

**DISTRICT: NADIA**

**BEFORE THE NATIONAL GREEN TRIBUNAL  
EASTERN ZONE BRANCH, KOLKATA, WEST BENGAL  
FINANCE CENTRE, 3RD FLOOR, NEW TOWN**

(Under Section 18(1) read with Section 14 and 15 of the National Green  
Tribunal Act, 2010

Original Application No.        of 2023

In the matter of:

All India Anti Corruption Organization(Regd.), having branch office at Qtr.  
No.RI/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman,  
West Bengal, Pin Code-713206, represented by Subrata Mallick, Addl.  
Director Crime, son of D.C. Mallick, Qtr. No.RIII/81, Bidhannagar  
Housing Colony. Durgapur, Post office - ABL Township, Police Station new  
Township, District - Paschim Bardhaman, West Bengal, Pin Code-713206.  
..... Applicant

-Versus-

The State of West Bengal, service through the Principal Secretary,  
Department of Environment, 5<sup>th</sup> Floor, Pranisampad Bhawan, Block LB-II,  
Salt Lake, Sector-III, Bidhannagar, Kolkata- 700106, Email- psecy.env-  
wb@gov.in, Phone No.033-2335222742. & Ors.

..... Respondents

**PAPER BOOK**

**MR. SAHEB BANERJEE**

Advocate

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High Court, Calcutta

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**SYNOPSIS**

A Section of Corrupt Govt. officials, have been involved in lifting silver sand from the bed of the River Ganga, in contravention of nroms established by law including the Sand Mining Policy 2021, declared by the Govt. of West Bengal in July 2021. It is also noteworthy that the said illegal activities are being conducted within 500 metres of the ISWARGUPTASETU connecting the districts of Hooghly and Nadia, which is already declared as a weak bridge and construction of new bridge is underway in the vicinity.

As a matter of fact, the illegal activity is under the supervision of several big-shots of the local area who have neither obtained any environment clearance nor any but the said silver sand is supplied at the work site of WBHDC at Kalyani-Barackpore Express way which is being constructed by Dr Agarwal Infracon Pvt. Ltd. as a contractor of WBHDC, who is the principal developer of the Kalyani Barrackpore Expressway, for the said supply daily 70-80 Vehicle loaded from the said river side.

Moreover, this pattern of illegal sand mining is dangerously effecting the environment and is an upcoming threat to the entire Ganga basin of West Bengal. This can be ascertained from the SUSTAINABLE SAND MINING MANAGEMENT GUIDELINES, 2016, published by the Ministry of Environment, Forest and Climate Change, Govt. of India.

**LIST OF DATES**

- 30.07.2021 : Government of West Bengal declared sand mining policy 2021.
- 16.05.2022 : All India Anti corruption organization captioned photograph illegal mining 18.05.2022.
- 18.05.2022 : On behalf of All India Anti corruption organization its Additional Director give representation to the respondent authorities.
- 19.11.2022: Respondent no.10 submitted a letter for excavation.
- 06.04.2023: A.D.M. & D.L & L.R.O. Nadia issued permit certificate.



**DISTRICT: NADIA**

**BEFORE THE NATIONAL GREEN TRIBUNAL  
EASTERN ZONE BRANCH, KOLKATA**

O.A. No. \_\_\_\_\_ of 2023;  
-And-

In the matter of :

An application under Section 14,  
18(2)(e) of the National Green  
Tribunal Act, 2010 and Rule 8 of the  
National Green Tribunal (Practice  
and Procedure) Rule, 2011;

-And-

In the matter of :

All India Anti Corruption  
Organization(Regd.), represented by  
Sri Subrata Mallick

..... Applicant

-Versus-

The State of West Bengal & Ors.

..... Respondents

**DETAILS OF THE APPLICATION:**

**1. PARTICULARS OF THE APPLICANT:**

All India Anti Corruption Organization(Regd.), having branch office at Qtr.  
No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim  
Bardhaman, West Bengal, Pin Code-713206, represented by Sri Subrata  
Mallick, Addl. Director <sup>Crime</sup> ~~Crime~~, son of D.C. Mallick, Qtr. No.RIII/81,  
Bidhannagar Housing Colony, Durgapur, Post office ABL Township, Police



Station New Township, District - Paschim Bardhaman, West Bengal, Pin Code-713206.

**2. PARTICULARS OF THE RESPONDENTS:**

1) The State of West Bengal, service through the Principal Secretary, Department of Environment, 5<sup>th</sup> Floor, Pranisampad Bhawan, Block LB-II, Salt Lake, Sector-III, Bidhannagar, Kolkata- 700106. Email- psecy.env-wb@gov.in, Phone No.033-2335222742.

2) The Secretary, Industry Commerce & Enterprises, The Govt. of West Bengal, Shilpa Sadan, 6th Floor, 4, Abanindranath Tagore Sarani(Camac Street), Kolkata-700016. Email: seci@wb.gov.in , Phone No.033 4094 4245

3) The Director General of Police, The State of West Bengal, "Nabanna" 325, Sarat Chatterjee Road, Mandirtala, Shibpur, Howrah-711102. Email:dgpwestbengal@gmail.com Phone No.033 2214 5400

4) The Chairman, Shyama Prasad Mukherjee Port Trust (Kolkata),Kolkata-700001. Email:dc.hdc@kolkataporttrust.gov.in, Phone NO. 033-2230-5370

5) The Chairman, The West Bengal Mineral Development & Trading Corporation Ltd., 3rd Floor, DJ-10, WBIIDC Building, DJ Block, Sector-II, Salt Lake City, Kolkata-700091  
Email:wbmdtcltd@gmail.com , Phone No. 33 - 22520643

6) The District Magistrate, Nadia, Nadia District, Krishna Nagar, Pin-741235. Email:dm-ndi@nic.in, Phone NO. 03472 251 001

7) The Superintendent of Police, Buddha Park, Ranaghat Police District, Kalyani, Pin-741235. Email:spnadiawb@gmail.com., Phone No. 3325822946

8) The Managing Director, West Bengal Highway Deelopment Corporation HEBC Bhawan, 4th & 5th Floor, Munsii Premchand Sarani, Kolkata-700021, Email:wbhdc\_08@rediffmail.com, Phone No. (033) 2262 5267

- 9) Inland Waterways Authority of India, service through Chairman, A-13, Block-A, Sector-II, Noida, Uttar Pradesh- 201301, Email:chairman.iwai@nic.in, Phone No. 0120-2544036
- 10) Dinesh Chandra R. Agarwal, Infracon Pvt. Ltd., Engineers & Contractors, service through managing director/directors, 401, The Grand Mall, S. M. Road, Ambawadi, Ahmedabad-380015, Email:drainfra89@gmail.com, Phone No. 079 2630 9789
- 11) D.L.&L.R.O. Nadia, having officer Krishnanagar Court Compound, P.O.- Krishnanagar, P.S.- Krishnanagar, Dist - Nadia - 741101, Email:admg.nadia@gmail.com, Phone No. 9433531691
- 12) State Environment impact Assessment Authority, service through member secretary 5<sup>th</sup> Floor, Pranisampad Bhawan, Block LB-II, Salt Lake, Sector-III, Bidhannagar, Kolkata- 700106, Ph- 23350238, Email-[environmentwb@gmail.com](mailto:environmentwb@gmail.com).
- 13) The West Bengal Pollution Control Board, through the Member Secretary, Department of Environment, Government of West Bengal, Paribesh Bhawan, 10A, Block-LA, Sector-III, Bidhannagar, Kolkata-700098, Ph- 1800 - 0345 3390, Email- [ms.wbpcb-wb@bangla.gov.in](mailto:ms.wbpcb-wb@bangla.gov.in).
- 14) Central Pollution Control Board (Zonal Office), Service through Member Secretary having office at Southend Conclave, 6<sup>th</sup> floor, 1582, Rajdanga Main Road, Kolkata-700107, Ph- 3324418725 [Email-zokolkata.cpcb@nic.in](mailto:zokolkata.cpcb@nic.in).

**3. PARTICULARS OF THE ORDER ACTION AGAINST WHICH THIS APPLICATION IS MADE :**

The applicant is an additional director of <sup>Crime</sup> ~~Enme~~ of All India Anti-Corruption Organization which is registered Non Governmental organization having permanent branch office at Qtr. No.RIII/81, Bidhannagar Housing Colony, Durgapur, Post office ABL Township, Police Station new Township, District - Paschim Bardhaman, West Bengal, Pin Code-713206, India. It is stated that illegal sand mining at the captioned location i.e. Majherchar, Kacharipara of Kalyani Sub Division, District Nadia. In violation of the express norms set by the National Green

Tribunal. Applicant has preferred to give notice to the Respondents by which illegal mining activity/ illegal lifting of silver sand from the river Ganga can be stopped and/or restrained any such illegal activities by the unscrupulous greedy person/s with the help of Governmental officials. The applicant have lodged complain before the respondents, but no action has been taken on the part of the respondent authorities even after the knowledge of the illegal mining of sand/ illegal lifting of silver sand from the river Ganga.

4. **JURISDICTION OF THE TRIBUNAL :**

This application relates to causing illegal mining /lifting silver sand from the <sup>bed</sup> ~~bed~~ of the river Ganga, in contravention of norms established by law and also the sand mining policy 2021, declared by the Government of West Bengal and this Hon'ble Tribunal has jurisdiction to adjudicate upon the dispute in question.

5. **FACTS OF THE CASE:**

5.1 That the applicant is non Governmental organization having branch office at addresses as envisaged in the cause title.

5.2 The applicant is filing this application through its Additional Director having branch office at Qtr. No.RIII/81, Bidhannagar Housing Colony, Durgapur, Post office ABL Township, Police Station new Township, District -Paschim Bardhaman, West Bengal, Pin Code-713206. It is stated that some unscrupulous wicked person illegally lifting silver sand from the bed of the river Ganga near at Majherchar, Kacharipara of Kalyani Sub-Division, District Nadia in violation of the express norms set by the - National Green Tribunal. Respondents are violating environment clearance. In this illegal activity there is allude involvement of some



Governmental Officials who indulging the unscrupulous wicked person for their illegal lifting of silver sand from river Ganga.

5.3 The basin of river Ganga drains about 10,60,000 Km. and is the fifth largest basin in the world and bears very high cultural, heritage and <sup>religious</sup> ~~religions~~ values. The river basin <sup>is</sup> ~~in~~ also home to a variety of life forms ranging from phytoplankton to Ganga river dolphin, thus signifying this biological and ecological importance mainly southern tributaries of the river Ganga originating from Central India are the main source of coarse Sand in the main stem of the Ganga. The main source of the coarse sand in Ganga near Patna is the river son originating from Amarkantak Hills in Madhya Pradesh. The Coarse sand is preferred for building and road construction as it required less processing, easily accessible and may be mined without using expensive equipment. Manual sand nining using country boats, has been in practice in Ganga but with increasing demand for coarse sand in the lost three to four decades, thousands of mechanized country boats are being used for sand mining at various sites in Ganga in and around Katwa to Mogra and there is no information available on its impacts on over all ecology of the river Ganga.

5.4 In July, 2021, the State brought out a notification regarding the new sand mining policy to prevent damage to the riverine ecology and to protect black marketing and hoarding of sand. The State earned a revenue of Rs. 200 Crore in the financial year 2021-2022. Earlier, the entire process of allotting sand banks and monitoring the transportation of building material uses to be done manually and there are ample scope for pilferage. However, with the introduction of the new sand mining policy that empowered the most Gangal Minaral Development and Trading Corporation (WBMDTCL) as the monitoring authority has in the current scientific environmentally sustainable and socially responsible process, all



lessees have been provided with a log in id ad password and an e-challan is generated as soon as payment is done.

5.5 Illegal mining of sand from the riverbeds and riverbanks is rampant in several districts and the business runs into thousands of Crores of rupees. There exists a nexus between local politicians, the mafia and the administrative. Clashes over the control of dry riverbeds, which form the bedrock of the thriving illegal sand mining industry, are not uncommon in the districts such as Birbhum, Bankura, Hooghly, Purba and Paschim Bardhaman, Nadia and Howrah amongst others sometimes these become fatal. There have been crack downs in the past but the menace goes on unabated with the help of local politicians, mafia and a section of the administration because huge money is involved. In an auction done legally, the bids can go as high as Rs. 2-3 Crore.

5.6 Sand mining increases the concentration of suspended materials which ultimately increases the turbidity of the water. The most important effects of sand mining on zooplankton were reduction in species diversity and abundance, in the river Ganga.

5.7 Sand mining in riverbeds is a practice that is used to extract sand through mining from riverbeds. Sand mining is a direct cause of erosion and also impacts the local wildlife, excessive instream sand and gravel mining causes the degradation of rivers.

5.8 Global biodiversity has been dwindling at fast pace. A 2018 report by the world wide fund for Nature and concluded that biodiversity declined by 60 percent between 1970 and 2014.

5.9 Mining for sand had ruined rivers and riverine eco-systems. Mining had impacted riverine flood plains and with them, the biodiversity that dwelt in them.



5.10 Sand mining threatened the biodiversity of river system we found that sand mining caused human intrusion into the basking sites, nesting patterns and egg laying of gharials and fresh water turtles causing them to leave the area. The availability of food in a river enabled birds to decide their area of habitation many birds lay eggs on sandbank, sand mining destroys all this and forces them to leave.

5.11 Your Petitioner state that after implementation of sand mining policy 2021, the West Bengal Government has identified 30 new sand blocks decided to start their mining under the state's new policy for an attempt to generate more revenue. Under the new sand policy the State Government will not auction sand mines but instead engage agencies to mine sand and dump it at designated stack yards following which it would auction the sand.

5.12 The interstate movement of sand has also been made online through railway and road network the necessary integration has been made so that the railways also have an idea of the material being transported and keep track accordingly.

5.13 The enforcement mechanism should be strengthened with officers of any enforcement agency getting records to the permit details just by scanning the QR Code on the road challan which controls the illegal sale of sand.

5.14 Your petitioner states that under the old system, auctions of specific areas of riverbeds were done by District Magistrates but under the new policy it was decided that the West Bengal Mining Development & Trading Corporation, under the State industries department, will hold the auctions. The process will be mentioned by the Chief Secretary and Finance Secretary.



5.15 Your petitioner states that there is no house or road or bridge or part in West Bengal whose builders can claim has been built with legally obtained sand alone. Illegal mining of sand from riverbeds is so ubiquitous in the West Bengal that on the rare occasions it is stopped temporarily by a Judicial order.

5.16 Your petitioner states that the most blatant case of illegal sand mining takes place in the lowest reaches of the Ganga, between the Farakka Barrage and the confluence of the river with the Bay of Bengal. Pontoons are anchored in the middle of the rivers, large pumps are set up on them, and the sand is pumped up and sent to the riverbank through a pipe. The effects are there for all to see. Riverbanks erosion has increased, to the point that one of the bridges over the Ganga has become unusable as a girder collapsed because so much sand and silt were removed around this foundation.

5.17 Your applicant states that Respondent no.8 vide Memo No.1514/WBHDCL dated July 17, 2019 inform all bidder about up-gradation of Kalyani Expressway to 4/6 Lane configuration from Muragacha to Kampa including Elevated connection with proposed mogra kampa Barajaguli Road corridor in the District of North 24 Parganas in West Bengal (Phase-II) to be executed through EPC Mode- Replies to pre bid quarries, Addendum-I and Amended Schedule of Bidding process.

Photo copy of the up-gradation information are collectively annexed herewith and marked with letter "A".

5.18 Your petitioner states that respondent No. 10 has requested to Respondent No. 4 by submitting a letter dated 19.10.2022 for permission to excavate silt from river Hugli near majerchar, Char Kancharapara, Char Nandabati of village Kencharapara Sub-Division – Kalyani, District –

Nadia by attached copy of N.O.C. which Respondent No. 09 has granted in favour of Respondent No. 10.

Photocopy of the said letter is annexed herewith and marked with letter "B".

5.19 Your petitioner states that Respondent No. 10 has requested on 19.10.2022 for permission of excavating from Respondent No. 4. In his letter Respondent No. 10 has asked for permission of 15,000 cube meter i.e. 5,29,720.001 cft. By going necessary information that it will be applied for 4 month. But one stock permit which is not for sale issued by the Additional District Magistrate & D.L.&L.R.O. Nadia vide permission letter No. 1194/T/23-24/06042802494/PT dated 06.04.2023. This permit has issued from 01.04.2023 to 01.05.2023 i.e. for one month. From this permission letter and stock permit it is clear that such Respondent No. 10 is using his permission of excavating illegally and excavating more sand beyond of permission limit.

Photocopy of the stock permit is annexed herewith and marked with letter "C".

5.20 Your petitioner states that as a activist and environment lover your petitioner previously filed a O.A. application bearing O.A. No. 94/2022 for protest against wrongdoer illegally by Hon'ble Tribunal intervention but due to lack of sufficient papers your petitioner prayed for liberty to withdraw the case. Hon'ble Tribunal pleased to grant liberty with file a fresh. Thereafter your petitioner applied for necessary information from the respective authorities. But after pursuing with appellate authority your petitioner able to collect the necessary documents. In such situation if some delay took place to file this application be condone. Actually cause of action is continuing because of illegal excavation is going on continuously which is prevailing from stock permit is annexed by A.

Photocopy of all R.T.I. application is annexed herewith and marked with letter "D".

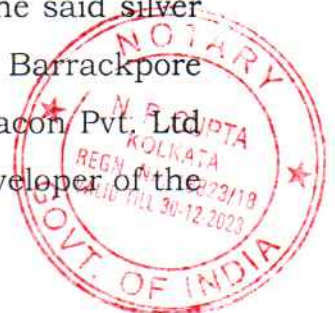
5.21 Your applicant states that one final detailed project report i.e. main report which has published in August, 2018 by the West Bengal Highway Development Corporation Ltd. is not matching, with the authorities which is going in project area. Respondent no.10 violating all terms and condition and respondent no.8 after aware about all illegal activities indulging the respondent no.10.

Photo copy of the Final detailed project report i.e. main report is annexed herewith and marked with the letter "E".

5.22 That the officials of West Bengal Government with the help of local pradhan of the local Gram Panchayat have been involved in lifting silver sand from the bed of the river Ganga, in contravention of norms established by law and also with sand mining policy 2021, framed by the Government of West Bengals.

5.23 That your applicant begs to state that there is a weak bridge namely "Iswar Gupta Setu" connecting the districts of Hooghly and Nadia. The abovementioned illegal activity is conducting within 500 meters of "Iswar Gupta Setu", which has already been declared as a weak bridge and construction of new bridge is underway in the vicinity.

5.24 That your applicant further begs to submit that the illegal activity is under the supervision of several big shots of the local area who has neither obtained any environmental clearance nor any but the said silver sand is supplied at the work site of WBHDC at Kalyani - Barrackpore Express way which is being constructed by Dr. Agarwal infracon Pvt. Ltd on behalf of WBHDC as a contractor, who is the principal developer of the



Kalyani - Barrackpore Expressway for the said supply daily 70-80 vehicle loaded from the said river side.

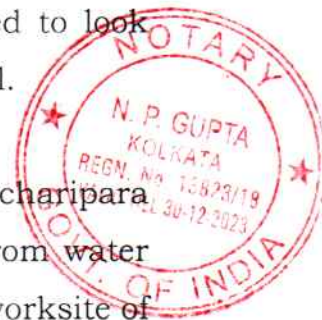
5.25 That your applicant states it humbly West Bengal Government has framed and declared its sand mining policy in the year 2021 by publishing it in the Kolkata Gazette on 30th July 2021, Friday vide notification Memo No.284 ICE/01 MIN/GEN- MIS/02/2021 at Part -I. Therefore the entire sand mining sector is now under the control of supervision of the WBMDTCL, who is a nodal agency of the Government of West Bengal.

Photocopy of said policy published by Kolkata Gazette is annexed herewith and marked with letter "F".

5.26 That your applicant further begs to state it this pattern of illegal sand mining is dangerously effecting the environment and is an upcoming threat to the entire Ganga basin of West Bengal. This can be ascertained from the sustainable sand mining Management Guideline, 2016 and 2020, published by the Ministry of Environment, Forest and Climate change, Government of India. But the Respondent authorities are not following the said guideline as mentioned above.

5.27 That your applicant begs to submit that responsibility of maintaining the depth and navigability of the river Ganga lies with the Respondent no.4, who hold the key to allow or detained any activity of dredging in the basin of the river Ganga as respondent no.4 statutorily entitled to look after the entire riverbed up to District Murshidabad, West Bengal.

5.28 That the illegal sand mining being done in Majherchar, Kacharipara of Kalyani Sub-Division, District Nadia, State of West Bengal from water bodies river Ganga in the guise of dredging and supplied to the worksite of



Respondent no.8 for constructing road and the said activities are against the rules and the sustainable sand mining policy issued by the Ministry of Environment, Forest and Climate change, Government of India, and it is also pertinent to mention here that such dredging activity is going on against the provision of wet lands (conservation and management) rules, 2017.

5.29 Your applicant begs to state that Ministry of Environment, Forest and Climate change, Government of India, New Delhi, has issued EIA Notification dated 14th September, 2006 which requires certain project to obtain prior environmental clearance before any construction work in case of new projects or expansion and modernization of existing projects or activities. The schedule to the notification details the categories or projects or activities which require prior environmental clearance.

5.30 Your applicant begs to submit that one direction passed by Hon'ble National Green Tribunal in its order dated 04/09/2018 in O.A. 173 of 2018 in the matter of Sudarsan Das Vs State of West Bengal & Ors. directed and from this Ministry of Environment, Forest and Climate change, Government of India, New Delhi, formulated the new guidelines i.e. enforcement of and monitoring guidelines for sand mining 2020, supplemental to the existing guidelines i.e. sustainable sand management guideline 2016 which focus on the effecting monitoring of the sand mining seems from the identification of sand mineral sources to its dispatch and end used by consumers and the general public. This document will serve as a guideline for collection of critical information for enforcement of the regulatory provision(s) and also highlights the essential infrastructural requirements necessary for effecting monitoring for sustainable sand mining.



5.31 Your applicant begs to submit that the EMGSM 2020 & SSMG -2016 shall be read and implemented with each other in case any ambiguity or variation between the provisions of both these documents arises the provision made in "enforcement & monitoring guidelines for sand mining 2020 shall prevail. Your petitioner also state that the National Green Tribunal, New Delhi in O.A. No.8 of 2018 Suraj Hagara & Anr. Vs. State of M.P. has directed the Principal Secretary, Mines: Director, Mines and state of Madhyapradesh to follow the guidelines issued by MOEF in January, 2020, i.e. EMGSM 2020.

5.32 Your applicant further submits that Hon'ble Tribunal vide Order Dated 26/02/2021 passed in the matter of O.A. No.307 of 2015 titled as National Green Tribunal Bar Association Vs. Virender Singh(State of Gujrat) directed all the states / UTS to strictly follow the SSMG 2016 read with EMGSM 2020 - reinforced by mechanism for preparation of DSRS, Environment Management Plants replenishment studies, mine closure plans, grand of EC, assessment and recovery of compensation, seizure and release of vehicles involved in illegal mining, other safe guards against violations, grievance redressal, accountability of the designated officers and periodical review at higher levels.

