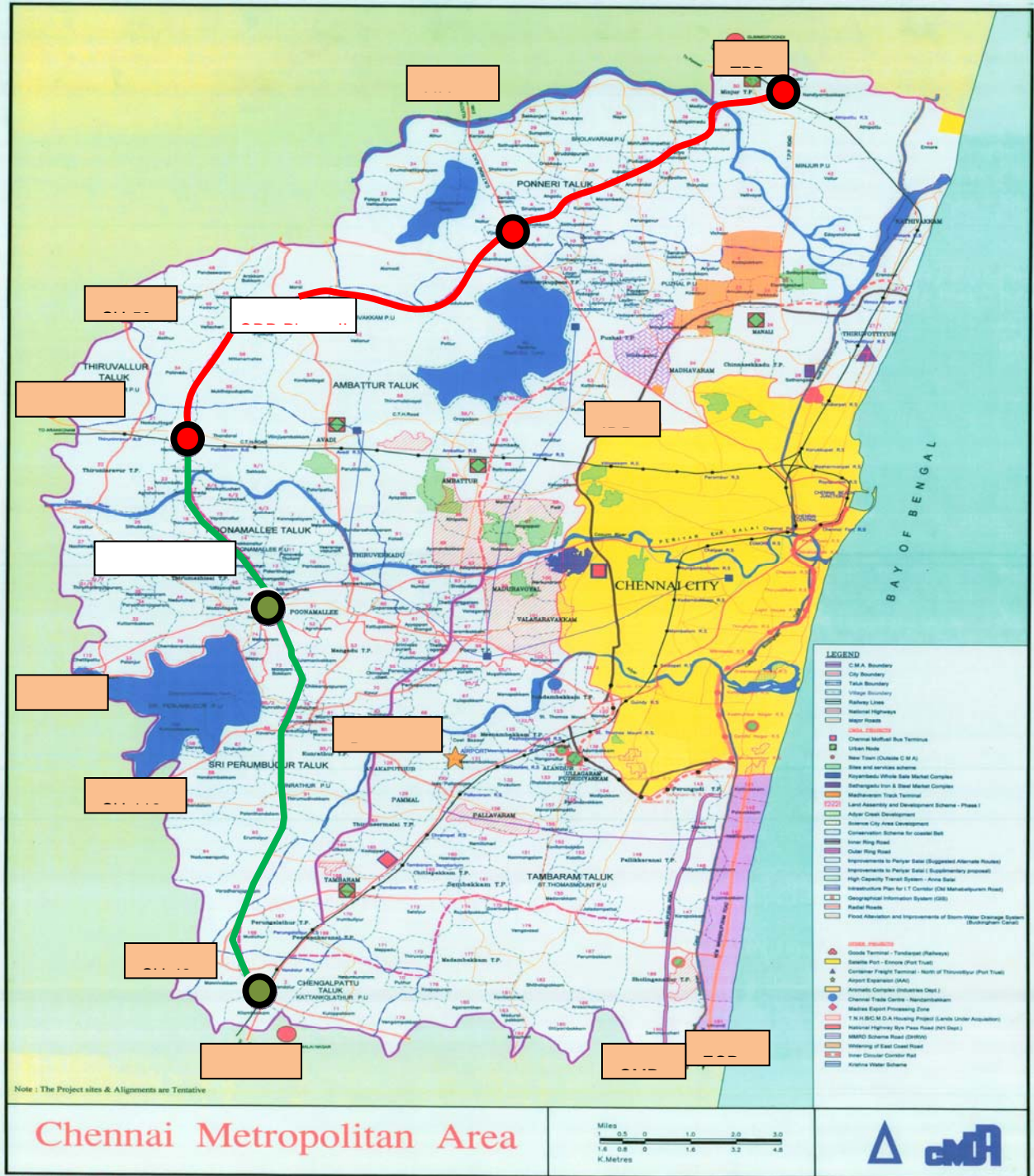
1.3.4 Terrain

The alignment passes through plain terrain.

1.4 Traffic

The indicative traffic estimates for the Project Highway due to the future development along the Project Highway is given in Tables A-1 to A-2.

Figure A-1: Chennai Outer Ring Road Phase II



NOTE: This figure has been provided only for the purpose of reference and convenience; for details refer to volume IV and for actual and commercial calls bidders to conduct their own survey and analysis

Table A-1 Estimated Total Traffic on Section1 NH 205 to NH 5

Year	LC V	2A Trucks	3A Trucks	MA V	Car	Bus	Two Wheeler	Load Auto	Auto	Agricultural Tractors	Total Traffic (in Veh)	Total Traffic (in PCUs)	Tollable Traffic (in Veh)	Tollable Traffic (in PCUs)
2015	788	520	526	137	3147	566	1416	78	157	78	7413	11113	5683	9780
2020	1390	430	930	232	6201	857	2219	102	218	88	12667	17858	10040	15982
2025	1908	373	1251	315	7795	1036	3337	131	291	97	16534	22649	12678	20055
2030	2863	401	1787	444	10544	1438	4725	161	373	106	22843	31174	17478	27717
2035	3903	413	2342	581	13412	1858	6263	191	457	115	29534	40112	22509	35722
2040	4979	431	2896	712	16339	2289	7730	217	532	121	36247	49129	27647	43862

Table A-2 Estimated Total Traffic on Section 2: NH 5 to TPP Road

Year	LCV	2A Truck	3A Truck	MA V	Car	Bus	Two Wheeler	Load Auto	Auto	Agricultural Tractors	Total Traffic (in Veh)	Total Traffic (in PCUs)	Tollable Traffic (in Veh)	Tollable Traffic (in PCUs)
2015	617	403	284	126	2404	570	1082	121	240	121	5967	9171	4403	7665
2020	1191	380	625	248	4865	840	1695	159	332	136	10472	15333	8150	13303
2025	1785	347	890	372	6410	1071	2549	203	445	151	14221	20386	10874	17683
2030	2823	386	1334	550	8875	1519	3608	250	570	165	20081	28795	15487	25303

Year	LCV	2A Truc k	3A Truck	MA V	Car	Bus	Two Wheeler	Load Auto	Aut o	Agricultural Tractors	Total Traff ic (in Veh)	Total Traff ic (in PCUs)	Tollabl e Traffic (in Veh)	Tollabl e Traffic (in PCUs)
2035	3981	406	1803	739	1148 0	198 7	4783	295	697	178	26351	37701	20397	33368
2040	5214	431	2286	927	1418 1	246 6	5904	336	812	188	32745	46835	25505	41722

1.4.1 Land Use Pattern

Land use pattern along the project corridor is predominantly agricultural, barren land. Few structures residences, commercial establishments and educational institutions are also located along the corridor. Land use pattern along the project corridor is given in the **Table A-3**

Table A-3 Details of Land Use Pattern adjacent to Project Corridor

S. No.	Chainage	Left Side	Right Side
1	0+000 to 0+950	Residential area/barren	Residential area
2	0+950 to 1+800	Agricultural, Pallavedu lake.	Agricultural/ Pallavedu lake
3	1+800 to 2+200	Pallavedu lake and residential area	Barren, residential area, Educational institutions
4	2+200 to 4+950	Agricultural and Commercial area	Agricultural
5	4+950 to 7+000	Barren	Barren
6	7+000 to 7+600	Commercial area and barren	Barren/Residential area
7	7+600 to 8+400	Barren	Barren
8	8+400 to 8+800	Educational Institutional area and barren	Educational Institutional area and barren
9	8+800 to 10+550	Barren	Coconut Plantation and barren
10	10+550 to 11+400	SIDCO, Eucalyptus plantation, Barren	Eucalyptus plantation, barren
11	11+400 to 12+750	SIDCO	Educational institution area, residential area
12	12+750 to 15+050	Barren/agricultural	Commercial area, barren/agricultural.
13	15+050 to 15+900	Barren, Commercial /residential area	Barren/ residential area
14	15+900 to 16+550	Commercial / residential area.	Coconut Plantations and Commercial / residential area

S. No.	Chainage	Left Side	Right Side
15	16+550 to 18+200	Barren	Agricultural, barren, and residential area
16	18+200 to 18+450	Commercial area and barren.	Commercial area and barren
17	18+450 to 19+100	Pannivakkam Lake	Pannivakkam Lake
18	19+100 to 21+250	Barren/ Agricultural	Barren/agricultural
19	21+250 to 24+100	Agricultural, residential area.	Residential and agricultural.
20	24+100 to 25+000	Agricultural	Agricultural
21	25+000 to 25+800	Periyamullaivoyal lake and agricultural	Periyamullaivoyal lake
22	25+800 to 28+750	Agricultural	Agricultural.
23	28+750 to 29+000	Kosathalayar River	Kosathalayar River
23	29+000 to 30+050	Agricultural and barren.	Agricultural and barren.
24	30+050 to 30+500	Barren and Commercial area	Barren and Education Institutional, Commercial area

1.4.2 Road Geometrics

The proposed alignment traverses through plain terrain. The Concessionaire shall prepare suitable designs for Horizontal and Vertical alignment as per IRC standards. The geometric designs shall be carried out within the available RoW and shall be finalized after discussions with IE and approval by IE/the authority.

1.5. Road Inventory

The alignment length of 30.50 km (approx.) traverses through plain terrain. The proposed alignment is a green-field alignment to be developed on a new formation, and shall be constructed as per the provisions of schedule B, C and D.

1.6. Land

The land width available is 122 metres, and includes: (a) a 50 m road land width (in two strips of 25m each) allocated for project; (b) a strip of 22m earmarked for locating a

Public Transportation Corridor (PTC) within the ROW (in-between the two strips of 25m for the main carriageway), and, (c) a strip of 50 m, earmarked for future development on the inner side of the alignment.

The ROW available for the Concessionaire for the development of the Project Highway shall be limited to the 50m road land width (in two strips of 25m each) allocated for Highways mode of transport. The right of utilization and development of the remaining ROW, at any point during the Concession Period, shall vest with the Authority. The Concessionaire shall have no objection during any time of the concession period for access to Government or its nominated agencies on development in the 22m and 50m strip of land.

The Site of the Project Highway comprises the land described below:

S. No.	Village	Chainage
1	Thiruninravur	0+000 to 0+900
2	Pallavedu	0+900 to 2+200 & 2+800 to 3+600
3	Mukthapudupettai	2+200 to 2+800
4	Mittanamallee	3+600 to 4+950
5	Pulikuttai	4+950 to 5+050
6	Vellacheri	4+950 to 5+000
7	Tenambakkam	5+000 to 5+800
8	Morai	5+800 to 8+700
9	Vellanur	8+700 to 13+100
10	Pammadukulam	13+100 to 15+200
11	Attanthangal	15+200 to 17+800
12	Vijayanallur	17+800 to 18+500
13	Padiyanallur	18+350 to 18+700
14	Nallur	18+500 to 18+600
15	Pannivakkam	18+700 to 20+100

S. No.	Village	Chainage
16	Siruniam	20+100 to 20+150
17	Sothupakkam	20+100 to 20+400
18	Angadu	20+400 to 20+850
19	Kummanur	20+850 to 21+950
20	Kandigai	23+100 to 23+300
21	Marambedu	21+950 to 23+100
22	Arumandai	23+300 to 24+600
23	Pudupakkam	24+600 to 25+400
24	Periyamullaivoyal	25+400 to 26+900
25	Chinnamullaivoyal	26+900 to 27+200
26	Valuthigaimedu	27+200 to 27+650
27	Seemapuram	27+650 to 28+900
28	Minjur	28+900 to 30+500

1.7. Road Crossings/Junctions

There are in total 49 road crossings / junctions along the Project Highway, which includes 11 major intersections of primary importance with NH and SH and 38 minor intersections of secondary importance with MDR, ODR or Village roads.

1.8. Details of proposed structures and facilities

(a)	No. of Major Bridges	-	1
(b)	No. of Railway Over Bridges/ Road under Bridge	-	Nil
(c)	No. of Grade Separators	-	2
(d)	No. of Minor Bridges	-	2
(e)	No. of Vehicular Underpasses	-	13

(f)	No. of Pedestrian Underpasses	-	11
(g)	No. of Culverts	-	98

The total number of bus bays and truck lay byes on the Project Highway is noted below:

(a)	No. of Bus bays on LHS	-	25
(b)	No. of Bus bays on RHS	-	25
(c)	No. of Truck lay-byes on LHS	-	1
(d)	No. of Truck lay-byes on RHS	-	1

1.9. Shifting of Utilities

Existing utilities within the ROW acquired for the Project Highway will require relocation. The utilities impacted include optical fibre cable (OFC), electrical poles, telephone poles, high-tension cable towers, water mains etc.

1.10. Drainage

There are no existing drainage facilities within the proposed ROW. The designs for the Project Highway shall include adequate provisions for overall drainage (cross drainage and longitudinal and/or roadside) as per standards.

SCHEDULE - B

(See Clause xx)

DEVELOPMENT OF THE PROJECT HIGHWAY

1 Development of the Project Highway

Development of the Project Highway shall include construction of the Project Highway as described in this Schedule-B and in Schedule-C.

2 Six Lane

2.1 Six Lane shall include construction of the Six Lane with service roads on either side described in Annex-I of this Schedule B and Annex-I of Schedule C.

2.2 Six Lane shall be undertaken and completed by the Concessionaire in conformity with the Specification and Standards set forth in Schedule-D.

Annex – I (Schedule-B)

Description of Six Lane-Project Highway

1 Width of Carriageway

- 1.1 The paved carriageway shall be 36 meters wide, as proposed in the typical cross-section (figure B-1), which includes (i) dual three lane carriageway, each 10.5m wide, (ii) 2.0m wide paved shoulders (1.0m wide on either side of the main carriageway), on each direction, and, (iii) 5.5m wide service roads, on either side of the divided highway.
- 1.2 Except as otherwise provided in this Agreement, the width of the paved carriageway shall conform to clause 1.1 above.

2 Project facilities

Project Facilities shall be constructed in conformity with Annex- I of Schedule C.

3. Specifications and Standards

Project Highway shall be constructed in conformity with the Specifications and Standards specified in Schedule D.

4. Features of Six Lane- Project Highway

4.1 General

The description of the requirements for the various elements of the Project Highway given herein under is the bare minimum requirements of the Project. The locations for the proposed elements of the Project Highway shall be finalized in consultation and approval from IE and Authority. The scope of work shall be as per Stipulations of this Schedule B and Schedule C and constructed in accordance with the Specifications and Standards mentioned in Schedule D, and includes,

- Construction of a new Six-Lane divided carriageway with service roads (approx. length of 30.500 km);
- Construction of 5.5 m wide service roads, one on each direction, with 2.0m wide planter strips between the service roads and the main carriageway;
- Construction of footpaths, with covered drain and utility duct for the full length of the Project Highway, one each along the edge of the service road in both directions;

- Development of 49 intersections;
- Construction of 1 major bridge, 2 minor bridges, 5 slab culverts and 73 box culverts. Provision for an additional 20 culverts are included in the Scope of works for which locations shall be finalised by concessionaire in discussion with IE and Authority ;
- Construction of 13 VUPs and 11 PUPs. Provision for additional 3 PUPs shall be included in the scope for which location shall be finalised by concessionaire in discussion with IE and Authority.
- Construction of 50 bus bays with passenger shelters, 25 on either side of the Project Highway;
- Construction of traffic safety measures;
- Construction of wayside amenities, truck lay-bys and other road side facilities; and,
- Provision of additional facilities like illumination, landscaping and tree planting, roadside furniture and a system for efficient traffic management.

Notwithstanding the details 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 components relevant for development of the Project Highway to fulfil the scope of the Project as envisaged in this Agreement.

All General Arrangement Drawings (GAD) shall be reviewed and approved by the Independent Engineer (IE). The concessionaire shall maintain the different elements of the Project Highway and facilities thereon as per the maintenance requirements described in Schedule K.

4.2 CORE CONSTRUCTION REQUIREMENT

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:

- Enable Authority to provide safe highway in respect of its condition (structural safety) and use (road safety);
- Enable Authority to fulfil its statutory and common law obligations;

- 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;
- Minimize the occurrence and adverse effects of accidents and ensure that all accidents and emergencies are responded to as quickly as possible;
- Minimize the risk of damage, destruction or disturbance to third party property;
- Ensure that members of the public are treated with all due courtesy and consideration;
- Provide a safe, clear and informative system of road signs;
- Comply with any specified program requirements, including for the completion of the new road;
- 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;
- Achieve a high standard in the appearance and aesthetic quality of the Project Highway and achieve integration of Project Highway with the character of surrounding landscape through both sensitive design and sensitive management of all visible elements;
- Undertake proper safety audit through an appropriate expert of the IE team.
- Carry out accident recording and reporting (to IE and Authority) by type on regular basis; and
- Ensure adequate safety of the Project Workers on the work Site.

4.3 CROSS SECTIONS

The Project Highway shall be a 6-lane divided carriageway with paved shoulders and 5.5 m wide service road separated by planter strip on both sides as per cross section type given in **Table B-1**. The typical cross section of 6-lane with paved shoulder with 22.0m of land reserved in between for accommodating a Public Transportation Corridor (PTC) as indicated in **Figure B-1** applicable for the Project Highway. The typical cross section shall be followed along with the design standards, indicated in Schedule D for development of the Project Highway.

The alternative cross section of the Project Highway at cross drainage structures shall follow the typical cross sections in consultation with IE and Authority at the time of detailed design prior to construction. Along the Project Highway, provisions for the utility services, including optical fibre cables, shall be provided in the utility duct earmarked for this purpose. The location of the utility duct shall be finalized by the Concessionaire, in consultation with the concerned Authority and the approval of IE and Authority.

For cross connections, the utility services shall be carried through the nearest cross drainage structure/cattle crossing below its deck slab and above HFL. Location and

design of the cross utility ducts, if required, shall be finalized at the detailed design stage in consultation with the IE and Authority. Minor alterations/ modifications can be carried out to the alignment plan within the overall suggested cross-section, along with proper justification, in consultation and approval from IE and Authority.

Figure B-1

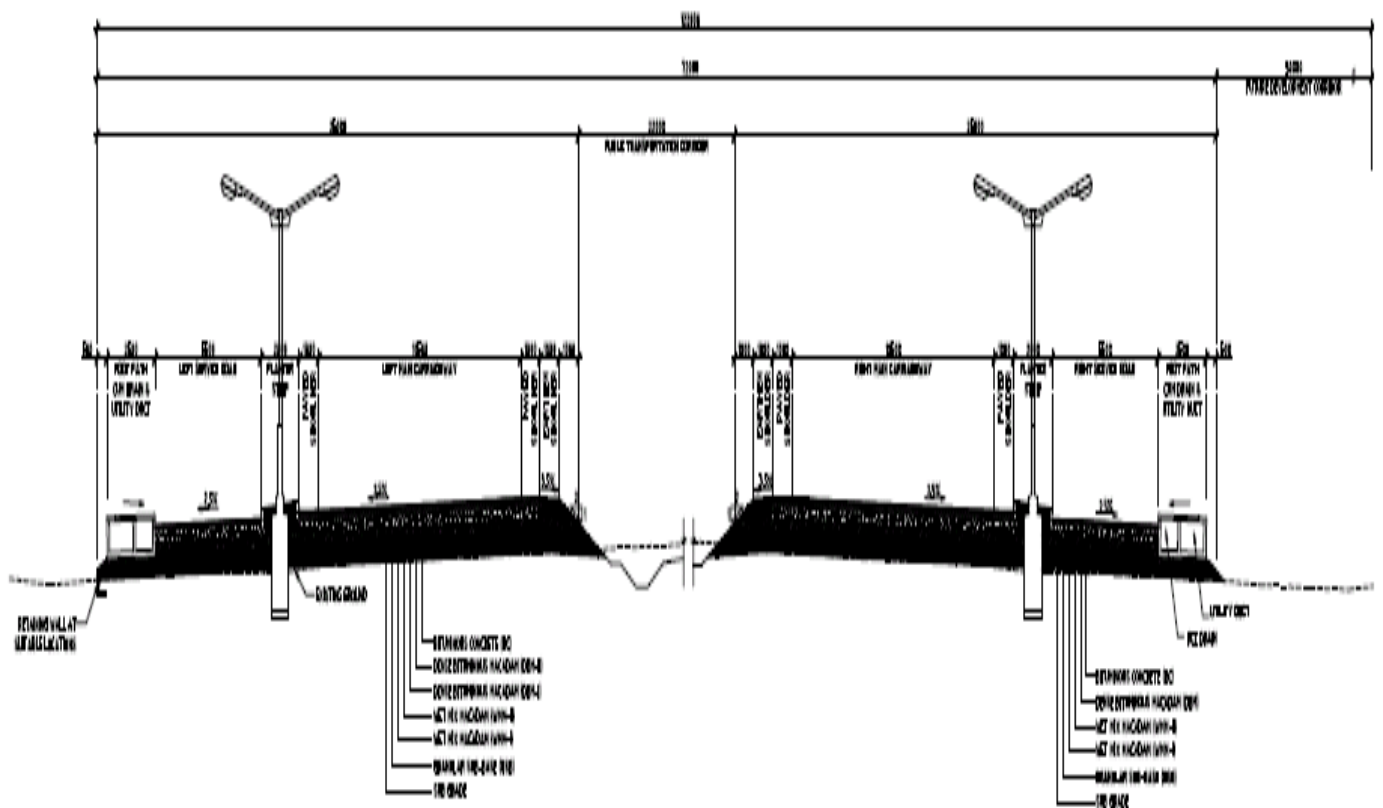


Table B-1: Type of Road Cross Sections

Segment	Location		Cross Section
	From	To	
I	NH-205	NH-5	Figure B-1
II	NH-5	TPP Road	Figure B-1

4.4. ALIGNMENT PLAN

The alignment plan and vertical profile of the Project Highway shall be prepared and finalized by the Concessionaire in consultation with and approval from IE and Authority. The Finished Road Top Level (FRL) shall conform to the design standards stipulated through Schedule D of this **Concession** Agreement.

4.5 SERVICE ROADS

Service roads (5.5m wide), one each on the LHS and RHS of the divided six lane carriageway, for the entire length of the Project Highway shall be designed and constructed. Planter strips of 2.0m width will separate the main carriageway and service roads.

