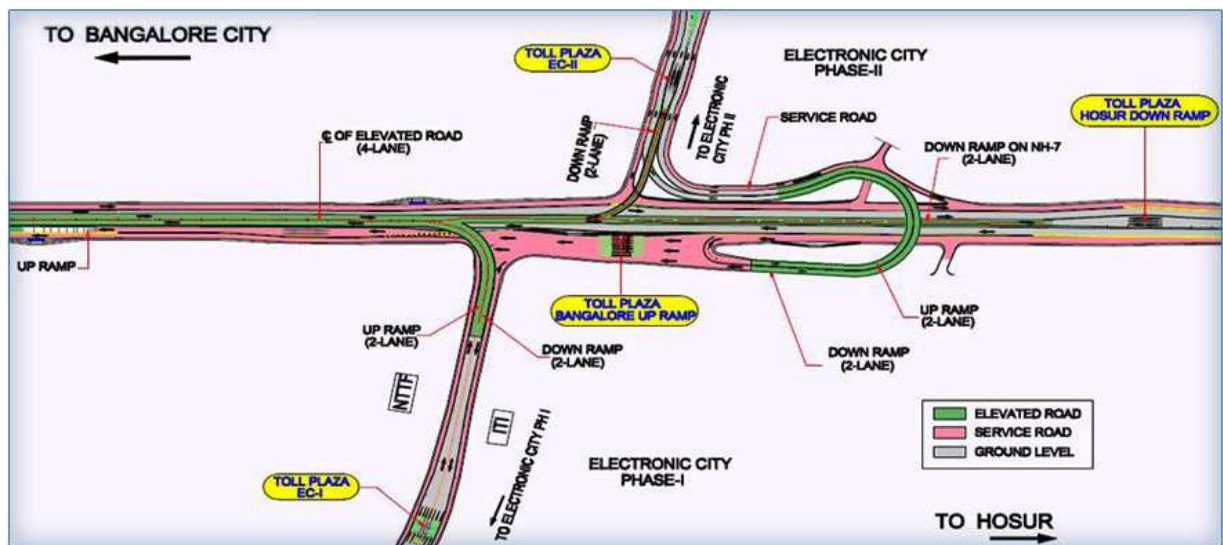




Case Study: Bangalore Elevated Tollway Limited, Bangalore

Project Brief:

Bangalore Elevated Tollway Limited (BETL) is the Special Purpose Vehicle (SPV) created to undertake the Construction, operation, maintenance of the elevated highway from Silk board junction (Bengaluru) to Electronic city (Outer Bengaluru) and the operation and maintenance the at-grade section from Silk Board Junction to Attibele junction (near Hosur).



The project entails Improvements at ground level including construction of underpass and construction of elevated highway in Electronic City section and HTMS in Km 8.765 and Km 33.130 of NH-7. The elevated section runs close to 10 km and is intended to relieve the intensity of traffic plying on the stretch. This was one of the longest elevated corridors in India.





Project Credits:

Client	NHAI
Project Type	Express Way
Length of Elevated Road	11.5 Km Length
Location	Bangalore
Consultant	Renardet S.A.
Contractor	SOMA / MAYTAS / NCC
Lighting	Wipro Ltd

Lighting for Elevated Highway:

The Elevated Highway consists of different areas to be illuminated as per NHAI requirements. The areas to be illuminated are –

- 1. Approach Road lighting**
- 2. Approach Ramp lighting**
- 3. Truck / Bus Lay bay lighting**
- 4. Lighting for Various descending Ramps at the end of elevated road**
- 5. Main elevated road lighting**
- 6. Under deck lighting of elevated roads**
- 7. Underpass Lighting**
- 8. Service Road Lighting**