5.33 The Supreme Court's verdict in Deepak Kumar and others Vs State of Haryana in 2012. The aped court noted in the judgment that years of sand mining was imperiling the very existence of aquatic biodiversity.

6. That the illegal mining of silver sand/lifting of silver sand from the bed of river Ganga in question is running illegally in the following manner:-

- a) Enforcement of and monitoring guidelines for sand mining 2020, supplemental to the existing guidelines i.e. sustainable sand



management guideline 2016 which focus on the effecting monitoring of the sand mining seems from the identification of sand mineral sources to its dispatch and end used by consumers and the general public.

- b) The Government of West Bengal has introduced sand mining policy, 2021, by which entire sand mining policy controlled by respondent no.5 but mining in question is running without obtaining any consent to operate from the respondent no. 5.
- c) The said illegal mining is violating the guidelines of the notification made Annexure 'F' herein by operation in violation of guideline and is not complying with the provisions of the said guidelines regarding the management of sand mining.

6.1 That National Green Tribunal has framed a guideline in relation with National Mission for Clean Ganga (NMCG). In the year 2019 Hon'ble National Green Tribunal in its order dated 12.12.2019 vide Original Application No. 200/2014 in M.C. Mehta Vs Union of India and Ors. has framed a guideline for protection of river Ganga. In this case Govt. of West Bengal was also a party. But the State of West Bengal is violating the guideline and illegal lifting of silver sand is going on.

Photo copy of the Hon'ble Tribunal Order is annexed herewith and collectively marked as Annexure "G".

6.2 That pursuant to the judgment and order passed by Hon'ble National Green Tribunal in its order dated 04/09/2018 in O.A. 173 of 2018 in the matter of Sudarsan Das Vs State of West Bengal & Ors. directed and from this Ministry of Environment, Forest and Climate change, Government of India, New Delhi, formulated the new guidelines i.e. enforcement of and monitoring guidelines for sand mining 2020.



6.3 That National Green Tribunal Bar Association Vs. Virender Singh(State of Gujrat) directed all the states / UTs to strictly follow the SSMG-2016 read with EMGSM - 2020 reinforced by mechanism for preparation of DSRS, Environment Management Plants replenishment studies, mine closure plans, grand of EC, assessment and recovery of compensation, seizure and release of vehicles involved in illegal mining, other safe guards against violations, grievance redressal, accountability of the designated Sofficers and periodical review at higher levels.

6.4 That inspite of having not fulfill the terms of the guidelines of the sand mining policy, 2021, declared by the Department of Environment, Government of West Bengal and having no consent to establish and operate under the sand mining policy, 2021, in connection with SSMG-2016 read with EMGSM 2020 is lifting sand from the river bed of Ganga by illegal mining.

6.5 The applicant is a social activist who conducting social welfare for social consciousness and by this bonafide will thought bring under knowledge to the respondent authorities who have social as well as departmental responsibility to protect the environment and ecology. Thus the applicant lodged complaint on 16.05.2023 to the respondent authorities and/or made representation before them. But till then no steps have been taken to prevent from the illegal mining/lifting silver sand from the river bed of Ganga. Accordingly kind intervention this Hon'ble Tribunal is highly warranted.

Photocopy of the representations are annexed herewith and marked with letter "H".

7. **GROUND S :-**

- I. The excessive extraction of sand from the river disturbs the natural balance.



- II. Aquatic plants and microorganisms get effected.
- III. The food chains in the riverine system are effected.
- IV. Consequently, many animals lose their food supply.
- V. There are more than 10 bacteriophages on the planet, more than every other organism on Earth, as well as bacteria. The water of Holy Ganga river is pure due to the presence of :-
  - a) Cyanophages
  - b) Hydrophytes
  - c) Bacteria
  - d) Bacteriophages

The water of holy river Ganga doesn't get spoiled easily and may be stored for long. In Hindu mythology, Ganga is taken into account to possess descent from the heavens for the aim to redemption of the deaf. The scientific reason is that water of river Ganga is of course having bacteriophages, the viruses that eat bacteria, don't allow bacterial growth were found in the waters of Ganga.

A bacteriophage is a virus that infects a bacterium and destroys it.

Bacteriophages have been uses as an alternative to antibiotics against infectious diseases for over 90 years.

Bacteriophages are composed of proteins that encapsulate DNA or RNA genome, and may have structures that are either simple or elaborate.



Bacteriophages copy inside the bacterium following the injection of their genome into its cytoplasm.

Bacteriophages are one of the most common and diverse babies in biosphere.

River Ganges in India, for centuries, has been revered for its "Self cleansing and special healing properties". More than 450 million people depend on the waters of Ganges for many aspects of their life. In 1896, one of the first published works on Ganges water by Frnst Hankin, a British bacteriologist demonstrated antibacterial property of Ganges water against vibrio cholera. Further work by French micbiologist D' Herelles in the beginning of twentieth century established that antibacterial property of Ganges waters to be due to a factor later named "bacteriophages". The above said studies were conducted during the period of Crown rute in India and a significant number of founding studies on Ganges were carried out mainly by Brithsh and French microbiologists. Such studies on Ganges led to the introduction of bacteriophages to the world. Bacteriophages are the prokaryotic viruses that solely infect and / or destroy the bacteria. Bacteriophages were associated with the special property of river Ganges.

- e) For that illegal mining / lifting of silver sand is going on at Majherchar, Kacharipara of Kalyani Sub Division, District Nadia. In violation of the express norms set by the National Green Tribunal.
- f) For that due to said illegal mining / lifting of silver sand from the river bed of Ganga weak Iswar Gupta Setu" connecting the districts of Hooghly and Nadia. The abovementioned illegal activity is conducting within 500 meters of "Iswar Gupta Setu" which has already been declared as a weak bridge and construction of new



bridge is underway in the vicinity is effected and any fatal incident can be took place there in the area.

- g) For that the said illegal mining / lifting of silver sand from the river bed of Ganga is violating sand mining policy 2021 & sustainable sand mining Management Guideline, 2016 and 2020.
- h) For that by this illegal mining / lifting of silver sand from the river bed of Ganga seriously threatening on environment of ecology.
- i) For that the said illegal mining / lifting of silver sand from the river bed of Ganga Government Revenue is facing loss due to negligence by Government officials.

7. **RELIEF SOUGHT FOR:**

The applicants pray for the following reliefs:-

- i) Mandatory order/direction upon the respondents authorities to stop the illegal excavation from the river ganges and not to contaminate the ganges water by destroying bacteriophages which is a friend bacteria in ecological system.
- ii) Declare that sand mining activities in the river bed is illegal and also a punishable offence and give direction to investigate the matter who are involved in this illegal mining /lifting of silver sand on river bed of Ganga must be punished after duly investigation;
- iii) Give direction on respondent no.3 to investigate the illegal mining/lifting of silver sand from the river bed of Ganga;
- iv) Give direction on Respondent No. 3 to constitute a Special Investigation team under the observing of the Hon'ble Tribunal to investigate the matter and submit report to the Hon'ble Tribunal forthwith;



- v) Give direction on the respondent authority to calculate the revenue which has illegally coaxed by the Agarwal Construction Company to access the quantum of sand mined illegally and thereby the revenue loss caused to the exchequer and further recover the same from respondent no.10.

8. **INTERIM ORDER AS PRAYED FOR:**

Pending disposal of this application the applicants pray for an interim order(s) restraining the unscrupulous wicked person through respondent authorities from lifting / illegal mining of silver sand from the river bed of Ganga at the Majherchar, Kacharipara of Kalyani Sub Division, District - Nadia.

ALL INDIA ANTI CORRUPTION ORGANISATION

*Subrata Mallik*

ADDL. DIRECTOR OF CRIME

9. **LIMITATION:**

Under the provisions of the relevant statute this application is within the period of limitation as your Lordships has pleased to give liberty vide Original Application /94/2022 for filing afresh on 27.07.2022 your applicant made representation on 16.05.2023 for violation of environment norms is still going on in such situation limitation is still continue.

11. **CAUSE OF ACTION:**

Cause of Action arose on 18.05.2022 and subsequently it is still going on when the D.L.&L.R.O. has given stock permit No. 1194/T/23-24/060423024921/PT dated 06.04.2023.

12. **DETAILS OF INDEX:**

An Index in duplicate containing the details of documents to the relied upon the application.

13. **LIST OF ENCLOSURES:-**

- 1) Annexure -A and H
- 2) Hon'ble Second Judges copy
- 3) Vokalatnama
- 4) Photographs of the alleged, illegal lifting of silver sand.



**VERIFICATION**

I, Sri Subrata Mallick, Addl. Director Crime, son of D.C. Mallick, aged about 48 years, by faith Hindu, by occupation-Social Work, residing at Qtr. No.RIII/81, Bidhannagar Housing Colony, Durgapur, Post office ABL Township Police NOTA RPGD NO. Station new Township, District - Paschim Bardhaman, West Bengal, Pin Code- 713206, do hereby verify that the contents of paragraphs 1 to 6.18 NOTARY to my knowledge and those made in paragraphs are based on Legal 93-01 Advice and those made in paragraphs to an prayer portions are my respectful submissions before this Hon'ble Tribunal and I have not suppressed my materials facts in this case and do also verify and sign the above verification of the application at the chamber of the Learned Advocate on Record.

ALL INDIA ANTI CORRUPTION ORGANISATION

*Subrata Mallick*

ADDL. DIRECTOR OF CRIME

DEPONENT

Identified by me

*Saleb Bamerjee*  
Advocate

SI. No. 72/23 (25)

**AFFIDAVIT**

1, Sri Subrata Mallick, Addl. Director Crime, son of D.C. Mallick, aged about 48 years, by faith - Hindu, by occupation-Social Work, residing at Qtr. No RIII/81, Bidhannagar Housing Colony. Durgapur, Post office ABL Township, Police Station new Township, District -Paschim Bardhaman, West Bengal, Pin Code-713206, do hereby solemnly affirm and state as follows:-

1. That I am the applicant in the instant application. I am well acquainted with the facts and circumstances of the case. I am duly authorized by the All India Anti Corruption Organization (Regd.), to affirm and swear this affidavit.
2. That the statements made out in the foregoing paragraphs of the application are true to my knowledge and belief and they are also my respectful submissions before this Hon'ble Court.

ALL INDIA ANTI CORRUPTION ORGANISATION

*Subrata Mallick*

ADDL. DIRECTOR OF CRIME

Prepared in my office

*Sahab Banerjee*  
Advocate

**DEPONENT**

*Signature in my presence and identified by me*

*Sahab Banerjee*  
*Advocate*  
*W.B. 640/2012*

NARENDRA PRASAD GUPTA  
**NOTARY**  
GOVERNMENT OF INDIA  
REGN. NO.-13823/2018

Advocate, HIGH COURT CALCUTTA  
Old Post Office Street (Ground Floor)  
Opp. F-Gate (High Court)  
Mob.-9910578874  
9883125090

T.I.(s)/Signatures(s) of the  
Executant/s attested by me on identification

*[Signature]*  
NARENDRA PRASAD GUPTA, NOTARY  
Advocate, HIGH COURT, KOLKATA  
Regd. No.-13823/2018, Govt. of India



30 JUN 2023

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ANNEXURE - 'A'



## West Bengal Highway Development Corporation Limited (A Wholly Owned Company of Govt. of West Bengal)

HRBC Bhawan, 4th & 5th Floor, Munshi Premchand Sarani, Kolkata - 700021  
Tel : (033) 2262 5267, Tele Fax : (033) 2262 5266, Email : info@wbhdcl.gov.in  
Corporate Identity Number : U45203WB2012SGC180687

www.wbhdcl.gov.in

**Memo No.:** 1514/WBHDCL

**Date:**

**July 17, 2019**

**To:** All Bidders

**Subject:** Up-gradation of Kalyani Expressway to 4/6 lane configuration from Muragacha to Kampa including Elevated Connection with proposed Mogra Kampa Barajaguli road corridor in the district of North 24 Parganas in West Bengal (Phase – II) to be executed through EPC Mode – **Replies to Pre Bid Queries, Addendum – I and Amended Schedule of Bidding Process**

**Reference:** NIT Ref: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> Call)

Pursuant to the subject and reference mentioned above, please find enclosed the following:-

1. Replies to Pre Bid Queries
2. Addendum – I

The Schedule of Bidding Process as per Clause 1.3 of Section – 1 of RFP is amended as follows:-

Sl. No.	Event Description	Date & Time (As per RFP)	Date & Time (Modified)
6	Last date of Request for BID Document	23.07.2019 (Up to 15:00 Hrs.)	30.07.2019 (Up to 15:00 Hrs.)
7	Last date for online submission of bids (BID Due Date)	23.07.2019 (Up to 15:00 Hrs.)	31.07.2019 (Up to 15:00 Hrs.)
8	Physical Submission of Bids	24.07.2019 (Up to 15:00 Hrs.)	02.08.2019 (Up to 14:00 Hrs.)
9	Opening of Technical BIDs at venue 2.11.4 (i)	25.07.2019 (At 15:00 Hrs.)	02.08.2019 (At 15:00 Hrs.)

All other terms and conditions remain unchanged.

This is issued in line with Clause 2.8 & 2.9, Section 2 and Section – 5 of RFP.

  
19.7.2019  
Chief General Manager, WBHDCL



Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Propose. Mogra - Kampa - Barajaguli Road Corridor in District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode - NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> call)

**REPLIES TO PRE BID  
QUERIES**

Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
1.	General Land Acquisition		<p><b>Status of Land Acquisition:</b> What is the status of land acquisition for the project? kindly provide the following:-</p> <p>A. Total Land required in Hectare/ Sq. m/KM for the project. B. Total Land already acquired. C. Total Land to be acquired. D. Total Agricultural / private / Govt. / Forest land to be acquired.</p> <p>Also please provide detailed schedule for handing over land to the Contractor.</p> <p><b>National Board for Wildlife clearance.</b></p> <p>1) Please clarify whether the project is in or nearby Wildlife/ National Park / Sanctuary / Eco sensitive Zone Land? 2) If yes, Has Authority applied for National Board for Wildlife clearance and if so please clarify the status of the same?</p>	There is no land acquisition involved in this project.
2.	General Wildlife Clearance			Not Applicable
3.	General Forest Clearance			Not Applicable
4.	General Environment Clearance			Not Applicable
5.	General Tree Cutting/ Tree Felling			As per RFP - Refer Article 9, Clause 9.4
6.	General Encroachment details			As per RFP - Refer Article 8



Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Propose. Mogra - Kampa - Barajaguli Road Corridor in District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode - NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> call)

**REPLIES TO PRE BID  
QUERIES**

Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
7.	General Pending Litigation		Appointed Date. Delay in execution of the Project Alignment/ ROW due to pending litigations, if any, shall be treated as Political Force Majeure event and Concessionaire may kindly be compensated accordingly.	As per RFP
8.	General Utility Shifting		Is the Project Alignment/ ROW needs Utility shifting? (i.e. Gas/Water Pipe Lines, Sewer Lines, Electricity High Tension Line etc.). If yes, please provide scope of the same.	As per RFP and refer Addendum - I
9.	General Existing Canal		During Site Visit of the Proposed highway, it has been observed that, Canal is running parallel to the alignment approximately 2 to 2.5 Kms. at Km 11.000 to 13.500 on LHS. Kindly confirm whether the above mentioned canal is within the ROW? And needs to be shifted. If yes, whether the permission for the shifting of Canal from competent/ concern Authority has been obtained. Also requested to revise the Project Cost considering canal shifting/ diversion, as the same is not mentioned in Schedule-B.	Refer Schedule A, Annex - I. Scope of work is defined in Schedule B.
10.	General Filling Material		As per Site Visit, the Embankment/ borrow/ murrum will not be available nearby 5 to 7 Kms radius. It is requested to provide the State Government Land for extraction of murrum for embankment of work. As the same is to be brought from Land may be more than 20 Kms which will have impact on project cost.	As per RFP. The Authority will not provide any land for extraction of earth for embankment and other works. EPC Contractor has to arrange materials at their cost and risk.
11.	General Pipeline		Laying with MS Pipe of dia 1400 mm and 250 mm is being done by P&H Dept on 7.5 Km stretch at RHS from Km 23.00 to km 30.500. As per Site Visit it is observed that, at some locations the alignment of Pipe is coming at Service Road i.e. within the ROW. The same shall be reviewed and alignment may be revised to avoid unnecessary wastage of public money in shifting work at later stage.	As per RFP.



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Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Propose. Mogra - Kampa - Barajaguli Road Corridor in District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode - NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> call)

**REPLIES TO PRE BID  
QUERIES**

Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
12.	Due Date Extension		The bidders request Authority to kindly extend the bid due date so that bidder will get minimum 30 days effective time period after receipt of all the information necessary for quoting Realistic Bid.	Pl refer Addendum-1
13.	RFP Cl. 2.2.1 (a)	Only Sole Bidders [Companies only within the country] can apply after fulfillment of required qualification criteria. No Joint Venture allowed for this project. Any clause(s) related to JV will not apply here.	We request you to kindly allow bidders to participate as Joint Venture.	As per RFP
14.	General		As per guidelines of MoEF & CC issued on 25th Jan 2016, utilization of Fly Ash is mandatory in all construction projects within a radius of 300 km from the thermal power plants. As per our knowledge Thermal power plants of NTPC, WBPDL, NTPC-SAIL JV etc. are within a radius of 300 Km from this project. So, please confirm that the use of Fly Ash in this project is mandatory or we can consider other alternative material for embankment fill. If use of Fly Ash is mandatory, can we consider that the transportation cost up to 100 Km will be borne by thermal power plant and from 100 Km to 300 Km 50% cost borne by thermal power plant & 50% by contractor as per guidelines of MoEF&CC issued on 25th Jan 2016?	As per RFP. However, the EPC Contractor may consider and contemplate on using Fly Ash conforming specifications by arranging the same at their cost and risk. But the Authority does not mandate it obligatory.
15.	General		Type of Structure and span configuration	As per RFP
16.	General		Please confirm that the Type of Superstructure mentioned in "Schedule B" may change by Contractor considering EPC project. Type & grade of material As an EPC contract, can bidder adopt alternate material of structures? Please confirm.	As per RFP
17.	Schedule B Cl. 1.1 & Cl. 2.10	Segment-D Portion Length of 6/4-lane straight flyover along B-K Expressway	As per Cl. 1.1, length of flyover is (310+400) m=710m, however as per Cl. 2.10 that same given as 465.35m (from ch:34+143.93 to ch:34+609.28). Please confirm the length of flyover	Length of the Fly over (viaduct) is 465.35 m & total length including approach on both sides is 710 m



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Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Propose. Mogra – Kampa – Barajaguli Road Corridor in the District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode – NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019. (2<sup>nd</sup> call)

**REPLIES TO PRE BID  
QUERIES**

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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
18.	General		Congestion Factor Since it is expressway, Congestion factor is not applicable for this project. Please confirm.	As per RFP
19.	General		Structures S V Loading is applicable for BK Exp Flyover & not for the ramp, as the radius is very sharp S V Vehicle unable to turn. Please confirm.	For all new structures, S V loading will be applicable.
20.	General		Structures Bidder understand that Structure drawings are only for reference however structure shape and dimensions shall be based on contractor's design. Please confirm.	As per RFP
21.	Schedule B Cl. 2.10		Grade separated structures Please confirm that, the Change in type of superstructure for all grade separated structures is permitted.	As per RFP
22.	General		Tender drawings Can bidder adjust the FRL to meet minimum requirements as per design?	Under no circumstances, FRL is to be lowered down. However, FRL may be raised in view to meet the standards and specifications.
23.	General		Design and drawings Bidder understand that Independent approval from esteemed academic institute i.e. IIT or equivalent is not mandatory. Please confirm.	It is not mandatory unless specifically mentioned.
24.	Schedule B Cl. 1.4		TCS Bidder understands that the TCS provided along with schedule Appendix B-1 are indicative only. However same shall be adopted for the purpose of to know deck width configuration of carriageway and service roads and also locations of drain and drain width. Please confirm.	As per RFP



Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Propose, Mogra – Kampa – Barajaguli Road Corridor in District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode – NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> call)

**REPLIES TO PRE BID  
QUERIES**

Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
25.	General		Painting Please mention the Specification of Painting for Substructure and Superstructure if any? Expansion joints	As per RFP
26.	General		Bidder understand that three span continuity as shown in drawings will not mandatory and any type of continuity system shall be allowed based on contractor design. Please confirm.	As per RFP
27.	General		Span arrangement for grade separated structures (Left and right turning ramp) Bidder understands that there is no obligatory span and bidder has freedom to adopt longer spans also. Please confirm.	As per RFP
28.	EPC Cl. 8.1	The site of the Project Highway (the "Site") shall comprise the site described in Schedule-A in respect of which the Right of Way shall be provided by the Authority to the Contractor. The Authority shall be responsible for: (a) acquiring and providing Right of Way on the Site in accordance with the alignment finalised by the Authority, free from all encroachments and encumbrances, and free access thereto for the execution of this Agreement; and.....	Bidder requests the Authority to provide the current status of ROW in possession of the Authority and status of balance ROW acquisition.	As per RFP. Refer Schedule A. There is no additional land acquisition, involved for the work.
29.	General		Utility shifting Please provide detailed network drawings of underground telephone lines, OFC & Electric cable lines, pipe line and other utilities. We presume that, Authority will obtain the necessary approvals/permissions regarding utility shifting plans and their cost estimates from respective	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
30.	2.1.14, General terms of Bidding	<p>.....The Bidder, including any Joint Venture Member, shall be deemed to be a non-performing party (not applicable to the project whose contract is terminated by the Authority) if it attracts any or more of the following parameters:</p> <p>(i) Fails to complete or has missed more than two milestones in already awarded two or more projects, even after lapse of 6 months from the scheduled completion date, unless Extension of Time has been allowed on the recommendations of the Independent Engineer due to Authority's default;</p> <p>(ii) Fails to complete a project, as per revised schedule, for which One Time Fund Infusion (OTFI) has been sanctioned by the Authority;.....</p> <p>(iv) Punch List Items in respect of any project are pending due to Bidder's default in two or more Projects even after</p>	<p>departments. Please confirm the status.</p> <p>Bidder requests to delete such unilateral provision, wherever available under the RFP or under the EPC Agreement.</p> <p>Notwithstanding the above, the Bidder requests the following modifications in the parameters of non-performing party:</p> <p>(i) Fails to complete or has missed more than two milestones in already awarded two or more projects, even after lapse of 6 months from the scheduled completion date, unless Extension of Time has been allowed on the recommendations of the Independent Engineer due to Authority's default; <b>or the Bidder's/ contractor's Extension of Time applications are pending with the Authority's Engineer or the Authority or have been referred to the dispute resolution mechanism which has not yet reached finality.</b></p> <p>(ii) Fails to complete a project, as per revised schedule, for which One Time Fund Infusion (OTFI) has been sanctioned by the Authority; <b>unless such failure to complete a project is on account of the reason beyond the control &amp; responsibility of the Bidder.</b></p> <p>(iv) Punch List Items in respect of any project are pending solely due to Bidder's default in two or more Projects in <b>last Six months</b> even after lapse of the prescribed time for completion of such items;</p> <p>(v) Fails to fulfil its obligations to maintain a highway in a satisfactory condition in spite of two rectification notices issued in this behalf; <b>unless such failure to maintain a highway is on account of the reason beyond the control &amp; responsibility of the Bidder.</b></p>	AS per RFP



Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
	<p>lapse of the prescribed time for completion of such items;</p> <p>(v) Fails to fulfill its obligations to maintain a highway in a satisfactory condition in spite of two rectification notices issued in this behalf;</p> <p>(vi) Fails to attend to Non Conformity Reports (NCRs) issued by the Independent/Authority's Engineer on the designs/ works constructed by the Bidder pending for more than one year in two or more projects.....</p> <p>(viii) Damages/ Penalties recommended by the Independent/ Authority's Engineer on the Bidder during O&amp;M period and the remedial works are not taken up in two or more projects.</p>	<p>(vi) Fails to attend to Non Conformity Reports (NCRs) issued by the Independent/Authority's Engineer on the designs/ works constructed by the Bidder pending for more than one year in two or more projects. <b>Unless such failure to attend NCRs is on account of the reason beyond the control &amp; responsibility of the Bidder.</b></p> <p>(viii) Damages/ Penalties levied by the Authority on the Bidder during O&amp;M period solely on account of Bidder's default, unless levying of such Damages/Penalties have been referred to dispute resolution mechanism which has not yet reached finality and the remedial works are not taken up for more than 6(six) months period in two or more projects.</p> <p>(ix) Fails to achieve financial closure in two or more projects in last six months within the given or extended period (which shall not be more than six months in any case); <b>unless such failure is on account of the reason beyond the control &amp; responsibility of the Bidder.</b></p>		



Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Logra - Kampa - Barajaguli Road Corridor in District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode - NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> call)

REPLIES TO PRE BID  
QUERIES

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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
		(ix) Fails to achieve financial closure in two or more projects within the given or extended period (which shall not be more than six months in any case).		
31.	1.1 Definitions	..... "Appointed Date" means the date declared by the Authority as the project commencement with the consent of the contractor, as per the process prescribed in Article 3 and 8 of this Agreement;	Bidder requests the Authority to modify the definition as under:  "Appointed Date" means the date declared by the Authority as the project commencement date after providing 90% of ROW to the Contractor and subsequent consent of the Contractor with regard to receipt of the same, as per the process prescribed in Article 3 and 8 of this Agreement;	As per RFP
32.	1.1 Definitions	"Right of Way" means and refers to the total land required and acquired for the project, both in its width and length, together with all way leaves, easements, unrestricted access and other rights of way, howsoever described, necessary for construction and maintenance of the Project Highway in accordance with this Agreement;	Bidder requests the Authority to modify the definition as under:  "Right of Way" means the constructive possession of the Site free from encroachments and encumbrances, together with all way leaves, easements, unrestricted access and other rights of way, howsoever described, necessary for construction and maintenance of the Project Highway in accordance with this Agreement;	As per RFP
33.	3.1 (iii) (a) - obligations of the Authority	no less than 90% (ninety per cent) of the Highway required Right of Way of the Construction Zone of total length of the Project Highway within a period of 30 (thirty) days from the date of this Agreement, which shall be in contiguous stretches of length not less than 5 (five) kilometre.;	Bidder requests to modify the Clause 2.1(a) as follows:  no less than 90% (ninety per cent) of the Right of Way within a period of 30 (thirty) days from the date of this Agreement, which shall be in continuous stretches of length not less than 5 (five) kilometer.;	As per RFP
34.	Obligations of the Authority	"Notwithstanding anything to the contrary contained in this Agreement, the Parties expressly agree that the aggregate Damages payable under Clauses 3.1(iv),	Bidder submits that Damages to the tune of 1% of the Contract Price is very minimal in comparison to the actual losses suffered by the Contractor under Clauses 4.1 (iv), 8.3 and 9.2. Accordingly, the Authority is requested to	As per RFP



**REPLIES TO PRE BID  
QUERIES**

Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
		<p>8.3 and 9.5 shall not exceed 1% (one per cent) of the Contract Price.....</p> <p>Both the parties agree that payment of such Damages shall be full and final settlement of all claims of the Contractor and such compensation shall be the sole remedy against delays of the Authority and both parties further agree that the payment of Damages shall be the final cure for the Contractor against delays of the Authority, without recourse to any other payments."</p>	<p>modify the clause so as to get the Damages on above account to the Contractor as per actuals.</p>	
35.	4.1 (ix) - obligations of the Contractor	<p>"The Contractor shall obtain and maintain a project related bank account operational at site where all transactions related to the payment of work will be done. The Contractor shall submit a monthly account statement and a detailed report on utilization of funds transferred to this project related bank account to Authority's Engineer. Notwithstanding anything contrary to this agreement, the authority, in the interest and to ensure timely completion of the work, reserves the right to audit such bank accounts to ensure that there is no diversion of funds from this project specific account to any other project being implemented by the Contractor."</p>	<p>Bidder request to delete this provision. However, Bidder will ensure that there is no diversion of funds.</p>	As per RFP
36.	4.2 (j) - Obligations relating to sub-contracts and any other agreements	<p>"The Contractor, whether Joint Venture or sole, shall not sub-contract any Works in more than 49% (forty nine per cent) of Contract Price and shall carry out Works directly under its own supervision</p>	<p>Bidder requests to allow subcontracting of Works up to 80% (eighty per cent) of the Contract Price.</p>	As per RFP



Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Propose. Mogra – Kampa – Barajaguli Road Corridor in District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode – NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> call)

**REPLIES TO PRE BID  
QUERIES**

Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
37.	4.4 (i) – Contractor's personnel	and through its own personnel and equipment in at least 51% (fifty one per cent) of the Contract Price. ".....The Contractor will organize training at project site/sites for the trainees as and when required as per the training schedule finalized in consultation with the training centres. The trainees shall be paid stipend by the Contractor (subject to maximum limit of Rs. 15,000/- per person) on the basis of minimum wages to compensate for loss of income during the training period."	Bidder requests Authority to bear cost for organizing training and stipend to be paid to the trainees.	As per RFP
38.	4.9 (i) - Co-ordination of the Works	The Contractor acknowledges that in addition to the Agreement, it is also aware of terms of the other Project contracts and other agreements the Authority has negotiated and entered into for performance of its obligations under the Agreement (copies of other contracts and other agreements are made available to the Contractor from time to time) and that the Contractor is fully aware of the consequences to the Authority which would or are likely to result from a breach by the Contractor of its obligations under the Agreement.	In addition to this Agreement, the Authority has not made available any terms of the other Project contracts and other agreements, which the Authority has negotiated and entered into for performance of its obligations under the Agreement, hence Bidder request to delete all such unilateral provision.	As per RFP
39.	4.9 (ii) - Co-ordination of the Works	The Contractor shall be responsible for the co-ordination and proper provision of the Works, including co-ordination of other Contractors or Subcontractors for the Project. The Contractor shall co-operate with the Authority in the co-ordination of the Works with the works	Bidder request information on other Subcontractors to be appointed for the Project.	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
40.	7.3 (i) of Appropriation Performance Security	under the other Project contracts. The Contractor shall provide all reasonable support for carrying out their work to:..... "Upon occurrence of a Contractor's Default, the Authority shall, without prejudice to its other rights and remedies hereunder or in law, be entitled to encash and appropriate the relevant amounts from the Performance Security as Damages for such Contractor's Default."	Bidder requests the Authority to modify the Clause as follows:  "Upon occurrence of a Contractor's Default, the Authority shall, without prejudice to its other rights and remedies hereunder or in law, be entitled to encash and appropriate the relevant amounts from the Performance Security as Damages for such Contractor's Default. <b>The Authority shall notify the Contractor of its decision to encash the Performance Security in pursuance with the provisions of this Clause 7.3 (i) provided that no encashment of Performance Security on account of any reason shall be effected by the Authority without notifying the Contractor of its decision to encash Performance Security, and taking into consideration the representation, if any, made by the Contractor within 20 (twenty) days of such notice.</b> "	As per RFP
41.	7.4 (ii) - Release of Performance Security	"The Authority shall return the Additional Performance Security to the Contractor within 28 (twenty eight) days from the date of issue of Completion Certificate under Article 12 of this Agreement."  The site of the Project Highway (the "Site") shall comprise the site described in Schedule-A in respect of which the Right of Way shall be provided by the Authority to the Contractor. The Authority shall be responsible for:  (a) acquiring and providing Right of	Bidder requests the return the Additional Performance Security within 28 days after the date of issue of Provisional Certificate.	As per RFP
42.	8.1 The Site		Bidder requests the Authority to provide the current status of ROW in possession of the Authority and status of balance ROW acquisition, if any.	As per RFP. Refer Schedule A



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43.	8.2 (ii) Procurement of the Site	Way on the Site in accordance with the alignment finalised by the Authority, free from all encroachments and encumbrances, and free access thereto for the execution of this Agreement; and..... ..... If the contractor fails to join for site inspection or disputes the parts of the site available for work, the Authority's Engineer shall decide the parts of the site where work can be executed and notify to both the parties within 3 days of the proposed date of inspection. The parties agree that such notification of the Authority's Engineer as mentioned hereinabove shall be final and binding on the parties.	Bidder request that decision on Site availability shall be mutually agreed between the Parties and should not be unilateral. Please confirm	As per RFP
44.	8.3 (i) - Damages for delay in handing over the Site	"In the event the Right of Way to any part of the Site is not provided by the Authority on or before the date(s) specified in Clause 8.2 for any reason other than Force Majeure or breach of this Agreement by the Contractor, the Authority shall pay Damages to the Contractor a sum calculated in accordance with the following formula for and in respect of those parts of the Site to which the Right of Way has not been provided:  Amount of Damages in Rs. per day per meter = $0.05 \times C \times 1/L \times 1/N$	Bidder requests:  <b>Either Compensation should be as per actuals.</b>  or Amended formula as below:  <b>Amount of Damages in Rs. per day per meter = <math>2.5 \times C \times 1/L \times 1/N</math></b>	As per RFP



Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
45.	8.3 (iv) - Damages for delay in handing over the Site	<p>Where C = the Contract Price; L = length of the Project Highway in meters; and N = Completion period in days (Appointed Date to Scheduled Completion Date)</p> <p>"....."</p> <p>"In the event of withdrawal of Works under Clause 8.3.(iii) (a), the Contract Price shall be reduced by an amount equal to 90 (ninety) per cent of the value of the Works withdrawn and the Contractor shall not be entitled to any other compensation or Damages for the withdrawal of Works....."</p>	<p>Bidder request to modify clause as under:</p> <p><i>In the event of withdrawal of Works under Clause 8.3.(iii), the Contract Price shall be reduced by an amount equal to 90 (ninety) per cent of the value of the Works withdrawn.....</i></p>	As per RFP
46.	9.2 - Shifting of obstructing utilities	<p>"The Contractor shall, in accordance with Applicable Laws and with assistance of the Authority, undertake the work of shifting of any utility (including electric lines, water pipes, gas pipelines and telephone cables) to an appropriate location or alignment, if such utility or obstruction adversely affects the execution of Works or Maintenance of the Project Highway in accordance with this Agreement. ...."</p>	<p>The scope of work of shifting of utilities has not been indicated in Schedule-B of the Agreement. Bidder request to kindly clarify whether utility shifting is to be carried out by the Contractor or not. If utility shifting is to be done by the Contractor, Bidder requests to provide the following details:</p> <ol style="list-style-type: none"> <li>status of approval of estimate by the competent authority of the Authority.</li> <li>details of supervision charges deposited.</li> <li>Mode of reimbursement of the amount that will be incurred by the Contractor for shifting of utilities.</li> </ol>	<p>Utility shifting is to be carried out by the EPC Contractor in terms of the Article 9 of Agreement.</p> <p>The tentative estimates received from the respective utility owning department have been uploaded with RFP and Addendum I for guidance only.</p>
47.	9.4 - Felling of trees	<p>"The Authority shall assist the Contractor in obtaining the Applicable Permits for felling of trees in non-forest area to be identified by the Authority for this purpose if and only if such trees cause a Material Adverse Effect on the construction or maintenance of the Project Highway. ...."</p>	<p>Bidder request to provide the following details:</p> <ol style="list-style-type: none"> <li>No. of trees present in RoW.</li> <li>Status of permission for felling of revenue trees/forest trees.</li> <li>Status of estimate for felling of trees and its approval from the competent authority.</li> <li>Status of deposition of demand amount by the Authority.</li> <li>Mode of reimbursement of the amount that will be incurred for tree felling.</li> </ol>	<p>Approx. no. of trees being 573 which are to be felled in terms of Article 9 of RFP.</p>



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
48.	10.2 (iv) (c) - Design and Drawings	"within 15 (fifteen) days of the receipt of the Drawings, the Authority's Engineer shall review the same and convey its approval / observations to the Contractor with particular reference to their conformity with the Scope of the Project and the Specifications and Standards. Provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days;"	Bidder request to modify clause as under:  within 15 (fifteen) days of the receipt of the Drawings, the Authority's Engineer shall review the same and convey its approval / observations to the Contractor with particular reference to their conformity with the Scope of the Project and the Specifications and Standards. <b>The Contractor shall not be obliged to await the observations submitted pursuant hereto beyond the said period of 15 (fifteen) days and may begin or continue Works at its own discretion and risk; Provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days;</b>	As per RFP
49.	10.2 (v) - Design and Drawings	"Any cost or delay in construction arising from review / approval by the Authority's Engineer shall be borne by the Contractor."	The Bidder requests the Authority to delete such unilateral clause.	As per RFP
50.	10.3 (ii) – Construction of the Project Highway	"The Parties agree that for determining achievement or delays in completion of the Project Milestones or the Project on the due date, the works affected due to delay in providing the site for which time extension has been granted beyond the Scheduled Completion Date will be excluded....."	Bidder request to modify para as under:  .....  The Parties agree that for determining achievement or delays in completion of the Project Milestones or the Project on the due date, the works affected due to delay in providing the site for which time extension has been recommended by the Authority's Engineer will be excluded .....	As per RFP
51.	10.3 (iii) - Construction of the Project Highway	"The Authority shall notify the Contractor of its decision to impose Damages in pursuance with the provisions of this Clause 10.3. Provided that no deduction on account of Damages shall be effected by the Authority without notifying the	Bidder request that the total amount of Damages under Clause 10.3 (iii) shall be limited to 5% (five percent) of the Contract Price.	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
52.	13.2 (vi) (c) - Procedure for Change of Scope	Contractor of its decision to impose the Damages, and taking into consideration the representation, if any, made by the Contractor within 20 (twenty) days of such notice..... The design charges shall be considered only for new works or items (i.e the Works or items not similar to the works or items in the original scope) @ 1% (one per cent) of cost of such new works or items.	Bidder request to consider design changer for all COS works @ 2% of such additional works.	As per RFP
53.	13.5 - Power of the Authority to undertake works	"..... The Contractor shall not be responsible for rectification of any Defects, but the Contractor shall carry out maintenance of such works after completion of Defect Liability Period of work by other person or agency during the remaining period of this agreement without any extra payment."	Bidder request to modify clause as under: "..... The Contractor shall not be responsible for rectification of any Defects and maintenance of such works."	As per RFP
54.	14.1 (i) Maintenance obligations of the Contractor	The Contractor shall maintain the Project Highway for a period of <b>5 (five) /years</b> , corresponding to the Defects Liability Period, commencing from the date of the Completion Certificate (the " <b>Maintenance Period</b> "). For the performance of its Maintenance obligations, the Contractor shall be paid:	Maintenance Period of 5 years is too high, Bidder request to reduce it to 3 years.	As per RFP
55.	17.1 (i) Defects Liability Period	"The Contractor shall be responsible for all the Defects and deficiencies, except usual wear and tear in the Project Highway or any Section thereof, till the expiry of a period commencing from the date of Provisional Certificate (the " <b>Defects Liability Period</b> ") as specified below:	DLP of 5 years is too high, Bidder request to reduce it to 3 years.	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
56.	19.2 (i) - Advance Payment	(a) 5 (five) years from the date of completion in case of a road being constructed with flexible pavement;..... "The Authority shall make an interest-bearing advance payment (the "Advance Payment") @ <b>Bank Rate + 3%</b> , equal to 10% (ten percent) of the Contract Price, exclusively for mobilisation expenses. The Advance Payment for mobilisation expenses shall be made in 4 (four) instalments each equal to 2.5% (Two point five percent) of the Contract Price. The second and subsequent 2.5% (Two point five percent) mobilisation advance would be released after submission of utilization certificate by the Contractor for the previous 2.5% advance already released earlier.	Bidder understand that Bank Rate means the rate of interest as declared by the Reserve Bank of India.  However, Bidder requests to make an interest free Advance Payment for mobilization expenses as well as for acquisition of the equipment, as this interest amount would ultimately be loaded by the Bidders in the Contract Price.	As per RFP
57.	19.2 (iii) - Advance Payment	"The Contractor may apply to the Authority for the first instalment of the Advance Payment ..... with an irrevocable and unconditional guarantee from a Bank for an amount equivalent to 110% (one hundred and ten per cent) of such instalment, substantially in the form provided at Annex-III of Schedule-G, to remain effective till the complete and full repayment thereof."	Bidder request to amount of guarantee shall be limited to 100% of the amount of advance payment being availed.  Please confirm.	As per RFP
58.	19.2 (iv) (c) - Advance Payment	"if total certified stage payments (excluding the Advance Payment and deductions and repayments of retention) does not exceed 20% (twenty percent) of the Contract Price within [50% of the Scheduled Construction Period] from the	Bidder request to modify clause as under:  if total certified stage payments (excluding the Advance Payment and deductions and repayments of retention) does not exceed 20% (twenty percent) of the Contract Price within [50% of the Scheduled Construction Period]	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
59.	19.2 (vii) - Advance Payment	Appointed Date then the Advance Payment including interest shall be recovered by encashment of the Bank Guarantee for the Advance Payment." " .....Without prejudice to the provisions of Clause 19.2.(vi), in the event of Termination for Contractor Default, the Advance Payment shall be deemed to carry interest at @ "Bank Rate+5%" per annum from the date of Advance Payment to the date of recovery by encashment of the Bank Guarantee for the Advance Payment....."	from the Appointed Date for the reasons solely attributable to the Contractor, then the Advance Payment including interest shall be recovered by encashment of the Bank Guarantee for the Advance Payment. Bidder request not to charge interest more than Bank Rate + 2%.	As per RFP
60.	19.7 (iv) - Payment for Maintenance of the Project Works	"The Authority shall pay to the Contractor every quarter any amount due under any IPC under this Clause 19.7. The payment shall be made no later than 30 (thirty) days from the date of submission of the last IPC for the relevant quarter." " Price adjustment shall be due and payable only in respect of the stages of Works for which the Stage Payment Statement has been submitted by the Contractor no later than 30 (thirty) days from the date of the applicable Project Milestone or the Scheduled Completion Date, as the case may be, including any Time Extension in accordance with the provisions of this Agreement. For the avoidance of doubt, in the event of any Stage Payment Statement after the period specified herein, price adjustment shall be applicable until the date of the respective	The bidder request release of Maintenance payment on monthly basis in line with Clause 19.4 and 19.5 to maintain the steady cash flow for carrying out Maintenance Works. Bidder request to modify clause as under:	As per RFP
61.	19.11 Restrictions on price adjustment	" Price adjustment shall be due and payable only in respect of the stages of Works for which the Stage Payment Statement has been submitted by the Contractor no later than 30 (thirty) days from the date of the applicable Project Milestone or the Scheduled Completion Date, as the case may be, including any Time Extension in accordance with the provisions of this Agreement. For the avoidance of doubt, in the event of any Stage Payment Statement after the period specified herein, price adjustment shall be applicable until the date of the respective	Bidder request to modify clause as under: Price adjustment shall be due and payable only in respect of the stages of Works for which the Stage Payment Statement has been submitted by the Contractor no later than 30 (thirty) days from the date of the applicable Project Milestone or the Scheduled Completion Date, as the case may be, including any Time Extension recommended by the Authority's Engineer therefore in accordance with the provisions of this Agreement. For the avoidance of doubt, in the event of any Stage Payment Statement after the period specified herein, price adjustment shall be applicable until the date of the respective Project Milestone or the Scheduled Completion Date, as the case may be.	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
62.	26.3 (i) Arbitration	Project Milestone or the Scheduled Completion Date, as the case may be. Any Dispute which is not resolved amicably by conciliation, as provided in Clause 26.2, shall be finally settled by a Dispute Resolution Committee.	Clause is incomplete. Bidder request to provide clarification on the Dispute resolution mechanism through Arbitration.	Refer Addendum-I
63.	14 - Change of Scope, Schedule-B	"The length of Structures and bridges specified hereinabove shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13."	The Bidder understands that the scope defined in the schedules is accurate and forms the base for arriving at the bid price. Hence, requests the Authority to delete such arbitrary provision.	As per RFP
64.	Schedule H - Contract Price Weightages	"1.3 Procedure of estimating the value of work done shall be as follows. ..... This insurance shall be not less than: Rs. [*****]"	Stringent payment procedure as per Schedule H would strangulate the Contractor's cash flow. Hence, Bidder requests for release of payment as per Annexure I.	As per RFP
65.	Schedule-P - 3.1 Insurance	"..... This insurance shall be not less than: Rs. [*****]"	Bidder understand that the insurance cover shall not be less than: Rs. 2 Crore [Rupees Two Crore].	Refer Addendum - I
66.	Schedule-P - 4. Insurance to be in joint names	"The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority."	The bidder requests to modify the Clause as follows: "The insurance under paragraphs 1 to 3 except the resources mobilized by the Contractor shall be in the joint names of the Contractor and the Authority."	As per RFP
67.	General		Please confirm. Bidder request Authority to provide land for setting up office, batching plants, casting yards at no additional cost to the Contractor. please confirm.	Contractor has to arrange land for setting up their office, batching plant etc. at



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68.	General	Plan & Profile provided with RFP	Contractor requests to provide the alignment plan and profile in CAD format.	As per standard practice, document in PDF format has been uploaded. It is the responsibility of contractor to prepare the final plan profile in conformity with the documents furnished in the RFP.
69.	General	Utility shifting	Kindly provide a detailed Utility Relocation plan and network drawings of underground telephone lines, OFC & Electric cable lines, pipe line and other utilities. We presume that, Authority will obtain the necessary approvals/permissions regarding utility shifting plans and their cost estimates from respective departments. Kindly confirm the status.	All the relevant details pertaining to utility has been uploaded with the RFP.
70.	General	Mining and Quarry availability	Request to clarify the restriction on Mining, if any, We presume that Authority will obtain the necessary permissions/ approvals from respective department before awarding the project. Kindly confirm.	It is the obligation of the contractor as per RFP.
71.	General	Canal Bridge	Kindly provide details of canal type, FSL & cross section at canal bridge location.	As per RFP
72.	General	Cross Drainage Structure	Kindly provide hydrological details of nallahs / streams at cross drainage structures locations.	The details of the existing cross drainage structures have been furnished in Schedule A and introduction of new cross drainage structures has been furnished in Schedule B as per project requirement. However, if required, further necessary investigation shall be made by the contractor.
73.	General	Geotechnical investigation report	Kindly provide detailed geotechnical report for entire corridor including rock profile underneath	All the relevant geotechnical reports have been furnished.