4.6. PAVEMENT

4.6.1 General

The pavement design including pavement characteristics requirements of the Project Highway and that of the service roads in Urban Sections shall be done in accordance with Schedule D. Pavement shall be flexible for main carriageway, paved shoulders, service roads, pick up bus stops, Truck lay-byes, wayside amenities complex and for cross roads up to ROW limits. To ensure internal drainage of the pavement structure, the lower drainage layer or filter layer of the road sub base shall extend up to full formation width.

Roughness value of the flexible pavement on completion shall not be more than 1800 mm per km (for both Main Carriage Way and Service Roads) measured jointly (by The Concessionaire, The IE and Authority) with Bump Integrator fitted in a vehicle or an equivalent device approved by the IE and Authority. The instrument used in the measurement of roughness shall be duly calibrated.

4.6.2 Pavement composition

The pavement composition for the main carriageway shall be designed as per IRC: 37-2001. The concessionaire shall design the pavement for design life of 20 years with minimum of 100msa (Million Standard Axles) and should be designed for a minimum CBR of 6% (Soaked CBR). The pavement composition shall be reviewed and approved by IE and Authority prior to the execution.

4.6.3 Paved Shoulder composition

The paved shoulders shall be designed as an integral part of the pavement for the main carriageway. The pavement thickness of the paved shoulders shall be the same as in the main carriageway.

4.6.4 Pavement Composition for Service Road

The pavement composition for service roads shall be designed as per IRC: 37-2001. The concessionaire shall design the pavement for design life of 20 years and design MSA shall be 10 MSA (Million Standard Axles) and should be designed for a minimum CBR of 6% (Soaked CBR)

4.7 Intersections/ Junctions (AT GRADE)

All major and minor intersections shall be designed and developed in accordance with standards mentioned in Schedule-D. The tentative locations of intersections are listed in Table B-2 and Figure B-4.

Table B-2 At Grade Intersections

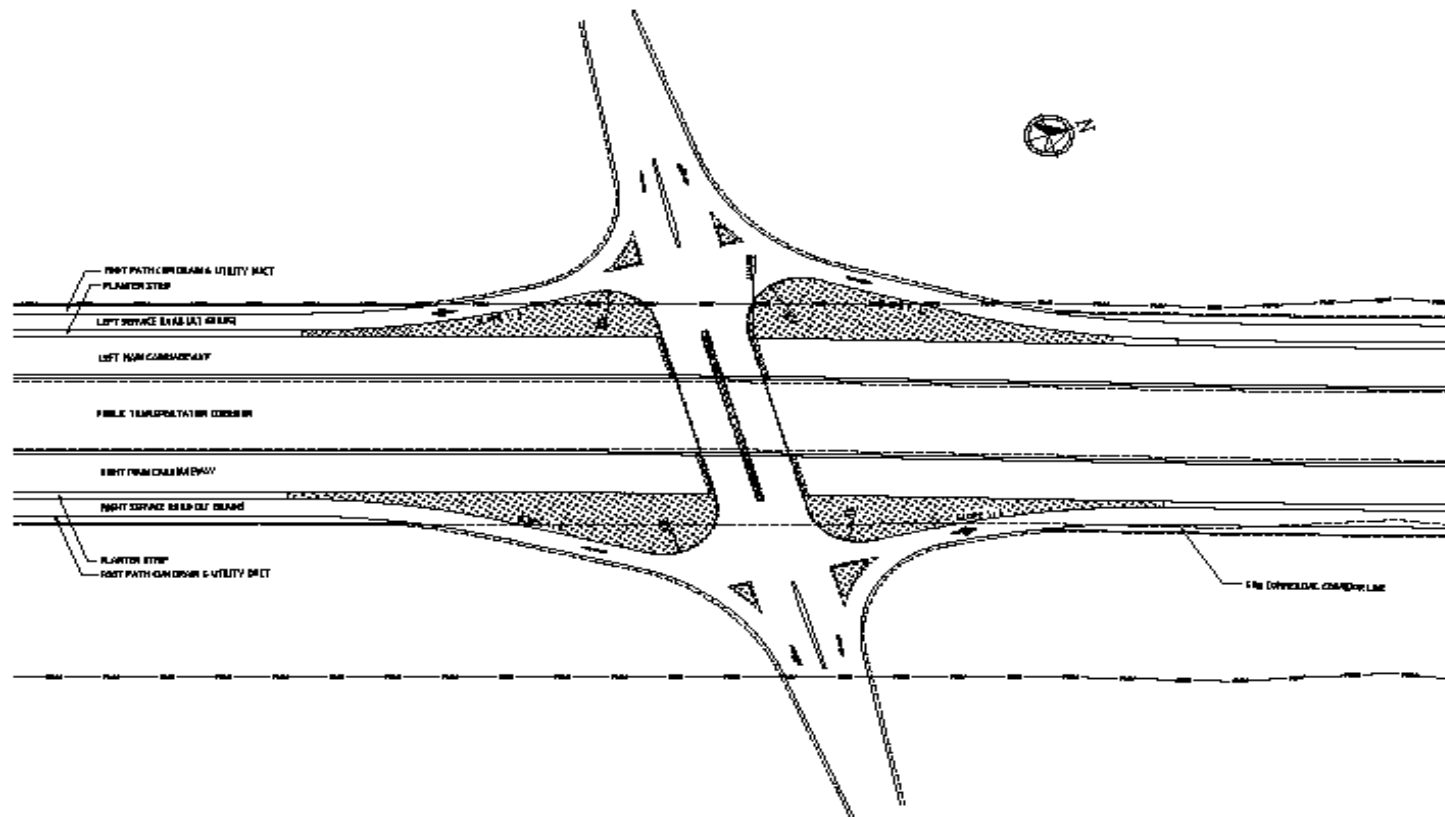
S. No.	Chainage	Cross Road Description			
		Width (m)	Type	Type of Junction	Road Connectivity
1	0+040	3	BT road/gravel road	(+)	Village road
2	0+080	3.5	BT road	(+)	Village road
3	0+140	3	Mud road	T Junction	Village road
4	0+180	3	Mud road	(+)	Village road
5	0+225	4	Mud road	(+)	Village road

S. No.	Chainage	Cross Road Description			
		Width (m)	Type	Type of Junction	Road Connectivity
6	0+265	3	BT road	(+)	Village road
7	0+300	2	Foot path	(+)	Village road
8	0+350	4.5	Mud road	(+)	Village road
9	0+475	3	Mud road	(+)	Village road
10	0+530	3	BT road	(+)	Village road
11	0+560	3	BT road	(+)	Village road
12	0+580	2	Foot path	(+)	Village road
13	0+650	4	Mud road	(+)	Village road
14	0+780	4	Mud road	(+)	Village road
15	0+900	1.5	Foot path	(+)	Village road
16	2+000	4	BT road	(+)	Pallavedu- Avadi
17	2+000	3	Cement Road	(+)	Village road
18	2+875	6.5	BT road	(+)	Mittanamallee- Pallavedu
19	4+970	3	Mud road (inspection road)	(+)	Village-Morai
20	5+100	3	Mud road	(+)	Village road
21	5+950	3.6	BT road	(+)	Keezhikondakarai- Morai
22	6+700	3.75	BT road	(+)	Keezhikondakarai- Avadi
23	7+020	7	BT road	(+)	Veerapuram- Avadi
24	7+600	4	BT road	(+)	Veerapuram (Police

S. No.	Chainage	Cross Road Description			
		Width (m)	Type	Type of Junction	Road Connectivity
					Camp)- Avadi
25	8+500	4.0	Mud road	(+)	Veerapuram (Police camp)- Educational Institutions
26	8+600	4.0	Mud road	(+)	Educational Institutions
27	9+065	6.7	BT road	(+)	Vel's group of institution- Avadi
28	10+600	3	Mud road	(+)	SIDCO-Village
29	10+675	3	Mud road	(+)	SIDCO- Village
30	12+200	3.5	Mud road	(+)	SIDCO- Village
31	12+775	7	BT road	(+)	Redhills- Avadi
32	14+075	3.75	BT road	(+)	Avadi- Lakshmipuram
33	15+620	7	BT road	(+)	Avadi-Redhills
34	16+160	Four lane divided carriageway (7m Carriageway+ 1.2m Median)	BT road (SH-114)	(+)	Thiruvallur-Redhills
35	16+250	3.5	BT road	(+)	Attanthangal- Village
36	16+820 & 16+900	3.5	BT road	(+)	Attanthangal- Village
37	17+620	3.6	BT road	(+)	Village road
38	18+420	Four lane	BT road (NH-	(+)	Tada-Chennai

S. No.	Chainage	Cross Road Description			
		Width (m)	Type	Type of Junction	Road Connectivity
		divided carriageway (dual 7.5 carriageway with 1.5 Paved shoulder and 4.5m median)	5)		
39	20+200	3.7	Gravel road	(+)	Pannivakkam-Agricultural field
40	21+250	6	BT road	(+)	Pudur-Kummanur
41	22+650	3	BT road	(+)	Kandigai-Agricultural field
42	22+900	3.25	BT road	(+)	Agricultural field-Village
43	23+150	7	BT road	(+)	Pudur-Arumandai
44	23+700	3.0	BT Road	(+)	Kandigai-Agricultural field
45	24+120	4	WMM road	(+)	Arumandai-Madhavaram
46	25+800	3	Gravel road	(+)	Village road
47	26+000	5.6	BT road	(+)	Seemapuram-Periyamullaivoyal
48	28+750	3.75	BT road	(+)	Village-Seemapuram
49	30+500	6.65	BT road (TPP road)	(+)	Cholavaram-Ennore

Figure B-4: Major intersection



4.8 STRUCTURES

4.8.1 Major and Minor Bridges

The major and minor bridges shall be designed in accordance with the Design Standards and Specifications set in Schedule ‘D’. Construction of 1 major bridge and 2 minor bridges in Project Highway, listed in Table B-3 and B-4 are the minimum requirement. The designs, drawings, and locations shall be approved by IE and Authority. The adequacy of the vent size for all bridges shall be ascertained through detailed hydrological surveys and finalized in consultation with the IE and Authority. The Highest Flood Level / Maximum Supply Level shall be properly assessed after collecting flood histories from local authorities/ interviews with local residents / Irrigation authorities etc.

Canal bridges shall be designed as per hydraulic requirements of irrigation department or concerned authorities. The construction plans shall be prepared as per closure schedule of canals. Approval of GAD from irrigation department or concerned authorities, as required shall be obtained by the Concessionaire.

The cross drainage plan of the Project Highway shall be finalized in consultation with IE and Authority and additional culverts provided, if required.

Table B-3 List of Major Bridge Locations

S. No.	Chainage	Type of Structure	Length (m)	Remarks
1	28+850	Major Bridge	10 x 25m	Kosathalayar River

Table B-4 List of Minor Bridge’s Locations

S. No.	Chainage	Type of Structure	Span (m)	Remarks
1	4+950	Minor Bridge	1 x 20	Krishna Canal
2	17+600	Minor Bridge	1 x 30	Kandaleru Canal

4.8.2 Cross Drainage Structures

The Concessionaire shall design the cross drainage structures in accordance with the Standards and Specifications set in Schedule-D. Construction of 5 slab culverts and 73 box

culverts is the minimum requirement. In addition, a provision of 20 box culverts shall be included in the Scope of Works, to be decided as per the site conditions during the Project Development period. Culverts of LHS and RHS shall be connected with lined channel across PTC with suitable slope to ensure smooth flow of water from upstream to downstream. The tentative locations of these structures are given in Table B-5, and the locations of these and the additional culverts shall be finalized in consultation with the IE and Authority.

Table B-5 List of Culvert's Locations

S. No.	Chainage	Type of Structure	Span/Size of Culvert	Proposed Culverts
1.	0+225	Box Culvert	2 x 1.5m	Balancing culvert
2.	0+900	Box Culvert	2 x 1.5m	Balancing culvert
3.	1+400	Box Culvert	2 x 1.5m	Balancing culvert for Pallavedu lake
4.	1+760	Box Culvert	2 x 1m	Water stream from Pallavedu lake
5.	1+950	Box Culvert	2 x 1m	Local drain near the Existing road
6.	2+165	Box Culvert	3 x 2m	Pond in Pallavedu
7.	2+550	Box Culvert	2 x 1.5m	Balancing culvert
8.	2+820	Box Culvert	2 x 1m	Local drain near the existing road
9.	3+230	Box Culvert	2 x 1.5m	Balancing culvert
10.	3+830	Box Culvert	2 x 1.5m	Balancing culvert
11.	4+275	Box Culvert	2 x 1.5m	Balancing culvert
12.	4+675	Box Culvert	2 x 1.5m	Balancing culvert
13.	5+300	Box Culvert	2 x 1.5m	Balancing culvert
14.	5+800	Box Culvert	2 x 1.5m	Balancing culvert
15.	6+300	Box Culvert	2 x 1.5m	Balancing culvert
16.	6+700	Box Culvert	2 x 1m	Local drain near existing road.

S. No.	Chainage	Type of Structure	Span/Size of Culvert	Proposed Culverts
17.	7+380	Box Culvert	2 x 1.5m	Balancing culvert for the pond near existing road.
18.	7+590	Box Culvert	2 x 1m	Local drain along the existing road
19.	7+610	Box Culvert	2 x 1m	Local drain along the existing road
20.	8+200	Box Culvert	2 x 1.5m	Balancing culvert
21.	8+750	Box Culvert	2 x 1.5m	Balancing culvert
22.	9+040	Box Culvert	2 x 1m	Local drain near existing road.
23.	9+060	Box Culvert	2 x 1m	Local drain near existing road.
24.	9+290	Box Culvert	2 x 1.5m	Balancing culvert
25.	9+700	Box Culvert	2 x 1.5m	Balancing culvert
26.	10+120	Box Culvert	3.5 x 1m	Water Stream near SIDCO
27.	10+560	Box Culvert	2 x 1.5m	Balancing culvert
28.	11+140	Box Culvert	2 x 1.5m	Balancing culvert
29.	11+460	Box Culvert	2 x 1.5m	Balancing culvert
30.	11+700	Box Culvert	2 x 1m	Water Stream near Polytechnic College
31.	12+040	Box Culvert	2 x 1.5m	Balancing culvert
32.	12+540	Box Culvert	2 x 1.5m	Balancing culvert
33.	12+945	Box Culvert	2 x 1.5m	Balancing culvert
34.	13+310	Box Culvert	3.5 x 1.0m	Proposed for local irrigation channel
35.	13+700	Box Culvert	2 x 1.5m	Balancing culvert
36.	14+400	Box Culvert	2 x 1.5m	Balancing culvert

S. No.	Chainage	Type of Structure	Span/Size of Culvert	Proposed Culverts
37.	14+940	Box Culvert	2 x 1.5m	Balancing culvert
38.	15+300	Box Culvert	2 x 1.5m	Balancing culvert
39.	15+650	Box Culvert	2 x 1m	Local drain near existing road.
40.	16+100	Box Culvert	2 x 1m	Local drain near existing road.
41.	16+390	Box Culvert	2 x 1.5m	Balancing culvert
42.	16+675	Box Culvert	2 x 1.5m	Balancing culvert
43.	16+875	Box Culvert	2 x 1.5m	Balancing culvert.
44.	17+300	Slab culvert	2 x 1m	Water Stream near Kandaleru canal
45.	17+900	Box Culvert	3.5 x 1.5m	Balancing culvert
46.	18+150	Box Culvert	3.5 x 1.5m	Balancing culvert
47.	18+400	Box Culvert	2 x 1m	Local drain near NH-5
48.	18+670	Slab Culvert	2 x 1.5m	Balancing culvert for Pannivakkam lake. Maximum depth will be 5 to 6 feet.
49.	18+770	Slab Culvert	2 x 1.5m	Balancing culvert for Pannivakkam lake. Maximum depth will be 5 to 6 feet.
50.	18+870	Slab Culvert	2 x 1.5m	Balancing culvert for Pannivakkam lake. Maximum depth will be 5 to 6 feet.
51.	18+970	Slab Culvert	2 x 1.5m	Balancing culvert for Pannivakkam lake. Maximum depth will be 5 to 6 feet.
52.	19+300	Box Culvert	2 x 1.5m	Balancing culvert

S. No.	Chainage	Type of Structure	Span/Size of Culvert	Proposed Culverts
53.	19+690	Box Culvert	2 x 1.5m	Balancing culvert
54.	20+250	Box Culvert	2 x 1m	Local drain along the existing road.
55.	20+750	Box Culvert	3.5 x 1.5m	Balancing Culvert
56.	21+150	Box Culvert	2 x 1.5m	Pond near existing road
57.	21+600	Box Culvert	2 x 1.5m	Balancing Culvert
58.	22+150	Box Culvert	2 x 1.5m	Balancing culvert
59.	22+550	Box Culvert	2 x 1.5m	Balancing culvert for Marambedu lake
60.	23+050	Box Culvert	2 x 1.5m	Balancing culvert
61.	23+200	Box Culvert	2 x 1.5m	Balancing Culvert
62.	23+550	Box Culvert	2 x 1m	Pond in Kandigai
63.	24+100	Box Culvert	2 x 1.5m	Balancing culvert
64.	24+500	Box Culvert	2 x 1.5m	Balancing culvert
65.	24+950	Box Culvert	2 x 1.5m	Balancing culvert
66.	25+200	Box Culvert	2 x 1.5m	Balancing culvert for Periyamullaivoyal lake. Max water depth will be 4-5 feet along the project corridor.
67.	25+480	Box Culvert	2 x 1.5m	Balancing culvert for Periyamullaivoyal lake. Max water depth will be 4-5 feet along the project corridor.
68.	25+900	Box Culvert	2 x 1.5m	Balancing culvert
69.	26+400	Box Culvert	2 x 1.5m	Balancing culvert

S. No.	Chainage	Type of Structure	Span/Size of Culvert	Proposed Culverts
70.	26+900	Box Culvert	2 x 1.5m	Balancing culvert
71.	27+350	Box Culvert	2 x 1.5m	Balancing culvert
72.	27+800	Box Culvert	2 x 3 x 1.5m	Balancing culvert
73.	28+300	Box Culvert	2 x 1.5m	Balancing culvert
74.	28+580	Box Culvert	2 x 1.5m	Balancing culvert
75.	29+450	Box Culvert	2 x 3 x 1.5m	Balancing culvert
76.	29+950	Box Culvert	2 x 1.5m	Balancing culvert
77.	30+300	Box Culvert	2 x 1.5m	Balancing culvert
78.	30+500	Box Culvert	2 x 3 x 1.5	Local drain near TPP road.

Additional 20 No of Culverts shall be added for which location will be finalised during execution

4.8.3 Grade Separators

There are two Grade separators to be provided by the Concessionaire along the Project Highway. Details and tentative locations of grade separators are furnished in Table B-6(A) and B-6 (B) and typical layout is presented in Figure B6. The backfill in the approaches will be protected by providing reinforced earth/ RCC retaining walls.

Table B-6 (A)

List of Interchange / Flyover Locations

S. No.	Chainage	Type of Structure	Minimum Vertical Clearance (m)	Type of Major intersection	Span Arrangement
1	18+420	Full cloverleaf Interchange	5.5	NH-5 (Chennai-Kolkotta Highway)	4 x 20 + 2 x 30 + 4 x 20 with 17 m wide deck for obligatory and adjoining spans on the clover leaf portions. Clover leaf and balance ramps shall be with RE wall with necessary openings by providing VUP /PUP.

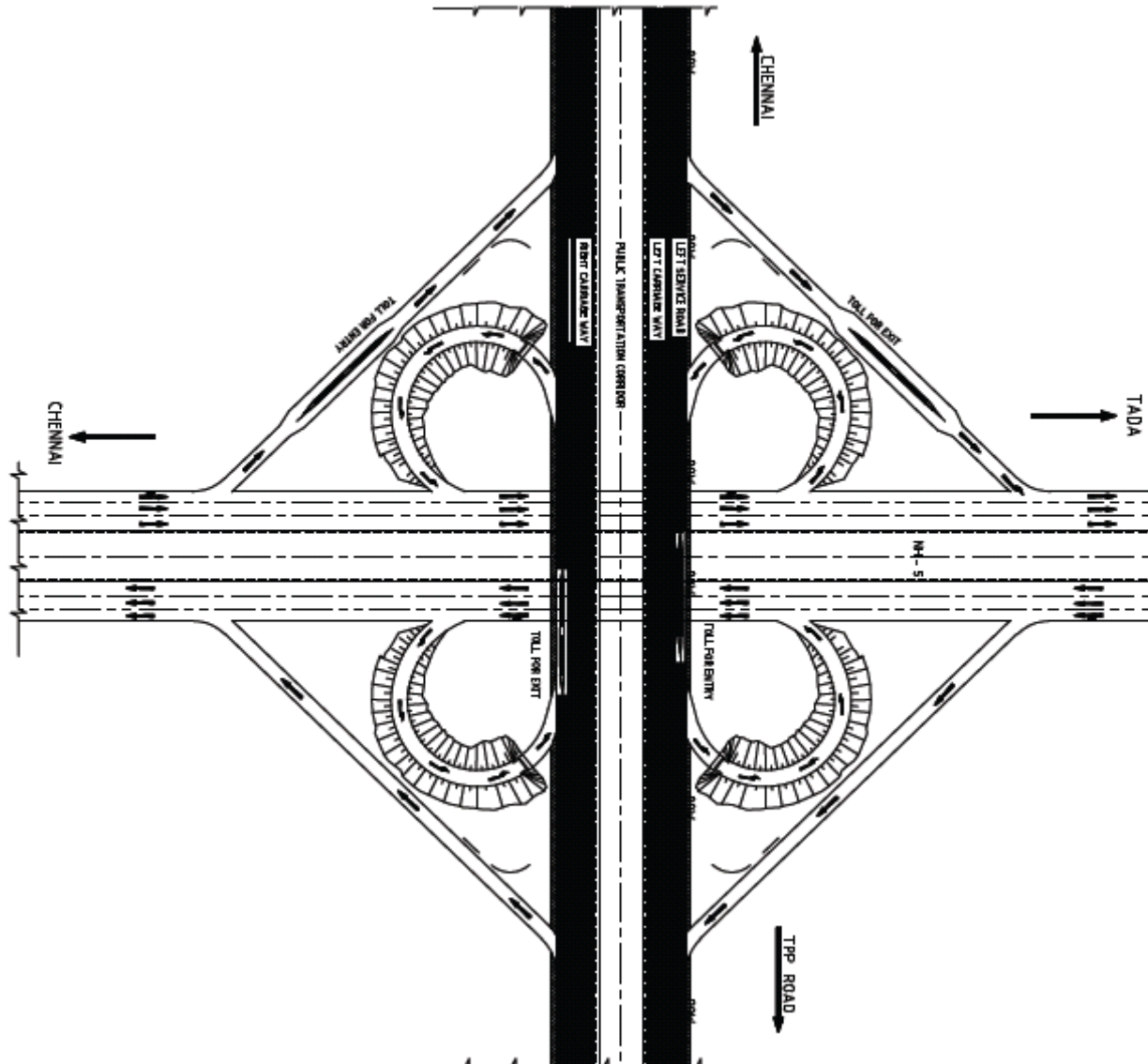
Table B-6 (B)

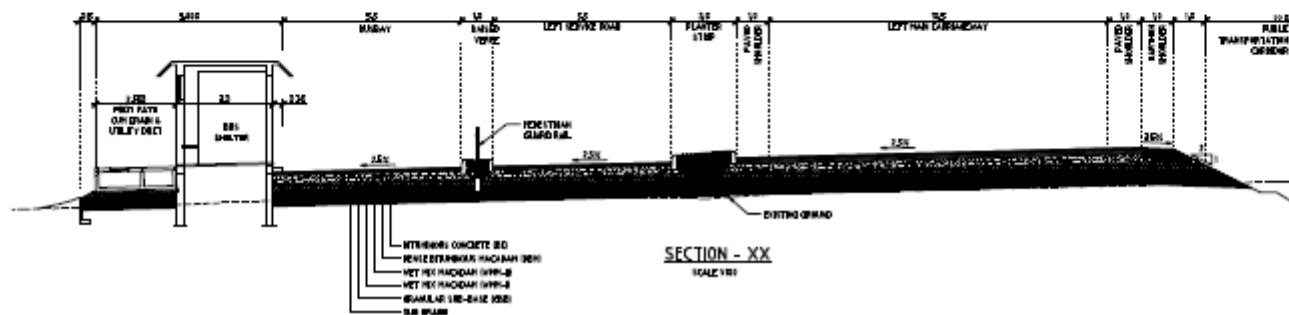
S. No.	Chainage	Type of Structure	Span Arrangement (m)	Road Connectivity	Minimum Vertical Clearance (m)	Width (m)
1	16+160	Flyover	2 x 20 + 1 x 30	Thiruvallur-Redhills (SH-114)	5.5	13.5

Note:

The dimensions furnished are the minimum requirements and the concessionaire has to prepare the detailed designs in consultation with the NHAI, TNHD and other relevant agencies, obtain approvals and any increase in the requirement will be at the risk and cost of the concessionaire.