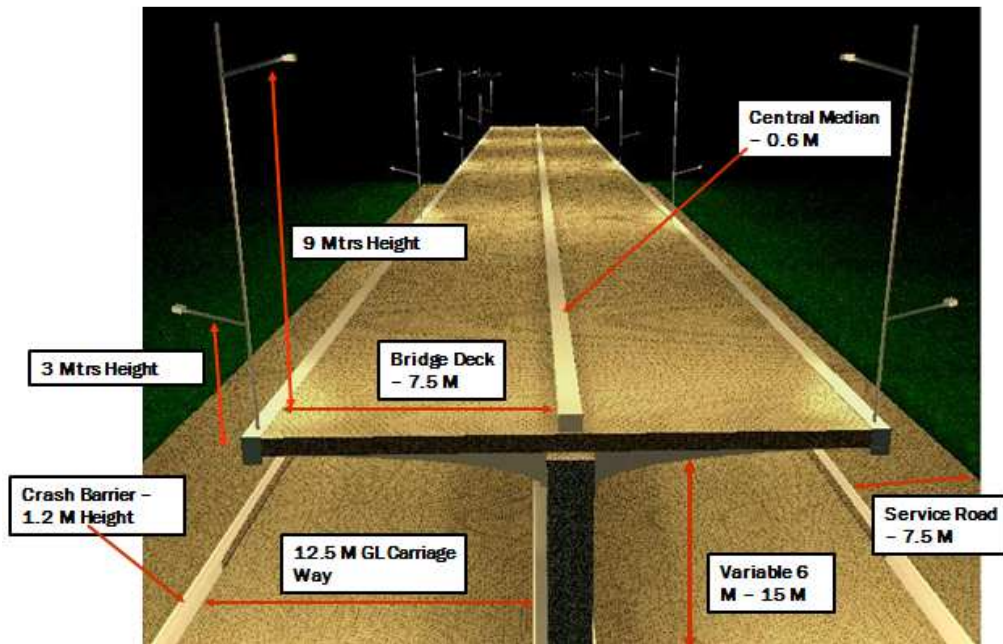


Lighting Requirements as per NHAH Guidelines:

Particulars	Locations				
	Elevated Highway		Recessed Lights in Segments for GL Road	Service Road at GL	Underpasses (6 nos) (*)
	For Bridge Deck	For GL Carriageways			
Height of Luminaires	9.0 M	3.0 M (above Elevated Deck)	Variable	Variable	----
Spacing of Poles	34 m c/c on each side	34 m c/c on each side	34 m c/c on each side	34 m	----
Wattage of Luminaires	250 W HPSV	250 W HPSV	250 W HPSV	250 W HPSV	2 x 36 W CFL
Average Illuminance	40 Lux	30 Lux		20 Lux	70 Lux
Minimum Illuminance	18 Lux	19 Lux		8 Lux	---
Uniformity	> 40 %	> 40 %		> 40 %	> 60 %

Proposed Solution:

Wipro proposed solution of High performance Street Lights and Under Carriage Luminaire specially developed for this project to achieve required design results.



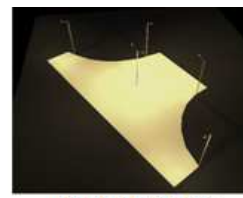
Proposed Solution for Main Carriage Way / Under Carriage Way and Service Road