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
74.	General	Ground Improvement Technique	<ul style="list-style-type: none"> <li>All major and minor structures, VUPs, LVUPs, PUPs, Flyover and culverts</li> <li>Major junction at Wireless More, any other major junction for which geotech data is not shared</li> <li>All Minor Junctions</li> <li>MNB at Ichhapur Canal</li> <li>Embankments and cut locations along the entire corridor</li> </ul> <p>Also provide</p> <ul style="list-style-type: none"> <li>Liquefaction assessment for the structures as well as along the entire corridor.</li> </ul> <p>Water levels in Ichhapur Canal and Mathura Beel (Lowest level, Highest level and HHFL)</p> <p>Schedule B is silent about the Ground Improvements. Whereas there are a plenty of marshy and water logged areas along the project corridor. Kindly confirm the requirement of ground improvement for VUP/PUP/LVUP approaches and other locations where water bodies are present.</p>	However, Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement.
75.	General	End chainage of the Project road Schedule A Specifies that Segment D starts at Ch: 34+000 and ends at Ch: 35+340 (1.34 km)  As per Schedule B, TCS types are proposed from Ch: 34+000 to Ch:34+860 for Segment D.  The alignment plans of the project highway are specified in Annex -III. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan.	Kindly confirm that the project length is 30.295km and Km34+860 is the end chainage.	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement.  End chainage of the project is 35.014 as mentioned in plan drawings.
76.	Schedule A Clause 1.4		Responsibility of the contractor involves both design and construction.  Schedule B, Clause 2.1 gives the freedom to design the geometry of the project highway as per IRC:SP:84 /SP 87. Though there are limitations in changing the horizontal alignment due to land constraints, vertical profile of the highway has to be designed afresh based on the original	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
			ground levels obtained from topographic surveys.  Stipulating minimum FRL criteria is not prudent as there is no guarantee on the original ground levels considered in Schedule A drawings. The profile of the project road is governed by the top level of structures (VUP, PUP, FO etc.). Minimum vertical clearance of the structures is fixed. However the depth of superstructure may vary depend on the structural design and hence the top level guiding the FRL. There may also be changes in invert levels of VUP & PUPs during the detail design. Hence there will be both raising OR lowering of the profile during detailed design, which are technically justified. Also the section is urban location, wherein raising of road will lead to access issues to the properties.	
77.	Schedule A, Annexure II.	Right of Way	Considering the above, the minimum FRL criteria shall be deleted and design freedom as per the essence of EPC contract shall be given to the contractor. From Km. 5+140 to Km. 13+895, the existing ROW has been shown as 52 m. Kindly mention the extent of ROW on either side of the center line.	Details of ROW have been indicated in the utility plans.
78.	Drawings	Plan & Profile	The existing topo details with topo features are missing in the plan & profile. Request you to provide the drawings in AutoCAD format.	As per RFP
79.	Plan and Profile drawings	Super elevation	Maximum super elevation of 7% has been applied which will create rollover problem between carriageway and shoulder. Kindly confirm that the super elevation shall be restricted to maximum of 5%.	As per RFP
80.	Plan and Profile drawings	Entry exit arrangement at grade-separated structures with service road cum/side road	The entry exit arrangement shown in Fig 2.1A to Fig 2.1F in IRC SP 84 – 2014 & IRC SP 87 – 2013 are not adopted in the plan drawings, which may be due to the land / ROW constraints. EPC Contractor understands that taper type entry / exit arrangements, as shown in the Plan & Profile drawings, shall be provided as per RFP. Kindly confirm.	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
81.	Schedule A Clause 14	Road side drains	The table provides the location of existing drains. Kindly confirm the type of existing drain (brick / concrete lined etc.).	Available details have been furnished. Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement
82.	Schedule Annexure-III A,	Geometric Design	In profile / vertical alignment, limiting gradient of 3.3% has been adopted for the approaches to the structures, which may be due to urban section. Bidder requests to confirm that the limiting gradient of 3.3%, as shown in the drawings, shall be adopted, as per RFP.	As per RFP
83.	Schedule Annexure-III A,	Geometric Design	Minimum longitudinal gradient of 0.3% is to be followed for vertical alignment design as per IRC:SP-42. However, vertical alignment has been designed by considering the longitudinal gradients of less than 0.3% to avoid the reconstruction of existing culverts. Bidder requests to confirm that longitudinal gradients (less than 0.3%) as shown in the drawings, shall be adopted, as per RFP.	As per RFP
84.	Schedule B Annex I Clause 1.1	Width of Carriageway	The paragraph provides the width of carriageway as 2 x 9m and 2 x 10.50m. We understand that the carriageway widths shall be as specified in the table provided under Clause 1.1. Kindly confirm.	Refer Addendum – I
85.	Schedule B Annex I Clause 1.1 and Clause 2.8 & TCS drawings		Proposal of service road from Ch: 4+799 to 5+487 as per Schedule B and TCS drawings is as follows:  1. Table below clause 1.1 provides the 3.5 m wide service road on both sides (2 X 3.5m) from Ch: 4+799 to Ch:5+487. 2. Clause 2.8 of Schedule B does not specify any service road from Ch: 4+799 to Ch:5+487	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
86.	Schedule B, Clause 2.9		<p>TCS 6 shows 3.5 m wide service road on right side.</p> <p>Kindly clarify the service road proposal from Ch: 4+799 to 5+487.</p> <p>Slip Roads: Length of the slip Road mentioned in the Schedule B under clause 1.1 is 9.253km and under clause 2.8 is 9.530km.</p> <p>Kindly confirm that slip road of length 9.253km only shall be built by the EPC Contractor, as per RFP.</p> <p>There is a mismatch in the service/slip road locations as per Clause 1.1 and Clause 2.8 of Schedule B near the approaches of PUP at Ch:10+213.</p>	As per RFP
87.	Clause 1.1 and clause 2.8 of Schedule B	Service road and Slip Road:	<p>For Example:</p> <ol style="list-style-type: none"> <li>1. Service road is proposed from Ch:9+979 to Ch:10+444 as per Clause 2.8 of Sch B.</li> <li>2. Slip road is proposed from Ch:9+979 to Ch:10+444 as per Clause 1.1 of Sch B.</li> </ol> <p>Kindly revise the service and slip road chainages at this PUP location.</p>	As per RFP
88.	Clause 2.8 of Schedule B and TCS drawings (Segment C)		<p>Clause 2.8 of Schedule B proposed 10.6 m wide slip road from Ch: 4+799 to 5+487 (688 m) on right side.</p> <p>However, in the TCS 6 at respective Chainages it is shown as 7 m slip road and 3.5 m service road on right side.</p> <p>Kindly confirm that slip road of 7m width &amp; 3.5m wide service road on RHS shall only be provided from Ch4+799 to 5+487.</p>	As per RFP
89.	Clause 5.2 of Schedule B	Pavement type for Toll plaza	Kindly confirm the type of pavement at Toll plaza.	Rigid Pavement.



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
90.	Clause 5.6, Pavement Design	Design CBR: Min Design CBR should be 8%.	Design CBR/Effective CBR of subgrade depends CBR value of soil used for subgrade and CBR of the embankment/existing ground soil. Due to unavailability of borrow areas with good quality of soil, achieving 8% design CBR is difficult. Hence request the authority to remove this design CBR clause (Clause 5.6) and allow the bidder to adopt the CBR as per available soil parameters.	As per RFP
91.	Clause no. 6. of Schedule B	Drainage system	As mentioned in clause 6, the drainage system shall be designed considering the requirement of existing Municipality / Authority. Kindly confirm the extent of catchment area and design discharge that needs to be considered in drainage design.	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement
92.	Schedule B Clause 6	Road Drainage	It is mentioned as some existing drainage system constructed by Municipality / PWD may be augmented in the project. Request to provide those information / details so that the bidder can understand the construction scope clearly.	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement
93.	Clause 6, Schedule B, Annexure- I	Clause specifies, "Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual (IRC:SP:84, 2014 & IRC:SP:87, 2013)."	Clause 6.2.3. of IRC SP 84-2014 states that longitudinal slope of drain shall not be less than 0.3 % for lined drain and 0.1 % for unlined drain. It may not however be possible to maintain such slopes in all sections of drain. At such sections, Kindly confirm that only the velocity criteria as per IRC: SP 42-2014 and IRC: SP 50-2013 may be followed.	As per RFP
94.	Clause 6, Schedule B, Annexure- I	Drainage: Box drains are shown in the TCS drawings.	Due to the absence of sufficient discharge points along the corridor, the drain depth requirement is more, which results in huge cost for the construction of drains including more construction period/time. So we request to provide the available discharge points in the project corridor, so that the possible cost reduction can be taken up the bidders.	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement
95.	Clause no. 13. of Schedule B	Hazardous Locations Clause says "a major transmission water pipeline runs parallel to the project road	Bidder requests to incorporate required safety measures in schedule B/RFP for the protection and future maintenance of existing water pipe line, to avoid ambiguity. Provision of clear scope will help the bidders to be same line with less	Refer Addendum - I



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
96.	Clause no. 13. of Schedule B	<p>within ROW from Km. 5+150 to 9+150 (RHS). Development of road has been conceptualized without disturbing the stability / relocating the pipelines. Special safety measures as required to ensure continuous water supply may be taken during the construction stage. Provision of future maintenance of pipeline is also to be kept into consideration....."</p> <p>Hazardous Locations</p> <p>Clause says "a major transmission water pipeline runs parallel to the project road within ROW from Km. 5+150 to 9+150 (RHS). Development of road has been conceptualized without disturbing the stability / relocating the pipelines. Special safety measures as required to ensure continuous water supply may be taken during the construction stage. Provision of future maintenance of pipeline is also to be kept into consideration....."</p>	<p>cost towards the project.</p> <p>Kindly provide vertical profile/height for the water pipe line.</p>	Refer Addendum – I
97.	Drawings	Typical Cross Section of Project Highway	The TCS drawings are shown with pavement layers. However as per clause 5 of schedule B, EPC contractor has to design the pavement as per Manual / IRC guidelines. Kindly confirm that the pavement shall be designed by the EPC Contractor, as per RFP.	As per RFP
98.	Drawings	Typical Cross Section of Project Highway Figure 2 to Figure 5	TCS drawings show the filter media in side slopes. Being EPC project, the design is under the scope of the Contractor and it is understood that EPC Contractor shall design the pavement including the drainage & filter requirements as per RFP. Kindly confirm.	As per RFP
99.	Clause 2.9 of		Type of Medians:	The TCS 11 & TCS 12



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
	Schedule-B and TCS drawings		Median width mentioned in Clause 2.9 of Schedule B is not matching with the median widths shown in the typical cross section drawings.  For example: Proposed median width for TCS 11 and TCS 12 is shown as 2.5 m in TCS drawings and in schedule B it is shown as 1.1m.  Kindly confirm that the median widths shown in the TCS drawings shall be adopted, as per RFP	drawings are to be followed
100.	Drawings	Typical Cross Section of Project Highway Figure 6,7,9 & Figure 10 (With RE wall)	The retention system is shown with the 1200 mm thick selected granular fill material at the bottom most layer. Since this is EPC contract, bidder shall design the retention system as per the Manual & IRC guidelines. Kindly confirm.	Design may be made by EPC contractor as per relevant IRC guidelines and manuals.
101.	TCS Drawing	Extension of Drainage layer in TCS 1 to TCS 5.	As per TCS 1 to TCS -5 (9m median), the drainage layer has not been provided below the central median, which may be due to availability of open drain in the median.  Kindly confirm that the drainage layer extension in the central median is not required as per RFP.	For efficient drainage system, the EPC contractor has to adopt the design as per manuals and IRC guidelines.
	Clause 2(g) of Schedule C	Facilities at Toll plaza	It has been stated that general arrangement drawings which has been provided are for reference only. Final drawing will be considering all road safety aspects of administrative building.  Kindly confirm the requirement of facilities to be developed at toll plaza location since the provided ROW at toll plaza is 60 m.	Layout of the Administrative Building is being uploaded with Addendum - I. However, for safety of toll booths and administrative complex in 1 <sup>st</sup> floor is to be taken care of while finalizing the detailed drawing for construction.  Semi-Automated Toll Collection System is to be provided including all networking system. Relevant
102.				



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Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposea Mogra - Kampa - Barajaguli Road Corridor in District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode - NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> call)

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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
103.	Clause 2(g) of Schedule C	Toll plaza Layout Clause specifies that general arrangement drawings which have been provided are for reference only. Final drawing will be considering all road safety aspects of administrative building.... Traffic Aid Posts	Kindly provide the final toll plaza drawings with required facilities.	clause of manuals (IRC SP 84) for toll plaza will be adopted.  Refer Addendum - I
104.	Schedule C Clause 2 (h)	Traffic Aid Posts	Kindly specify the area requirement (building area) for the traffic aid post building at toll plaza location.	One dedicated room in the Administrative Complex is to be setup with all essential medical equipment for first aid treatments
105.	Clause 2(i) of Schedule C	Facilities at Truck Lay Bye	Kindly confirm the requirement of facilities to be developed at Truck lay bye location.	As per manuals
106.	Clause 2(i) of Schedule C	Truck Lay Bye Location & numbers	Table provided below Clause 2 (i) of Schedule B specifies that one number of truck lay bye need to be provided on RHS side for a length of 200m. Kindly confirm.	As per RFP
107.	Annex-I of Schedule-D	Annex-I of Schedule-D: Deviation from the Specification and Standards: Item No. 5	As per Annex-I of Schedule-D, It is mentioned that "RE Wall height is 5.6m at highest point". Kindly confirm whether this clause is applicable for VUPs in Segment C where total vertical height is (5.5m + Depth of Superstructure + Camber) more than 5.6m.	Refer Addendum - I
108.	Schedule-B and Annex-I of Schedule-D	Raising of Profile:	There are a plenty of water bodies and marshy areas along the project corridor.  In DPR alignment drawings, vertical alignment is designed by matching to existing road levels (other than approaches) and existing culverts are proposed as widening near water body locations.  As per Clause 4.2.1(ii) of IRC:SP-84-2014, bottom of subgrade levels shall be 1m above the high flood levels	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
109.	General	Total Project Cost	(HFL) for water logged/high water table/high flood locations. Hence the profile need to be raised by more than 2m.  Kindly confirm that the profile shall be raised at water body locations so that the subgrade shall be above by 1m from the HFL, as specified in IRC SP84-2014.  Bidder feels that the project cost considered by the Authority is less and need to be updated as the cost towards ground improvements, increased drain depths, profile raising are huge. Request the Authority to consider and increase the project cost.	As per RFP
110.	Plan Profile Drawing		Superelevation shall be limited to 5% if the radius of curve is more than desirable minimum as per clause 2.9.3 of IRC:SP:84-2014.  Maximum superelevation of 7% has been applied which may create rollover problem between carriageway and shoulder. Please confirm the maximum superelevation.	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement
111.	Plan Profile Drawing	Entry exit arrangement at grade-separated structures with service road cum slip road	Merging and diverging arrangement of traffic between main carriageway and service road is not as per fig 2.1D/2.1E/2.1F of IRC:SP:84-2014. Please confirm the arrangement shown in the plan profile drawings are to be followed.	As per RFP
112.	Plan Profile Drawing	At the approach of grade separated structure.	At the approach of grade separated structure 3.33% gradient has been followed. The Gradient for approaches shall not be steeper than 2.5% as per clause 3.2.2 of IRC:SP:84-2014, please confirm the maximum gradient.	As per RFP
113.	TCS Drawing	Extension of Drainage layer	As per TCS 1 to TCS -5, the drainage layer has not been provided below the central median, Please confirm whether the drainage layer is to be extended below the median.	Contractor will ensure efficient surface and sub-surface drainage system to meet the project requirement. In view to ensure the same, the Contractor shall undertake



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
114.	TCS Drawing	Toe Drain	The provision of toe drain has not been considered at TCS-1, TCS-2, TCS-3 and TCS-5, Please confirm whether the aforesaid is to be provided or not.	the survey, investigation, design and engineering.  As per RFP
115.	TCS Drawing	Details of underground hume pipe with median (between main carriageway and service road). Road Drainage	Please provide details of the structure to be considered at this location.	As per RFP
116.	Clause no. 6. of Schedule B, Page No. 263		As mentioned in clause 6, the drainage system shall be designed considering the requirement of existing Municipality / Authority. Please confirm the corridor width that needs to be considered in drainage design. Also please confirm the availability of the data related to existing/proposed above drainage systems will be available before the handing over of the site/commencement of the work.	Contractor will ensure efficient surface and sub-surface drainage system to meet the project requirement. In view to ensure the same, the Contractor shall undertake the survey, investigation, design, engineering.
117.	Clause 5, Pavement Design, Page No. 261	Subgrade	The ratio of mixing of fly ash and sand for subgrade design has been mentioned in TCS drawings. As the Pavement design under the scope of concessionaire, please confirm that alternative suitable method can be adopted for achieving the desired subgrade strength.	As per RFP
118.	Clause 5, Pavement Design, Page No. 261	Pavement of Toll plaza	Please confirm the type of pavement at Toll plaza	Rigid Pavement
119.	Clause 5, Pavement Design, Page No. 261	Rigid Pavement Design	Details of the Axle Load Survey is not available with the provided documents.	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement, set out in contract as per specifications.
120.	Clause 5, Pavement Design, Page No. 262	Pavement Design	Reconstruction has been proposed for entire stretch for the existing in RFP clause 5.7. Is this mandatory to follow this recommendation or bidder may propose alternative suitable solution based on the condition of the existing	As per RFP



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
121.	Schedule C, of Part-I, Page No. 280	One No. 10-Lane Toll Plaza is proposed at km 24+068 km (Design Chainage). General Arrangement drawing has been attached for guidance. Detailed Arrangement & Design may be made taking into account of Road safety aspect of the administrative building.	pavement, please confirm. Minimum 16 lane toll plaza is required as per IRC: SP:84-2014. But here 10 lane toll plaza has been provided. Please confirm if any future provision is being kept or not.	As per RFP
122.	Schedule C, of Part-I, Page No. 280	ETC toll lane	Minimum 2 ETC lanes are to be provided as per IRC:SP:84-2014, Please confirm.	Semi-Automated Toll Collection System is to be provided including all networking system
123.	ATMS Drawings	Clause 12.12 of IRC:SP:84-2014 Drawings	Please confirm whether the ATMS is to be provided or not. 1. Kindly provide the Drawings for Pay and use toilet. 2. The plan profile drawings are not prepared with topographic feature (existing road and other existing features) and ROW line in the background. Please provide the same.	Not required. Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement. Basic facilities namely water supply, electricity provision etc. for Use and Pay Toilets are to be ensured.
125.	Material Report General	Material Report Vetting of Design and drawings	Please provide Material report of the project.	Refer Addendum - I
126.			Bidder understand that Independent approval from esteemed academic institute i.e. IIT or equivalent is not mandatory. Please confirm.	It is not mandatory unless specifically mentioned.
127.	Schedule A, Clause 2 (Land), Page No. 228 and Schedule A, Annexure II, Page No. 230	Right of Way	From Km. 5+140 to Km. 13+895, the existing ROW has been shown as 52 m. Extent of ROW on either side of the Center Line has not been mentioned.	Refer Utility plan drawings
128.	Schedule B, Clause 13 (Hazardous Locations), Page No. 277	A major transmission water pipeline runs parallel to the project road within ROW from Km. 5+150 to 9+150 (RHS). Development of road has been conceptualized without disturbing the	To take care the existing Pipe line, the alignment need to be adjusted accordingly within the ROW. In the same way the vertical profile also will change causing a huge increase in the quantity. Further keeping at mind the future maintenance aspect, the pipeline will have to be within a	Refer Addendum - I



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
129.	Schedule C, Clause 2.g (Toll Plaza), Page No. 281	stability / relocating the pipelines. Special safety measures as required to ensure continuous water supply may be taken during the construction stage. Provision of future maintenance of pipeline is also to be kept into consideration. Minor shifting of project road centreline, if indispensable may be made. Drawing of Toll Plaza	casing with adequate space for maintenance. Without casing a fill over the pipeline cannot be compacted properly. As such, this is very important to understand the exact view of the client in this regard.	Layout of the Administrative Building is being uploaded with Addendum – I. However, for safety of toll booths and administrative complex in 1 <sup>st</sup> floor is to be taken care of while finalizing the detailed drawing for construction.
130.	Schedule D, Clause 2, Page No. 283	RE Wall height is 5.6m at highest point	As per schedule D, the height of RE wall at highest point has been fixed as 5.6 m (Max.). However clarification needed in case of single span arrangement VUP locations where 5.5 m min. clear height is required.	Refer Addendum – I
131.	Typical Cross Section (Segment C)	Typical Cross Section	Steel / concrete railing has been shown in TCS 1 (RHS) and TCS 3,4,11,12 (Both side). However the same has not been mentioned in Schedule B. Please clarify.	As per RFP
132.	Typical Cross Section (Segment C)	Typical Cross Section	Median width has been increased from 1.1 m to 2.5 m in TCS 11 and TCS 12 but not in Schedule B, Clause 2.9.	As per RFP
133.	General	High Flood Level	As there are several water bodies and submerged land present at site, the HFL criteria need to be mentioned for the fixation of subgrade level. Is there any specific stretch where the DPR profile needs correction due to HFL. Any data on HFL from client would allow the bidders to bid from an equal footing.	All the data, available with Authority has been uploaded. Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement.
134.	General	Ground Improvement Technique	There are a plenty of marshy and submerged area along the project corridor. Ground improvement technique and	Contractor shall undertake the survey, investigation,