Figure B-6: Typical Layout of Clover leaf





4.9 Underpasses

4.9.1. Vehicular underpasses

The Concessionaire shall provide underpasses as given in Table B-7. The dimensions furnished here are for one carriageway the same has to be followed for the other carriageway also to accommodate six lane wide road with service road configurations. Any related ancillary works in this regard, which are required to be executed to ensure proper connectivity and elevations envisaged for the Project Highway shall be covered in the Scope of work under this Concession Agreement

Table B-7 List of VUP's Locations

S. No.	Chainage	Size (m)	Clear Height	Total Width (m)	Road Connectivity
1	2+875	1 x 12	5.5	13.5	Pallavedu-Mittanamallee
2	6+800	1 x 12	5.5	13.5	Morai Junction – Km : 0/4 ODR
3	7+020	1 x 12	5.5	13.5	Avadi – Vanichatram – Km:7/2 MDR
4	7+600	1 x 12	5.5	13.5	Veerapuram Branching from SAP Camp Road – Union Road
5	9+065	1 x 12	5.5	13.5	Vel's group of Institution- Avadi Morai – Alamathi Road (1.3Km from AVC Road)
6	12+775	1 x 12	5.5	13.5	Vellanur – Redhills Road – Km:6/2 ODR
7	14+000	1 x 12	5.5	13.5	Ellayammanpettai – Lakshmipuram Avadi Road – Km : 0/6 to 8
8	15.620	1 x 12	5.5	13.5	Redhills-Avadi (Pammadakulam – Konimedu) Km:9/0 ODR
9	21+250	1 x 12	5.5	13.5	Pudur-Kummanur – Km:1/10 ODR
10	23+175	1 x 12	5.5	13.5	Pudur-Arumandai-Orakkadu – Arumandai – Km:3/2 ODR

S. No.	Chainage	Size (m)	Clear Height	Total Width (m)	Road Connectivity
11	24+000	1 x 12	5.5	13.5	Pudur-Arumandai
12	26+000	1 x 12	5.5	13.5	Semmapuram- Periyamullaivoyal – Kodungaiyur – Valuthigaimedu – Km:5/10 ODR
13	28+700	2 x 12	5.5	13.5	Seemavaram-Karanodai - Minjur – Km:12/8 ODR

4.9.2 Pedestrian Underpasses

The Concessionaire shall provide pedestrian underpasses as given in Table B-8.

Table B-8 List of PUP's Locations

S. No.	Chainage	Span (m)	Road Connectivity
1	0+560	6 x 4	Thirunandriyur village
2	2+000	6 x 4	Pallavedu-Avadi
3	5+100	6 x 4	Approach to Village Morai
4	5+950	6 x 4	Keezhikondakarai-Morai
5	8+800	6 x 4	Veerapuram, Vel's hostel- Vel's Engg. College, Avadi
6	10+675	6 x 4	SIDCO-surrounding settlement
7	12+200	6 x 4	SIDCO-Surrounding village
8	17+400	6 x 4	Surrounding village of Attanthangal
9	20+200	6 x 4	Pannivakkam-Agricultural field.

S. No.	Chainage	Span (m)	Road Connectivity
10	22+600	6 x 4	Marambedu-Agricultural Field
11	30+100	6 x 4	Kakanji Nagar, Minjur – Panchayat Road

Note:

Provision of three (3) additional pedestrian underpasses shall be included in the scope of works. The exact locations of all these pedestrian underpasses shall be decided as per the site conditions during the project development period/Execution with due consultation with the IE and Authority

4.10 Drainage Measures

The drains along the Project Highway shall be designed in accordance with the design standards set in Schedule 'D'. The drainage plan shall be prepared by the concessionaire and approved from IE and Authority, and shall include, but not be limited to, the following:

- i) Efficient drainage scheme shall be prepared for the 22m wide PTC to enable drainage of water from the PTC .Unlined drains shall be provided at the centre of the PTC and,
- ii) Covered Pucca drains shall be provided at outer edges of service roads, along the Project Highway with proper connection to the outfall location. Chute drains along with kerbs and channel drains in high embankment (3m and above), and,
- iii) Covered pucca drains underneath the footpath (bus bays, truck lay byes etc.)

4.11. Slope Protection Measures

The slope protection measures along the Project Highway shall be designed in accordance with the design standards set in Schedule 'D'.

4.12. Traffic Signs and Pavement

Traffic signs and pavement markings shall include roadside signs, overhead signs, kerb mounted signs and road marking along the Project Highway. The designs for traffic signs and pavement markings for the Project Highway shall be as per the design standards indicated in Schedule-D. The location for provision of traffic signs and pavement markings shall be finalized in consultation with the IE.

4.13. Lighting

The lighting on the Project Highway shall be carried out for the entire length of the Project Highway, in accordance with the requirements for Urban Roads. The design of the lighting system on the Project Highway shall be as per the design standards set in Schedule 'D' for urban stretches.

4.14. Light Emitting Diode (LED)

LEDs shall be provided by the Concessionaire at bus bay locations as per the design standards set in Schedule 'D'.

4.15. Blinkers at Intersection

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

4.16. Delineators and Guard Posts

Delineators shall be provided at all Horizontal curves as per the design standards in Schedule D.

Guard posts shall be provided on either side of the carriageway, as per the design standards indicated in Schedule D.

4.17. Safety Barriers

Metal beam safety Barrier shall be provided on all outer periphery of curves with radius of 600 m and less. The barriers will also be provided on either side of the carriageways, at locations where the embankment height is greater than 3m, as per the design standards.

Safety barriers shall be provided on the approaches of all minor and major bridges, PUP and VUP locations on both left and right sides as per design standards set in Schedule D.

4.18. 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'.

5 Guard Rail and Traffic Safety Devices

The following shall be provided by the Concessionaire:

- i) For the safety of pedestrian at the intersection / Junction, guard rails in GI pipe shall be provided.
- ii) Metal beam / Concrete Barriers shall be provided at locations of bridge, PUP and VUP 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/Sq.m.

6. Landscaping

The finished road facility shall exhibit adequate landscaping of aesthetically pleasing view. Landscaping with shrubs shall be carried out in planter strips, as per IRC: SP-21. All the borrow areas used for the project shall be rehabilitated.

7. Right of Way (RoW) Boundaries

Right-of-Way (RoW) boundaries of the Project Highway shall be marked and demarcated by fixing RCC boundary pillars size 60 cm x 15 cm x 15 cm embedded in concrete (as per IRC) along the Project Highway at 100 m interval on both sides. At junctions and curves, the interval between boundary pillars will be reduced to 50m. 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 IE and Authority. In case of damages during maintenance period, these shall be replaced by the concessionaire at their cost. A system for the identification of chainages along the Project Highway shall be prepared in consultation with IE.

8. Pre-Construction Activities

8.1 Land Acquisition (LA)

In case of additional land requirement, for the development of project highway, the same shall be acquired by the Authority. The cost of such land acquisition shall be borne by Authority. However the Concessionaire shall be involved pro-actively in this regard submitting all relevant land acquisition proposals as per Tamil Nadu Highways Act 2001 and pursuing the matter with the concerned Government Departments.

8.2 Utility Shifting and Removal of Trees

The ‘project’ involves shifting of utilities and removal of trees within the Proposed RoW, and shall be the responsibility of the Concessionaire. The costs towards the same be borne by the concessionaire. The costs shall be based on estimates prepared by the respective Departments / Agencies as per the respective Schedule of Rates, applicable.

8.3 Encroachment Removal

Encroachments, if any, within the acquired ROW, shall be removed by the Concessionaire at his own cost. Authority will provide administrative support in removal of the encroachments.

8.4 Rehabilitation & Resettlement

For any Rehabilitation and Resettlement (R&R) issues arising out of the additional land acquisition, the Authority shall bear cost in this regard. However, Concessionaire shall proactively be involved for all related activities.

8.5. Environment

An Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the Project Highway has been prepared by the Authority. The Concessionaire shall be responsible to follow and implement the environmental mitigation measures and environmental management plan for monitoring and implementation as proposed in EIA/EMP.

The Project Highway is proposed to be an Urban Road. The requirements laid down in the MoEF notification (2006) for EIA requirements for Development Projects, does not include Urban Roads. The Project Highway is neither a National Highway nor a State Highway. Therefore, the Environmental Clearance requirements are not required for the Project Highway.

The Concessionaire, during design, construction, operation and maintenance, shall conform to the environmental rules and regulations in force.

As per Ministry of Environment and Forests Notification, New Delhi dated 14.01.1997 (and its further amendments), the construction of Rain water harvesting structure is mandatory in and around Water Crisis area, notified by the Central Ground Water Board/Tamil Nadu Water supply and Drainage Board (TWAD). Water Collected through drain should be diverted to available minor/major water bodies in consultation with IE.

8.6. Clearances to be Obtained

The Concessionaire shall obtain all necessary clearances from all the concerned authorities required for implementing the project.

SCHEDULE – C

(See Clause 2.1)

PROJECT FACILITIES

1 Project Facilities

Include:

- (a) toll plaza(s);
- (b) roadside furniture;
- (c) Wayside Amenities;
- (d) Landscaping and tree plantation;
- (e) truck lay-byes;
- (f) bus-bays and bus shelters;
- (g) pedestrian facilities;
- (h) administrative, operation and maintenance base camp;
- (i) Site office for TNRDC;
- (j) Rest areas
- (k) Traffic aid posts
- (l) Medical aid posts
- (m) Vehicle rescue posts
- (n) project laboratory; and,
- (o) Others
 - 1. Highway Patrol vehicles and systems;
 - 2. Facilities for emergency assistance, ambulance, crane, tow trucks
 - 3. Advanced Traffic Management Systems (ATMS)

Project Facilities for Six Lane

Project Facilities forming part of the Project Highway and to be completed on or before Project Completion Date have been described in Annex-I of this Schedule-C.

Annex – I

(Schedule-C)

PROJECT FACILITIES

1. General

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

2. Proposed Facilities

2.1 Toll Plaza

Toll plazas are envisaged as per Schedule –D , even though the Project Highway is proposed to be developed on DBFOT Annuity basis. The location of Toll Plazas are as mentioned below:

<u>Sl No.</u>	<u>Tolling Sections</u>	<u>Tolling Section's Length in Km</u>	<u>Location</u>
<u>1</u>	<u>Pattabiram - Padiyanallur</u>	<u>18.5</u>	<u>Ch. 18+400 (Check Toll plaza at NH-5 Interchange) 2+2 lanes</u>
<u>2</u>	<u>Padiyanallur - Minjur</u>	<u>12</u>	<u>Ch. 27+500 near Seemapuram village (8+2+2 lanes)</u>

Note: The Location of Toll Plazas mentioned above are tentative only. The same will be finalised as per the site requirements and as approved by IE/Authority.

2.2 Way Side Amenities

Way side amenities shall be provided at two locations by the Concessionaire in consultation with the IE and Authority. These shall have provisions for toilets, drinking water facilities, cafeteria and truck parking area, emergency health care facilities for accident victims. The location and layout plan of way side amenities shall be finalized in consultation with IE and Authority.

2.3 Truck Lay-byes

The Concessionaire shall provide two Truck Lay-byes, with minimum provision for 50 trucks each, one on either side along the Project Highway. Lay-by shall be designed in the form of rectangle/trapezoidal area parallel and separated from the carriageway of the service road by a physical barrier. The parking lots shall be suitably landscaped. Basic facilities such as drinking water and toilets, with proper disposal system shall be provided at the lay-by location. The location and layout plan of truck lay-by shall be finalized in consultation with IE and Authority.

2.4 Bus Bays

The Concessionaire shall provide a minimum of 50 bus bays along with bus stops (25 along each direction), along the Project Highway according to standards and specifications set forth in Schedule-D. The locations of these bus bays and the designs shall be finalized by the Concessionaire in consultation with the IE and the Authority.

2.5 Pedestrian Facilities - pedestrian markings

The Concessionaire shall provide minimum of 17 pedestrian underpasses as specified in Schedule -B conforming to Standards set forth in Schedule D.

2.6 Lighting

Lighting shall be provided by the Concessionaire along the entire length of the Project Highway, as specified in Schedule D.

2.7 Arboriculture & Landscaping

Landscaping in planter strips and PTC corridor through provision of trees and shrubs shall be provided, where shrubs shall not normally exceed 1-1.5 m heights and shall be as per IRC: SP-21.

2.8 Administrative, Operation and Maintenance Base Camp

A minimum of 500 sq m (approx.) of covered area for functional base camp shall be provided by the Concessionaire. The proposed facilities available at base camp are described hereunder.

- a) The main administrative, operation and maintenance base camp shall be provided to cater to the requirements of the following services:
 - Security Office;
 - Project Highway Maintenance including functional laboratory;
 - Facilities for storage and repair of maintenance equipments, vehicles and materials; and,

- Any other requirement.
- b) The base camp shall be housed in suitable area. The layout of the different buildings and facilities shall be finalized in consultation with the IE.
- c) The Administrative building shall primarily house the Main Control Centre, the Security Headquarters, the Central Store, in addition to other secondary facilities such as computer room, office space, stores, sanitary facilities, canteen etc. The main base camp shall have adequate parking space for staff and visitors.
- d) The maintenance area shall have a centrally located building to overlook the maintenance workshop etc. A separate storage area shall be earmarked for inflammable materials. The maintenance block shall have enough spaces to park the equipments and machinery deployed for maintenance activities. Adequate parking space shall be earmarked for the staff vehicles and visitors' vehicles. In addition, there shall be adequate and well-illuminated covered parking space for all the maintenance vehicles.
- e) In addition the base camps shall have a power sub-station and supplies room to cater to the power requirements of the camp. The sub-station shall house a standby generator to provide the required power in case of failure of normal power.
- f) The camps shall have adequate lighting during dark periods and night.
- g) There shall be a fuel storage area (preferably underground) with delivery facilities (Petrol / Diesel Filling Station) at the Main Base Camp site to adequately cater to the demands of maintenance and patrolling activities.
- h) The base camps shall not have more than one entry and one exit point.
Both of these shall be manned by security personnel at all times besides installing effective electronic security system.
- i) The camps shall be landscaped so as to protect the area from dust and noise from the Project Highway.
- j) The laboratory facility, to be established for testing of various materials related to Highway construction and maintenance, shall be located at the main base camp.

2.9 Site Office for TNRDC

An air conditioned and fully furnished office space, to house the TNRDC Project staff shall be provided by the Concessionaire with a working space (of approx. 300 sq.m) for 15 people and office space after consultation with TNRDC in a leased/ rented premise. The Site office shall commence functioning by the Appointed Date.

2.10 Project Vehicle

Two, brand new A/C vehicles (Make Mitsubishi Cedia Sports and Mahindra XUV 500 W8) shall be provided by the Concessionaire to TNRDC within 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 provided to TNRDC (Managing Associate for the Project) at Chennai. The vehicle will run about 5000 km/month including Sundays/Holidays. The vehicles shall be replaced by brand new vehicles after these have run 150000 km or 3 years whichever is earlier.

2.11 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 construction and maintenance activities. The laboratory shall be fully functional by the Appointed Date. The trained technicians and helpers, etc. shall also be provided by the Concessionaire for the envisaged tests involved for the project. The laboratory shall be fully equipped and functional including provision of one vehicle attached to it. The cost of running and maintaining the laboratory including running and maintenance of the vehicles attached to the laboratory, and drivers, fuel, etc., complete shall be borne by the Concessionaire.

2.12 Project Furniture and Facilities on Roadside

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

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

2.13 Facilities for emergency assistance, ambulance, crane, tow trucks

The facilities for emergency assistance shall be provided in accordance with Schedule D provisions. The Concessionaire shall provide an ambulance having all facilities for emergency assistances required, as specified in Schedule D. The Concessionaire shall provide crane of at least 30 Tonnes capacity having all requisite arrangements for pulling and lifting accident / break-down vehicles, apart from tow-trucks.

2.14 Advanced Traffic Management Systems (ATMS)

ATMS on the Project Highway shall be provided in accordance with the Standards set in Schedule 'D'. ATMS shall provide facilities to the highway users to make emergency calls through Emergency Call Booths (ECBs) to control centre in case of accidents, break down of vehicle and fire and to pre-warn the highway users about unusual conditions on the road. It shall provide information / data to traffic managers on traffic flow, conditions, speed and weather conditions, location of any incident and help required and on incoming calls. Based on these, the traffic managers should be able to exercise control on changing the variable message signs, mobilising the movement of ambulances, cranes, highway patrol units and fire tenders. HTMS shall also provide on line recording and reviewing of the voice and individual information for record and analysis.

2.15 Traffic / Medical Aid / Vehicle Rescue Post

This post shall be designed for round the clock operation of monitoring, online information acquisition and processing the same for decision making. This post should have computers, call centre, uninterrupted power supply and operators. Ambulances manned by at least two trained paramedics shall be available on Project Highway so that the response time is not more than 10 minutes of call. Each Ambulance shall be equipped with first aid, life saving medical services and support system implements for transporting the victims to the nearest trauma hospital for emergency medical aid during transportation of victims from accident site to the nearest trauma hospital. Cranes shall be provided within an hour of incident to clear the disabled vehicle off the carriageway.

2.16 Highway patrol

Highway patrol manned by at least two persons apart from the driver shall continue patrol the stretch and shall remain in contact with the traffic post on real time basis. The patrol shall render assistance to users in distress and disabled vehicles through intervention or by calling assistance from aid post. The patrol shall promptly clear the road of any obstruction. When obstructions take time to clear, the section shall be cordoned off by placing traffic cones, which shall be illuminated during night. The patrol vehicle shall be big enough to carry at least four personnel beside driver and space to carry traffic management tools. It shall also have a light on top and siren on board.

SCHEDULE – D

Section – 1 Specifications and Standards for Six Lane Project Highway

1 Manual of Specifications and Standards to apply

Subject to the provisions of Clause 2 of this Section-1, Six-Lane of the Project Highway shall conform to IRC SP 87 - 2010: “Manual of Specifications and Standards for Six Laning of Highways through Public Private Partnership” published by Indian Road Congress.

While the Manual of Specifications and Standards for Six Laning is mainly for six laning of existing four lane highways, the manual also provides for green field six laning projects.

The Project Highway is a Greenfield Six lane alignment. The provisions in the manual specifically relevant for widening and upgradation of existing four lanes highways to six lanes, are not relevant for the Project Highway, and shall not be applicable.

2 Deviations from the Manual

In the event of a discrepancy in the design, specifications and standards between the aforesaid Manual and provisions in “Schedule B and Schedule C”, the design, specifications and standards in “Schedule B and Schedule C” shall prevail.

SCHEDULE – E

(See Clause 4.1.3)

APPLICABLE PERMITS

1 Applicable Permits

1.1 The Concessionaire shall obtain, as required under the Applicable Laws, the following Applicable Permits on or before the Appointed Date, save and except to the extent of a waiver granted by Authority in accordance with Clause 4.1.3 of the Concession Agreement:

- (a) Permission of the State Government for extraction of boulders from quarry;
- (b) Permission of Village Panchayat and Pollution Control Board for installation of crushers;
- (c) Licence for use of explosives;
- (d) Permission of the State Government for drawing water from river/reservoir;
- (e) Licence from Inspector of factories or other competent authority for setting up Batching Plant;
- (f) Clearance of Pollution Control Board for setting up Batching Plant;
- (g) Clearance of Village Panchayats and Pollution Control Board for Asphalt Plant;
- (h) Permission of Village Panchayat and State Government for borrow earth;
- (i) Approvals and Clearances from railways for the ROB if any
- (j) Approvals & Clearances from Irrigation department/NHAI/TWAD/TNHD
- (k) Permission of State Government for cutting of trees; and
- (l) Any other permits or clearances required under Applicable Laws.

SCHEDULE –F

(See Clause 9.1)

PERFORMANCE SECURITY

Formats for Performance Security, Schedule F.1 and Schedule F.2 are annexed.