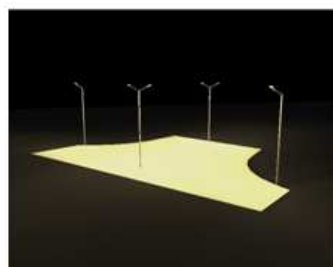
J1 at 9.8 Km



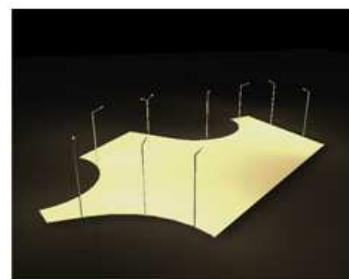
J1 at 11.4 Km



J1 at 12.2 Km

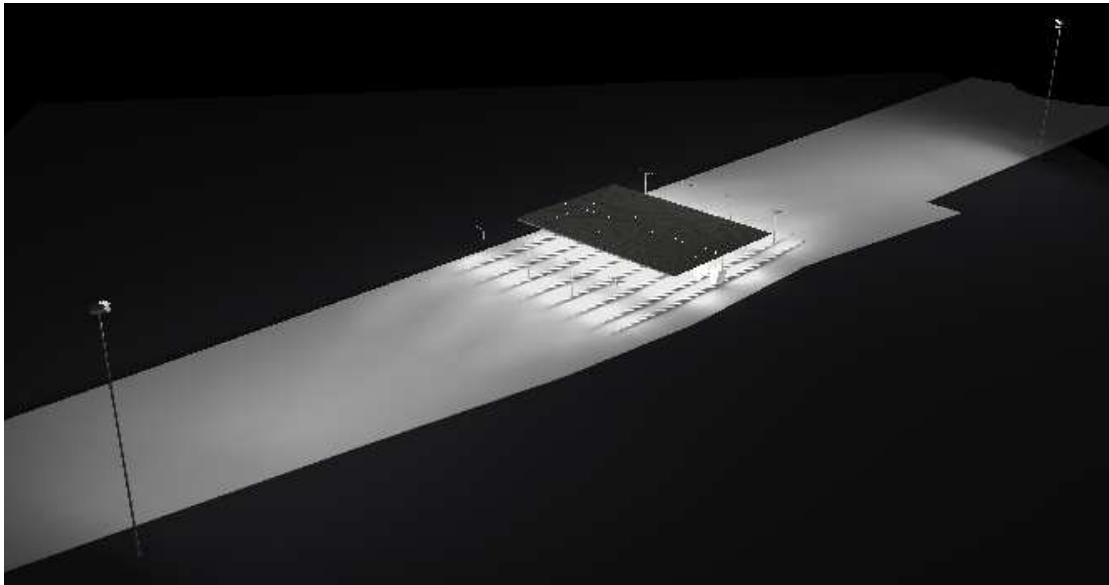
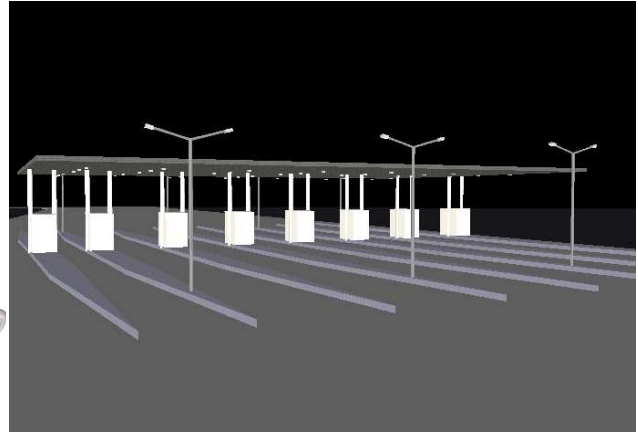
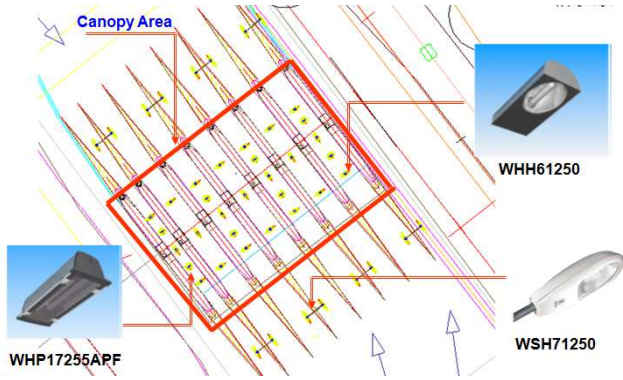


J1 at 13.3 Km



J1 at 16.6 Km

Lighting for Various Junctions using Street Lights



Entry and Exit Toll Plaza



Design Results Achieved:

Particulars	For Bridge Deck	For GL Carriage Way and GL Road with Bottom of Bridge Deck (from GL) at 6-15 M	For Service Road at GL with Bottom of Bridge Deck (from GL) at	
			6-10 M	10-15 M
Luminaire Cat. No.	WST 71250	WHT 61250	WST 71250	WST 71250
Lamp Wattage & Type	250 W HPSV-T	250 W HPSV	250 W HPSV-T	
Mounting Arrangement	Opposite Pole Mounting on 9 M High Pole.	Under Bridge Deck (Opposite)	Opposite Pole Mounting at the Top of Bridge Deck on 9 M High Pole used for Illumination of Bridge Deck @ 3 Mtr Height	
Length of Pole Bracket	1.5 Mtrs	Not Applicable	1.5 Mtrs	1.5 Mtrs
Angle of Tilt	15 Degrees	15 Degrees	25 Degrees	25 Degrees
IP Protection for Luminaire	IP 66	IP 66	IP 66	
Type of Installation	Pole Mounted	Surface mounted on Pedestal	Pole Mounted	
Spacing	34 M c/c on each side	34 M c/c on each side for 10M and above. 22M c/c on each side for 6-10M	34 M c/c on each side	
Average Illuminance	43 Lux	40 Lux	28 - 29 Lux	29 Lux
Minimum Illuminance	23 Lux	18 Lux	14 - 21 Lux	22 Lux
Uniformity of Installation	0.537	0.452	0.50 - 0.71	0.743



Luminaire Used: UNO Street Light

We have proposed Uno range of Street Light luminaires to Main Carriage Way and Service Roads:

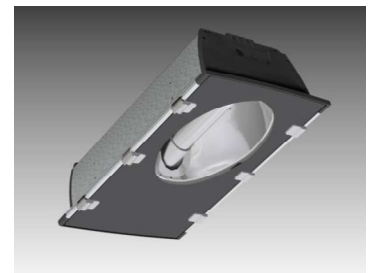
- Die cast aluminium compact and aesthetically designed housing with electrochemically brightened high purity anodised aluminium pot optics reflector
- IP 66 optically sealed lamp compartment with flat toughened glass and silicon sealant
- Top maintainable hingable top cover.
- Anti corrosive stainless steel clamps with gasket to seal lamp holder cap and facilitate lamp replacement
- Special air breathing filter in lamp holder compartment for better ventilation and for removal of excessive heat from lamp compartment
- Provision of adjustable lamp position to control distribution of light both on street side and kerb side.
- Removable control gear for ease of maintenance
- Heavy duty, low loss inductive copper wound ballast



Luminaire Used: Under Deck Luminaire WHT61250


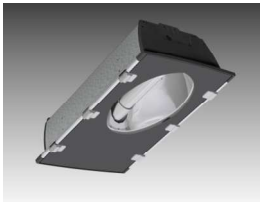

We have proposed specially developed and designed under deck luminaires for Main Carriage Way below elevated highway:

- Die cast aluminium compact and aesthetically designed end caps and extruded aluminium housing with electrochemically brightened high purity anodised aluminium pot optics reflector
- IP 66 optically sealed lamp compartment with flat toughened glass and silicon sealant
- Top maintainable hingable top cover.
- Anti corrosive stainless steel clamps with gasket to seal lamp holder cap and facilitate lamp replacement
- Provision of adjustable lamp position to control distribution of light both on street side and kerb side.
- Removable control gear for ease of maintenance
- Heavy duty, low loss inductive copper wound ballast





Proposed Key Products:

Product Details	Lamp Details	Product Photograph
UNO Street Light	150W HPSV-T 250W HPSV-T	
WHT61 (Under deck Luminaire)	150W HPSV-T 250W HPSV-T	
WFZ66250	2 x 250W HPSV-T	

Project Images:





Results Achieved:

- ✘ Lux levels achieved as per NHAI Standards for the complete areas
- ✘ Lighting Power Density achieved using next High Lumen Output HPSV-T Plus Lamp
- ✘ Specially developed under deck luminaire with vibration dampeners as per NHAI requirements

Benefits to Client:

- ✘ Proposed solution of Wipro helped getting good lighting for the elevated tollway
- ✘ More footfall because of well illuminated elevated, under deck roads
- ✘ Energy saving through use of next generation HPSV-T Plus Lamps

BETL is one of the first major and prestigious NHAI projects done by Wipro. Since then we have added various prestigious NHAI projects like NH3-Dhule stretch, NH-8 Kishangarh Beewar stretch to our portfolio making it an established player in Highway lighting.

With the addition of latest generation high performance street lighting products, Wipro continue to build its credentials.

Wipro would like to answer any queries or questions you have on Energy Efficient lighting, stand alone and network based Lighting Control systems related topics. Please feel free to contact us on helpdesk.lighting@wipro.com. You can also visit our website www.wiprolighting.com for more information.