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
135.	Cl. 8 of "Schedule A" & Cl. 7.4.2 of "Schedule B"	Carriageway width of existing Minor Bridge at Ch. 34+809	total patch length need to be clarified for the case of high embankment as well as for the placement of subgrade material over marshy land.	design, engineering to meet the project requirement. Wherever ground improvement is required, the same is to be carried out by the contractor as per standards and specifications.
136.	Cl. 11 of "Schedule B"	Repair & strengthening of bridges	As per "Schedule A" carriageway of is given as 7.0m whereas in "Schedule B" same is shown as 7.5m. Please confirm.	Refer Addendum - I
137.	Cl. 2.10 & 2.11 of "Schedule B" for Segment-C Portion	C/W Width	Please specify the scope of Repairing & Rehabilitation for bridges.	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement
138.	Cl. 2.6.2 of "Schedule B" for Segment-C Portion	Lateral Clearance	Overall width of structures are not given in "Schedule B". As per attached GAD, width of Kerb Shyness given as 0.25m. Please confirm the same.	Width Provided in Schedule B is without kerb shyness which is to be provided as per manuals.  Yes.
139.	Cl. 2.10 of "Schedule B" for Segment-D Portion	Overall Width	As per attached GAD other than Box type structure lateral clearance is considered as Bearing to Bearing span of structure. Please confirm same to be followed.	Refer Addendum I
140.	Cl. 1.1 & Cl. 2.10 of "Schedule B" for Segment-D Portion	C/W Width & Overall Width	Overall width as given in TCS-2 of DWG. NO. : BK EXP/PH-II/SEGMENT-D/TCS/01 of 01 (Sh-01 of 04) is not matching with "Schedule B".  Overall width given as 6.0m (Cl. 2.10 of "Schedule B") for Right turning ramp (ch: 1046.59 to ch: 1115.59) and Left turning ramp (ch: 854.78 to ch: 923.78) which is not matching with carriageway width (Cl. 1.1 of "Schedule B")	Refer Addendum I
141.	Geotechnical Report	Geotechnical Report	Geotechnical Report at each structure location is not available. Please furnish the same. Geotechnical report are available for following locations, 1) VUP at Ch:5+140 2) VUP at Ch:25+359 3) VUP at Ch:28+303	Geotechnical Report has already been uploaded. However, Contractor shall undertake the survey, investigation, design, engineering to meet the



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Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
142.	Cl. 1.1 & Cl. 2.10 of "Schedule B" for Segment-D Portion	Length of 6/4- lane straight flyover along B-K Expressway	As per Cl. 1.1, length of flyover is (310+400)m=710m, however as per Cl. 2.10 that same given as 465.35m (from ch:34+143.93 to ch:34+609.28). Please confirm the length of flyover.	project requirement Length of the Fly over (viaduct) is 465.35 m & total length including approach on both sides is 710 m
143.	Cl. 7.2 of "Schedule B"	Culverts	The opening size (clear span & clear height) of box culverts given in schedule are final and hydrology calculation of culverts are not required. Please confirm.	Opening of the culverts provided is the minimum requirement. However, Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement
144.	Cl. 2.10 of "Schedule B"	VUP, LVUP & PUP	Kindly furnish skew angles of VUP, LVUP & PUP location if applicable.	As per RFP
145.	General	Type & grade of material	Please confirm that Contractor can adopt alternative material satisfying codal provision and specification.	As per RFP
146.	General	Project location and Special vehicle loading	Whether stretch under consideration is nearer to heavy industries or mines? Please confirm whether consideration of Special vehicle loading is required or not.	For all new structures, S V loading will be applicable
147.	General	Congestion Factor	Please confirm whether consideration of Congestion factor is required or not.	As per Manuals
148.	General	Exposure condition	Exposure condition is moderate. Please confirm.	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement
149.	General	Seismic zone	The project location fall under Seismic zone III. Please confirm.	As per the latest publications of Ministry of Earth Sciences, GOI
150.	General	Culverts	Kindly provide the drawings of culverts	As per RFP
151.	General	Existing Structure	Kindly provide the drawings of existing structures in project corridor.	As per RFP
152.	General	Span configuration	As an EPC contract, can bidder alter the span configuration of structures by maintaining client requirements i.e. total span length, clearances & deck widths? Please confirm.	Span arrangements can be changed keeping the total length same except for VUP / LVUP / PUP



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Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Mogra - Kampa - Barajaguli Road Corridor in District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode - NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> call)

**REPLIES TO PRE BID  
QUERIES**

Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
153.	General	GAD	Please share the drawing no. 1) BK EXP/PH-II/SEGMENT-D/GAD/STRUCTURE/03 of 07 2) BK EXP/PH-II/SEGMENT-D/GAD/STRUCTURE/04 of 07 (Sh-01 of 03) 3) BK EXP/PH-II/SEGMENT-D/GAD/STRUCTURE/05 of 07 (Sh-01 of 03) as above drawing are not readable.	Refer Addendum - I
154.	Clause 7.2.2 & Clause 7.2.4, Schedule B,	Clause 7.2.2 :- Reconstruction of existing culverts table Clause 7.2.4 :- Additional new culverts shall be constructed as per particulars given in the table below	Additional RCC Box culvert at Ch:34+520 introduced in reconstruction of existing culverts table. As per additional new culverts table here is a culvert at Ch: 34+522 (size- 1/2.0/0). Please clarify requirement of culverts with in 2m chainage difference.	Refer Addendum - I
155.	Clause 7.2.3 (note), Schedule B	Apart from the list furnished above in Clause 7.2.2 & Clause 7.2.3, existing missing culverts if any, are to be reconstructed.	Kindly confirm the no's of missing culvert if any.	Contractor shall undertake the survey, investigation, design, engineering to meet the project requirement
156.	Clause 2.10, Schedule B	Grade separated structures	Kindly confirm that 1 x50m span arrangement of grade separated structures may be suitably modified providing intermediate support maintaining minimum vertical clearance and not disturbing at grade traffic movement with proper junction design.	Span arrangements cannot be changed for VUP / LVUP / PUP
157.	Clause 2.6, Schedule B & Clause 2.10, Schedule B	Lateral and vertical clearances at Underpasses & Grade separated structures	Kindly confirm that type of superstructure of grade separated structures (VUP) at Ch: 5+140 & 13+895 having span arrangement 1x50.0m, may be modified to cast-in-situ PSC Box girder type maintaining minimum vertical clearance as per codal provision and not disturbing at grade movement with following impact, a) Vertical profile shall be raised by 1.0 - 1.5m at respective locations. b) Approach/ RE wall length will increase from Clause 19 of Schedule B. c) Service road length and Drain length will increase from Clause 2.8 and Clause 6 respectively of Schedule B. d) TCS schedule will need modification.	Type of super structure may be modified maintaining the span arrangement and vertical clearance as mentioned in RFP.



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Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Mogra - Kampa - Barajaguli Road Corridor in District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode - NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> call)

**REPLIES TO PRE BID  
QUERIES**

Sl. No.	Reference	As per RFP	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
158.	Schedule H		e) Raising of vertical profile at mentioned location will further violates Clause 2 of Schedule D, which states that RE Wall height is 5.6m at highest point. The queries / modifications / suggestions received from bidders are enclosed vide Annexure A.	

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**Annexure – A**

**1.1.1.1. Segment – C (4+565 KM To 34+000 KM)**

Item	Percentage weightage Stage wise	Individual Stage for Payment	Percentage weightage Item wise	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
Main Carriageway	46.24%	Earth Work upto Top of the Subgrade	16.67 %	Unit of measurement is linear Length in Km. Payment of each stage shall be made on pro rata basis on completion of a stage in a length not less than <b>0.1 Km</b> of equivalent two lane length of the total length excluding VUP/LVUP/PUP and its approaches.	As per RFP
		Earth work in Shoulders	2.94 %		
		Sub-Base Course	25.84 %		
		Non Bituminous Base Course	10.37 %		
		Bituminous Base	34.17 %		
		Wearing Coat	9.88 %		
		Repairing & Rehabilitation Work of Existing Cross Drainage	0.13 %		
Earth Work upto Top of the Subgrade	29.12 %	As per RFP			



Service Road	24.13%	Earth work in Shoulders	2.76 %	Unit of measurement is linear Length in Km. Payment of each stage shall be made on pro rata basis on completion of a <b>stage in a length not less than 0.1 Km of equivalent two lane length.</b>	As per RFP
		Sub-Base Course	23.67 %		
		Non Bituminous Base Course	21.12 %		
		Bituminous Base	13.94 %		
		Wearing Coat	9.39 %		
Cross Drainage Works	14.59 %	Cross Drainage Works	100.00 %	Cost of completed culvert shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on completion of at- least <b>1 (one) Culvert on equivalent two lane section.</b>	As per RFP
Surface Drain	6.06 %	Surface Drain	100.00 %	Unit of measurement is linear Length in Km. Payment of each stage shall be made on pro rata basis on completion of a stage in a length not less than <b>0.1 Km on equivalent two lane section.</b>	As per RFP
Protective Work	1.59 %	Protective Work	100.00 %	Unit of measurement is linear Length in Km. Payment of each	As per RFP



Item	Percentage weightage Stage wise	Individual Stage for Payment	Percentage weightage Item wise	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
				stage shall be made on pro rata basis on completion of a stage in a length not less than <b>5 (five) percent of the total scope.</b>	As per RFP
Bus Shelters	0.66 %	Bus Shelters	100.00 %	Payment Shall be made on pro rata basis for <b>1 no. of completed bus shelters.</b>	As per RFP
Toll Plaza Work	2.29 %	Toll Plaza Work	100.00 %	Unit of measurement is each Completed Toll Plaza. Payment shall be <b>as per Main Carriageway Pavement.</b>	As per RFP
Traffic Sign & Marking	2.17 %	Traffic Sign & Marking	100.00 %	Unit of measurement is linear Length in Km. Payment of each stage shall be made on pro rata basis on completion of a stage in a length not less than <b>10 (Ten)</b> percent of the total length.	As per RFP
Miscellaneous Works including Maintenance of Road & Tree Plantation etc.	2.27 %	Miscellaneous Works including Maintenance of Road & Tree Plantation etc.	100.00 %	Unit of measurement is linear Length in Km. Payment of each stage shall be made on pro rata basis on completion of a stage in a length not less than <b>10 (Ten)</b> percent of the total length.	As per RFP
<b>Total</b>	<b>100%</b>				



L-VUP	5.69 %	Foundation	33.18 %	Cost of each L-VUP Shall be determined on pro rata basis with respect to the total linear length of the L-VUP. Payment against foundation shall be made on Completion of each foundation of one L-VUP.	As per RFP
		Sub-Structure	6.23 %	Cost of each L-VUP Shall be determined on pro rata basis with respect to the total linear length of the L-VUP. Payment against Sub-Structure shall be made on Completion of Sub-Structure of at least one L-VUP.	As per RFP



Item	Percentage weightage Stage wise	Individual Stage for Payment	Percentage weightage Item wise	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
		Super Structure	59.04 %	<p>Cost of each L-VUP Shall be determined on pro rata basis with respect to the total linear length of the L-VUP. Payment against Super Structure shall be made on Completion of Super-structure of at least one L-VUP. In case of structures where pre-cast/ prefabricated girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting/ prefabrication of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above.</p>	As per RFP
		Wearing Coat	1.55 %	<p>Payment shall be made of completion of wearing coat including expansion joints complete in all respect as specified.</p>	As per RFP



PUP				Cost of each PUP Shall be determined on pro rata basis with respect to the total linear length of the PUP. Payment against foundation shall be made on Completion of each foundation of one PUP.	As per RFP
	6.52 %	Foundation	30.42 %		
		Sub-Structure	7.34 %	Cost of each PUP Shall be determined on pro rata basis with respect to the total linear length of the PUP. Payment against Sub-Structure shall be made on Completion of Sub-Structure of at-least one PUP.	As per RFP
		Super Structure	51.13 %	Cost of each PUP Shall be determined on pro rata basis with respect to the total linear length of the PUP. Payment against Super Structure shall be made on Completion of Super-structure of at-least one PUP.	As per RFP



Item	Percentage weightage Stage wise	Individual Stage for Payment	Percentage weightage Item wise	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
				<p>In case of structures where pre-cast/prefabricated girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting / prefabrication of girders and balance 50% of the stage payment shall be made on completion of stage specified as above.</p>	<p>As per RFP</p>
		Wearing Coat	4.75 %	<p>Payment shall be made of completion of wearing coat including expansion joints complete in all respect as specified.</p>	<p>As per RFP</p>
		Miscellaneous Works i.e. Expansion Joints, Bearing etc. etc	6.36 %	<p>Payment shall be made of completion of all Miscellaneous in all respect as specified.</p>	<p>As per RFP</p>



VUP	7.55 %			Cost of each VUP Shall be determined on pro rata basis with respect to the total linear length of the VUP. Payment against Foundation shall be made on Completion of each foundation of one VUP.	As per RFP
	24.63 %	Foundation		Cost of each VUP Shall be determined on pro rata basis with respect to the total linear length of the VUP. Payment against Sub-Structure shall be made on Completion Sub-Structure of at least one VUP.	As per RFP
	11.32 %	Sub-Structure		Cost of each VUP Shall be determined on pro rata basis with respect to the total linear length of the VUP. Payment against Super Structure shall be made on Completion of Super-structure of at least one VUP. In case of structures where pre-cast/ prefabricated girders have been proposed by the Contractor, 50% of the	As per RFP
	62.16 %	Super Structure			



Item	Percentage weightage Stage wise	Individual Stage for Payment	Percentage weightage Item wise	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
				stage payment shall be due and payable on casting/prefabrication of girders and balance 50% of the stage payment shall be made on completion of stage specified as above.	As per RFP
		Miscellaneous Works i.e. Expansion Joints, Bearing etc. etc	1.89 %	Payment shall be made of completion of all Miscellaneous in all respect as specified.	As per RFP
		Ground Improvement with drainage and surcharge layer and construction of approach with Reinforced wall up to existing G.L	40%	Payment shall be made per square meter (plan view area) on pro rata basis on completion of <b>the stage of</b> each side approaches of at least one LVUPS/VUPS/PUPS	As per RFP

Approach

NOTARY  
M. P. GUPTA  
KOLHATA  
REGD. No. 10020/18  
VALID TILL 30-12-2023  
GOVT OF INDIA

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Ramps & other Ancillary works	80.24 %	Construction of approach ramp beyond existing G.L with Reinforced Earth Wall up to GSB Level including Capping Beam	40%	Payment shall be made per square meter (plan view area) on pro rata basis on completion of <b>the stage of</b> each side approaches of at-least one LVUPs/VUPs/PUPs	As per RFP
		Other ancillary balance work complete in all respect	20%	Payment shall be made per square meter (plan view area) on pro rata basis on completion of each side approaches of at-least one LVUPs/VUPs/PUPs.	As per RFP
<b>Total</b>	<b>100%</b>				
Electrical & Illumination Works		Electrical & Illumination Works	100.00%	Payment shall be made on completion of all Works, Complete in all respects of a stage not less than 25% of the stretch having illumination works.	As per RFP
<b>Total</b>	<b>100%</b>				



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1.1.2. Segment – D (34+000 KM To 35+340 KM)

Item	Percentage weightage Stage wise	Individual Stage for Payment	Percentage weightage Item wise	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
Main Carriageway & Service Road	77.79%	Earth Work upto Top of the Subgrade	10.92 %	Unit of measurement is linear Length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length not less than 0.1 km of Left Carriageway and Right Carriageway.	As per RFP
		Earth work in Shoulders	3.00%		
		Sub-Base Course	25.04 %		
		Non Bituminous Base Course	21.56 %		
		Bituminous Base Course	22.40 %		
		Wearing Coat	14.15 %		
		Repairing & Rehabilitation Work of Existing Cross Drainage	2.91 %		



Cross Drainage Works	10.64%	Cross Drainage Works	100.00 %	Cost of <b>one</b> completed culvert shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on completion of at-least One Culvert.	As per RFP
Drainage & Protection Work	8.47%	Drainage & Protection Work	100.00 %	Unit of measurement is linear Length in Km. Payment of each stage shall be made on pro rata basis on completion of a stage in a length not less than <b>5 (five)</b> percent of the total length.	As per RFP
Traffic Sign & Marking	3.10%	Traffic Sign & Marking	100.00 %	Unit of measurement is linear Length in Km. Payment of each stage shall be made on pro rata basis on completion of a stage in a length not less than <b>10 (Ten)</b> percent of the total length.	As per RFP
<b>Total</b>	<b>100%</b>				



Item	Percentage weightage Stage wise	Individual Stage for Payment	Percentage weightage Item wise	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
		Foundation	27.89 %	Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. Payment against foundation shall be made on Pro rata basis on Completion of each foundation of the structure.	As per RFP
		Sub-Structure	13.47 %	Payment against Sub- Structure shall be made on Pro rata basis on Completion of each Sub- Structure.	As per RFP



Bridge Works (Elevated Corridor)		Super Structure	48.71 %	Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of at-least one span in all respects as specified. In case of structures were pre-cast girders have been proposed by the contractor, 50% of the stage payment shall be due & payable on casting of girders for each span & balance 50 % of the stage payment shall be made on completion of stage specified above.	As per RFP
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Item	Percentage weightage Stage wise	Individual Stage for Payment	Percentage weightage Item wise	Queries / Suggestions / Modifications (Received from prospective bidders)	Replies of Authority
		Miscellaneous Works like Crash barrier, Road Marking, Hand Rails. etc.	5.03 %	Payment shall be made on completion of all miscellaneous works as specified.	As per RFP
		Wearing Coat including Expansion Joints	1.97 %	Payment shall be made on completion of all wearing coats including expansion joints complete in all respect for each structure as specified.	As per RFP
		Approach Ramps & other Ancillary works	2.93 %	Payment shall be made per square meter (plan view area) on pro rata basis on completion of the stage of each side approaches of at least one structure.	As per RFP
		<b>Total</b>	<b>100%</b>		
		Electrical & Illumination Works	100.00%	Payment shall be made on completion of all Works, Complete in all respects as specified.	As per RFP



Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Mogra - Kampa - Barajaguli Road Corridor in the District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode - NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> Call)

**ADDENDUM - I**

Sl. No.	Reference	As per RFP	Modification / Amendment / Clarifications
1.	Article 26, Clause 26.3 (i)	Any Dispute which is not resolved amicably by conciliation, as provided in Clause 26.2, shall be finally settled by a Dispute Resolution Committee (DRC). The Parties shall appoint a DRC, comprising three suitably qualified persons (member); each of whom shall be a professionally experienced in the type of construction involved in this work and with the previous knowledge/experience of interpretation of contractual documents.	<p>(i) Any Dispute which is not resolved amicably by conciliation, as provided in Clause 26.2, shall be finally settled by a Dispute Resolution Committee (DRC). The Parties shall appoint a DRC, comprising three suitably qualified persons (member); each of whom shall be a professionally experienced in the type of construction involved in this work and with the previous knowledge/experience of interpretation of contractual documents.</p> <p>(a) Each of party will nominate one member from the IRC panels of Arbitrators for approval of the other party. The two members will appoint the third member from the IRC panels of Arbitrators, as the Chairman of the DRC within 30 days from their appointment. The party has to appoint a member within 30 days from the receipt of a request to do so from the other party.</p> <p>(b) If any member declines to act or is unable to act as a result of death, disability, resignation, then his replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described.</p> <p>(c) The DRC after receiving all references will deliver its decision within 6 months from the initiation of the proceedings, which shall be reasoned and shall state that it is given under this Sub-Clause.</p> <p>(d) Any award made pursuant to this Article 26 shall be final and binding on the parties as from the date it is made, and the contractor and the Authority agree and undertake to carry out such award without delay.</p> <p>(e) The terms and conditions including fees and other facilities will be settled mutually by both the parties. The fees of the members of the DRC and the cost of the proceedings shall be shared equally by the parties.</p> <p>(f) The sitting of the Committee will be at Kolkata only.</p>
	Schedule-P Insurance	"..... This insurance shall be not less than: Rs. [*****]"	"..... This insurance shall be not less than: Rs. Two Crores"



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**Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Mogra – Kampa - Barajaguli Road Corridor in the District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode – NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> Call)**

**ADDENDUM – I**

Consequent upon Pre Bid Queries, the following list of Annexures are to be read in continuation to RFP and shall form part of Bidding Documents. The bidders are advised to consider them.

Sl. No.	Reference of Sl. No. w.r.t the Replies to Pre Bid Queries	Details of Annexure	Remarks
1.	8, 46	Utility relocation estimates	Annexure – 1
2.	102, 103, 129	Toll Plaza – Layout of Administrative complex	Annexure – 2
3.	125	Main Report	Annexure – 3
4.	153	GAD 1. BK EXP/PH-II/SEGMENT-D/GAD/STRUCTURE/03 of 07 2. BK EXP/PH-II/SEGMENT-D/GAD/STRUCTURE/04 of 07 (Sh-01 of 03) 3. BK EXP/PH-II/SEGMENT-D/GAD/STRUCTURE/05 of 07 (Sh-01 of 03)	Annexure – 4



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**Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Mogra – Kampa - Barajaguli Road Corridor in the District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode – NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> Call)**

**ADDENDUM – I**

**SCHEDULE – A**

Annex – I, Schedule – A, Clause 1 – Site

As per RFP	Modification / Amendment
Up gradation of Kalyani Expressway to 4/6 lane configuration from Elevated Connector at Belgharia Expressway (Ch. 0+000 KM) to Kampa (Ch. 35.340 KM) including elevated connection with proposed Mogra- Kampa-Barajaguli Road corridor implement in 2 (Two) phases.	Up gradation of Kalyani Expressway to 4/6 lane configuration from Elevated Connector at Belgharia Expressway (Ch. 0+000 KM) to Kampa ( <b>Ch. 35.014 KM</b> ) including elevated connection with proposed Mogra- Kampa-Barajaguli Road corridor implement in 2 (Two) phases.
Presently Phase-II of the project is considered (from Muragacha (Ch. 4+565 KM) to Kampa (Ch. 35+340 KM) including elevated connection with proposed Mogra- Kampa- Barajaguli Road corridor)	Presently Phase-II of the project is considered (from Muragacha (Ch. 4+565 KM) to Kampa ( <b>Ch. 35.014 KM</b> ) including elevated connection with proposed Mogra- Kampa- Barajaguli Road corridor)
Total Length of the Kalyani Expressway from Muragacha (Ch. 4+565 KM) to Kampa (Ch. 35+340 KM) including elevated connection with proposed Mogra- Kampa- Barajaguli Road corridor is about 30.775 km which is divided into two Segments:	Total Length of the Kalyani Expressway from Muragacha (Ch. 4+565 KM) to Kampa ( <b>Ch. 35.014 KM</b> ) including elevated connection with proposed Mogra- Kampa- Barajaguli Road corridor is about <b>30.449 km</b> which is divided into two Segments:
Segment-D- The Flyover along B-K Expressway over the existing junction at Kampa, starts from existing Km 34+000 near Kampa junction and meets with the elevated Kampa bypass through two ramps over the Mathura beel of the Mogra- Barojaguli Section of the on-going connectivity works of SH 13 - NH 34 (Package III) in the state of West Bengal. The at grade meeting point of the segment is at Ch. 35+340 km. Therefore the total length of the Segment is 1.34 km.	Segment-D- The Flyover along B-K Expressway over the existing junction at Kampa, starts from existing Km 34+000 near Kampa junction and meets with the elevated Kampa bypass through two ramps over the Mathura beel of the Mogra- Barojaguli Section of the on-going connectivity works of SH 13 - NH 34 (Package III) in the state of West Bengal. The at grade meeting point of the segment is at ( <b>Ch. 35.014 KM</b> ). Therefore the total length of the Segment is <b>1.014 km</b> .