SCHEDULE –F.1.

(See Clause 9.1.(a))

PERFORMANCE SECURITY

The Secretary to Government of Tamil Nadu,
Highways and Minor Ports Department,
Secretariat, Fort St. George,
Chennai 600 009

WHEREAS:

M/s. _____ (the “**Concessionaire**”) had submitted the proposal for Development of Chennai Outer Ring Road Phase II from Nemilicheri in NH 205 To Minjur in Thiruvottiyur – Ponneri – Panchetti (TPP) Road on Design, Build, Finance, Operate and Transfer (DBFOT) Annuity basis at Chennai, in the State of Tamil Nadu, India (Six lanes plus two service lanes, total length approximately 30.50 km)

(A) **GOVERNMENT OF TAMIL NADU, HIGHWAYS AND MINOR PORTS DEPARTMENT**, represented by its Secretary and having its office at Secretariat, Fort St. George, Chennai-600009, Tamil Nadu, India (hereinafter referred to as “**Authority**”) have appointed M/s. Tamil Nadu Road Development Company Limited, (**TNRDC**), Chennai as its Managing Associate to assist the Authority and function on behalf of Authority in performing its roles and responsibilities during the bid process, Development Period, Construction Period etc. and **TNRDC** will, inter alia, finalize the bid process and accordingly select the successful Bidder.

(B) Based on the above, the bid submitted by the ***** [Consortium] or ***** [Bidder] has been accepted by TNRDC and a Letter of Award (LOA) was issued by TNRDC vide its communication no. ***** dated ***** to the *****[Consortium] or *****[Bidder] requiring, inter alia, the execution of Concession Agreement within 30 days from the date of LOA.

(C) Pursuant to the above, M/s.***** Ltd having its Registered office at ***** has been

incorporated as a Special Purpose Vehicle (SPV) hereinafter called the “Concessionaire”

As provided in Request for Proposal(RFP) the Concessionaire has to furnish a Performance Security to Authority for a sum of ₹49, 30, 00, 000/- (Rupees Forty Nine Crore Thirty Lakhs only) (the “**Guarantee Amount**”) as security for due and faithful performance of its obligations, before signing of the Concession Agreement, under and in accordance with the RFP and/or LOA during the Development Period (as defined in the Concession Agreement).

(E) We, ***** through our Branch at ***** (the “**Bank**”) have agreed to furnish this Bank Guarantee by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Concessionaire’s obligations during the Construction Period, under and in accordance with the Concession Agreement, and agrees and undertakes to pay to Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Concessionaire, such sum or sums upto an aggregate sum of the Guarantee Amount as Authority shall claim, without Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from Authority, or under the hand of any of the employee of Authority or any other person or entity duly authorised by Authority in this regard, that the Concessionaire has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the RFP and/or LOA and/or Concession Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that Authority shall be the sole judge as to whether the Concessionaire is in default in due and faithful performance of its obligations during the Construction Period under the Concession Agreement and its decision that the Concessionaire is in default shall be final, and binding on the Bank, notwithstanding any differences between Authority and the Concessionaire, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Concessionaire for any reason whatsoever.

3. We, the Bank unconditionally undertake to pay to Authority any money so demanded under this Guarantee notwithstanding any dispute or disputes raised by the Bidder or any other party including in any suit or proceeding pending before any court or tribunal relating thereto or any instructions or purported instructions by the Bidder or any other party to the Bank not to pay or for any cause to withhold or defer payment to Authority under this Guarantee. The Bank’s liability under this Guarantee is irrevocable, unconditional, absolute and unequivocal. The payment so made by the Bank under this Guarantee shall be a valid discharge of the bank’s liability for payment hereunder and the Bidder shall have no claim against the Bank for making such payment.

4. In order to give effect to this Guarantee, Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Concessionaire and/or the Bank, whether by their absorption with any other body or

corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

5. It shall not be necessary, and the Bank hereby waives any necessity, for Authority to proceed against the Concessionaire before presenting to the Bank its demand under this Guarantee.

6. Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Concession Agreement or to extend the time or period for the compliance with, fulfilment and/ or performance of all or any of the obligations of the Concessionaire contained in the Concession Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by Authority against the Concessionaire and either to enforce or forbear from enforcing any of the terms and conditions contained in the Concession Agreement and/or the securities available to Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Concessionaire or any other forbearance, indulgence, act or omission on the part of Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

7. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by Authority in respect of or relating to the Concession Agreement or for the fulfilment, compliance and/or performance of all or any of the obligations of the Concessionaire under the Concession Agreement.

8. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 9 below and unless a demand or claim in writing is made by Authority on the Bank under this Guarantee, not later than 6 (six) months from the date of expiry of this Guarantee, all rights of Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

9. We, the Bank further agree that the Guarantee herein contained shall remain in full force and effect upto and until 1700 hours on the date which falls 45 days beyond the Appointed Date i.e.(hereinafter called “the End Date”). Unless a demand or claim under this Guarantee is made on the Bank by Authority or under the hand of any of the employee of Authority or any other person or entity duly authorised by Authority in this regard, in writing on or before the said End Date, the Bank shall be discharged from all liability under this Guarantee thereafter.

10 We hereby agree to renew and extend the validity of this guarantee for a period not exceeding one year from the End Date on a request made by Authority or under the hand of any of the employee of Authority or any other person or entity duly authorised by Authority in this regard

11. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank
12. Any notice by way of request, demand or otherwise hereunder may be sent by post or in person by an employee of TNRDC addressed to the Bank at its above referred Branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of Authority that the envelope was so posted shall be conclusive.
13. We, the bank lastly undertake not to revoke this Guarantee during its currency.
14. Notwithstanding anything contained herein.
- a) Our liability under the Bank Guarantee shall not exceed ₹49, 30, 00, 000/- (Rupees Forty Nine Crore Thirty Lakhs only)
 - b) The Bank Guarantee shall be valid upto [date], 201__.
 - c) Unless a demand in writing is made upon us on or before _____, or any other extended date, all our liability under this guarantee shall cease.

IN WITNESS WHEREOF THE BANK HAS SET ITS HANDS HERETO ON THE DAY, MONTH AND YEAR MENTIONED HEREUNDER.

Signed and Delivered

On behalf of(Bank name)

(Signature)

(Date)

by the hand of Mr

(name of authorized signatory)

Designation

Address of the controlling officer of the issuing branch with phone number and fax number to be provided.

Note: Authenticated copy of Letter of Authority authorizing the signatory of this guarantee to execute the same has to be enclosed herewith.

SCHEDULE –F.2.

(See Clause 9.1.(b))

PERFORMANCE SECURITY

The Secretary to Government of Tamil Nadu,
Highways and Minor Ports Department,
Secretariat, Fort St. George,
Chennai 600 009

WHEREAS:

(A) M/s. _____ (the “**Concessionaire**”) and the **GOVERNMENT OF TAMIL NADU, HIGHWAYS AND MINOR PORTS DEPARTMENT**, represented by its Secretary and having its office at Secretariat, Fort St. George, Chennai-600009, Tamil Nadu, India (hereinafter referred to as “**Authority**”) have entered into a Concession Agreement dated _____ (the “**Agreement**”) whereby Authority has agreed to the Concessionaire undertaking Development of Chennai Outer Ring Road Phase II from Nemilicheri in NH 205 To Minjur in Thiruvottiyur – Ponneri – Panchetti (TPP) Road on Design, Build, Finance, Operate and Transfer (DBFOT) Annuity basis at Chennai, in the State of Tamil Nadu, India (the “**Project**”) (Six lanes plus two service lanes, total length 30.50 km)”

(B) The Agreement requires the Concessionaire to furnish a Performance Security to Authority in a sum of ₹ 28, 98, 00, 000 (Rupees Twenty Eight Crores Ninety Eight Lakhs only) (the “**Guarantee Amount**”) as security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the Construction Period (as defined in the Agreement).

(C) We, ***** through our Branch at ***** (the “**Bank**”) have agreed to furnish this Bank Guarantee by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Concessionaire’s obligations during the Construction Period, under and in accordance with the Agreement, and agrees and undertakes to pay to Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Concessionaire, such sum or sums upto an aggregate sum of the Guarantee Amount as Authority shall claim, without Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. We, the Bank unconditionally undertake to pay to Authority any money so demanded under this Guarantee notwithstanding any dispute or disputes raised by the Bidder or any other party including in any suit or proceeding pending before any

court or tribunal relating thereto or any instructions or purported instructions by the Bidder or any other party to the Bank not to pay or for any cause to withhold or defer payment to Authority under this Guarantee. The Bank's liability under this Guarantee is irrevocable, unconditional, absolute and unequivocal. The payment so made by the Bank under this Guarantee shall be a valid discharge of the bank's liability for payment hereunder and the Bidder shall have no claim against the Bank for making such payment.

3. A letter from Authority, or under the hand of any of the employee of Authority or any other person or entity duly authorised by Authority in this regard, that the Concessionaire has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that Authority shall be the sole judge as to whether the Concessionaire is in default in due and faithful performance of its obligations during the Construction Period under the Agreement and its decision that the Concessionaire is in default shall be final, and binding on the Bank, notwithstanding any differences between Authority and the Concessionaire, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Concessionaire for any reason whatsoever.
4. In order to give effect to this Guarantee, Authority shall be entitled to act as if the Bank was the principal debtor and any change in the constitution of the Concessionaire and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
5. It shall not be necessary, and the Bank hereby waives any necessity, for Authority to proceed against the Concessionaire before presenting to the Bank its demand under this Guarantee.
6. Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and/or performance of all or any of the obligations of the Concessionaire contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by Authority against the Concessionaire, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Concessionaire or any other forbearance, indulgence, act or omission on the part of Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law
7. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by Authority in respect of or relating to the Agreement or for the fulfilment, compliance and/or performance of all or any of the obligations of the Concessionaire under the Agreement.

8. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 9 below and unless a demand or claim in writing is made by Authority on the Bank under this Guarantee, not later than 6 (six) months from the date of expiry of this Guarantee, all rights of Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
9. We, the Bank further agree that the Guarantee herein contained shall remain in full force and effect upto and until 1700 hours on the date which falls 45 days beyond the date of issue of Completion Certificate i.e.(hereinafter called “the End Date”). Unless a demand or claim under this Guarantee is made on the Bank by Authority or under the hand of any of the employee of Authority or any other person or entity duly authorised by Authority in this regard, in writing on or before the said End Date, the Bank shall be discharged from all liability under this Guarantee thereafter.
10. We hereby agree to renew and extend the validity of this guarantee for a period not exceeding one year from the End Date on a request made by Authority or under the hand of any of the employee of Authority or any other person or entity duly authorised by Authority in this regard
11. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank
12. Any notice by way of request, demand or otherwise hereunder may be sent by post or in person by an employee of TNRDC, addressed to the Bank at its above referred Branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of Authority that the envelope was so posted shall be conclusive.
13. We, the bank lastly undertake not to revoke this Guarantee during its currency.
14. Notwithstanding anything contained herein.
 - a) Our liability under the Bank Guarantee shall not exceed ₹ 28, 98, 00, 000 (Rupees Twenty Eight Crores Ninety Eight Lakhs only).
 - b) The Bank Guarantee shall be valid upto [date], 201_.
 - c) Unless a demand in writing is made upon us on or before _____, or any other extended date, all our liability under this guarantee shall cease.

IN WITNESS WHEREOF THE BANK HAS SET ITS HANDS HERETO ON THE
DAY, MONTH AND YEAR MENTIONED HEREUNDER.

Signed and Delivered

On behalf of(Bank name)

(Signature)

(Date)

by the hand of Mr

(name of authorized signatory)

Designation

Address of the controlling officer of the issuing branch with phone number and fax number to be provided.

Note: Authenticated copy of Letter of Authority authorizing the signatory of this guarantee to execute the same has to be enclosed herewith.

SCHEDULE –G

(See Clause 12.1)

PROJECT COMPLETION SCHEDULE

1 Project Completion Schedule

During Construction Period, the Concessionaire shall comply with the requirements set forth in this Schedule-G for each of the Project Milestones and the Scheduled Six Laning with service roads Date (the “**Project Completion Schedule**”). Within 15 (fifteen) days of the date of each Project Milestone, the Concessionaire shall notify Authority of such compliance alongwith necessary particulars thereof.

2 Project Milestone-I

2.1 Project Milestone-I shall occur on the date falling on the 180th (one hundred and eightieth) day from the Appointed Date (the “**Project Milestone-I**”).

2.2 Prior to the occurrence of Project Milestone-I, the Concessionaire shall have progressed construction of the Project Highway and progressed not less than 10% (ten per cent) of the total capital cost set forth in the Financial Package.

3 Project Milestone-II

3.1 Project Milestone-II shall occur on the date falling on the 456th (four hundred and fifty sixth) day from the Appointed Date (the “**Project Milestone-II**”).

3.2 Prior to the occurrence of Project Milestone-II, the Concessionaire shall have progressed construction of all bridges and expended not less than 35% (thirty five per cent) of the total capital cost set forth in the Financial Package.

4 Project Milestone-III

4.1 Project Milestone-III shall occur on the date falling on the 598th (Five hundred and Ninety Eighth) day from the Appointed Date (the “**Project Milestone-III**”).

4.2 Prior to the occurrence of Project Milestone-III, the Concessionaire shall have expended not less than 60% (Sixty per cent) of the total capital cost set forth in the Financial Package.

5 Scheduled Six Laning with Service Lane Date

5.1 The Scheduled Six Laning with Service Roads Date shall occur on the 913th (nine hundred and thirteenth) day from the Appointed Date.

5.2 On or before the Scheduled Six Laning with Service Roads Date, the Concessionaire

shall have completed Six Laning with Service Roads, structures and all Project Facilities in accordance with this Agreement.

6 Extension of period

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Six Laning with Service Roads Date, as the case may be, under and in accordance with the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly. However, the extension of time should be necessarily got approved from Authority based on the recommendations of Independent Engineer.

SCHEDULE –H

(See Clause 12.3)

DRAWINGS

1 Drawings

In compliance of the obligations set forth in Clause 12.3 of this Agreement, the Concessionaire shall furnish to the IE and Authority, free of cost, all Drawings listed in Annex-I of this Schedule-H.

The Concessionaire shall adhere to the following sequence of preparation of the drawings listed in Annex I. All drawings shall be prepared by the Concessionaire and submitted for review and approval to the IE.

1.1 During the Development Period,

i. Road Way Geometrics:

- Typical Pavement Cross Sections,
- Horizontal and Vertical Alignment with details of reference pillars,
- Alignment Stake out details
- Horizontal Intersection Points, Vertical Intersection Points
- Curve details, and sight distances
- Detailed Plan and Profile Drawings with Finished Road Levels (FRL),
- Geometric Cross-sections

ii. Structures

- GAD's with Typical Details

iii. Project Facilities Other Specialized Drawings:

- Location plans, layout, General Arrangement Plans
- Conceptual Drawings for:
 - Underpasses, interchanges, major intersections, grade separators and Bridges.
 - Traffic Control Centre
 - Truck parking layby with furniture and drainage system
 - Road furniture items including traffic signage, markings, safety barriers, etc.

- Traffic diversion plans and traffic control measures
- Road drainage measures
- Typical details of slope protection measures
- Landscaping and horticulture
- Pedestrian and cattle crossings
- Street lighting
- General Arrangement of Base camp and Administrative Block
- Other Crossing Structure's General Arrangement Drawing (like river Canal if any) for approval from Irrigation/concern Government department after clearance from Independent Engineer and TNRDC

1.2 During the construction period,

i. Road Way Geometrics:

Good For Construction (GFC) Drawings for Geometrics and Pavement, Misc. Works duly approved by Independent Engineer as prepared (i) above.

ii. Structures:

Detailed Designs, Detailed GFC Construction Drawings, Working Drawings duly approved by Independent Engineer.

iii. Project Facilities:

Detailed GFC Drawings and Plans as duly approved by IE listed above (i).

1.3 On achievement of substantial completion of works,

As-built drawings for all components of the Project Highway. The approval of the as-built drawings shall be pre-requisite for issue of Completion Certificate

2 Additional drawings

If the IE determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it shall by notice, require the Concessionaire to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Concessionaire shall promptly prepare and furnish such drawings to the IE for review and approval, as if such drawings formed part of Annex-I of this Schedule-H.

Annex - I (Schedule-H)

Indicative List of Drawings to be prepared

1. All the Drawings that the Concessionaire is required to furnish under Clause 12.3
The Project Highway drawings, as defined in the Concession Agreement, shall consist:
 - (a) Working Drawings of all the components/elements of the Project Highway as determined by Independent Engineer/Authority, and
 - (b) As-built drawings for the Project Highway components/elements as determined by IE/ Authority. As-built drawings shall be duly certified by Independent Engineer.
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:
Specifying the Drawings for Chennai Outer Ring Road phase II are as under.
 - Horizontal and Vertical Alignment with details of reference pillars, Horizontal Intersection Points, Vertical Intersection Points, elements of curves, and sight distances.
 - Cross-section at 25 m interval along the alignment within ROW
 - Typical cross-section with details of pavement structures
 - Detailed drawings of individual Bridges and Structures
 - Detailed drawings for individual culverts
 - Detailed layout drawings for intersections and interchanges
 - Drawings for Road signs, Markings, Bus bays, Parking areas, truck lay-bys
 - Detailed layout drawings for traffic circulation for service roads, for vehicular underpasses including cross-section drawings through vehicular and pedestrian underpasses at the Project Highway level and the structure bed level
 - Street lighting
 - Landscaping & Tree plantation
 - Traffic aid post
 - Medical aid post
 - Vehicle rescue post
 - Traffic management drawings for safety in construction zones
 - Detailed drawings of road side furniture and safety structures
 - General arrangement of Base camp and Administrative Block
 - Any other drawings for completion of work.

SCHEDULE –I

(See Clause 14.1.2)

TESTS

1 Schedule of Tests during development and construction

- 1.1 The Concessionaire shall, ensure that the construction of the laboratory for the project, is complete and it is equipped with all necessary equipments and staff, prior to the Appointed Date.
- 1.2 The Project Execution Plan, to be formulated in the Development period shall include a Detailed Quality Assurance Plan (QAP) during the construction and maintenance stages of the Project. The QAP shall conform to the MORT&H specifications for Road and Bridge Works, 2001 (fourth revision) and applicable Codal provisions. The QAP shall include details pertaining to the nature and type of tests and investigations to be carried out, methods to carry out the same, frequency of testing and analysis protocols in line with the standard engineering practices. The QAP shall be reviewed and approved by the IE, and shall form a control chart for monitoring the testing and investigations to be carried out by the Concessionaire. The testing and investigations to be carried out shall include, but not limited to the list in Table below.

Table I-1: Indicative Listing of Tests to be carried out during Development and Construction Period

Sl. No.	Item	Test
1.0	Earthwork for embankment, subgrade construction and cut formation	
	Embankment and sub grade borrow materials	<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 • Deleterious Content Test as per IS: 2720 (Part 27) • CBR Test as per IS: 2720 (Part 16)

1.1	Compaction	<ul style="list-style-type: none"> • Compaction density • Determination of dry density of soils in place according to IS-2720, Part 28 by the Sand Replacement Method
2.0 Pavement Structure		
S. No.	Item	Test
2.1	Granular Sub base and base courses	<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 • Deleterious Content Test • 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)
2.2	Bituminous base and wearing courses	<ul style="list-style-type: none"> • Quality of binder • Aggregate Impact Value/ Los Angeles Value as per IS2386 (Part 4) • Flakiness Index and Elongation Index • Stripping value test as per AASHTO T182 • Water absorption of Aggregates as per IS : 2386 (Part 3) • Water Sensitivity of Mix • Polished Stone Value • Grading of Aggregates • Sand Equivalent Test • Plasticity Index • Soundness Test as per IS : 2386 Part 5 • Marshall stability test as per ASTM D-1559 • Stability of Mix • Swell test on the Mix • Rate of spread of mixed material • Density of mixed material

2.3	Cement concrete Pavement	<ul style="list-style-type: none"> Aggregate Impact Value as per IS : 2386 (Part 4) Gradation 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 Workability of fresh Concrete - Slump Test IS : 1199 Core strength of hardened concrete as per IS: 516
2.4		<ul style="list-style-type: none"> Workability of fresh concrete- Slump test as per IS: 1199 Thickness determination Thickness measurement for trial strength
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
3.2	Superstructure	Static load testing of any one span of the structure for carrying design load as per IRC SP 37
3.3	Expansion Joints	Checking and verification of the Expansion joints to ascertain proper functioning as per MORT&H Specifications

- 1.3 The testing shall be carried out by an authorized representative of the Concessionaire, in the presence of the IE. The tests shall be carried out by the Concessionaire at the Project laboratory established on site under the Supervision of the IE, unless and until specifically requested otherwise by the IE or Authority, to carry out the tests at a different laboratory / institution. A monthly audit of the Concessionaire's laboratory at site shall be carried out by the IE along with Authority to assess the conformance of the laboratory to the standard operating procedures with respect to testing of materials, and adherence to the QAP. Expenses for all tests carried out shall be borne by the Concessionaire.

2 Schedule for Tests during construction completion

- 2.1 The Concessionaire shall, not later than 30 (thirty) days prior to the likely completion of the Project, notify the IE and Authority of its intent to subject the Project Highway to Tests, and not later than 7 (seven) days prior to the actual date of Tests, furnish to the IE and Authority detailed inventory and particulars of all works and equipment forming part of the Project.

- 2.2 The Concessionaire shall notify the IE of its readiness to subject the Project Highway to Tests at any time after 7 (seven) days from the date of such notice, and upon receipt of such notice, the IE shall, in consultation with the Concessionaire, determine the date and time for each Test and notify the same to Authority who may designate its representative to witness the Tests. The IE shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 14 and this Schedule-I.

3 Tests

- 3.1 Visual and physical Test: The IE shall conduct a visual and physical check of the Project to determine that all works and equipment forming part thereof conform to the provisions of this Agreement.

3.2 Test drive: The IE shall undertake a test drive of the Project Highway by a Car and by a fully loaded Truck to determine that the quality of service conforms to the provisions of the Concession Agreement.

- 3.3 Riding quality Test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be [1,800 (one thousand and eight hundred)] mm for each kilometre.

- 3.4 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 3(three) kilometres of the Project Highway. The first pit for the sample shall be selected by the IE through an open draw of lots and every fifth kilometre from such first pit shall form part of the sample for this pavement quality Test.

- 3.5 Cross-section Test: The cross-sections of the Project Highway shall be checked on a sample basis through physical measurement 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) kilometre of the Project Highway. The first spot for the sample shall be selected by the IE through an open draw of lots and the spots located at every one kilometre from such first spot shall form part of the sample. For the bridge portion, one spot shall be selected at random by the IE in each span of the bridge.

- 3.6 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 at random by the IE. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.

- 3.7 Other Tests: The IE may require the Concessionaire to carry out or cause to be carried additional Tests, in accordance with Good Industry Practice, for determining compliance of Project Highway with Specifications and Standards.
- 3.8 Environmental audit: The IE shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.
- 3.9 Safety review: Safety audit of the Project Highway shall be undertaken by the IE as set forth in Schedule-L, and on the basis of such audit, the IE shall determine conformity of the Project Highway with the provisions of this Agreement.

4 Agency for conducting Tests

All Tests set forth in this Schedule-I shall be conducted by the IE or such other agency or person as it may specify in consultation with Authority.

5 Completion Certificate and Provisional Certificate

Upon successful completion of Tests, the IE shall issue the Completion / Provisional Certificates, as the case may be, after obtaining consent from Authority, in accordance with the provisions of Article 14.

6. Tests during Operation and Maintenance

- 6.1 The Concessionaire shall carry out, on a quarterly basis, the key tests specified to be undertaken during O&M Period and any other specific tests required by the IE or Authority. The periodic quarterly tests shall be carried out by the Concessionaire at the Project laboratory established on site under the Supervision of the IE, unless and until specifically requested otherwise by the IE or Authority, to carry out the tests at a different laboratory / institution. Expenses for all tests carried out shall be borne by the Concessionaire.

7 Key Tests during Maintenance Period

Pavement Surface Condition Test: The condition of the pavement shall be recorded on each kilometer of Project Highway, and should specify the condition of Pavement (such as cracking, potholing ravelling, rutting or such parameters, as suggested by IE) in terms of percentage for each kilometer of the Project Highway. The concessionaire shall

incorporate rectification measures for this distress in maintenance plan specified in Article 17.

Structural Strength Test for Pavement: The pavement shall be tested for characteristic deflection with Benkelman beam test as specified in IRC:81-1997 or as set forth in Schedule-D. Deficiency in the structural strength assessed based on the tests shall form basis for pavement strengthening as specified in IRC: 81-1997

Riding Quality Test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be 2,000 (two thousand) mm for each kilometre.

Structural Test for bridges: All major and minor bridges constructed by the Concessionaire shall be subject 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 at random by the IE. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.

SCHEDULE –J

(See Clauses 14.2 & 14.3)

COMPLETION CERTIFICATE

- 1 I, (Name of the Independent Engineer), acting as Independent Engineer, under and in accordance with the Concession Agreement dated (the “Agreement”), for Development of Chennai Outer Ring Road Phase II from Nimalicheri in NH 205 To Minjur in Thiruvottiyur – Ponneri – Panchetti (TPP) Road at Chennai, in the State of Tamil Nadu, India (the “Project Highway”) on design, build, finance, operate and transfer (DBFOT) basis, through (Name of Concessionaire), hereby certify that the Tests specified in Article 14 and Schedule-I of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in commercial service of the Users thereof.
- 2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Six-Laning have been completed, and the Project Highway is hereby declared fit for entry into commercial operation on this the day of 20.....

SIGNED, SEALED AND DELIVERED

For and on behalf of

the INDEPENDENT

ENGINEER by:

(Signature)

(Name)

(Designation)

(Address)

PROVISIONAL CERTIFICATE

- 1 I, (Name of the Independent Engineer), acting as Independent Engineer, under and in accordance with the Concession Agreement dated (the “**Agreement**”), for Development of Chennai Outer Ring Road Phase II from Nemilicheri in NH 205 To Minjur in Thiruvottiyur – Ponneri – Panchetti (TPP) Road at Chennai, in the State of Tamil Nadu, India (the “**Project Highway**”) on design, build, finance, operate and transfer (DBFOT) basis through (Name of Concessionaire), hereby certify that the Tests specified in Article 14 and Schedule-I of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.
- 2 Construction Works that were found to be incomplete and/or deficient have been specified in the Punch List appended hereto, and the Concessionaire has agreed and accepted that it shall complete and/or rectify all such works in the time and manner set forth in the Agreement. (Some of the incomplete works have been delayed as a result of reasons attributable to the Authority or due to Force Majeure and the Provisional Certificate cannot be withheld on this account. Though the remaining incomplete works have been delayed as a result of reasons attributable to the Concessionaire,)[@] I am satisfied that having regard to the nature and extent of such incomplete works, it would not be prudent to withhold commercial operation of the Project Highway, pending completion thereof.
- 3 In view of the foregoing, I am satisfied that the Project Highway can be safely and reliably placed in commercial service of the Users thereof, and in terms of the Agreement, the Project Highway is hereby provisionally declared fit for entry into commercial operation on this the day of 20.....

ACCEPTED, SIGNED, SEALED
AND DELIVERED

For and on behalf of

CONCESSIONAIRE by:

(Signature)

(Name and Designation)

(Address)

SIGNED, SEALED AND
DELIVERED

For and on behalf of

INDEPENDENT ENGINEER by:

(Signature)

(Name and Designation)

(Address)

[@] Strike out if not applicable.

SCHEDULE –K

(See Clause 17.2)

MAINTENANCE REQUIREMENTS

1 Maintenance Requirements

- 1.1 The Concessionaire shall, at all times, operate and maintain the Project Highway in accordance with the provisions of the Agreement, Applicable Laws and Applicable Permits. In particular, the Concessionaire shall, at all times during the Operation Period, conform to the maintenance requirements set forth in this Schedule-K (the “**Maintenance Requirements**”).
- 1.2 The Concessionaire shall repair or rectify any defect or deficiency set forth in Paragraph 2 of this Schedule-K within the time limit specified therein and any failure in this behalf shall constitute a breach of the Agreement. Upon occurrence of any breach hereunder, Authority shall be entitled to recover Damages as set forth in Clause 17.8 of the Agreement, without prejudice to the rights of Authority under the Agreement, including Termination thereof.

2 Repair/rectification of defects and deficiencies

The obligations of the Concessionaire in respect of Maintenance Requirements shall include repair and rectification of the defects and deficiencies specified in Annex - I of this Schedule - K within the time limit set forth therein.

3 Other defects and deficiencies

- 3.1 In respect of any defect or deficiency not specified in Annex - I of this Schedule-K, the Concessionaire shall undertake repair or rectification in accordance with Good Industry Practice.
- 3.2 In respect of any defect or deficiency not specified in Annex - I of this Schedule-K, the IE may, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards, and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Concessionaire within the time limit specified by the IE.

4 Extension of time limit

Notwithstanding anything to the contrary specified in this Schedule-K, if the nature and extent of any defect or deficiency justifies more time for its repair or rectification than the time specified herein, the Concessionaire shall be entitled to additional time in

conformity with Good Industry Practice. Such additional time shall be determined by the IE and conveyed to the Concessionaire and Authority with reasons thereof. The extension of time will be decided by IE after getting the approval of Authority.

5 Emergency repairs/restoration

Notwithstanding anything to the contrary contained in this Schedule-K, if any defect, deficiency or deterioration in the Project Highway poses danger to the life or property of the Users thereof, the Concessionaire shall promptly take all reasonable measures for eliminating or minimizing such danger.

6 Daily Inspection by the Concessionaire

The Concessionaire shall, through its engineer, undertake a daily visual inspection of the Project Highway and maintain a record thereof in a register to be kept in such form and manner as the IE may specify. Such record shall be kept in safe custody of the Concessionaire and shall be open to inspection by Authority and the IE at any time during office hours.

7 Divestment Requirements

All defects and deficiencies specified in this Schedule-K shall be repaired and rectified by the Concessionaire so that the Project Highway conforms to the Maintenance Requirements on the Transfer Date.

8 Display of Schedule - K

The Concessionaire shall display a copy of this Schedule - K at the Toll Plaza[s] along with the Complaint Register stipulated in Article 46.

Annex - I (Schedule-K)

Repair/Rectification of Defects and Deficiencies

The Concessionaire shall repair and rectify the defects and deficiencies specified in this Annex-I of Schedule-K within the time limit set forth herein.

Nature of defect or deficiency	Time limit for repair/rectification
--------------------------------	-------------------------------------

ROADS

(a) Carriageway and paved shoulders

- | | |
|--|--|
| (i) Breach or blockade | Temporary restoration of traffic within 24 hours; permanent restoration within 15 days |
| (ii) Roughness value exceeding 2,000 mm in a stretch of 1 km (as measured by a standardised roughometer/bump integrator) | - 180 days |
| (iii) Pot holes | - 48 hours |
| (iv) Cracking in more than 5% of road surface in a stretch of 1 km | - 30 days |
| (v) Rutting exceeding 10 mm in more than 2% of road surface in a stretch of 1 km (measured with 3 m straight edge) | - 30 days |
| (vi) Bleeding/skidding | - 7 days |
| (vii) Ravelling/Stripping of bitumen surface exceeding 10 sq m | - 15 days |
| (viii) Damage to pavement edges exceeding 10 cm | - 15 days |
| (ix) Removal of debris | - 6 hours |

(b) Hard/earth shoulders, side slopes, drains and culverts

- (i) Variation by more than 2% in the prescribed slope of camber/cross fall - 30 days
- (ii) Edge drop at shoulders exceeding 40 mm - 7 days
- (iii) Variation by more than 15% in the prescribed side (embankment) slopes - 30 days
- (iv) Rain cuts/gullies in slope - 7 days
- (v) Damage to or silting of culverts and side drains during and immediately preceding the rainy season - 7 days
- (vi) Desilting of drains in urban/semi-urban areas - 48 hours

(c) Road side furniture including road signs and pavement marking

- Damage to shape or position; - 48 hours
- poor visibility or loss of retro-reflectivity

(d) Street lighting and telecom (ATMS)

- (i) Any major failure of the system - 24 hours
- (ii) Faults and minor failures - 8 hours

(e) Trees and plantation

- (i) Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs - 24 hours
- (ii) Deterioration in health of trees and bushes - Timely watering and treatment
- (iii) Replacement of trees and bushes - 90 days
- (iv) Removal of vegetation affecting sight line and road structures - 15 days

(f) Rest areas

- (i) Cleaning of toilets - Every 4 hours
- (ii) Defects in electrical, water and sanitary installations - 24 hours

(g) Toll plaza[s]

- (i) Damage to toll plaza - 7 days

(h) Other Project Facilities and Approach roads

- (i) Damage or deterioration in Approach Roads, [pedestrian facilities, truck lay-bys, bus-bays, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works] - 15 days

BRIDGES

(a) Superstructure of bridges

- (i) Cracks - within 48 hours
- Temporary measures, Permanent measures - within 30 days
- (ii) Spalling/scaling - 15 days

(b) Foundations of bridges

- (i) Scouring and/or cavitation - 15 days

(c) Piers, abutments, return walls and wing walls of bridges

- (i) Cracks and damages including settlement and tilting - 30 days

(d) Bearings (metallic) of bridges

- (i) Deformation - 15 days

(e) Joints in bridges

- (i) Loosening and malfunctioning of joints - 15 days
- (f) Other items relating to bridges**
- (i) Deforming of pads in elastomeric bearings - 7 days
- (ii) Gathering of dirt in bearings and joints; or
clogging of spouts, weep holes and vent-holes - 3 days
- (iii) Damage or deterioration in parapets and
handrails - 2 days
- (iv) Rain-cuts or erosion of banks of the side slopes of
approaches - 7 days
- (v) Damage to wearing coat - 15 days
- (vi) Damage or deterioration in approach slabs,
pitching, apron, toes, floor or guide bunds - 15 days
- (vii) Growth of vegetation affecting the structure or
obstructing the waterway - 15 days

Annex II (Schedule K)

SERVICE LEVEL REQUIREMENTS – (FRAMEWORK ONLY)

The Concessionaire shall operate and maintain the highway in a manner that provides the Users Assured Lane Availability as specified in this Annex -II of Schedule -K within the time limit set forth herein.

1. Lane Availability

Item	Number of total lane sections – hrs available	Assured availability – minimum time for which lane sections are
Assured Lane Availability	Lane section = [Project Highway length (m) x number of lanes] / 250 (m) Hours available = days in an Annuity Payment Period x 24	[] Lane section – hrs

Item	Service Level	Measurement/ Detection
Assured Availability	The availability of Carriageway assured by the Concessionaire for each Annuity Payment Period, computed as under: Assured Lane Availability = Number of lanes X Lane sections X 24 (hours) X Actual number of days in the relevant Annuity Payment Period X [98%] (Lane sections = Length of lane / 250m)	Monthly Report / IE Monthly Inspection Report / IE Routine inspection

SCHEDULE –L

(See Clause 18.1.1)

SAFETY REQUIREMENTS

1 Guiding principles

- 1.1 Safety Requirements aim at reduction in injuries, loss of life and damage to the properties resulting from accidents on the Project Highway, irrespective of the person(s) at fault.
- 1.2 Users of the Project Highway include motorised and non-motorised vehicles as well as pedestrians and animals involved in, or associated with accidents. Vulnerable Road Users (VRU) include pedestrians as well as riders of motorised two-wheelers, bicycles and other vehicles which do not provide adequate occupant protection.
- 1.3 Safety Requirements apply to all phases of construction, operation and maintenance with emphasis on identification of factors associated with accidents, consideration of the same, and implementation of appropriate remedial measures.
- 1.4 Safety Requirements include measures associated with traffic management and regulation such as road signs, pavement marking, traffic control devices, roadside furniture, highway design elements, enforcement and emergency response.

2 Obligations of the Concessionaire

The Concessionaire shall abide by the following as they relate to safety of the Users:

- (a) Applicable Laws and Applicable Permits;
- (b) Manual for Safety in Road Design, issued by MORTH;
- (c) relevant Standards/Guidelines of IRC relating to safety, road geometrics, bridges, culverts, road signs, pavement marking and roadside furniture;
- (d) provisions of this Agreement; and
- (e) Good Industry Practice.
- (f) Appoint a safety officer to ensure all the safety measures are implemented by the concessionaire.

3 Appointment of Safety Experts

For carrying out safety audit of the Project Highway under and in accordance with this Schedule-L, IE shall employ a team comprising, without limitation, one road safety expert and one traffic and transportation experts to undertake safety audit of the Project Highway.

4 Safety measures during Development Period

- 4.1 IE shall constitute Safety Expert for carrying out safety audit at the design stage of the Project.
- 4.2 The Concessionaire shall provide to the IE, in four copies, the relevant drawings containing the design details that have a bearing on safety of Users (the “**Safety Drawings**”). Such design details shall include horizontal and vertical alignments; sightlines; layouts of intersections; interchanges; road cross-section; bridges and culverts; side drains; provision for parked vehicles, slow moving vehicles (tractors, bullock carts, bicycles) and pedestrians; bus bays; truck lay-bys; and other incidental or consequential information. The IE shall review the design details and forward one copy of the Safety Drawings each to Authority and the Concessionaire.
- 4.3 The design details shall be compiled, analysed and used by the IE for evolving a package of recommendations consisting of safety related measures for the Project Highway. The safety audit shall be completed in a period of three months and a report thereof (the “**Safety Report**”) shall be submitted to Authority, in five copies. One copy each of the Safety Report shall be forwarded by Authority to the Concessionaire and the forthwith.
- 4.4 The Concessionaire shall endeavour to incorporate the recommendations of the Safety Report in the design of the Project Highway, as may reasonably be required in accordance with Applicable Laws, Applicable Permits, Manuals and Guidelines of MORTH and IRC, Specifications and Standards, and Good Industry Practice. If the Concessionaire does not agree with any or all of such recommendations, it shall state the reasons thereof and convey them to Authority forthwith. In the event that any or all of the works and services recommended in the Safety Report fall beyond the scope of Schedule-B, Schedule-C or Schedule-D, the Concessionaire shall make a report thereon and seek the instructions of Authority for funding such works in accordance with the provisions of Article 18.
- 4.5 Without prejudice to the provisions of Paragraph 4.4, the Concessionaire shall, within 15 (fifteen) days of receiving the Safety Report, send their respective comments thereon to Authority, and not later than 30 (thirty) days of receiving such

comments, Authority shall review the same along with the Safety Report and by notice direct the Concessionaire to carry out any or all of the recommendations contained therein with such modifications as Authority may specify; provided that any works or services required to be undertaken hereunder shall be governed by the provisions of Article 18.

5 Safety measures during Construction Period

- 5.1 The Safety Expert of IE in the Development Period, shall, during the Construction Period, carry out a periodic safety audit, of the safety measures adopted, including those for the safety of workers and road users during construction.
- 5.2 The Concessionaire shall make adequate arrangements during the Construction Period for the safety of workers and road Users in accordance with the guidelines of IRC for safety in construction zones, and notify Authority and the IE about such arrangements.
- 5.3 On completion of the construction works, the IE shall study the Safety Report for the Development Period and inspect the Project Highway to assess the adequacy of safety measures. The IE shall complete the safety audit within a period of 4 (four) months and submit a Safety Report recommending a package of additional road safety measures, if any, that are considered essential for reducing accident hazards on the Project Highway. Such recommendations shall be processed, *mutatis mutandis*, and acted upon in the manner set forth in Paragraphs 4.3, 4.4 and 4.5 of this Schedule-L.

6 Safety measures during Operation Period

- 6.1 The Concessionaire shall develop, implement and administrate a surveillance and safety programme for Users, including correction of safety violations and deficiencies and all other actions necessary to provide a safe environment in accordance with this Agreement.
- 6.2 The Concessionaire shall establish a Highway Safety Management Unit (the “HSMU”) to be functional on and after COD, and designate one of its officers to be in-charge of the HSMU. Such officer shall have specialist knowledge and training in road safety and traffic engineering by having attended a course conducted by a reputed organisation on the subject.
- 6.3 The Concessionaire shall keep a copy of every FIR recorded by the Police with respect to any accident occurring on the Project Highway. In addition, the Concessionaire shall also collect data for all cases of accidents not recorded by the

Police but where a vehicle rolled over or had to be towed away. The information so collected shall be summarised in the form prescribed by IRC/ MORTH for this purpose. The Concessionaire shall also record the exact location of each accident on a road map. The aforesaid data shall be submitted to Authority at the conclusion of every quarter and to the IE as and when appointed.

- 6.4 The Concessionaire shall submit to Authority before the 31st (thirty first) May of each year, an annual report (in ten copies) containing, without limitation, a detailed listing and analysis of all accidents of the preceding Accounting Year and the measures taken by the Concessionaire pursuant to the provisions of Paragraph 6.1 of this Schedule-L for averting or minimising such accidents in future.
- 6.5 Once in every Accounting Year, a safety audit shall be carried out by the IE to be appointed by Authority. It shall review and analyse the annual report and accident data of the preceding year, and undertake an inspection of the Project Highway. The IE shall complete the safety audit within a period of 15 days and submit a Safety Report recommending specific improvements, if any, required to be made to the road, bridges, culverts, markings, signs, road furniture and Project Facilities, including cattle crossings and pedestrian crossings. Such recommendations shall be processed, *mutatis mutandis*, and acted upon in the manner set forth in Paragraphs 4.3, 4.4 and 4.5 of this Schedule-L.
- 6.6 The audit report will be reviewed by the committee consisting of representatives from concessionaire, Safety Audit expert and Authority. The committee will give direction for the necessary remedial measures to the concessionaire within 15 (fifteen) days from the receipt of the report.

7 Costs and expenses

Costs and expenses incurred in connection with the Safety Requirements set forth herein, including the provisions of Paragraph 2 of this Schedule, shall be met in accordance with Article 18, and in particular, safety audit, and costs incidental thereto, shall be met out of the Safety Fund.

SCHEDULE –M
(See Article 27)

ANNUITY PAYMENT STATEMENT

<i>S. No.</i>	<i>Annuity Payment Date</i>	<i>Annuity Amount</i>

SCHEDULE –N

(See Clause 22.1)

DELETED

SCHEDULE –O

(See Clause 22.3.1)

TRAFFIC SAMPLING

1 Traffic sampling

Authority may, in its discretion and at its own cost, undertake traffic sampling, pursuant to Clause 22.3, in order to determine the actual traffic on the Project Highway. Such traffic sampling shall be undertaken through the IE in the manner set forth below.

2 Manual traffic count

The IE shall employ the required number of enumerators who shall count, classify and record all the vehicles as they pass by, and divide the survey into fixed time periods. The count stations shall be located on a straight section of the road with good visibility. The survey shall be conducted continuously for a minimum of 24 (twenty four) hours and maximum of 7 (seven) days at a time. The count period shall be 15 (fifteen) minutes with results summarised hourly.

3 Automatic traffic count

For automatic traffic count to be conducted on intermittent (non-continuous) basis, the IE shall use suitable and standardised equipment to classify and record the range of vehicles passing through the Toll Plaza[s]. For this purpose, the counter shall be checked with at least 100 (one hundred) vehicles, including all major vehicle types, over a range of speeds to ensure that all vehicles are being counted and classified correctly.

4 Variation between manual and automatic count

Average Daily Traffic (ADT) for each type of vehicle shall be determined separately by the aforesaid two methods and in the event that the number of vehicles in any category, as counted by the manual method, varies by more than 1% (one per cent) of the number of such vehicles as counted by the automatic method, the manual and automatic count of such category of vehicles shall be repeated, and in the event of any discrepancy between the two counts in the second enumeration, the average thereof shall be deemed to be the actual traffic. For the avoidance of doubt, it is expressly agreed that Authority may, in consultation with the IE and informing Concessionaire, adopt modified or alternative processes of traffic sampling for improving the reliability of such sampling.

SCHEDULE –P

(See Clause 23.1)

SELECTION OF INDEPENDENT ENGINEER

1 Selection of IE

- 1.1** TNRDC shall, on behalf of Authority, appoint a consulting engineering firm (“Independent Engineer/IE”) through a competitive bidding process under the provisions of The Tamil Nadu Transparency in Tenders Act, 1998 and read with the rules thereof by following the selection criteria and procedures in line with the provisions of Article 23 of the Concession Agreement and TNRDC will invite proposals to submit their technical and financial proposals from consulting engineering firms or bodies corporate to undertake and perform the duties and functions set forth in Schedule-Q and thereupon technically shortlist firms in accordance with predetermined criteria. The selection from amongst the technically qualified consulting firms shall be on least cost basis.