Annex – I, Schedule – A, Clause 2 – Land

As per RFP

Chainage		Length (m)	Existing ROW width (m)	Remarks
From	To			
34380	35400	920	65	No requirement of Additional Land Purchase

This is to be read as:-

Chainage		Length (m)	Existing ROW width (m)	Remarks
From	To			
34380	<b>35014</b>	<b>634</b>	65	No requirement of Additional Land Purchase

Annex – II, Schedule – A, Dates for providing ROW

The table under this Annex – II is deleted and shall be replaced with the following:-

Dates for providing ROW
<b>The dates on which WBHDCL shall provide Right-of-Way to the agency on different stretches of the B K Expressway are given below</b>



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**Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Mogra – Kampa - Barajaguli Road Corridor in the District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode – NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> Call)**

**ADDENDUM – I**

**SCHEDULE – A**

Chainage		Length (m)	Existing ROW width (m)	Date of providing ROW
From	To			
Segment C				
4565	5140	575	52	On Appointed Date
5140	13895	8755	52	
13895	16350	2455	60	
16350	16650	300	100	
16650	34000	17350	60	
Segment D				
34000	34380	380	60	On Appointed Date
34380	35014	634	65	150 days from Appointed Date

Annex – I, Schedule – A, Clause 8 – Minor Bridges

Sl. No. 2, Chainage – 34+809 (Segment D) – Carriageway Width (m)

As per RFP	Modification / Amendment / Clarifications
7 m	To be read as 7.5 m



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**Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Mogra – Kampa - Barajaguli Road Corridor in the District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode – NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> Call)**

**ADDENDUM – I**

**SCHEDULE – B**

Annex – I, Schedule – B, Clause 1.1 – Width of Carriageway

Segment C Portion:

As per RFP	Modification / Amendment / Clarifications
The paved carriageway shall be 2 x 9.00m wide including paved shoulder and having a central median in between the carriageway following (design Chainage). Similarly paved carriageway on same stretches shall be of 2x10.50 meters wide including either side paved shoulder and having a central median in between the two carriageway	The paved main carriageway shall be 2 x 9.00m wide or 2x10.50m wide or 2X12.00m wide including paved shoulder and having a central median in between the carriageway following (design Chainage) as detailed in the table below

Annex – I, Schedule – B, Clause 2.5 – Type of Shoulders

As per RFP

Sl. No.	Chainage		Name of TCS	Width of Paved Shoulders (m)	Remarks
	From	To			
63	31964	32471	TCS – 1 to 10 of Segment D	NIL	Elevated Structure Portion

This is to be read as:-

Sl. No.	Chainage		Name of TCS	Width of Paved Shoulders (m)	Remarks
	From	To			
63	34.000	35.014	<b>TCS – 1 to TCS – 10 of Segment D</b>	<b>As indicated in TCS drawings</b>	Elevated Structure Portion

Annex – I, Schedule – B, Clause 7.2.2 – Reconstruction of existing culverts

The following is deleted:-

Sl. No.	Type	Design Chainage	Nc/a-b/Ec*	Remarks
Segment D				
23	RCC Box	34+520		Exiting pipe culvert to be reconstructed 2mX2m box type

Annex – I, Schedule – B, Clause 7.2.4 – Additional new culverts shall be constructed as per particulars given in the table below:

As per RFP

Sl. No.	Type	Design Chainage	Nc/a-b/Ec*	Remarks
Segment D				
9	RCC Box	34+522	1/2.0 - 2.00/0	Newly Proposed

This is to be read as:-

Sl.	Type	Design Chainage	Nc/a-b/Ec*	Remarks



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**Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Mogra – Kampa - Barajaguli Road Corridor in the District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode – NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> Call)**

**ADDENDUM – I**

**SCHEDULE – B**

No.				
Segment D				
9	RCC Box	34+522	1/2.0 - 2.00/0	Newly Proposed <b>(This is in lieu of existing pipe culvert at 34+520)</b>

Annex – I, Schedule – B, Clause 2.10 – Grade Separated Structures

2.10.1, Segment – D Portion:

As per RFP

Sl. No.	Chainage		Span Arrangement	Overall Width (m)	Remarks
	From	To			
11	1046.59	115.59	22+25+22	6.00	Right Turning Ramp
18	854.78	923.78	22+25+22	6.00	

This is to be read as follows:-

Sl. No.	Chainage		Span Arrangement	Overall Width (m)	Remarks
	From	To			
11	1046.59	115.59	22+25+22	<b>8.50</b>	Right Turning Ramp
18	854.78	923.78	22+25+22	<b>8.50</b>	

Annex – I, Schedule – B, Clause 13 – Hazardous Locations

Add the following:

The safety measures to be taken shall be as follows:-

1. During execution of the expansion of road work, utmost care is to be paid to not disturb the existing pipeline all along the stretch where the pipeline runs parallel to Kalyani Expressway. In case of acute land constraint for expansion of road work, pipeline is to be protected by means of sheet piling / any other appropriate method as per the ground reality while excavation of adjoining area is to be carried out. These measures are to be decided by the executing agency from case to case basis.
2. Major structures namely flyover and its approaches may be realigned in case the approach of flyover (Retaining wall / Reinforced Earth Wall) comes over the existing pipeline.
3. Construction program for road work where pipeline is required to get exposed is to be shared with KMDA well in advance for better coordination among WBHDCL, KMDA & EPC Contractor. All sorts of preventive measures are to be ensured for protecting the pipeline for ensuring uninterrupted water supply.
4. Service road / Slip Road can be constructed over the pipeline with sufficient cushions of minimum 1 meter from road top level. In case of Pipe Bridge, culvert with sufficient clearance is to be constructed for maintenance of Pipe Bridge. The details of the structure at that location are to be shared with KMDA.



**Upgradation of Kalyani Expressway to 4/6 Lane Configuration From Muragacha (Ch. 4.565 Km) To Kampa (Ch. 35.340 Km) Including Elevated Connection With Proposed Mogra – Kampa - Barajaguli Road Corridor in the District of North 24 Parganas In West Bengal (Phase-II) to be Executed Through EPC Mode – NIT Ref.: WBHDCL/CGM/eNIT-12/2018-2019 dated 03.06.2019 (2<sup>nd</sup> Call)**

**ADDENDUM – I**

**SCHEDULE – D**

Annex – I, Schedule – D, Clause 2 – Deviations from the Specifications and Standards

Sl. No. 5, Item – RE Wall – Description of Deviation

<b>As per RFP</b>	<b>Modification / Amendment / Clarifications</b>
RE Wall height is 5.6m at highest point	Contractor shall undertake the survey, investigation, design and engineering. Based on the same, the height of RE wall shall be suitably assessed to maintain the vertical clearances of the grade separated structures.



ESTIMATE FOR SHIFTING OF 33KV, 11KV LINE DTR & LT LINE FROM MURAGACHA MORE TO KOYRAPUR ALONG THE KALYANI HIGHWAY ROAD UNDER BARRACKPORE DIVISION.

		COST SUMMARY										TOTAL			
		33KV UG LINE		11KV UG LINE		33KV OH LINE		11KV OH LINE		SUB-STATION		LTOH LINE		TOTAL	
A	Material Cost	Rs	13,48,29,695.84	Rs	1,09,80,744.89	Rs	5,34,051.92	Rs	8,08,00,956.65	Rs	2,35,94,431.50	Rs	79,48,788.04	Rs	25,86,88,668.84
B	Labour Cost	Rs	9,30,60,186.00	Rs	92,42,058.00	Rs	7,43,628.50	Rs	86,94,579.59	Rs	29,25,419.70	Rs	29,44,396.04	Rs	11,76,10,267.83
C	Supervision 15% of L	Rs	1,39,59,027.90	Rs	13,86,308.70	Rs	1,11,544.28	Rs	13,04,186.94	Rs	4,38,812.96	Rs	4,41,659.41	Rs	1,76,41,540.17
E	Cess 1% of total (A+B+C)	Rs	24,18,489.10	Rs	2,16,091.12	Rs	13,892.25	Rs	9,07,997.23	Rs	2,69,586.64	Rs	1,13,348.43	Rs	39,39,404.77
F	GST 18% of B	Rs	1,67,50,833.48	Rs	16,63,570.44	Rs	1,33,853.13	Rs	15,65,024.33	Rs	5,26,575.55	Rs	5,29,991.29	Rs	2,11,69,848.21
G	Total	Rs	26,10,18,232.32	Rs	2,34,86,773.15	Rs	15,36,970.07	Rs	9,32,72,744.73	Rs	2,77,54,826.35	Rs	1,19,78,183.21	Rs	41,90,49,729.83

*[Signature]*  
10/07/19

Assistant Engineer (TECH-II)  
Barrackpore Division  
W.B.S.E.D.C.L.

*[Signature]*  
D. E. & Co. (P) Ltd.  
Barrackpore Division  
W.B.S.E.D.C.L.



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**Annexure - 1**

ESTIMATE FOR SHIFTING OF 33KV, 11KV LINE DTR & LT LINE FROM MURAGACHA MORE TO KOYRAPUR ALONG THE KALYANI HIGHWAY ROAD UNDER BARRACKPORE DIVISION.

**COST SUMMARY**

	33KV UG LINE	11KV UG LINE	33KV OH LINE	11KV OH LINE	SUB-STATION	LTOH LINE	TOTAL
A	Rs 134,829,695.84	Rs 10,980,744.89	Rs 534,051.92	Rs 80,800,956.65	Rs 23,594,431.50	Rs 7,948,788.04	Rs 258,688,668.84
B	Rs 93,060,186.00	Rs 9,242,058.00	Rs 743,628.50	Rs 8,694,579.59	Rs 2,925,419.70	Rs 2,944,396.04	Rs 117,610,267.83
C	Rs 5,697,247.05	Rs 505,570.07	Rs 31,942.01	Rs 2,237,388.41	Rs 662,996.28	Rs 272,329.60	Rs 9,407,473.42
E	Rs 2,335,871.29	Rs 207,283.73	Rs 13,096.22	Rs 917,329.25	Rs 271,828.47	Rs 111,655.14	Rs 3,857,064.10
F	Rs 1,025,504.47	Rs 91,002.61	Rs 5,749.56	Rs 402,729.91	Rs 119,339.33	Rs 49,019.33	Rs 1,693,345.22
G	Rs 236,948,504.64	Rs 21,026,659.30	Rs 1,328,468.22	Rs 93,052,983.80	Rs 27,574,015.29	Rs 11,326,188.15	Rs 391,256,819.41



**Annexure - 1**

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**MATERIAL COST**

SLNo	Code	Description	UoM	Rate	33KV HTDH Line				11KV HTDH Line				Sub-Station		LTDH Line		Total	
					Qty		Amount		Qty		Amount		Qty	Amount	Qty	Amount		
1	0110020711	Rail Pole	MT	79031.78	2,864	212,139,061.9	619.48	41,367,117.07	83,916	6,682,380.45	0	0.00	606.96	48,261,636.59				
2	0110030141	PCC Pole 8 Mtr	NDS	4193.26	0	0	0	0.00	0	0.00	380	1,593,435.00	380	1,593,435.00				
3	0102010911	M.S Channel 100x50x6 mm	MT	62139.84	1.1	68353.934	100.3	6,232,835.98	14.3	886,601.14	0	0.00	115.7	7,169,591.06				
4	0102010611	M.S channel 75x40x6 mm	MT	72682.87	0.5	36341.465	20.8	1,519,074.07	4.5	327,073.37	0	0.00	25.9	1,862,488.92				
5	0101011311	M.S Angle 85x65x6 mm	MT	71884.26	0.4	28753.7	47.1	3,395,748.18	13.38	961,811.27	6.2	373,798.10	66.8	4,760,111.24				
6	0103011911	M.S Flat 75x8 mm	MT	79072.68	0.7	55350.876	35.5	2,807,080.14	0	0.00	0	0.00	36.2	2,862,431.02				
7	0103011511	M.S Flat 65x8 mm	MT	79072.68	0	0	0	0.00	5.4	426,992.47	0	0.00	5.4	426,992.47				
8	0103011211	M.S Flat 50x8 mm	MT	79072.68	0	0	0	0.00	0	0.00	4.1	324,187.98	4.1	324,187.98				
9	0504130432	Stay Set H, T, 180x20 mm	Set	1035.93	8	8287.44	920	953,055.60	252	261,054.36	0	0.00	1180	1,222,397.40				
10	0503050711	Stay Wire 7.3-15 mm	MT	69399.15	0.07	8257.8405	8.44	575,730.63	1.8	169,858.39	0	0.00	8.41	751,846.95				
11	0508040841	Guy Insulator H.T.	NOS	38.82	8	318.56	970	36,834.40	252	10,034.64	0	0.00	1180	48,987.60				
12	0504130333	Stay set L.T., 188x16 mm.	NDS	590.68	0	0	0	0.00	0	0.00	380	224,458.40	380	224,458.40				
13	0503050611	Stay set wire 7/2.50 mm.	MT	92208.75	0	0	0	0.00	0	0.00	2.1	193,634.18	2.1	193,634.18				
14	0508040741	Guy Insulator L.T.	NOS	15.46	0	0	0	0.00	0	0.00	380	5,882.40	380	5,882.40				
15	0504110541	GI Earth spike 185x20 mm.	NOS	433.32	0	0	780	330,189.60	315	133,345.80	380	160,861.60	1475	624,397.00				
16	0503010911	GI wire 5mm	MT	65288.45	0	0	5.9	503,207.76	2.4	204,994.28	4.7	400,860.42	13	1,108,782.85				
17	0508011041	Polymer Pin Insulator 33 KV	NDS	514.93	36	18537.48	0	0.00	0	0.00	0	0.00	36	18,537.48				
18	0508011141	Polymer Pin Insulator 11 KV	NOS	218.9	0	0	4200	923,894.00	1134	245,964.80	0	0.00	5334	1,169,958.80				
19	0508030541	Polymer Disc Insulator 11 KV	NOS	200.38	0	0	3240	649,231.20	756	151,487.28	0	0.00	3996	800,718.48				
20	0504010232	Hard ware fittings 100 Sq. mm.	NOS	435.69	0	0	3240	1,390,207.80	756	322,048.64	0	0.00	3996	1,702,256.04				
21	0304010332	T.P.G.O. Isolator 400 Amp 33KV	NOS	37140.2	2	74280.4	0	0.00	0	0.00	0	0.00	2	74,280.40				
22	0304010632	T.P.G.O. Isolator 400 Amp 11KV	NOS	13539.6	0	0	10	135,398.00	1	13,539.80	0	0.00	11	148,937.80				
23	0304010532	T.P.G.O. Isolator 200 Amp	NOS	8300.62	0	0	0	0.00	62	514,638.44	0	0.00	62	514,638.44				
24	0309010841	Lighting Aerials 12KV	NOS	437.82	0	0	0	0.00	189	82,710.18	0	0.00	189	82,710.18				
25	0301011541	Transformer 25 KVA, 11/0.4 KV	NOS	68230.47	0	0	0	0.00	5	341,152.35	0	0.00	5	341,152.35				
26	0301012541	Transformer 83 KVA, 11/0.4 KV	NOS	123887.88	0	0	0	0.00	23	2,849,421.24	0	0.00	23	2,849,421.24				
27	0301013441	Transformer 100 KVA, 11/0.4 KV	NOS	169937.92	0	0	0	0.00	34	5,777,889.28	0	0.00	34	5,777,889.28				
28	0301013841	Transformer 180 KVA, 11/0.4 KV	NOS	256719.54	0	0	0	0.00	1	25,671.954	0	0.00	1	25,671.954				
29	0501018221	PVC Cable 4 Core 185 Sq.m.m.	KM	690040.9	0	0	0	0.00	0.05	34,532.05	0	0.00	0.05	34,532.05				
30	0501018121	PVC Cable 4 Core 120 Sq.m.m.	KM	475178.67	0	0	0	0.00	1.92	912,343.43	2	950,387.74	3.92	1,862,701.17				
31	0501017921	PVC Cable 4 Core 50 Sq.m.m.	KM	193922.31	0	0	0	0.00	0	0.00	1	193,922.31	1	193,922.31				
32	0502010921	ACSR 50 Sq.m.m.	KM	42950.51	0	0	0	0.00	1.9	81,805.97	40.8	1,743,790.71	42.5	1,825,396.89				
33	551023921	11KV 4ple 185sqmm cable	KM	1077662.18	0	0	0	0.00	0.02	21,553.04	0	0.00	0.02	21,553.04				
34	0502011221	ACSR 100 Sq.m.m.	KM	84898.17	0	0	178.4	14,895,708.22	0	0.00	0	0.00	178.4	14,895,708.22				
35	0502010621	ACSR 30 Sq.m.m.	KM	25837.72	0	0	0	0.00	0	0.00	13.7	353,976.76	13.7	353,976.76				
36	0502010321	ACSR 20 Sq.m.m.	KM	16773	0	0	57.7	910,102.10	0	0.00	0	0.00	57.7	910,102.10				
37	0501013021	PVC Cable 2 core 6 Sq.m.m.	KM	34932.18	0	0	0	0.00	0	0.00	8	279,457.44	8	279,457.44				
38	0505031541	D.Jon Clamp 3"x3.5"	NOS	28.03	0	0	0	0.00	604	14,127.12	1422	39,886.66	1926	53,983.78				
39	0508010321	Shackle Strap	PAA	31.53	0	0	0	0.00	0	0.00	323	10,119.59	323	10,119.59				
40	0508040441	Shackle Insulator 3"x3.5"	NOS	17.33	0	0	0	0.00	804	6,734.32	1314	22,771.62	1818	31,505.94				
41	0508040641	C.J. Rail	NOS	25.89	0	0	0	0.00	0	0.00	431	11,158.59	431	11,158.59				
42	0807080522	Polythene Pipe	NOS	11	0	0	0	0.00	0	0.00	1684	18,574.00	1684	18,574.00				
43	0512013341	G.I. Turn Buckle	NOS	177.54	0	0	280	49,711.20	126	22,370.04	0	0.00	406	72,081.24				
44	0505010741	P.G. Clamp 100 Sq. mm.	NOS	323.32	0	0	1020	328,788.40	0	0.00	0	0.00	1020	328,788.40				
46	0505010641	P.G. Clamp 50 Sq. mm.	NOS	88.46	0	0	0	0.00	188	16,807.84	0	0.00	188	16,807.84				
46	NA	L.T. X-rod	NOS	11308.93	0	0	0	0.00	83	712,462.59	0	0.00	83	712,462.59				
47	0504070541	Spacer 5W	NOS	72.71	0	0	0	0.00	0	0.00	1304	94,813.64	1304	94,813.64				
48	0504070341	Spacer 2W	NOS	24.48	0	0	0	0.00	0	0.00	228	5,527.96	228	5,527.96				
49	010010241	Cantile Board	NOS	124	0	0	70	8,680.00	83	7,812.00	0	0.00	133	16,492.00				
50	504043841	11KV 3C3S0050mm XLPE 1φ/11KV XLPE CABLE 11KV	NOS	7268.3	0	0	0	0.00	1	7,268.30	0	0.00	1	7,268.30				
51	504043741	11KV 3C3S0050mm XLPE 1φ/11KV XLPE CABLE 11KV	NOS	10782.84	0	0	0	0.00	1	10,782.84	0	0.00	1	10,782.84				
52	0508030841	Eye Hook for HT & LT AB Cable	NOS	114.82	0	0	0	0.00	0	0.00	68	7,908.78	68	7,908.78				
53	0505030341	Anchor Clamp for AB Cable	NOS	360.22	0	0	0	0.00	0	0.00	20	7,204.40	20	7,204.40				
54	0501030421	LT AB Cable 3C3S0050mm XLPE 11KV	KM	163937.28	0	0	0	0.00	0	0.00	2.1	344,268.29	2.1	344,268.29				
55	0504026741	IPC Connector 50-70Sqmm	NOS	120.49	0	0	0	0.00	0	0.00	245	29,520.05	245	29,520.05				
58	0504027141	IPC Tee Connector ABC to ABC	NOS	156.56	0	0	0	0.00	0	0.00	50	7,778.00	50	7,778.00				
57	0504060841	LT Distribution Box	NOS	2278.21	0	0	0	0.00	0	0.00	49	111,681.29	49	111,681.29				
58	0504140641	Cable end cap for different size	NOS	11.47	0	0	0	0.00	0	0.00	150	1,720.50	150	1,720.50				
58	0504151441	Cable tie with adjustable locking mechanism	NOS	7.36	0	0	0	0.00	0	0.00	1050	7,728.00	1050	7,728.00				
60	0505030641	Suspension clamp 35sqmm	Set	356.95	0	0	0	0.00	0	0.00	49	17,490.55	49	17,490.55				
61	0505034941	Clamp for 8m PCC pole	NOS	487.93	0	0	0	0.00	0	0.00	69	33,667.17	69	33,667.17				
62																		
63																		
64																		
65																		
66																		
67																		
68																		
69																		
		TOTAL				506,520.88		76,953,292.04		22,470,887.15		7,570,274.33		107,500,074.39				
		Survey @ 5%				25,431.04		3,847,664.60		1,123,844.36		378,513.72		5,375,153.72				
		Total Material cost				534,051.92		80,800,956.64		23,594,431.50		7,948,788.04		112,878,228.11				