2 Fee and expenses

- 2.1** The expenses towards fees and expenses of the IE shall be borne equally by Authority and the Concessionaire in accordance with the provisions of this Agreement.
- 2.2** The nature and quantum of duties and services to be performed by the IE during the Concession Period shall be determined by TNRDC/Authority in conformity with the provisions of this Agreement and with due regard for economy in expenditure.

- 3** The appointment of the IE shall normally be for a period of three years. On expiry of the aforesaid period, Authority may in its discretion renew the appointment or appoint another firm as per Clause 23.1 of Volume II. .

4 Appointment of Government entity as IE

[Notwithstanding anything to the contrary contained in this Schedule, Authority may in its discretion to appoint a government-owned entity as the IE; provided that such entity shall be a body corporate having as one of its primary function the provision of consulting, advisory and supervisory services for engineering projects; provided that a government-owned entity which is owned or controlled by Authority shall not be eligible for appointment as IE.

SCHEDULE Q
(See Clause 23.2.1)

TERMS OF REFERENCE FOR INDEPENDENT ENGINEER

1 Scope

- 1.1 These Terms of Reference for the Independent Engineer (the “**TOR**”) are being specified pursuant to the Concession Agreement dated (the “**Agreement**”), which has been entered into between the Authority and (the “**Concessionaire**”) for Development of Chennai Outer Ring Road Phase II from Nimilicheri in NH 205 To Minjur in Thiruvottiyur – Ponneri – Panchetti (TPP) Road at Chennai, in the State of Tamil Nadu, India of the Project Highway on design, build, finance, operate and transfer (DBFOT) on Annuity basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.
- 1.2 This TOR shall apply to construction, operation and maintenance of the Six-Lane Project Highway.

2 Definitions and interpretation

- 2.1 The words and expressions beginning with or in capital letters used in this TOR and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.
- 2.2 References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.
- 2.3 The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, mutatis mutandis, to this TOR.

3 Role and functions of the Independent Engineer

- 3.1 The role and functions of the Independent Engineer shall include the following:
- (i) review and approval of the project execution plan submitted by the Concessionaire;
 - (ii) review and approval of the Drawings and Documents as set forth in Paragraph 4;

- (iii) review, inspection and monitoring of Construction Works as set forth in Paragraph 5;
- (iv) conducting Tests on completion of construction and issuing Completion/ Provisional Certificate as set forth in Paragraph 5;
- (v) review, inspection and monitoring of O&M as set forth in Paragraph 6;
- (vi) during the construction period, at the end of every quarter or as may be required by the Authority/ TNRDC, certify the value of civil works done by the Concessionaire, for that quarter, or for the period specified, to enable the Authority to disburse Project Support Fund to the Concessionaire;
- (vii) review, inspection and monitoring of Divestment Requirements as set forth in Paragraph 7;
- (viii) determining, as required under the Agreement, the costs of any works or services and/or their reasonableness;
- (ix) determining, as required under the Agreement, the period or any extension thereof, for performing any duty or obligation;
- (x) undertake safety audit of the Project Highway as per Schedule - L
- (xi) assisting the Parties in resolution of disputes as set forth in Paragraph 9; and
- (xii) undertaking all other duties and functions in accordance with the Agreement.

3.2 The Independent Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.

4 Development Period

4.1 During the Development Period, the Independent Engineer shall undertake a detailed review of the Drawings to be furnished by the Concessionaire along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys and traffic surveys. The Independent Engineer shall complete such review and approval and send its comments/observations to the Authority and the Concessionaire within 15 (fifteen) days of receipt of such Drawings. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

4.2 The Independent Engineer shall review and approve any modified Drawings or supporting Documents sent to it by the Concessionaire and furnish its comments within 7 (seven) days of receiving such Drawings or Documents.

- 4.3 The Independent Engineer shall review the Drawings in accordance with Schedule-L and furnish its comments thereon to the Authority and the Concessionaire within 7 (seven) days of receiving such Drawings. The Independent Engineer shall also review the Safety Report and furnish its comments thereon to the Authority within 15 (fifteen) days of receiving such report.
- 4.4 The Independent Engineer shall review and approve the detailed design, construction methodology, quality assurance procedures and the procurement, engineering and construction time schedule sent to it by the Concessionaire and furnish its comments within 15 (fifteen) days of receipt thereof.
- 4.5 Upon reference by the Authority, the Independent Engineer shall review and comment on the EPC Contract or any other contract for construction, operation and maintenance of the Project Highway, and furnish its comments within 7 (seven) days from receipt of such reference from the Authority.

5 Construction Period

- 5.1 In respect of the Drawings, Documents and Safety Report received by the Independent Engineer for its review and comments during the Construction Period, the provisions of Paragraph 4 shall apply, *mutatis mutandis*.
- 5.2 The Independent Engineer shall review the monthly progress report furnished by the Concessionaire and send its comments thereon to the Authority and the Concessionaire within 7 (seven) days of receipt of such report.
- 5.3 The Independent Engineer shall inspect the Construction Works and the Project Highway frequently in a month, preferably after receipt of the monthly progress report from the Concessionaire, but before the 20th (twentieth) day of each month in any case, and make out a report of such inspection (the “**Inspection Report**”) setting forth an overview of the status, progress, quality and safety of construction, including the work methodology adopted, the materials used and their sources, and conformity of Construction Works with the Scope of the Project and the Specifications and Standards. In a separate section of the Inspection Report, the Independent Engineer shall describe in reasonable detail the lapses, defects or deficiencies observed by it in the construction of the Project Highway. The Inspection Report shall also contain a review of the maintenance of the existing lanes in conformity with the provisions of the Agreement. The Independent Engineer shall send a copy of its Inspection Report to the Authority and the Concessionaire within 7 (seven) days of the inspection.

- 5.4 The Independent Engineer shall inspect the Project Highway on regular basis, to identify any lapses, defects or deficiencies, and ensure that corrective remedial steps are taken up by the Concessionaire.
- 5.5 For determining that the Construction Works conform to Specifications and Standards, the Independent Engineer shall require the Concessionaire to carry out, or cause to be carried out, tests on a sample basis, to be specified by the Independent Engineer in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 5.5, the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the “**Quality Control Manuals**”) or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance. The Independent Engineer shall issue necessary directions to the Concessionaire for ensuring that the tests are conducted in a fair and efficient manner, and shall monitor and review the results thereof.
- 5.6 The sample size of the tests, to be specified by the Independent Engineer under Paragraph 5.5, shall comprise 10% (ten per cent) of the quantity or number of tests prescribed for each category or type of tests in the Quality Control Manuals; provided that the Independent Engineer may, for reasons to be recorded in writing, increase the aforesaid sample size by up to 10% (ten per cent) for certain categories or types of tests.
- 5.7 The timing of tests referred to in Paragraph 5.5, and the criteria for acceptance/ rejection of their results shall be determined by the Independent Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Concessionaire for its own quality assurance in accordance with Good Industry Practice.
- 5.8 In the event that the Concessionaire carries out any remedial works for removal or rectification of any defects or deficiencies, the Independent Engineer shall require the Concessionaire to carry out, or cause to be carried out, tests to determine that such remedial works have brought the Construction Works into conformity with the Specifications and Standards, and the provisions of this Paragraph 5 shall apply to such tests.
- 5.9 In the event that the Concessionaire fails to achieve any of the Project Milestones, the Independent Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Independent Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Concessionaire to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project

Completion Date shall be achieved. Upon receipt of a report from the Concessionaire, the Independent Engineer shall review the same and send its comments to the Authority and the Concessionaire forthwith.

- 5.10 If at any time during the Construction Period, the Independent Engineer determines that the Concessionaire has not made adequate arrangements for the safety of workers and Users in the zone of construction or that any work is being carried out in a manner that threatens the safety of the workers and the Users, it shall make a recommendation to the Authority forthwith, identifying the whole or part of the Construction Works that should be suspended for ensuring safety in respect thereof.
- 5.11 In the event that the Concessionaire carries out any remedial measures to secure the safety of suspended works and Users, it may, by notice in writing, require the Independent Engineer to inspect such works, and within 3 (three) days of receiving such notice, the Independent Engineer shall inspect the suspended works and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.
- 5.12 If suspension of Construction Works is for reasons not attributable to the Concessionaire, the Independent Engineer shall determine the extension of dates set forth in the Project Completion Schedule, to which the Concessionaire is reasonably entitled, and shall notify the Authority and the Concessionaire of the same.
- 5.13 The Independent Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-I and issue a Completion Certificate or Provisional Certificate, as the case may be. For carrying out its functions under this Paragraph 5.13 and all matters incidental thereto, the Independent Engineer shall act under and in accordance with the provisions of Article 14 and Schedule-I.
- 5.14 Upon reference from the Authority, the Independent Engineer shall make a fair and reasonable assessment of the costs of providing information, works and services as set forth in Article 16 and certify the reasonableness of such costs for payment by the Authority to the Concessionaire.
- 5.15 The Independent Engineer shall aid and advise the Concessionaire in preparing the Maintenance Manual.
- 5.16 The Independent Engineer shall be entirely responsible for ensuring the quality of implementation. Corrective steps towards quality enhancement, based on site visits and tests shall be carried out. Technical designs with cost implications to the Authority shall be arrived at after consent from TNRDC, as and when the need for the same arises, prior to the communication to Concessionaire.

6 Operation Period

- 6.1 In respect of the Drawings, Documents and Safety Report received by the Independent Engineer for its review and comments during the Operation Period, the provisions of Paragraph 4 shall apply, mutatis mutandis.
- 6.2 The Independent Engineer shall review the annual Maintenance Programme furnished by the Concessionaire and send its comments thereon to the Authority and the Concessionaire within 15 (fifteen) days of receipt of the Maintenance Programme.
- 6.3 The Independent Engineer shall review the monthly status report furnished by the Concessionaire and send its comments thereon to the Authority and the Concessionaire within 7 (seven) days of receipt of such report.
- 6.4 The Independent Engineer shall inspect the Project Highway once every month, preferably after receipt of the monthly status report from the Concessionaire, but before the 20th (twentieth) day of each month in any case, and make out an O&M Inspection Report setting forth an overview of the status, quality and safety of O&M including its conformity with the Maintenance Requirements and Safety Requirements. In a separate section of the O&M Inspection Report, the Independent Engineer shall describe in reasonable detail the lapses, defects or deficiencies observed by it in O&M of the Project Highway. The Independent Engineer shall send a copy of its O&M Inspection Report to the Authority and the Concessionaire within 7 (seven) days of the inspection.
- 6.5 The Independent Engineer may inspect the Project Highway more than once in a month, if any lapses, defects or deficiencies require such inspections.
- 6.6 The Independent Engineer shall in its O&M Inspection Report specify the tests, if any, that the Concessionaire shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures, if any, taken by the Concessionaire in this behalf.
- 6.7 In respect of any defect or deficiency referred to in Paragraph 3 of Schedule-K, the Independent Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.
- 6.8 The Independent Engineer shall determine if any delay has occurred in completion of repair or remedial works in accordance with the Agreement, and shall also determine the Damages, if any, payable by the Concessionaire to the Authority for such delay.

- 6.9 The Independent Engineer shall examine the request of the Concessionaire for closure of any lane(s) of the carriageway for undertaking maintenance/repair thereof, keeping in view the need to minimise disruption in traffic and the time required for completing such maintenance/repair in accordance with Good Industry Practice. It shall grant permission with such modifications, as it may deem necessary, within 3 (three) days of receiving a request from the Concessionaire. Upon expiry of the permitted period of closure, the Independent Engineer shall monitor the re-opening of such lane(s), and in case of delay, determine the Damages payable by the Concessionaire to the Authority under Clause 17.7.
- 6.10 The Independent Engineer shall monitor and review the curing of defects and deficiencies by the Concessionaire as set forth in Clause 19.4.
- 6.11 In the event that the Concessionaire notifies the Independent Engineer of any modifications that it proposes to make to the Project Highway, the Independent Engineer shall review the same and send its comments to the Authority and the Concessionaire within 15 (fifteen) days of receiving the proposal.
- 6.12 The Independent Engineer shall undertake traffic sampling, as and when required by the Authority, under and in accordance with Article 22 and Schedule-O.
- 6.13 As per the provisions of the Concession Agreement the Independent Engineer shall verify the invoices for Annuity payment submitted by the concessionaire and duly adjust the same for any bonus or reduction in Annuity in accordance with Article 28 of the Concession Agreement along with the necessary documentation in this regard. The Independent Engineer shall after verification and certification of the amount claimed in the invoice along with adjustments, forward the invoice to the Authority with necessary documentation recommending payment in full or part thereof so as to reach the Authority atleast 21 days prior to the relevant Authority Payment Date.

7 Termination

- 7.1 At any time, not earlier than 90 (ninety) days prior to Termination but not later than 15 (fifteen) days prior to such Termination, the Independent Engineer shall, in the presence of a representative of the Concessionaire, inspect the Project Highway for determining compliance by the Concessionaire with the Divestment Requirements set forth in Clause 38.1 and, if required, cause tests to be carried out at the Concessionaire's cost for determining such compliance. If the Independent Engineer determines that the status of the Project Highway is such that its repair and rectification would require a larger amount than the sum set forth in Clause 39.2, it shall recommend retention of the required amount in the Escrow Account and the period of retention thereof.

- 7.2 The Independent Engineer shall inspect the Project Highway once in every 15(fifteen) days during a period of 90 (ninety) days after Termination for determining the liability of the Concessionaire under Article 39, in respect of the defects or deficiencies specified therein. If any such defect or deficiency is found by the Independent Engineer, it shall make a report in reasonable detail and send it forthwith to the Authority and the Concessionaire.

8 Determination of costs and time

- 8.1 The Independent Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.
- 8.2 The Independent Engineer shall determine the period, or any extension thereof, that is required to be determined by it under the Agreement.

9 Assistance in Dispute resolution

- 9.1 When called upon by either Party in the event of any Dispute, the Independent Engineer shall mediate and assist the Parties in arriving at an amicable settlement.
- 9.2 In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Independent Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

10 Other duties and functions

The Independent Engineer shall perform all other duties and functions specified in the Agreement.

11 Miscellaneous

- 11.1 The Independent Engineer shall notify its programme of inspection to the Authority and to the Concessionaire, who may, in their discretion, depute their respective representatives to be present during the inspection.
- 11.2 A copy of all communications, comments, instructions, Drawings or Documents sent by the Independent Engineer to the Concessionaire pursuant to this TOR, and a copy of all the test results with comments of the Independent Engineer thereon shall be furnished by the Independent Engineer to the Authority forthwith.
- 11.3 The Independent Engineer shall obtain, and the Concessionaire shall furnish in two copies thereof, all communications and reports required to be submitted, under this Agreement,

by the Concessionaire to the Independent Engineer, whereupon the Independent Engineer shall send one of the copies to the Authority along with its comments thereon.

- 11.4 The Independent Engineer shall retain at least one copy each of all Drawings and Documents received by it, including ‘as-built’ Drawings, and keep them in its safe custody.
- 11.5 Upon completion of its assignment hereunder, the Independent Engineer shall duly classify and list all Drawings, Documents, results of tests and other relevant records, and hand them over to the Authority or such other person as the Authority may specify, and obtain written receipt thereof. Two copies of the said documents shall also be furnished in micro film form or in such other medium as may be acceptable to the Authority.

SCHEDULE –R

CASH FLOW PROJECTIONS

(To be finalised with 60 days of COD)

Cash Flow Projections							
		C1	C2				
Equity (as provided by Concessionaire) (1)							
Debt (as provided by the Concessionaire) (2)							
End of Annuity Payment Period from COD				1	2	-----	35
Annuity Amount (3)							
Less:							
Projected Operation & Routine Maintenance Cost (4)							
Projected Periodic Maintenance Cost (5)							
Debt repayment (principal) (6)							
Debt repayment (interest) (7)							
Projected Total O&M Expenses (8) = (4) + (5) +(6)+ (7)							
Projected Net Cash Flows to Equity (9) = (3)- (1)-(8)							
Internal Rate of Return for Equity– IRR of (10)							

*C1 and C2 denotes Construction Period

Note: “Discounted Value of Future Net Cash Flows to Equity” would be calculated on any day during the Operations Period, by discounting the Projected Net Cash Flows to Equity (item no. 9 in the table above) from that date till the end of the Concession Period at the rate equal to the Internal Rate of Return for Equity as calculated in the above table (item no 10).

SCHEDULE –S

(See Clause 31.1.2)

ESCROW AGREEMENT

THIS ESCROW AGREEMENT is entered into on this the day of 20....

AMONGST

- 1 LIMITED, a company incorporated under the provisions of the Companies Act, 1956 and having its registered office at (hereinafter referred to as the “**Concessionaire**” which expression shall, unless repugnant to the context or meaning thereof, include its successors, permitted assigns and substitutes);
- 2name and particulars of Lenders’ Representative and having its registered office atacting for and on behalf of the Senior Lenders as their duly authorised agent with regard to matters arising out of or in relation to this Agreement (hereinafter referred to as the “**Lenders’ Representative**” which expression shall, unless repugnant to the context or meaning thereof, include its successors and substitutes);
- 3name and particulars of the Escrow Bank and having its registered office at(hereinafter referred to as the “**Escrow Bank**” which expression shall, unless repugnant to the context or meaning thereof, include its successors and substitutes); and
- 4 Government of Tamil Nadu, Highways and Minor Ports Department, represented by its Secretary and having its office at Secretariat, Fort St. George, Chennai - 600009 (hereinafter referred to as the “**Authority**” which expression shall, unless repugnant to the context or meaning thereof, include its administrators, successors and assigns).

WHEREAS:

- (A) The Authority has entered into a Concession Agreement dated with the Concessionaire (the “**Concession Agreement**”) for Development of Chennai Outer Ring Road Phase II from Nimalicheri in NH 205 To Minjur in Thiruvottiyur – Ponneri – Panchetti (TPP) Road at Chennai, in the State of Tamil Nadu, India on Design, Build, Finance, Operate and Transfer (DBFOT) Annuity basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this Agreement.
- (B) The Senior Lenders namely _____ and _____ have agreed to finance the Project in accordance with the terms and conditions set forth in the Financing Agreements. The Senior Lenders appointed _____ as Lenders Representative as their duly authorised agent with regard to matters relating to the Financial Arrangements.

- (C) The Concession Agreement requires the Concessionaire to establish an Escrow Account, *inter alia*, on the terms and conditions stated therein.

NOW, THEREFORE, in consideration of the foregoing and the respective covenants and agreements set forth in this Agreement, the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound hereby, the Parties agree as follows:

1 DEFINITIONS AND INTERPRETATION

1.1 Definitions

In this Agreement, the following words and expressions shall, unless repugnant to the context or meaning thereof, have the meaning hereinafter respectively assigned to them:

“**Agreement**” means this Escrow Agreement and any amendment thereto made in accordance with the provisions contained herein;

“**Concession Agreement**” means the Concession Agreement referred to in Recital (A) above and annexed hereto as Annex-A, and shall include all of its Recitals and Schedules and any amendments made thereto in accordance with the provisions contained in this behalf therein;

“**Cure Period**” means the period specified in this Agreement for curing any breach or default of any provision of this Agreement by the Concessionaire, and shall commence from the date on which a notice is delivered by the Authority or the Lenders’ Representative, as the case may be, to the Concessionaire asking the latter to cure the breach or default specified in such notice;

“**Escrow Account**” means an escrow account established in terms of and under this Agreement, and shall include the Sub-Accounts;

“**Escrow Default**” shall have the meaning ascribed thereto in Clause 6.1;

“**Lenders’ Representative**” means the person referred to as the Lenders’ Representative in the foregoing Recitals;

“**Parties**” means the parties to this Agreement collectively and “**Party**” shall mean any of the Parties to this Agreement individually;

“**Payment Date**” means, in relation to any payment specified in Clause 4.1, the date(s) specified for such payment; and

“**Sub-Accounts**” means the respective Sub-Accounts of the Escrow Account, into which the monies specified in Clause 4.1 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 respective Sub Accounts and paid out therefrom on the Payment Date(s).

1.2 Interpretation

- 1.2.1 References to Lenders’ Representative shall, unless repugnant to the context or meaning thereof, mean references to the Lenders’ Representative, acting for and on behalf of Senior Lenders.
- 1.2.2 The words and expressions beginning with capital letters and defined in this Agreement shall have the meaning ascribed thereto herein, and the words and expressions used in this Agreement and not defined herein but defined in the Concession Agreement shall, unless repugnant to the context, have the meaning ascribed thereto in the Concession Agreement.
- 1.2.3 References to Clauses are, unless stated otherwise, references to Clauses of this Agreement.
- 1.2.4 The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Concession Agreement shall apply, mutatis mutandis, to this Agreement.

2 ESCROW ACCOUNT

2.1 Escrow Bank to act as trustee

- 2.1.1 The Concessionaire hereby appoints the Escrow Bank to act as trustee for the Authority, the Lenders’ Representative and the Concessionaire in connection herewith and authorises the Escrow Bank to exercise such rights, powers, authorities and discretion as are specifically delegated to the Escrow Bank by the terms hereof together with all such rights, powers, authorities and discretion as are reasonably incidental hereto, and the Escrow Bank accepts such appointment pursuant to the terms hereof.
- 2.1.2 The Concessionaire hereby declares that all rights, title and interest in and to the Escrow Account shall be vested in the Escrow Bank and held in trust for the Authority, the Lenders’ Representative and the Concessionaire, and applied in accordance with the terms of this Agreement. No person other than the Authority, the Lenders’ Representative and the Concessionaire shall have any rights hereunder as the beneficiaries of, or as third party beneficiaries under this Agreement.

2.2 Acceptance of Escrow Bank

The Escrow Bank hereby agrees to act as such and to accept all payments and other amounts to be delivered to and held by the Escrow Bank pursuant to the provisions of this Agreement. The Escrow Bank shall hold and safeguard the Escrow Account during the term of this Agreement and shall treat the amount in the Escrow Account as monies deposited by the Concessionaire, Senior Lenders or the Authority with the Escrow Bank. In performing its functions and duties under this Agreement, the Escrow Bank shall act in trust for the benefit of, and as agent for, the Authority, the Lenders' Representative and the Concessionaire or their nominees, successors or assigns, in accordance with the provisions of this Agreement.

2.3 Establishment and operation of Escrow Account

- 2.3.1 Within 30 (thirty) days from the date of this Agreement, and in any case prior to the Appointed Date, the Concessionaire shall open and establish the Escrow Account with the (name of Branch) Branch of the Escrow Bank. The Escrow Account shall be denominated in Rupees.
- 2.3.2 The Escrow Bank 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 similar customers on the balance in the said account from time to time.
- 2.3.3 The Escrow Bank and the Concessionaire shall, after consultation with the Lenders' Representative, agree on the detailed mandates, terms and conditions, and operating procedures for the Escrow Account, but in the event of any conflict or inconsistency between this Agreement and such mandates, terms and conditions, or procedures, this Agreement shall prevail.

2.4 Escrow Bank's fee

The Escrow Bank shall be entitled to receive its fee and expenses in an amount, and at such times, as may be agreed between the Escrow Bank and the Concessionaire. For the avoidance of doubt, such fee and expenses shall form part of the O&M Expenses and shall be appropriated from the Escrow Account in accordance with Clause 4.1.

2.5 Rights of the parties

The rights of the Authority, the Lenders' Representative and the Concessionaire in the monies held in the Escrow Account are set forth in their entirety in this Agreement and

the Authority, the Lenders' Representative and the Concessionaire shall have no other rights against or to the monies in the Escrow Account.

2.6 Substitution of the Concessionaire

The Parties hereto acknowledge and agree that upon substitution of the Concessionaire with the Nominated Company, pursuant to the Substitution Agreement, it shall be deemed for the purposes of this Agreement that the Nominated Company is a Party hereto and the Nominated Company 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 with the Nominated Company.

3 DEPOSITS INTO ESCROW ACCOUNT

3.1 Deposits by the Concessionaire

3.1.1 The Concessionaire agrees and undertakes that it shall deposit into and/or credit the Escrow Account with:

- (a) all monies received in relation to the Project from any source, including the Senior Lenders, lenders of Subordinated Debt and the Authority;
- (b) all funds received by the Concessionaire from its share-holders, in any manner or form;
- (c) all Annuity received by the Concessionaire;
- (d) any other revenues, rentals, deposits or capital receipts, as the case may be, from or in respect of the Project Highway; and
- (e) all proceeds received pursuant to any insurance claims.

3.1.2 The Concessionaire may at any time make deposits of its other funds into the Escrow Account, provided that the provisions of this Agreement shall apply to such deposits.

3.2 Deposits by the Authority

The Authority agrees and undertakes that, as and when due and payable, it shall deposit into and/or credit the Escrow Account with:

- (a) Annuity and any other monies disbursed by the Authority to the Concessionaire;
- (b) Deleted;
- (c) Deleted; and
- (d) Termination Payments:

Provided that, notwithstanding the provisions of Clause 4.1.1, the Authority shall be entitled to appropriate from the aforesaid amounts, any Concession Fee due and payable to it by the Concessionaire, and the balance remaining shall be deposited into the Escrow Account.

3.3 Deposits by Senior Lenders

The Lenders' Representative agrees, confirms and undertakes that the Senior Lenders shall deposit into and/or credit the Escrow Account with all disbursements made by them in relation to or in respect of the Project; provided that notwithstanding anything to the contrary contained in this Agreement, the Senior Lenders shall be entitled to make direct payments to the EPC Contractor under and in accordance with the express provisions contained in this behalf in the Financing Agreements.

3.4 Interest on deposits

The Escrow Bank agrees and undertakes that all interest accruing on the balances of the Escrow Account shall be credited to the Escrow Account; provided that the Escrow Bank shall be entitled to appropriate therefrom the fee and expenses due to it from the Concessionaire in relation to the Escrow Account and credit the balance remaining to the Escrow Account.

4 WITHDRAWALS FROM ESCROW ACCOUNT

4.1 Withdrawals during Concession Period

4.1.1 At the beginning of every month, or at such shorter intervals as the Lenders' Representative and the Concessionaire may by written instructions determine, the Escrow Bank shall withdraw amounts from the Escrow Account and appropriate them in the following order by depositing such amounts in the relevant Sub-Accounts for making due payments, and if such payments are not due in any month, then retain such monies in such Sub-Accounts and pay out therefrom on the Payment Date(s):

- (a) all taxes due and payable by the Concessionaire for and in respect of the Project Highway;
- (b) all payments relating to construction of the Project Highway, subject to and in accordance with the conditions, if any, set forth in the Financing Agreements;
- (c) payments to Independent Engineer during Construction Period.
- (d) O&M Expenses, subject to the ceiling, if any, set forth in the Financing Agreements;
- (e) O&M Expenses and other costs incurred by the Authority, provided it certifies to the Escrow Bank that it had incurred such expenses in accordance with the

provisions of the Concession Agreement and that the amounts claimed are due to it from the Concessionaire;

- (f) Concession Fee due and payable to the Authority;
- (g) monthly proportionate provision of Debt Service due in an Accounting Year;
- (h) all payments and Damages certified by the Authority as due and payable to it by the Concessionaire pursuant to the Concession Agreement;
- (i) monthly proportionate provision of debt service payments due in an Accounting Year in respect of Subordinated Debt;
- (j) any reserve requirements set forth in the Financing Agreements; and
- (k) balance, if any, in accordance with the joint instructions of the Concessionaire and the Authority.

4.1.2 No later than 60 (sixty) days prior to the commencement of each Accounting Year, the Concessionaire shall provide to the Escrow Bank, with prior written approval of the Lenders' Representative, details of the amounts likely to be required for each of the payment obligations set forth in this Clause 4.1; provided that such amounts may be subsequently modified, with prior written approval of the Lenders' Representative, if fresh information received during the course of the year makes such modification necessary.

4.2 Withdrawals upon Termination

Upon Termination of the Concession Agreement, all amounts standing to the credit of the Escrow Account shall, notwithstanding anything in this Agreement, be appropriated and dealt with in the following order:

- (a) all taxes due and payable by the Concessionaire for and in respect of the Project Highway;
- (b) 90% (ninety per cent) of Debt Due excluding Subordinated Debt;
- (c) outstanding Concession Fee;
- (d) all payments and Damages certified by the Authority as due and payable to it by the Concessionaire pursuant to the Concession Agreement, including claims in connection with or arising out of Termination;
- (e) retention and payments arising out of, or in relation to, liability for defects and deficiencies set forth in Article 39 of the Concession Agreement;
- (f) outstanding Debt Service including the balance of Debt Due;
- (g) outstanding Subordinated Debt;
- (h) incurred or accrued O&M Expenses;
- (i) any other payments required to be made under the Concession Agreement; and
- (j) balance, if any, in accordance with the joint instructions of the Concessionaire and the Authority

Provided that the disbursements specified in Sub-clause (j) of this Clause 4.2 shall be undertaken only after the Vesting Certificate has been issued by the Authority.

4.3 Application of insufficient funds

Funds in the Escrow Account shall be applied in the serial order of priority set forth in Clauses 4.1 and 4.2, as the case may be. If the funds available are not sufficient to meet all the requirements, the Escrow Bank shall apply such funds in the serial order of priority until exhaustion thereof.

4.4 Application of insurance proceeds

Notwithstanding anything in this Agreement, the proceeds from all insurance claims, except life and injury, shall be deposited into and/or credited to the Escrow Account and utilised for any necessary repair, reconstruction, reinstatement, replacement, improvement, delivery or installation of the Project Highway, and the balance remaining, if any, shall be applied in accordance with the provisions contained in this behalf in the Financing Agreements.

4.5 Withdrawals during Suspension

Notwithstanding anything to the contrary contained in this Agreement, the Authority may exercise all or any of the rights of the Concessionaire during the period of Suspension under Article 36 of the Concession Agreement. Any instructions given by the Authority to the Escrow Bank during such period shall be complied with as if such instructions were given by the Concessionaire under this Agreement and all actions of the Authority hereunder shall be deemed to have been taken for and on behalf of the Concessionaire.

5 OBLIGATIONS OF THE ESCROW BANK

5.1 Segregation of funds

Monies and other property received by the Escrow Bank under this Agreement shall, until used or applied in accordance with this Agreement, be held by the Escrow Bank in trust for the purposes for which they were received, and shall be segregated from other funds and property of the Escrow Bank.

5.2 Notification of balances

7 (seven) business days prior to each Payment Date (and for this purpose the Escrow Bank shall be entitled to rely on an affirmation by the Concessionaire and/or the Lenders' Representative as to the relevant Payment Dates), the Escrow Bank shall notify the

Lenders' Representative of the balances in the Escrow Account and Sub-Accounts as at the close of business on the immediately preceding business day.

5.3 Communications and notices

In discharge of its duties and obligations hereunder, the Escrow Bank:

- (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 document believed by it to be authentic;
- (c) shall, within 5 (five) business days after receipt, deliver a copy to the Lenders' Representative of any notice or document received by it in its capacity as the Escrow Bank from the Concessionaire or any other person hereunder or in connection herewith; and
- (d) shall, within 5 (five) business days after receipt, deliver a copy to the Concessionaire of any notice or document received by it from the Lenders' Representative in connection herewith.

5.4 No set off

The Escrow Bank 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 Account. For the avoidance of doubt, it is hereby acknowledged and agreed by the Escrow Bank that the monies and properties held by the Escrow Bank in the Escrow Account shall not be considered as part of the assets of the Escrow Bank and being trust property, shall in the case of bankruptcy or liquidation of the Escrow Bank, be wholly excluded from the assets of the Escrow Bank in such bankruptcy or liquidation.

5.5 Regulatory approvals

The Escrow Bank shall use its best efforts to procure, and thereafter maintain and comply with, all regulatory approvals required for it to establish and operate the Escrow Account. The Escrow Bank represents and warrants that it is not aware of any reason why such regulatory approvals will not ordinarily be granted to the Escrow Bank.

6 ESCROW DEFAULT

6.1 Escrow Default

- 6.1.1 Following events shall constitute an event of default by the Concessionaire (an “Escrow Default”) unless such event of default has occurred as a result of Force Majeure or any act or omission of the Authority or the Lenders’ Representative:
- (a) the Concessionaire commits breach of this Agreement by failing to deposit any receipts into the Escrow Account as provided herein and fails to cure such breach by depositing the same into the Escrow Account within a Cure Period of 5 (five) business days;
 - (b) the Concessionaire causes the Escrow Bank to transfer funds to any account of the Concessionaire in breach of the terms of this Agreement and fails to cure such breach by depositing the relevant funds into the Escrow Account or any Sub-Account in which such transfer should have been made, within a Cure Period of 5 (five) business days; or
 - (c) the Concessionaire commits or causes any other breach of the provisions of this Agreement and fails to cure the same within a Cure Period of 5 (five) business days.
- 6.1.2 Upon occurrence of an Escrow Default, the consequences thereof shall be dealt with under and in accordance with the provisions of the Concession Agreement.

7 TERMINATION OF ESCROW AGREEMENT

7.1 Duration of the Escrow Agreement

This Agreement shall remain in full force and effect so long as any sum remains to be advanced or is outstanding from the Concessionaire in respect of the debt, guarantee or financial assistance received by it from the Senior Lenders, or any of its obligations to the Authority remain to be discharged, unless terminated earlier by consent of all the Parties or otherwise in accordance with the provisions of this Agreement.

7.2 Substitution of Escrow Bank

The Concessionaire may, by not less than 45 (forty five) days prior notice to the Escrow Bank, the Authority and the Lenders’ Representative, terminate this Agreement and appoint a new Escrow Bank, provided that the new Escrow Bank 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 Bank. The termination of this Agreement

shall take effect only upon coming into force of an Escrow Agreement with the substitute Escrow Bank.

7.3 Closure of Escrow Account

The Escrow Bank shall, at the request of the Concessionaire and the Lenders' Representative made on or after the payment by the Concessionaire of all outstanding amounts under the Concession Agreement and the Financing Agreements including the payments specified in Clause 4.2, and upon confirmation of receipt of such payments, close the Escrow Account and Sub-Accounts and pay any amount standing to the credit thereof to the Concessionaire. Upon closure of the Escrow Account hereunder, the Escrow Agreement shall be deemed to be terminated.

8 SUPPLEMENTARY ESCROW AGREEMENT

8.1 Supplementary escrow agreement

The Lenders' Representative and the Concessionaire shall be entitled to enter into a supplementary escrow agreement with the Escrow Bank providing, inter alia, for detailed procedures and documentation for withdrawals from Sub-Accounts pursuant to Clause 4.1.1 and for matters not covered under this Agreement such as the rights and obligations of Senior Lenders and lenders of Subordinated Debt, investment of surplus funds, restrictions on withdrawals by the Concessionaire in the event of breach of this Agreement or upon occurrence of an Escrow Default, procedures relating to operation of the Escrow Account and withdrawal therefrom, reporting requirements and any matters incidental thereto; provided that such supplementary escrow agreement shall not contain any provision which is inconsistent with this Agreement and in the event of any conflict or inconsistency between provisions of this Agreement and such supplementary escrow agreement, the provisions of this Agreement shall prevail.

9 INDEMNITY

9.1 General indemnity

- 9.1.1 The Concessionaire will indemnify, defend and hold the Authority, Escrow Bank and the Senior Lenders, acting through the Lenders' Representative, harmless against any and all proceedings, actions and third party claims for any loss, damage, cost and expense 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 Applicable Laws and Applicable Permits.

- 9.1.2 The Authority will indemnify, defend and hold the Concessionaire harmless against any and all proceedings, actions and third party claims for any loss, damage, cost and expense arising out of failure of the Authority to fulfil any of its obligations under this Agreement materially and adversely affecting the performance of the Concessionaire's obligations under the Concession Agreement or this Agreement other than any loss, damage, cost and expense arising out of acts done in discharge of their lawful functions by the Authority, its officers, servants and agents.
- 9.1.3 The Escrow Bank will indemnify, defend and hold the Concessionaire harmless against any and all proceedings, actions and third party claims for any loss, damage, cost and expense arising out of failure of the Escrow Bank to fulfil its obligations under this Agreement materially and 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 the Escrow Bank, its officers, servants and agents.

9.2 Notice and contest of claims

In the event that any Party hereto receives a claim from a third party in respect of which it is entitled to the benefit of an indemnity under Clause 9.1 or in respect of which it is entitled to reimbursement (the “**Indemnified Party**”), it shall notify the other Party responsible for indemnifying such claim hereunder (the “**Indemnifying Party**”) within 15 (fifteen) days of receipt of the claim and shall not settle or pay the claim without the prior approval of the Indemnifying Party, which approval shall not be unreasonably withheld or delayed. 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 Indemnifying Party may reasonably require.

10 DISPUTE RESOLUTION

10.1 Dispute resolution

- 10.1.1 Any dispute, difference or claim arising out of or in connection with this Agreement, which is not resolved amicably, shall be decided finally by reference to arbitration to a Board of Arbitrators comprising one nominee of each Party to the dispute, and where the number of such nominees is an even number, the nominees shall elect another person to such Board. Such arbitration shall be held in accordance with the Rules of Arbitration of the International Centre for Alternative Dispute Resolution, New Delhi (the “Rules”) or such other rules as may be mutually agreed by the Parties, and shall be subject to the provisions of the Arbitration and Conciliation Act, 1996.

10.1.2 The Arbitrators shall issue a reasoned award and such award shall be final and binding on the Parties. The venue of arbitration shall be Chennai and the language of arbitration shall be English.

11 MISCELLANEOUS PROVISIONS

11.1 Governing law and jurisdiction

This Agreement shall be construed and interpreted in accordance with and governed by the laws of India, and the Courts at Chennai shall have jurisdiction over all matters arising out of or relating to this Agreement.

11.2 Waiver of sovereign immunity

The Authority unconditionally and irrevocably:

- (a) agrees that the execution, delivery and performance by it of this Agreement constitute commercial acts done and performed for commercial purpose;
- (b) agrees that, should any proceedings be brought against it or its assets, property or revenues in any jurisdiction in relation to this Agreement or any transaction contemplated by this Agreement, no immunity (whether by reason of sovereignty or otherwise) from such proceedings shall be claimed by or on behalf of the Authority with respect to its assets;
- (c) waives any right of immunity which it or its assets, property or revenues now has, may acquire in the future or which may be attributed to it in any jurisdiction; and
- (d) consents generally in respect of the enforcement of any judgement or award against it in any such proceedings to the giving of any relief or the issue of any process in any jurisdiction in connection with such proceedings (including the making, enforcement or execution against it or in respect of any assets, property or revenues whatsoever irrespective of their use or intended use of any order or judgement that may be made or given in connection therewith).

11.3 Priority of agreements

In the event of any conflict between the Concession Agreement and this Agreement, the provisions contained in the Concession Agreement shall prevail over this Agreement.

11.4 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 authorised representatives of the Parties.

11.5 Waiver

11.5.1 Waiver by any Party of a default by another Party in the observance and performance of any provision of or obligations under this Agreement:

- (a) shall not operate or be construed as a waiver of any other or subsequent default hereof or of other provisions of or obligations under this Agreement;
- (b) shall not be effective unless it is in writing and executed by a duly authorised representative of the Parties; and
- (c) shall not affect the validity or enforceability of this Agreement in any manner.

11.5.2 Neither the failure by any Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or any obligation thereunder nor time or other indulgence granted by any Party to another Party shall be treated or deemed as waiver of such breach or acceptance of any variation or the relinquishment of any such right hereunder.

11.6 No third party beneficiaries

This Agreement is solely for the benefit of the Parties and no other person or entity shall have any rights hereunder.

11.7 Survival

11.7.1 Termination of this Agreement:

- (a) shall not relieve the Parties of any obligations hereunder which expressly or by implication survive termination hereof; and
- (b) except as otherwise provided in any provision of this Agreement expressly limiting the liability of either Party, shall not relieve either Party of any obligations or liabilities for loss or damage to the other Party arising out of, or caused by, acts or omissions of such Party prior to the effectiveness of such termination or arising out of such termination.

11.7.2 All obligations surviving the cancellation, expiration or termination of this Agreement shall only survive for a period of 3 (three) years following the date of such termination or expiry of this Agreement.

11.8 Severability

If for any reason whatever any provision of this Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties will negotiate in good faith with a view to agreeing to one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable to such invalid, illegal or unenforceable provision. Failure to agree upon any such provisions shall not be subject to dispute resolution under Clause 10.1 of this Agreement or otherwise.

11.9 Successors and assigns

This Agreement shall be binding on and shall inure to the benefit of the Parties and their respective successors and permitted assigns.

11.10 Notices

All notices or other communications to be given or made under this Agreement shall be in writing and shall either be delivered personally or sent by courier or registered post with an additional copy to be sent by facsimile or e-mail. The address for service of each Party, its facsimile number or e-mail are set out under its name on the signing pages hereto. A notice shall be effective upon actual receipt thereof, save that where it is received after 5.30 (five thirty) p.m. on a business day, or on a day that is not a business day, the 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 or e-mail shall promptly deliver a copy thereof personally, or send it by courier or registered post to the addressee of such notice or communication. It is hereby agreed and acknowledged that any Party may by notice change the address 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.

11.11 Language

All notices, certificates, correspondence and proceedings under or in connection with this Agreement shall be in English.

11.12 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 such authorised representative by similar notice.

11.13 Original Document

This Agreement may be executed in four counterparts, each of which when executed and delivered shall constitute an original of this Agreement.

IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTEN.

THE COMMON SEAL OF	SIGNED,	SEALED
CONCESSIONAIRE has been affixed pursuant	AND DELIVERED	
to the resolution passed by the Board of	For and on behalf of	
Directors of the Concessionaire at its meeting	SENIOR LENDERS by the	
held on the day of 20..... hereunto	Lenders' Representative:	
affixed in the presence of, Director,		
who has signed these presents in token thereof		(Signature)
and, Company Secretary / Authorised		(Name)
Officer who has countersigned the same in		(Designation)
token thereof ^{\$} :		(Address)

SIGNED, SEALED
AND

DELIVERED

For and on behalf of
ESCROW BANK by:

(Signature)

SIGNED, SEALED AND

DELIVERED

For and on behalf of
GOVERNMENT OF TAMIL
NADU, HIGHWAYS AND
MINOR PORTS DEPARTMENT

(Signature)

^{\$} To be affixed in accordance with the articles of association of the Concessionaire.

(Name)
(Designation)
(Address)
(Fax No.)
(e-mail address)

(Name)
(Designation)
(Address)
(Fax No.)
(e-mail address)

In the presence of:

1.

2.

SCHEDULE –T

(See Clause 33.2.1)

PANEL OF CHARTERED ACCOUNTANTS

1 Panel of Chartered Accountants

Pursuant to the provisions of Clause 33.2.1 of the Agreement, the Authority and the Concessionaire shall prepare a mutually agreed panel of 10 (ten) reputable firms of Chartered Accountants having their registered offices in India (the “**Panel of Chartered Accountants**”). The criteria for preparing such Panel and the procedure to be adopted in this behalf shall be as set forth in this Schedule-T.

2 Invitation for empanelment

2.1 The Authority shall invite offers from all reputable firms of Chartered Accountants who fulfil the following eligibility criteria, namely:

- (a) the firm should have conducted statutory audit of the annual accounts of at least one hundred companies registered under the Companies Act, 1956, of which at least ten should have been public sector undertakings;
- (b) the firm should have at least 5 (five) practising Chartered Accountants on its rolls, each with a minimum experience of ten years in the profession;
- (c) the firm or any of its partners should not have been disqualified or black-listed by the Comptroller and Auditor General of India or the Authority; and
- (d) the firm should have an office in the State or in an adjacent State with at least 2 (two) practising Chartered Accountants on its rolls in such State.

2.2 Interested firms meeting the eligibility criteria shall be required to submit a statement of their capability including the bio-data of all the practising Chartered Accountants on its rolls. In particular, each firm shall be required to furnish year- wise information relating to the names of all the companies with an annual turnover exceeding Rs. 100,00,00,000 (Rs. one hundred crore) whose annual accounts were audited by such firm in any of the preceding 5 (five) Accounting Years.

3 Evaluation and selection

3.1 The information furnished by each firm shall be scrutinised and evaluated by the Authority and 1 (one) point shall be awarded for each annual audit of the companies specified in Paragraph 2.2 above. (For the avoidance of doubt, a firm which has conducted audit of the annual accounts of any such company for five years shall be awarded five points).