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ERECTION AND LABOUR CHARGES														
SLNo	Description	UoM	Rate	33KV HTDH Line		11KV HTDH Line		Sub-Station		LTDH Line		Total		
				Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount	
1	Survey H.T.O.H. Line	KM	2,761.00	0.00	0.00	56.200	155,188.20	0	0.00	0	0.00	56.2	155,188.20	
2	Survey L.T.O.H. Line	KM	1,714.00	0.00	0.00	0.000	0.00	0	0.00	13.3	22,796.20	13.3	22,796.20	
3	Erection of Rail Pole with fittings	NOS	4,657.00	0.00	0.00	640.000	2,980,460.00	0	0.00	0	0.00	640	2,980,460.00	
4	Erection of PCC Pole 8 mir	NOS	1,501.00	0.00	0.00	0.000	0.00	0	0.00	360	570,360.00	360	570,360.00	
5	Erection of D.P. by rail Pole 12.8mtr with fittings	NOS	13,969.00	2.00	27,938.00	70.000	877,830.00	0	0.00	0	0.00	72	1,005,768.00	
6	Erection of Sub/Stn structure by Rail pole	NOS	16,112.00	0.00	0.00	0.000	0.00	83	1,015,056.00	0	0.00	83	1,015,056.00	
7	Erection of Stay Set HT	SET	641.00	8.00	5,128.00	920.000	589,720.00	252	161,532.00	0	0.00	1,180	756,360.00	
8	Erection of Stay Set LT	SET	666.00	0.00	0.00	0.000	0.00	0	0.00	380	210,900.00	380	210,900.00	
9	Earth complete	NOS	313.00	0.00	0.00	760.000	244,140.00	315	96,595.00	380	118,940.00	1475	461,675.00	
10	Earth complete with supply of GI pipe & M.S. Flat	NOS	3,616.00	0.00	0.00	0.000	0.00	83	240,406.00	0	0.00	83	240,406.00	
11	Fixing of Pin Insulator 33KV	NOS	72.00	36.00	2,592.00	0.000	0.00	0	0.00	0	0.00	36	2,592.00	
12	Fixing of Pin Insulator 11KV	NOS	63.00	0.00	0.00	4260.000	269,380.00	1134	71,442.00	0	0.00	5394	339,822.00	
13	Fixing of Disc Insulator 11KV	NOS	65.00	0.00	0.00	3240.000	210,600.00	756	49,140.00	0	0.00	3996	259,740.00	
14	Fixing of LT bracket	NOS	605.00	0.00	0.00	0.000	0.00	0	0.00	348	210,540.00	348	210,540.00	
15	Fixing of Box bracket	NOS	1,433.00	0.00	0.00	0.000	0.00	126	180,558.00	64	91,712.00	190	272,270.00	
16	Fixing of Shackle Insulator	NOS	52.00	0.00	0.00	0.000	0.00	504	26,208.00	1314	68,328.00	1818	94,536.00	
17	Fixing of C.I. Reel	NOS	46.00	0.00	0.00	0.000	0.00	0	0.00	431	19,826.00	431	19,826.00	
18	Extension of Rail Pole	NOS	1,862.95	0.00	0.00	780.000	1,453,101.00	126	234,731.70	0	0.00	906	1,687,832.70	
19	Erection of 25 KVA Transformer	NOS	1,925.00	0.00	0.00	0.000	0.00	5	9,625.00	0	0.00	5	9,625.00	
20	Erection of 63 KVA Transformer	NOS	2,711.00	0.00	0.00	0.000	0.00	23	62,353.00	0	0.00	23	62,353.00	
21	Erection of 100 KVA Transformer	NOS	3,214.00	0.00	0.00	0.000	0.00	34	109,276.00	0	0.00	34	109,276.00	
22	Erection of 160 KVA Transformer	NOS	7,248.00	0.00	0.00	0.000	0.00	1	7,248.00	0	0.00	1	7,248.00	
23	Fixing of T.P.G.O. Isolator on S/S	NOS	1,163.00	0.00	0.00	0.000	0.00	83	75,159.00	0	0.00	83	75,159.00	
24	Fixing of T.P.G.O. Isolator 33KV	NOS	3,199.00	2.00	6,398.00	0.000	0.00	0	0.00	0	0.00	2	6,398.00	
25	Fixing of T.P.G.O. Isolator 11KV on line	NOS	3,199.00	0.00	0.00	10,000	31,990.00	0	0.00	0	0.00	10	31,990.00	
26	Fixing of Kees	NOS	3,100.00	0.00	0.00	0.000	0.00	83	195,300.00	0	0.00	83	195,300.00	
27	String sagging of ACSR 100 Sq mm. 3 Cond	KM	16,644.00	0.00	0.00	56.200	929,772.80	0	0.00	0	0.00	56.2	929,772.80	
28	String sagging of ACSR 50 Sq mm. 3 Cond	KM	8,289.00	0.00	0.00	0.000	0.00	0	0.00	12.1	100,296.90	12.1	100,296.90	
29	String sagging of ACSR 50 Sq mm. 2 Cond	KM	6,184.00	0.00	0.00	0.000	0.00	0	0.00	1.2	7,420.80	1.2	7,420.80	
30	String sagging of ACSR 30 Sq mm. 1 Cond	KM	2,845.00	0.00	0.00	0.000	0.00	0	0.00	13.3	37,638.50	13.3	37,638.50	
31	String sagging of GI. wire 4 mm. 1 cond	KM	1,582.00	0.00	0.00	0.000	0.00	0	0.00	13.3	21,173.60	13.3	21,173.60	
32	Fixing of S/C 1 ph	NOS	504.00	0.00	0.00	0.000	0.00	0	0.00	1450	730,800.00	1450	730,800.00	
33	Fixing of S/C 3 ph	NOS	570.00	0.00	0.00	0.000	0.00	0	0.00	150	85,500.00	150	85,500.00	
34	Dismantling of ACSR 150Sqmm 3 Wire & Return to store	KM	7,953.00	13.50	107,365.50	0.000	0.00	0	0.00	0	0.00	13.5	107,365.50	
35	Dismantling of ACSR 100Sqmm 3 Wire & Return to store	KM	7,202.40	0.00	0.00	9,830	70,799.59	0	0.00	0	0.00	9.83	70,799.59	
36	Dismantling of ACSR 50Sqmm 3 Wire & Return to store	KM	2,733.60	0.00	0.00	0.000	0.00	0	0.00	7.79	21,294.74	7.79	21,294.74	
37	Dismantling of ACSR 50Sqmm 4 Wire & Return to store	KM	3,417.00	0.00	0.00	0.000	0.00	0	0.00	0.06	170.85	0.06	170.85	
38	Dismantling of ACSR 50Sqmm 2 Wire & Return to store	KM	2,050.20	0.00	0.00	0.000	0.00	0	0.00	0.42	861.06	0.42	861.06	
39	Dismantling of ACSR 50Sqmm 1 Wire & Return to store	KM	1,139.00	0.00	0.00	0.000	0.00	0	0.00	2.15	2,448.85	2.15	2,448.85	
40	Dismantling of ACSR 30Sqmm 1 Wire & Return to store	KM	1,101.00	0.00	0.00	0.000	0.00	0	0.00	10.41	11,461.41	10.41	11,461.41	
41	Fixing of C.G. Bracket on SP	NOS	237.00	0.00	0.00	660.000	161,160.00	12	2,844.00	0	0.00	692	164,004.00	
42	Fixing of C.G. Bracket on DP	NOS	369.00	0.00	0.00	70.000	25,830.00	63	23,247.00	0	0.00	133	49,077.00	
43	Drawal of Lead Wire 2w up to 50 Mtr	NOS	312.00	0.00	0.00	710.000	221,520.00	0	0.00	0	0.00	710	221,520.00	
44	Fixing of Cross Laing	NOS	15.00	0.00	0.00	6900.000	84,000.00	0	0.00	0	0.00	6900	84,000.00	
45	Making & fixing of end termination joint 11KV 3C/300Sqmm ALPE	NOS	1,866.00	0.00	0.00	0.000	0.00	2	3,732.00	0	0.00	2	3,732.00	
46	Fixing of Lightning Arrester	SET	339.00	0.00	0.00	0.000	0.00	83	21,357.00	0	0.00	83	21,357.00	
47	Fixing of Safety device	NOS	35.00	0.00	0.00	0.000	0.00	0	0.00	842	29,470.00	842	29,470.00	
48	Fixing of LT Spacer 3-phase unit	NOS	56.00	0.00	0.00	0.000	0.00	0	0.00	1304	73,024.00	1304	73,024.00	
49	Fixing of LT Spacer 1-phase unit	NOS	37.00	0.00	0.00	0.000	0.00	0	0.00	228	8,362.00	228	8,362.00	
50	Fixing of Caution Board	NOS	24.00	0.00	0.00	70.000	1,680.00	83	1,912.00	0	0.00	133	3,192.00	
51	Uprooting of Rail Pole & Return to store	NOS	1,000.00	404.00	404,000.00	159.000	159,000.00	58	58,000.00	104	104,000.00	726	726,000.00	
52	Uprooting of 8 M PCC Pole & Return to store	NOS	594.00	0.00	0.00	84.000	39,016.00	10	5,940.00	5	2,970.00	79	48,926.00	
53	Uprooting of 8 M PCC Pole & Return to store	NOS	383.00	0.00	0.00	0.000	0.00	0	0.00	270	103,410.00	270	103,410.00	
54	Dismantling of Substation structure & Return to store	NOS	4,491.00	0.00	0.00	0.000	0.00	38	170,858.00	0	0.00	38	170,858.00	
55	Dismantling of T.P.G.O. Isolator	NOS	1,717.00	0.00	0.00	6.000	10,302.00	38	65,246.00	0	0.00	44	75,548.00	
56	Dismantling of T.P.G.O. Isolator 33KV	NOS	1,757.00	2.00	3,514.00	0.000	0.00	0	0.00	0	0.00	2	3,514.00	
57	Dismantling of Pin Insulator 11KV & Return to store	NOS	63.00	0.00	0.00	780.000	41,340.00	456	24,168.00	0	0.00	1236	65,508.00	
58	Dismantling of Pin Insulator 33KV & Return to store	NOS	61.00	1,545.00	94,245.00	0.000	0.00	0	0.00	0	0.00	1545	94,245.00	
59	Dismantling of Disc Insulator 11KV & Return to store	NOS	63.00	0.00	0.00	780.000	39,750.00	228	12,084.00	0	0.00	978	51,834.00	
60	Dismantling of Disc Insulator 33KV & Return to store	NOS	72.00	1,294.00	92,448.00	0.000	0.00	0	0.00	0	0.00	1294	92,448.00	
61	Dismantling of LT bracket Return to store	NOS	487.00	0.00	0.00	0.000	0.00	0	0.00	320	155,840.00	320	155,840.00	
62	Stringing and Sagging of LT AB Cable(3Cx50+1Cx16+1Cx35)	MTR	46.00	0.00	0.00	0.000	0.00	0	0.00	1950	89,700.00	1950	89,700.00	
63	Erection of Anchor Clamp LT ABC (MSG 35/50SQMM)	NOS	154.00	0.00	0.00	0.000	0.00	0	0.00	20	3,080.00	20	3,080.00	
64	Erection of Suspension Clamp LT ABC (MSG 35/50SQMM)	NOS	154.00	0.00	0.00	0.000	0.00	0	0.00	49	7,546.00	49	7,546.00	
65	Fixing of IPC Connector of LT ABC	NOS	32.00	0.00	0.00	0.000	0.00	0	0.00	245	7,840.00	245	7,840.00	
66	Fixing of IPC Tee Connector of LT ABC	NOS	32.00	0.00	0.00	0.000	0.00	0	0.00	50	1,600.00	50	1,600.00	
67	Erection of Distribution box	NOS	507.00	0.00	0.00	0.000	0.00	0	0.00	48	24,843.00	48	24,843.00	
68	Dismantling of LT AB Cable(3Cx50+1Cx16+1Cx35) & return to store	KM	13.00	0.00	0.00	0.000	0.00	0	0.00	1.7	22.10	1.7	22.10	
69	Galvanisation of fabricated MS Channel, Angle, Flat etc. (as per IS 4769 and zinc coating shall not be less than 610g/m <sup>2</sup> meter for all structural steel members) in Hot Dip Galvanising Method.	MT	28,000.00	2.70	70,200.00	203.600	5,299,800.00	37.56	977,060.00	7.7	200,200.00	248.86	6,497,060.00	
Total Erection and Labour Charges					743,626.50		6,694,579.59		2,925,419.70		2,944,396.96		15,308,023.35	

## LAYING OF 11KV 3Cx300sqmm XLPE CABLE FOR SHIFTING OF 11KV LINE FROM MURAGACHA MORE TO KOYRAPUR ALONG THE KALYANI HIGHWAY ROAD UNDER BARRACKPORE DIVISION.

## Material Schedule

Sl. NO.	Material Code	DESCRIPTION OF MATERIALS	PARTICULARS OF MATERIALS			
			UNIT	Quantity	UNIT RATE [RS]	Total Amount
1	110051011	Rail pole	MT	18.648	79631.78	1484973.43
2	102010911	M.S.Channel 100x50x6 mm.	MT	4.5	62139.94	279629.73
3	102010611	M.S.Channel 75x40x6 mm.	MT	1.6	72682.97	116292.75
4	101011311	M.S.Angle 65x65x6mm.	MT	1.2	71884.25	86261.10
5	103011511	M.S.Flat 65x6mm.	MT	1.5	79072.68	118609.02
6	508011041	polymer Pin Insulator 11KV.	NOS	336	216.90	72878.40
7	504130432	H.T. Stay Set Complete	SET	28	1035.93	29006.04
8	508040841	H.T. Guy Insulator	NOS	28	39.82	1114.96
9	503050711	G.I. Stay wire 7/10SWG.	MT	0.196	89399.15	17522.23
10	504110541	G.I. Earth Spike	NOS	28	423.32	11852.96
11	503010811	G.I. Wire 5 mm.	MT	0.112	85289.45	9552.42
12	304010532	T.P.G.O. Isolator 400 Amp.	SET		13539.80	0.00
13	309010541	12kv grade gapless LA	NOS	42	437.62	18380.04
14	504043741	11KV 300SQMM O/D. CABLE JOINTING KIT	NOS	28	10782.64	301913.92
15	504043941	11KV 300SQMM ST CABLE JOINTING KIT	NOS	6	19967.85	119807.10
16	502011521	A.CSR 100 Sq.mm.	KM	1.2	84696.17	101635.40
17	501025221	3C 11 KV XLPE Cable, 300 SQ.MM	KM	5.5	1392957.07	7661263.89
18	505010641	P.G. Clamp 100Sq.mm.	NOS	84	323.32	27158.88
		<b>TOTAL</b>				10457852.28
		<b>Sundry 5%</b>				522892.61
		<b>TOTAL</b>				<b>₹ 10,980,744.89</b>

## Erection Schedule

Sl no.	Description	Unit	Quantity	Unit Price	Total Price	
1	Survey of cable route as per instruction of site Engineer	KM	5	2500.00	12500.00	
2	Erection Of Rail Pole Dp With All Fittings With Painting	NOS	14	13969.00	195566.00	
3	Fixing Of Pin Insulator	NOS	336	63.00	21168.00	
4	H.T. Staying Complete	SET	28	641.00	17948.00	
5	Earthing Complete	NOS	28	313.00	8764.00	
6	Laying of 1 nos 3X 300 sqmm XLPE cable through Microtunnelling with supply of HDPE pipe (NOMINAL DIA 160 mm, IS: 4984 : 1995 ) as per direction of the site Engineer(11 KV UG Cable will be supplied by WBSEDCL) including preparation and submission of As built drawing.	MTR	3900	1980.00	7722000.00	
7	Excavation of soil for formation of that hole having minimum size 1.1 x 0.5 x 1.2 M in total cable route as per specification and direction of the site Engineer	Cum	16	31.00	496.00	
8	Excavation of soil (METAL ASPHALT NORMAL SOIL) for formation of cable trench and reinstatement of the cable trench with the excavated soil after completion of laying and dressing of 1 nos 11KV 3x300 SQMM XLPE UG cable and cable protection work as per specification and direction of the site Engineer. Size of cable trench should be at least 900x500 mm and the depth must not be less than 900 mm with 75 mm sand level at the base filling the space between cable and bricks with yellow sand and protection on sides and top by 24 Nos. good quality bricks per meter and the rest space should be filled up with					
8.1	Excavation Of Soil	Cum	1188	125.00	148500.00	
8.2	supply of kiln burnt brick	nos	26400	8.50	224400.00	
8.3	Laying of bricks	nos	26400	1.13	29832.00	
9	Laying And Dressing Of 01 Nos. Cable 12Kv Gr., 3C X 300 Sq.Mm Xlpe Cable In Excavated/Pucca Trench	MTR	1100	59.00	64900.00	
10	Arrangement for termination joint/st.joint. Jointing kit for end termination joint will be supplied by WBSEDCL and the work of jointing will be done by WBSEDCL's own personnel or other agency. But necessary arrangements for properly covering top and all sides of jointing pits with tarpaulin/ Polythene sheet has to be made at the time of jointing. Also required manpower is to be provided to help the cable jointer for straightening the cable at the joint location and re arrangement of cable loops until completion of jointing and necessary lighting arrangement is to be done if required	nos	34	934.00	31756.00	
11	Making of Straight through/Transition joint including making of jointing pit of 11KV 3Cx300sqmm XLPE cable without supply of jointing materials excluding making of protection duct for cable joint	NOS	6	1970.00	11820.00	
12	Making & fixing of end termination joint indoor/out door type for 11KV 3CX300sqmm XLPE cable including fixing of the joint box at the existing structure but without the jointing materials as per instruction of the site engineer	Nos	28	1866.00	52248.00	
13	Supply and erection of RCC cable markers on concrete foundation blocks for straight run as per specification and direction of the site Engineer.	nos	22	300.00	6600.00	
14	Supply & fixing of GI pipe as per ISI of the 150MM dia for cable protection as per instruction of site engineer.	Mtr	28	1353.00	37884.00	
15	Installation of 12 KV class gapless LA on the cable termination DP including earthing with G.I. Pipe.	Set	14	2011.00	28154.00	
16	Earthing of cable armour by G.I. earth electrode of G.I. Pipe 50 mm diameter and 3000 mm length with perforations of 12 mm dia holes@150 mm from each other at right angles along with type top cap & clamp. The clamp shall be 250 mm long, manufactured with 65 x 6 mm G.I flat and the electrode shall be inserted vertically in the bore hole of 300 mm dia in earth and G.I. Flat ( All materials except GI Pipe electrode to be supplied by the contractor)	nos	14	3816.00	53424.00	
17	Making of protection duct for cable joint, complete as per WBSEDCLs Approved Drawing(Ref.Drg.no.PLN(D)/SS/106 D/05/2015	No	34	9347.00	317798.00	
18	Galvanisation of fabricated MS Channel, Angle, Flat etc. (as per IS:4759 and zinc coating shall not be less than 810gm/sq. meter for all structural steel members) in Hot Dip Galvanising Method.	MT	8.8	26000.00	228800.00	
19	Transportation of cable drum from Barrackpore Divisional Store to Site	mtr	5500	5.00	27500.00	
					<b>TOTAL</b>	<b>₹ 9,242,056.00</b>



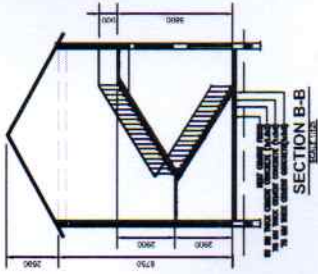
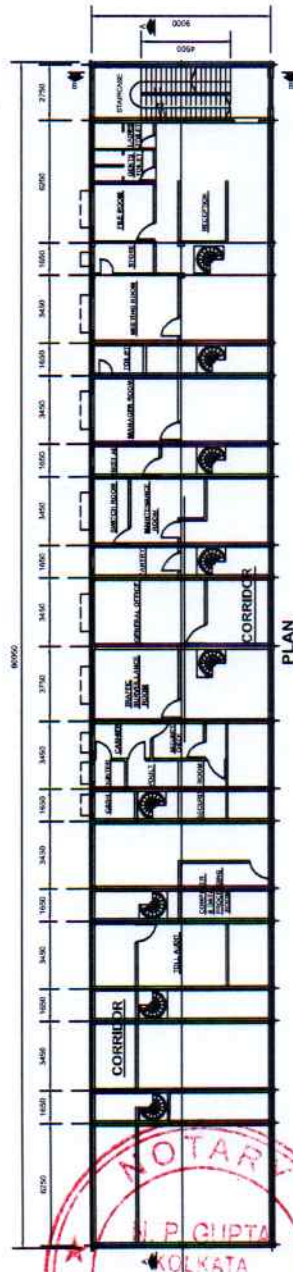
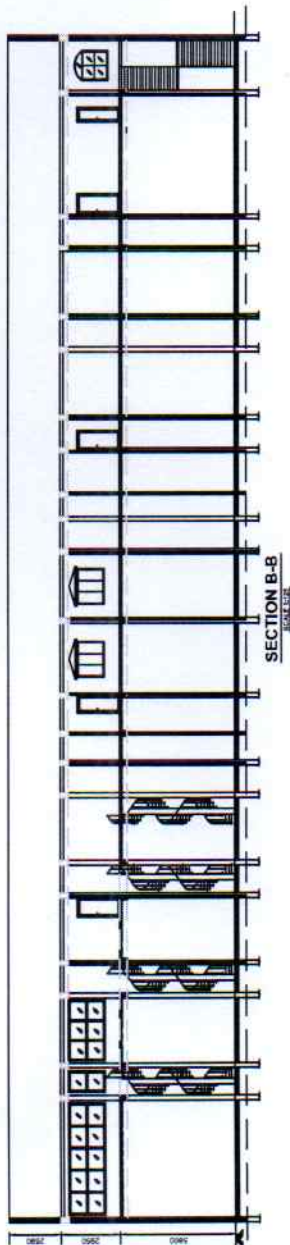
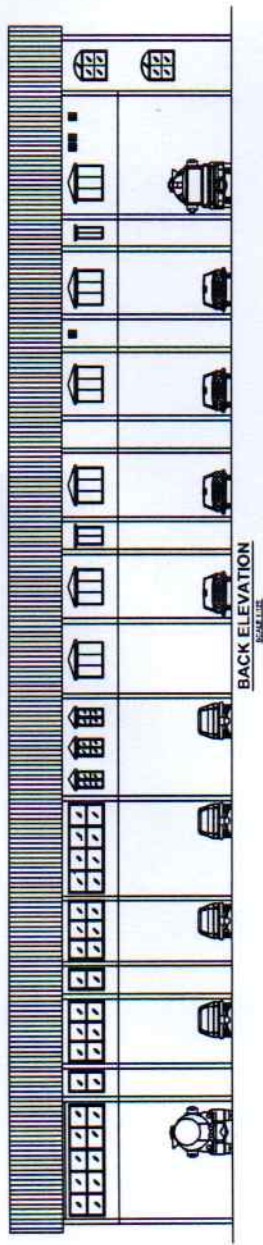
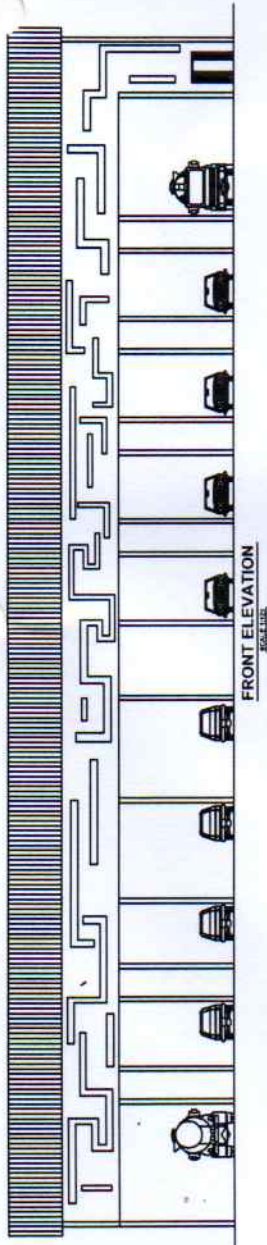
## LAYING OF 33KV 3CX400sqmm XLPE CABLE FOR SHIFTING OF 33KV LINE FROM MURAGACHA MORE TO KOYRAPUR ALONG THE KALYANI HIGHWAY ROAD UNDER BARRACKPORE DIVISION.