- 3.2 The Authority shall prepare a list of all the eligible firms along with the points scored by each such firm and 10 (ten) firms scoring the highest points shall be identified and included in the draft Panel of Chartered Accountants.

4 Consultation with the Concessionaire

The Authority shall convey the aforesaid panel of firms to the Concessionaire for scrutiny and comments, if any. The Concessionaire shall be entitled to scrutinise the relevant records of the Authority to ascertain whether the selection of firms has been undertaken in accordance with the prescribed procedure and it shall send its comments, if any, to the Authority within 15 (fifteen) days of receiving the aforesaid panel.

5 Mutually agreed panel

- 5.1 The Authority shall, after considering all relevant factors including the comments, if any, of the Concessionaire, finalise and constitute a panel of 10 (ten) firms which shall be deemed to be the mutually agreed Panel of Chartered Accountants.
- 5.2 After completion of every five years from the date of preparing the mutually agreed Panel of Chartered Accountants, or such earlier period as may be agreed between the Authority and the Concessionaire, a new panel shall be prepared in accordance with the provisions of this Schedule - T.

SCHEDULE –U

(See Clause 38.4)

VESTING CERTIFICATE

- 1 Government of Tamil Nadu, Highways Department (the “**Authority**”) refers to the Concession Agreement dated (the “**Agreement**”) entered into between the Authority and (the “**Concessionaire**”) for Development of Chennai Outer Ring Road Phase II from Nimilicheri in NH 205 To Minjur in Thiruvottiyur – Ponneri – Panchetti (TPP) Road at Chennai, in the State of Tamil Nadu, India (the “**Project Highway**”) on design, build, finance, operate and transfer (“**DBFOT**”) Annuity basis.
- 2 The Authority hereby acknowledges compliance and fulfilment by the Concessionaire of the Divestment Requirements set forth in Clause 38.1 of the Agreement on the basis that upon issue of this Vesting Certificate, the Authority 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 the Authority, free from any encumbrances, charges and liens whatsoever.
- 3 Notwithstanding anything to the contrary contained hereinabove, it shall be a condition of this Vesting Certificate that nothing contained herein shall be construed or interpreted as waiving the obligation of the Concessionaire to rectify and remedy any defect or deficiency in any of the Divestment Requirements and/or relieving the Concessionaire in any manner of the same.

Signed this day of, 20..... at Chennai.

AGREED, ACCEPTED AND SIGNED

For and on behalf of

CONCESSIONAIRE

by:

SIGNED, SEALED AND DELIVERED

For and on behalf of

GOVERNMENT OF TAMIL NADU,
HIGHWAYS AND MINOR PORTS
DEPARTMENT by:

(Signature)

(Name)

(Designation)

(Address)

(Signature)

(Name)

(Designation)

(Address)

In the presence of:

1.

2.

SCHEDULE –V

(See Clause 40.3.1)

SUBSTITUTION AGREEMENT

THIS SUBSTITUTION AGREEMENT is entered into on this the day of 20....

AMONGST

- 1 Government of Tamil Nadu, Highways Department, represented by its Principal Secretary and having its principal office at Secretariat, Fort St. George, Chennai – 600 009 (hereinafter referred to as the “Authority” which expression shall unless repugnant to the context or meaning thereof include its administrators, successors and assigns);
- 2 LIMITED, a company incorporated under the provisions of the Companies Act, 1956 and having its registered office at, (hereinafter referred to as the “**Concessionaire**” which expression shall unless repugnant to the context or meaning thereof include its successors and permitted assigns and substitutes);
- 3name and particulars of Lenders’ Representative and having its registered office at, acting for and on behalf of the Senior Lenders as their duly authorised agent with regard to matters arising out of or in relation to this Agreement (hereinafter referred to as the “**Lenders’ Representative**”, which expression shall unless repugnant to the context or meaning thereof include its successors and substitutes);

WHEREAS:

- (A) The Authority has entered into a Concession Agreement dated with the Concessionaire (the “**Concession Agreement**”) for Development of Chennai Outer Ring Road Phase II from Nimilicheri in NH 205 To Minjur in Thiruvottiyur – Ponneri – Panchetti (TPP) Road at Chennai, in the State of Tamil Nadu, India (the “**Project Highway**”) on design, build, finance, operate and transfer basis (DBFOT) on Annuity model, and a copy of which is annexed hereto and marked as Annex-A to form part of this Agreement.
- (B) Senior Lenders have agreed to finance the Project in accordance with the terms and conditions set forth in the Financing Agreements.
- (C) Senior Lenders have requested the Authority to enter into this Substitution Agreement for securing their interests through assignment, transfer and substitution of the Concession to

a Nominated Company in accordance with the provisions of this Agreement and the Concession Agreement.

- (D) In order to enable implementation of the Project including its financing, construction, operation and maintenance, the Authority has agreed and undertaken to transfer and assign the Concession to a Nominated Company in accordance with the terms and conditions set forth in this Agreement and the Concession Agreement.

NOW, THEREFORE, in consideration of the foregoing and the respective covenants and agreements set forth in this Agreement, the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound hereby, the Parties agree as follows:

1 DEFINITIONS AND INTERPRETATION

1.1 Definitions

In this Substitution Agreement, the following words and expressions shall, unless repugnant to the context or meaning thereof, have the meaning hereinafter respectively assigned to them:

“Agreement” means this Substitution Agreement and any amendment thereto made in accordance with the provisions contained in this Agreement;

“Financial Default” means occurrence of a material breach of the terms and conditions of the Financing Agreements or a continuous default in Debt Service by the Concessionaire for a minimum period of 3 (three) months;

“Lenders’ Representative” means the person referred to as the Lenders’ Representative in the foregoing Recitals;

“Nominated Company” means a company, incorporated under the provisions of the Companies Act, 1956, selected by the Lenders’ Representative, on behalf of Senior Lenders, and proposed to the Authority for assignment/transfer of the Concession as provided in this Agreement;

“Notice of Financial Default” shall have the meaning ascribed thereto in Clause 3.2.1; and

“Parties” means the parties to this Agreement collectively and “Party” shall mean any of the Parties to this Agreement individually.

1.2 Interpretation

- 1.2.1 References to Lenders' Representative shall, unless repugnant to the context or meaning thereof, mean references to the Lenders' Representative, acting for and on behalf of Senior Lenders.
- 1.2.2 References to Clauses are, unless stated otherwise, references to Clauses of this Agreement.
- 1.2.3 The words and expressions beginning with capital letters and defined in this Agreement shall have the meaning ascribed thereto herein, and the words and expressions used in this Agreement and not defined herein but defined in the Concession Agreement shall, unless repugnant to the context, have the meaning ascribed thereto in the Concession Agreement.
- 1.2.4 The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Concession Agreement shall apply, mutatis mutandis, to this Agreement.

2 ASSIGNMENT

2.1 Assignment of rights and title

The Concessionaire hereby agrees to assign the rights, title and interest in the Concession to, and in favour of, the Lenders' Representative pursuant to and in accordance with the provisions of this Agreement and the Concession Agreement by way of security in respect of financing by the Senior Lenders under the Financing Agreements.

3 SUBSTITUTION OF THE CONCESSIONAIRE

3.1 Rights of substitution

- 3.1.1 Pursuant to the rights, title and interest assigned under Clause 2.1, the Lenders' Representative shall be entitled to substitute the Concessionaire by a Nominated Company under and in accordance with the provisions of this Agreement and the Concession Agreement.
- 3.1.2 The Authority hereby agrees to substitute the Concessionaire by endorsement on the Concession Agreement in favour of the Nominated Company selected by the Lenders' Representative in accordance with this Agreement. (For the avoidance of doubt, the Senior Lenders or the Lenders' Representative shall not be entitled to operate and maintain the Project Highway as Concessionaire either individually or collectively).

3.2 Substitution upon occurrence of Financial Default

- 3.2.1 Upon occurrence of a Financial Default, the Lenders' Representative may issue a notice to the Concessionaire (the “**Notice of Financial Default**”) along with particulars thereof, and send a copy to the Authority for its information and record. A Notice of Financial Default under this Clause 3 shall be conclusive evidence of such Financial Default and it shall be final and binding upon the Concessionaire for the purposes of this Agreement.
- 3.2.2 Upon issue of a Notice of Financial Default hereunder, the Lenders' Representative may, without prejudice to any of its rights or remedies under this Agreement or the Financing Agreements, substitute the Concessionaire by a Nominated Company in accordance with the provisions of this Agreement.
- 3.2.3 At any time after the Lenders' Representative has issued a Notice of Financial Default, it may by notice require the Authority to suspend all the rights of the Concessionaire and undertake the operation and maintenance of the Project Highway in accordance with the provisions of Article 36 of the Concession Agreement, and upon receipt of such notice, the Authority shall undertake Suspension under and in accordance with the provisions of the Concession Agreement. The aforesaid Suspension shall be revoked upon substitution of the Concessionaire by a Nominated Company, and in the event such substitution is not completed within 180 (one hundred and eighty) days from the date of such Suspension, the Authority may terminate the Concession Agreement forthwith by issuing a Termination Notice in accordance with the provisions of the Concession Agreement; provided that upon written request from the Lenders' Representative and the Concessionaire, the Authority may extend the aforesaid period of 180 (one hundred and eighty) days by a period not exceeding 90 (ninety) days. For the avoidance of doubt, the Authority expressly agrees and undertakes to terminate the Concession Agreement forthwith, upon receipt of a written request from the Lenders' Representative at any time after 240 (two hundred and forty) days from the date of Suspension hereunder.

3.3 Substitution upon occurrence of Concessionaire Default

- 3.3.1 Upon occurrence of a Concessionaire Default, the Authority shall by a notice inform the Lenders' Representative of its intention to issue a Termination Notice and grant 15 (fifteen) days time to the Lenders' Representative to make a representation, stating the intention to substitute the Concessionaire by a Nominated Company.
- 3.3.2 In the event that the Lenders' Representative makes a representation to the Authority within the period of 15 (fifteen) days specified in Clause 3.3.1, stating that it intends to substitute the Concessionaire by a Nominated Company, the Lenders' Representative shall be entitled to undertake and complete the substitution of the Concessionaire by a Nominated Company in accordance with the provisions of this Agreement within a period

of 180 (one hundred and eighty) days from the date of such representation, and the Authority shall either withhold Termination or undertake Suspension for the aforesaid period of 180 (one hundred and eighty) days; provided that upon written request from the Lenders' Representative and the Concessionaire, the Authority shall extend the aforesaid period of 180 (one hundred and eighty) days by a period not exceeding 90 (ninety) days.

3.4 Procedure for substitution

- 3.4.1 The Authority and the Concessionaire hereby agree that on or after the date of Notice of Financial Default or the date of representation to the Authority under Clause 3.3.2, as the case may be, the Lenders' Representative may, without prejudice to any of the other rights or remedies of the Senior Lenders, invite, negotiate and procure offers, either by private negotiations or public auction or tenders for the take over and transfer of the Project Highway including the Concession to the Nominated Company upon such Nominated Company's assumption of the liabilities and obligations of the Concessionaire towards the Authority under the Concession Agreement and towards the Senior Lenders under the Financing Agreements.
- 3.4.2 To be eligible for substitution in place of the Concessionaire, the Nominated Company shall be required to fulfil the eligibility criteria that were laid down by the Authority for shortlisting the bidders for award of the Concession; provided that the Lenders' Representative may represent to the Authority that all or any of such criteria may be waived in the interest of the Project, and if the Authority determines that such waiver shall not have any material adverse effect on the Project, it may waive all or any of such eligibility criteria.
- 3.4.3 Upon selection of a Nominated Company, the Lenders' Representative shall request the Authority to:
- (a) accede to transfer to the Nominated Company the right to construct, operate and maintain the Project Highway in accordance with the provisions of the Concession Agreement;
 - (b) endorse and transfer the Concession to the Nominated Company, on the same terms and conditions, for the residual Concession Period; and
 - (c) enter into a Substitution Agreement with the Lenders' Representative and the Nominated Company on the same terms as are contained in this Agreement.
- 3.4.4 If the Authority has any objection to the transfer of Concession in favour of the Nominated Company in accordance with this Agreement, it shall within 15 (fifteen) days from the date of proposal made by the Lenders' Representative, give a reasoned order

after hearing the Lenders' Representative. If no such objection is raised by the Authority, the Nominated Company shall be deemed to have been accepted. The Authority thereupon shall transfer and endorse the Concession within 15 (fifteen) days of its acceptance/deemed acceptance of the Nominated Company; provided that in the event of such objection by the Authority, the Lenders' Representative may propose another Nominated Company whereupon the procedure set forth in this Clause 3.4 shall be followed for substitution of such Nominated Company in place of the Concessionaire.

3.5 Selection to be binding

The decision of the Lenders' Representative and the Authority in selection of the Nominated Company shall be final and binding on the Concessionaire. The Concessionaire irrevocably agrees and waives any right to challenge the actions of the Lenders' Representative or the Senior Lenders or the Authority taken pursuant to this Agreement including the transfer/assignment of the Concession in favour of the Nominated Company. The Concessionaire agrees and confirms that it shall not have any right to seek revaluation of assets of the Project or the Concessionaire's shares. It is hereby acknowledged by the Parties that the rights of the Lenders' Representative are irrevocable and shall not be contested in any proceedings before any court or Authority and the Concessionaire shall have no right or remedy to prevent, obstruct or restrain the Authority or the Lenders' Representative from effecting or causing the transfer by substitution and endorsement of the Concession as requested by the Lenders' Representative.

4 PROJECT AGREEMENTS

4.1 Substitution of Nominated Company in Project Agreements

The Concessionaire shall ensure and procure that each Project Agreement contains provisions that entitle the Nominated Company to step into such Project Agreement, in its discretion, in place and substitution of the Concessionaire in the event of such Nominated Company's assumption of the liabilities and obligations of the Concessionaire under the Concession Agreement.

5 TERMINATION OF CONCESSION AGREEMENT

5.1 Termination upon occurrence of Financial Default

At any time after issue of a Notice of Financial Default, the Lenders' Representative may by a notice in writing require the Authority to terminate the Concession Agreement forthwith, and upon receipt of such notice, the Authority shall undertake Termination under and in accordance with the provisions of Article 37 of the Concession Agreement.

5.2 Termination when no Nominated Company is selected

In the event that no Nominated Company acceptable to the Authority is selected and recommended by the Lenders' Representative within the period of 180 (one hundred and eighty) days or any extension thereof as set forth in Clause 3.3.2, the Authority may terminate the Concession Agreement forthwith in accordance with the provisions thereof.

5.3 Realisation of Debt Due

The Authority and the Concessionaire hereby acknowledge and agree that, without prejudice to their any other right or remedy, the Lenders' Representative is entitled to receive from the Concessionaire, without any further reference to or consent of the Concessionaire, the Debt Due upon Termination of the Concession Agreement. For realisation of the Debt Due, the Lenders' Representative shall be entitled to make its claim from the Escrow Account in accordance with the provisions of the Concession Agreement and the Escrow Agreement.

6 DURATION OF THE AGREEMENT

6.1 Duration of the Agreement

This Agreement shall come into force from the date hereof and shall expire at the earliest to occur of the following events:

- (a) Termination of the Agreement; or
- (b) no sum remains to be advanced, and no sum is outstanding to the Senior Lenders, under the Financing Agreements.

7 INDEMNITY

7.1 General indemnity

7.1.1 The Concessionaire will indemnify, defend and hold the Authority and the Lenders' Representative harmless against any and all proceedings, actions and third party claims for any loss, damage, cost and expense of whatever kind and nature 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 Applicable Laws and Applicable Permits.

7.1.2 The Authority will indemnify, defend and hold the Concessionaire harmless against any and all proceedings, actions and third party claims for any loss, damage, cost and expense arising out of failure of the Authority to fulfil any of its obligations under this Agreement,

materially and adversely affecting the performance of the Concessionaire's obligations under the Concession Agreement or this Agreement, other than any loss, damage, cost and expense, arising out of acts done in discharge of their lawful functions by the Authority, its officers, servants and agents.

- 7.1.3 The Lenders' Representative will indemnify, defend and hold the Concessionaire harmless against any and all proceedings, actions and third party claims for any loss, damage, cost and expense arising out of failure of the Lenders' Representative to fulfil its obligations under this Agreement, materially and 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 the Lenders' Representative, its officers, servants and agents.

7.2 Notice and contest of claims

In the event that any Party hereto receives a claim from a third party in respect of which it is entitled to the benefit of an indemnity under Clause 7.1 or in respect of which it is entitled to reimbursement (the “**Indemnified Party**”), it shall notify the other Party responsible for indemnifying such claim hereunder (the “**Indemnifying Party**”) within 15 (fifteen) days of receipt of the claim and shall not settle or pay the claim without the prior approval of the Indemnifying Party, such approval not to be unreasonably withheld or delayed. 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 Indemnifying Party may reasonably require.

8 DISPUTE RESOLUTION

8.1 Dispute resolution

- 8.1.1 Any dispute, difference or claim arising out of or in connection with this Agreement which is not resolved amicably shall be decided by reference to arbitration to a Board of Arbitrators comprising one nominee each of the Authority, Concessionaire and the Lenders' Representative. Such arbitration shall be held in accordance with the Rules of Arbitration of the International Centre for Alternative Dispute Resolution, New Delhi (the “Rules”) or such other rules as may be mutually agreed by the Parties, and shall be subject to provisions of the Arbitration and Conciliation Act, 1996.
- 8.1.2 The Arbitrators shall issue a reasoned award and such award shall be final and binding on the Parties. The venue of arbitration shall be Chennai and the language of arbitration shall be English.

9 MISCELLANEOUS PROVISIONS

9.1 Governing law and jurisdiction

This Agreement shall be construed and interpreted in accordance with and governed by the laws of India, and the Courts at Chennai shall have jurisdiction over all matters arising out of or relating to this Agreement.

9.2 Waiver of sovereign immunity

The Authority unconditionally and irrevocably:

- (a) agrees that the execution, delivery and performance by it of this Agreement constitute commercial acts done and performed for commercial purpose;
- (b) agrees that, should any proceedings be brought against it or its assets, property or revenues in any jurisdiction in relation to this Agreement or any transaction contemplated by this Agreement, no immunity (whether by reason of sovereignty or otherwise) from such proceedings shall be claimed by or on behalf of the Authority with respect to its assets;
- (c) waives any right of immunity which it or its assets, property or revenues now has, may acquire in the future or which may be attributed to it in any jurisdiction; and
- (d) consents generally in respect of the enforcement of any judgement or award against it in any such proceedings to the giving of any relief or the issue of any process in any jurisdiction in connection with such proceedings (including the making, enforcement or execution against it or in respect of any assets, property or revenues whatsoever irrespective of their use or intended use of any order or judgement that may be made or given in connection therewith).

9.3 Priority of agreements

In the event of any conflict between the Concession Agreement and this Agreement, the provisions contained in the Concession Agreement shall prevail over this Agreement.

9.4 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 authorised representatives of the Parties.

9.5 Waiver

9.5.1 Waiver by any Party of a default by another Party in the observance and performance of any provision of or obligations under this Agreement:

- (a) shall not operate or be construed as a waiver of any other or subsequent default hereof or of other provisions of or obligations under this Agreement;
- (b) shall not be effective unless it is in writing and executed by a duly authorised representative of the Party; and
- (c) shall not affect the validity or enforceability of this Agreement in any manner.

9.5.2 Neither the failure by either Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or any obligation thereunder nor time or other indulgence granted by a Party to another Party shall be treated or deemed as waiver of such breach or acceptance of any variation or the relinquishment of any such right hereunder.

9.6 No third party beneficiaries

This Agreement is solely for the benefit of the Parties and no other person or entity shall have any rights hereunder.

9.7 Survival

9.7.1 Termination of this Agreement:

- (a) shall not relieve the Parties of any obligations hereunder which expressly or by implication survive termination hereof; and
- (b) except as otherwise provided in any provision of this Agreement expressly limiting the liability of either Party, shall not relieve either Party of any obligations or liabilities for loss or damage to the other Party arising out of or caused by acts or omissions of such Party prior to the effectiveness of such termination or arising out of such termination.

9.7.2 All obligations surviving the cancellation, expiration or termination of this Agreement shall only survive for a period of 3 (three) years following the date of such termination or expiry of this Agreement.

9.8 Severability

If for any reason whatever any provision of this Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other

instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties will negotiate in good faith with a view to agreeing to one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable to such invalid, illegal or unenforceable provision. Failure to agree upon any such provisions shall not be subject to dispute resolution under Clause 8 of this Agreement or otherwise.

9.9 Successors and assigns

This Agreement shall be binding on and shall inure to the benefit of the Parties and their respective successors and permitted assigns.

9.10 Notices

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 or registered post with an additional copy to be sent by facsimile or e-mail. The address for service of each Party, its facsimile number and e-mail address are set out under its name on the signing pages hereto. A notice shall be effective upon actual receipt thereof, save that where it is received after 5.30 (five thirty) p.m. on any day, or on a day that is a public holiday, the notice shall be deemed to be received on the first working day following the date of actual receipt. Without prejudice to the foregoing, a Party giving or making a notice or communication by facsimile or e-mail shall promptly deliver a copy thereof personally, or send it by courier or registered post to the addressee of such notice or communication. It is hereby agreed and acknowledged that any Party may by notice change the address 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.

9.11 Language

All notices, certificates, correspondence and proceedings under or in connection with this Agreement shall be in English.

9.12 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 such authorised representative by similar notice.

9.13 Original Document

This Agreement may be executed in three counterparts, each of which when executed and delivered shall constitute an original of this Agreement.

IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTEN.

THE COMMON SEAL OF CONCESSIONAIRE has been affixed pursuant to the resolution passed by the Board of Directors of the Concessionaire at its meeting held on the day of 20..... hereunto affixed in the presence of, Director, who has signed these presents in token thereof and, Company Secretary / Authorised Officer who has countersigned the same in token thereof[§]:

SIGNED, SEALED AND DELIVERED

For and on behalf of

GOVERNMENT OF TAMIL NADU, HIGHWAYS AND MINOR PORTS DEPARTMENT by:

(Signature)

(Name)

(Designation)

(Address)

SIGNED, SEALED AND DELIVERED

For and on behalf of

SENIOR LENDERS by the Lenders' Representative:

(Signature)

(Name)

(Designation)

(Address)

(Fax)

(e-mail address)

In the presence of:

1.

2.

[§] To be affixed in accordance with the articles of association of the Concessionaire.