SL. NO.	Material Code	DESCRIPTION OF MATERIALS	PARTICULARS OF MATERIALS			
			UNIT	Total Quantity	UNIT RATE	AMOUNT
1	0110020711	Rail Pole	MT	74.592	79631.78	5939893.73
2	0102010911	M.S Channel 100x50x6 mm	MT	9.2	62139.94	571687.45
3	0102010611	M.S channel 75x40x6 mm	MT	4.5	72682.97	327073.37
4	0101011311	M.S Angle 65x65x6 mm	MT	4.2	71884.25	301913.85
5	0103011911	M.S. Flat 75x8 mm.	MT	2.3	79072.68	181867.16
6	0508011041	Polymer Pin Insulator 33 KV	NOS	336	514.93	173016.48
7	0504130432	Stay Set H.T. 1830x20 mm.	SET	112	1035.93	116024.16
8	0508040841	Guy Insulator H.T.	NOS	112	39.82	4459.84
9	0503050711	Stay Wire 7/3.15 mm.	MT	1.008	89399.15	90114.34
10	0504110541	GI Earth spike 1853x20 mm.	NOS	112	423.32	47411.84
11	0503010811	GI wire 5mm.	MT	0.448	85289.45	38209.67
12	309010541	42kv grade gapless L.A	NOS	114	8330.59	949687.26
13	504045841	33Kv 400Sqmm O/D. Cable Jointing Kit	NOS	96	30351.13	2913708.48
14	502011521	A.CSR 150 Sq.mm.	KM	1.14	137757.40	157043.44
15	501025221	3C 33 KV XLPE Cable, 400 SQ.MM	KM	46.82	2309042.00	108109346.44
16	504046041	Heat Shrinkable Jointing Kit 400 Sq.Mm Straight Through Joint	NOS	182	48325.41	8431224.62
17	505010641	P.G. Clamp 200Sq.mm.	NOS	144	360.00	51840.00
18	910012141	Caution Board 33KV	NOS	38	124.00	4712.00
		TOTAL				128409234.13
		Sundry 5%				6420461.71
		TOTAL				₹ 134,829,695.84

Erection Schedule					
Sl no.	Description	Unit	Quantity	Unit Price	Total Price
1	Survey of cable route as per guidance of site Engineer.	KM	44.500	3000.00	133500.00
2	Erection of F.P. by rail Pole 12.8mtr with fittings	NOS	18	35717.00	642906.00
3	Erection of D.P. by rail Pole 12.8mtr with fittings	NOS	20	13969.00	279380.00
4	Fixing of Pin Insulator 33KV	NOS	336	72.00	24192.00
5	H.T. STAYING COMPLETE	SET	112	641.00	71792.00
6	EARTHING COMPLETE	NOS	112	313.00	35056.00
7	FIXING OF CAUTION BOARD	NOS	38	24.00	912.00
8	Laying of 1 no. 45 kv Gr. 3X 400 sqmm XLPE cable through Microtunnelling with supply of HDPE pipe (PE 80, PN-6, NOMINAL DIA 160 mm, IS: 4984 : 1995 ) as per direction of the site Engineer(33 KV UG Cable will be supplied by WBSEDCL) including preparation and submission of As built drawing	MTR	31000	1980.00	61380000.00
9	Excavation of soil for formation of trial hole having minimum size 1.1 x 0.5 x 1.2 M in total cable route as per specification and direction of the site Engineer	CUM	123	34.00	4182.00
10	Excavation of soil (METAL ,ASPHALT ,NORMAL SOIL) for formation of cable trench and reinstatement of the cable trench with the excavated soil after completion of laying and dressing of 1 nos 45 KV grade 3x400 SQMM XLPE UG cable and cable protection work as per specification and direction of the site Engineer. Size of cable trench should be at least 900x1200 mm and the depth must not be less than 1200 mm with 75 mm sand level at the base filling the space between cable and bricks with yellow sand and protection on sides and top by 24 Nos. good quality bricks per meter and the rest space should be filled up with excavated soil as per				
10.1	EXCAVATION OF SOIL	CUM	145800	154.00	22453200.00
10.2	supply of kiln burnt brick	nos	324000	8.10	2622780.00
10.3	Laying of bricks	nos	324000	1.12	362880.00
11	LAYING AND DRESSING OF 01 NO. CABLE 45KV GR., 3C X 400 SQ.MM XLPE CABLE PARALLEL WITH EACH OTHER IN PACCA	MTR	13500	75.00	1012500.00
12	Arrangement for termination joint, jointing kit for end termination joint will be supplied by WBSEDCL and the work of jointing will be done by WBSEDCL's own personnel or other agency. But necessary arrangements for properly covering top and all sides of jointing pits with tarpaulin/ Polythene sheet has to be made at the time of jointing. Also required manpower is to be provided to help the cable jointer for straightening the cable at the joint location and re arrangement of cable loops until completion of jointing and necessary lighting arrangement is to be done if required.	nos	278	1007.00	279946.00
13	Making of straight through joint including making of jointing pit of the 33KV 3CX400sqmm XLPE cable without supply of jointing materials excluding making of "protection duct for cable joint"	NOS	182	2377.00	432614.00
14	Making & fixing of end termination joint indoor/out door type for 33KV 3CX400sqmm XLPE cable including fixing of the joint box at the existing structure but without the jointing materials as per instruction of the site engineer	Nos	96	2200.00	211200.00
15	Supply and erection of RCC cable markers on concrete foundation blocks for straight run as per specification and direction of the site Engineer.	nos	890	300.00	267000.00
16	Raising of 45 KV grade, 1no. 3 X 400 sq. mm. XLPE cable upto 10 metres through 6 mtrs. long medium duty GI pipe of 200 mm. dia. and fixing with terminal structures and MAKING JOINT ARRANGEMENT BETWEEN WOLF TO CABLE END TERMINAL with supply of MS clamp, Nuts, Bolts & washer with brick protection in between pipe and cable etc. including proper earthing ( G.I. pipe supplied by WBSEDCL )	nos	96	2077.00	199392.00
17	Installation of 42 KV class gapless LA on the cable termination DP including earthing with G.I. pipe (specification as sl no 10) and (G.I. fla GI Pipe electrode will be supplied by WBSEDCL)	Set	38	2011.00	76418.00
18	Earthing of cable armour by G.I. earth electrode of G.I. pipe 50 mm diameter and 3000 mm length with perforations of 12 mm dia holes@150 mm from each other at right angles along with type top cap & clamp. The clamp shall be 250 mm long, manufactured with 65 x 6 mm G.I flat and the electrode shall be inserted vertically in the bore hole of 300 mm dia in earth and G.I. Flat ( All materials except GI Pipe electrode to be supplied by the contractor)	nos	38	3816.00	146008.80
19	Making protective duct for Cable Joint complt as per WBSEDCLs Approved Drawing(Ref.Drg.no.PLN(D)/SS/127 Dt.23.06.2018	No	182	9154.00	166628.00
20	Galvanisation of fabricated MS Channel, Angle, Flat etc. (as per IS:4759 and zinc coating shall not be less than 610gm/sq. meter for all structural steel members) in Hot Dip Galvanising Method.	MT	20.2	26000.00	525200.00
21	Transportation of cable drum from Barrackpore Divisional Store to Site	mtr	46820	5.00	234100.00
			TOTAL		₹ 93,060,186.00



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CLIENT:	WEST BENGAL HIGHWAY DEVELOPMENT CORPORATION LIMITED (A Wholly Owned Company of Government of West Bengal)	PROJECT:	Construction of six lane connectivity between Belgharia Expressway and Kalyani Expressway along with improvement of Barrackpore-Kalyani expressway to 4/6 lane configuration upto Kampa including connection with proposed Magra - Kampa - Bara Jaguli Road corridor in the district of North 24 Parganas and Nadia in West Bengal (Total Length 35.400 km)	PROJECT CONSULTANT:	-/01- Legend\MBL logo.png MACKINTOSH BURRI LIMITED Engineers & Contractors (A Government of West Bengal Enterprise)	DRAWN BY:	U.K.D	DESIGNED BY:	T.K.B.	APPROVED BY:	P. Gangopadhyay	TITLE:	GENERAL ARRANGEMENT OF TOLL PLAZA
	REGD. NO.: 13823/19 VALID TILL 30-12-2023		REV. NO.:		WBHCL/BRK Expwy/Toll Plaza/01		ORG. NO.:		REVISION: RD				
						SCALE:	As Shown						MAR 2019

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ANNEXURE-'B'



Dineshchandra R. Agrawal  
Infracon Pvt. Ltd.  
Engineers & Contractors

401, The Grand Mall, S. M. Road, Ambawadi, AHMEDABAD - 380015, Gujarat, INDIA  
Phone: 91-79-30005789, 30021789 Fax: 91-79-4002 2556 Email: drainfra89@gmail.com Website: www.draipl.com

Ref: DRA/Other KE/2022-23/2437

Date: 19.10.2022

To,  
Director, Marine Department  
Syamaprasad Mookerjee Port, Kolkata,  
15 Strand Road,  
Kolkata - 700 001

Sub: Request for permission to excavate silt from River Hugli

Sir,

We would like to excavate silt from River Hugli near Majerchar, Char Kancharapara, Char nandanbati of Vill- Kancharapara, Sub Division: Kalyani, Distr: Nadia.

We have been already issued an NOC granted by M/s. Inland Waterways Authority of India for areas north of Indiasagar Setu considering marine navigation aspect (both copies attached).

Necessary information / documents as required are given below:

1.	Area of proposed excavation demarcated on 4 (four) copies latest Hydrographic Survey Chart of SMPK purchased from the DMD's Drawing Office on payment	Submitted
2.	Dumping site of excavated silt is demarcated on the river chart indicating distance from river bank	Yes ✓
3.	Purpose of excavation	Construction of Kalyani Expressway Project
4.	Quantity of silt to be excavated (in cu.m.)	15000 cum
5.	Period of excavation applied for (in months)	04 months
6.	Approx. quantity of silt to be excavated per day (in cu.m.)	125
7.	Whether Foreshore land owned by KoPT would be utilized for stacking yard (if so, a copy of the application submitted to Land Dept. of KoPT for permission to be attached)	No
8.	Mode of transportation of excavated silt from site of excavation to stacking yard	Dredging Machine Pipeline
9.	Contact details (address, email & phone numbers) of applicant (key person with designation in case of a company) for communication	Mr. Kumar Nilesh, GM, M/s DineshChandra R. Agrawal Infracon Pvt.Ltd., Camp-2, Vill+PO- Madrial, PS-Bhatpara, Madrail, North 24 Paraganas WB-743126 Cell No. 9093201200 kumar.nilesh@draipl.com

We hereby declare that SMP, Kolkata will not be held responsible for any dispute over the private land proposed by us for stacking of the silt or for any complaint / disruption from any corner in transportation / stacking of silt on the proposed land.

We are ready to pay Hydrographic Survey Charges and Impact Assessment Charges (for silt excavation) as per rules of SMP, Kolkata. We also undertake that We will abide by all the rules & regulations as well as terms & conditions of SMP, Kolkata.

We also hereby declare that no excavation will be carried out by us until NOC is granted to us by SMPK.

REDMI NOTE 5 PRO  
MI DUAL CAMERA

Yours faithfully,

2022/11/4 14:15

Kumar Nilesh

Dineshchandra R. Agrawal  
Infracon Pvt. Ltd.  
Engineers & Contractors

401, The Grand Mall, S.M. Road, Ambawadi, AHMEDABAD, Pin-380015, Gujarat, INDIA Phone : 91- 79-30005789, 30021789, Fax: 91-79-4002-2556, Email: [drainfra89@gmail.com](mailto:drainfra89@gmail.com) Website: [www.draipl.com](http://www.draipl.com)

Ref: DRA/Other/KE/2022-23/2437

Date: 19.10.2022

To  
**Director, Marine Department**  
Syamaprasad Mookerjee Port, Kolkata,  
15, Strand Road,  
Kolkata- 700001.

**Sub: Request for permission to excavate silt from River Hugli.**

Sir,

We would like to excavate silt from River Hugli near Majerchar, Char Kancharapara, Char nandanbati of Vill- Kancharapara, Sub-Division: Kalyani, Distt. Nadia.

We have been already issued an NOC granted by M/s. Inland Waterways Authority of India for areas north of Vidyasagar Setu considering marine navigation aspect (both copies attached).

Necessary information/documents as required are given below:

1.	Area of proposed excavation demarcated on 4(four) copies latest Hydrographic Survey Chart of SMPK purchased from the DMD's Drawing Office payment.	Submitted
2.	Dumping site of excavated silt is demarcated on the river chart indicating distance from river bank.	Yes
3.	Purpose of excavation	Construction of Kalyani Expressway Project.
4.	Quantity of silt to be excavated (in cu.m.)	15000 cum
5.	Period of excavation applied for (in months)	04 months
6.	Approx. quantity of silt to be excavated per day (in cu.m.)	125
7.	Whether Foreshore land owned by KoPT would be utilized for stacking yard (if so, a copy of the application submitted to Land Dept of KoPT for permission to attached)	No
8.	Mode of transportation of excavated silt from site of excavation to stacking yard	Dredging Machine Pipeline.
9.	Contact details (address, email & phone numbers) of applicant (key person with designation in case of a company) for communication.	Mr. Kumar Nilesh, GM, M/s. Dinesh Chandra Agrawal Infracon Pvt. Ltd., Camp-2, Vill + P.O.-Madrial, P.S.- Bhatpara, Madrail, North 24 Parganas, WB-743126, CellNo.9093201200 <a href="mailto:kumar.nilesh@draipl.com">kumar.nilesh@draipl.com</a>

We hereby declare that SMP, Kolkata will not be held responsible for any dispute over the private land proposed by us for stacking of the silt of for any complaint/disruption from any corner in transportation/stacking of silt shore on the proposed land.

We are ready to pay Hydrographic Survey Charges and Impact Assessment Charges (for silt excavation) as per rules of SMP, Kolkata. We also undertake that We will abide by all the rules & regulations as well as terms & conditions of SMP, Kolkata.

We also hereby declare that no excavation will be carried out by us until NOC is granted to us by SMPK.

Yours faithfully,

Sd/-



Government of West Bengal

Stock Permit [NOT FOR SALE]

Permit No : 1194T/23-24/060423024921/PT

Permit Date : 06/04/2023

Where as it appears that **MS DINESH CHANDRA RAGRAWAL INFRACON PVT LTD** , Permission Holder or authorized person of the Dredging/Desilting Material Stock **Majherchar, KANCHARAPARA [103/SS2022], P.S - CHAKDAHA, NADIA** has applied for Stock permit for extraction of Dredging/Desilting Material on **27/03/2023** .

Where as it also appears that payment for such extraction has been done on **06/04/2023**.

The Permission Holder has deposited Royalty ,Cess, Contribution to DMF, TDS and Convenience Fees for Stock of **300000.00** cft Dredging/Desilting Material accordingly in the following manner :-

Sl No	Head of A/C Description	Head Of A/c	Amount(Rs)
1	Royalty-Collection of Royalties from Mines and Minerals-Royalties	0029-00-104-002-09	249000.00
2	Cess-Collection Of Royalties from Mines and Minerals-Royalties-other receipts	0029-00-104-002-27	45000.00
3	DMF		24900.00
4	Income Tax		4980.00
5	Convenience Fees (Including GST)		5876.00
6	Prescribed Cost		0
7	Penalty/Other Charges		0.00
<b>Total</b>			<b>329756.00</b>

The payment of **Rs 329756.00** /- vide Transaction Reference Number **BRNCHM2263451** dated **06/04/2023** has been approved in the system on **06/04/2023** .

Hence, Prayer for Stock Permit for **300000.00** cft of Dredging/Desilting Material is hereby allowed in favour of **MS DINESH CHANDRA RAGRAWAL INFRACON PVT LTD**, in respect of the Dredging/Desilting Material Stock **Majherchar, KANCHARAPARA [103/SS2022]** under **CHAKDAHA** Dev. Block with the validity from **01/04/2023** to **01/05/2023**.

Memo No : 013/17

Dated : 31/03/2023

Additional District Magistrate & District Land and Land Reforms Officer NADIA

On QR code scanning pl check that the website address bar shows **mdtcl.wb.gov.in** as that is the only genuine website of the government.





-93- ANNEXURE-D  
**All India Anti Corruption Organisation (Regd.)**

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : msubrata939@gmail.com

Ref No - AIACO/\_\_\_\_/20 AIACO/53/

Date:- 27/02/23

AIACO/ATI/53/23

**TO**  
**THE PUBLIC INFORMATION OFFICER**  
**THE SECRETARY**  
**HIGHWAY DEVELOPMENT CORPORATION LIMITED, WEST BENGAL**  
Fourth Floor, HRBC Bhawan Vidyasagar Setu, Hastings,  
Kolkata, West Bengal, Pin Code - 700021.

**Sub :- Notice U/S - 6 of Right To Information Act, 2005**

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this notice as follows mentioned act for seeking information: -

That the work site of WBHDC at Kalyani - Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. on behalf of WBHDC as a Contractor, over the construction work of Road.

Under the aforesaid circumstances you are requesting to supply me the information(s) asked herein below within the stipulated time from the date of receipt of this notice: -

**Qn. No 1** > The said company are permitted for which material in the purpose of filling in space of said Road Work ? Please provide the detail documents in support of your answer.

That the Court Fee of Rs. 10/- is affixed herewith as per the provisions and rules of Right to Information Act. 2005.

Section 8 of the said Act is not applicable in this regard.  
In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You



Yours Faithfully  
All India Anti Corruption Organization  
*Subrata Mallick* 27/02/23  
Add Director Crime  
(Sri Subrata Mallick)  
KOLKATA  
REGN. No.-13023/10  
VALID TILL 30-12-2023



# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

-94-

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : msubrata939@gmail.com

Ref No - AIACO/\_\_\_\_/20 AIACO/RTI/52/23

Date: 27/02/23

TO  
**THE PUBLIC INFORMATION OFFICER**  
**THE DISTRICT MAGISTRATE, HOOGHLY**  
Hooghlym, Ghatakpara, Chinsurah R S, Chinsurah,  
West Bengal, Pin Code - 712101.



## Sub :- Notice U/S - 6 of Right To Information Act, 2005

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this notice as follows mentioned act for seeking information: -

That the work site of WBHDC at Kalyani - Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. on behalf of WBHDC as a Contractor, over the construction work of Road Silver Sand is mined from the Ganga River and used for filling in the said Road works.

Under the aforesaid circumstances you are requesting to supply me the information(s) asked herein below within the stipulated time from the date of receipt of this notice: -

**Qn. No 1** > Can the said company have any permission for withdrawal Silver Sand from river of Ganga and in which condition the permission was granted ? Please provide the detail documents in support of your answer.

**Qn. No 2** > In which quantity of Silver Sand are permitted for mined in Ganga River and what is the area in permission, what is the Rate are charged for per c. ft Silver Sand Mined from Ganga River? Please provide the required documents in support of your answer all the same.

That the Court Fee of Rs. 10/- is affixed herewith as per the provisions and rules of Right to Information Act. 2005.



Main Narela Road, Near Syndicate Bank, Alipur, Delhi - 100036

E - Mail : [allindiaanticorruptionorg01@gmail.com](mailto:allindiaanticorruptionorg01@gmail.com), [aiacoindia01@gmail.com](mailto:aiacoindia01@gmail.com)

# All India Anti Corruption Organisation (Regd.)

-95-

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : msubrata939@gmail.com

Ref No - AIACO/\_\_\_/20

AIACO/RTI/52/23

Date: 27/02/23

Section 8 of the said Act is not applicable in this regard.

In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You

Yours Faithfully

All India Anti Corruption Organization

*Subrata Mallick* 27/02/23  
(~~Sd/-~~ Subrata Mallick)



Main Narela Road, Near Syndicate Bank, Alipur, Delhi - 100 036

E - Mail : [allindiaanticorruptionorg01@gmail.com](mailto:allindiaanticorruptionorg01@gmail.com), [aiacoindia01@gmail.com](mailto:aiacoindia01@gmail.com)



# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

-96-

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)

Ref No - AIACO/\_\_\_\_\_/20

AIACO/RTI/55/23

Date: 29/02/23

**TO**  
**THE PUBLIC INFORMATION OFFICER**  
**THE DIRECTOR**  
**STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY**  
Prani Sampad Bhawan, 5<sup>th</sup> Floor, LB Block, Sector III,  
Salt Lake City, Kolkata, West Bengal, Pin Code - 700106.



**Sub :- Notice U/S - 6 of Right To Information Act, 2005**

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this notice as follows mentioned act for seeking information: -

That the work site of WBHDC at Kalyani - Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. on behalf of WBHDC as a Contractor, over the construction work of Road Silver Sand is mined from the Ganga River and used for filling in the said Road works.

Under the aforesaid circumstances you are requesting to supply me the information(s) asked herein below within the stipulated time from the date of receipt of this notice: -

**Qn. No 1>** Can the said company have any permission for withdrawal Silver Sand from river of Ganga and in which condition the permission was granted? Please provide the detail documents in support of your answer.

**Qn. No 2>** In which quantity of Silver Sand are permitted for mined in Ganga River and what is the area in permission? Please provide the required documents in support of your answer all the same.

That the Court Fee of Rs. 10/- is affixed herewith as per the provisions and rules of Right to Information Act. 2005.

Section 8 of the said Act is not applicable in this regard.



Page No. 1/2

Main Narela Road, Near Syndicate Bank, Alipur, Delhi - 100 036

E - Mail : [allindiaanticorruptionorg01@gmail.com](mailto:allindiaanticorruptionorg01@gmail.com), [aiacoindia01@gmail.com](mailto:aiacoindia01@gmail.com)



# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission -97-

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : msubrata939@gmail.com

Ref No - AIACO/\_\_\_\_/20 AIACO/ATI/55/23

Date: 27/02/23

In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You

Yours Faithfully  
All India Anti Corruption Organization

*Subrata Mallick* 27/02/23  
Asst. Director (Crime)  
(Subrata Mallick)



Page No. 2/2



# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : msubrata939@gmail.com

Ref No - AIACO/ /20 AIACO/RTI/54/23

Date:- 27/02/23

TO  
**THE PUBLIC INFORMATION OFFICER**  
**THE DISTRICT MAGISTRATE, NADIA**  
Nagendranagar, Kridhnanagar,  
West Bengal, Pin Code - 741101.



## Sub :- Notice U/S - 6 of Right To Information Act, 2005

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this notice as follows mentioned act for seeking information: -

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Under the aforesaid circumstances you are requesting to supply me the information(s) asked herein below within the stipulated time from the date of receipt of this notice: -

**Qn. No 1**> Can the said company have any permission for withdrawal Silver Sand from river of Ganga and in which condition the permission was granted ? Please provide the detail documents in support of your answer.

**Qn. No 2**> In which quantity of Silver Sand are permitted for mined in Ganga River and what is the area in permission what is the Rate are charged for per c. ft Silver Sand Mined from Ganga River? Please provide the required documents in support of your answer all the same.



Main Narela Road, Near Syndicate Bank, Alipur, Delhi - 100 036

E - Mail : [allindiaanticorruptionorg01@gmail.com](mailto:allindiaanticorruptionorg01@gmail.com), [aiacoindia01@gmail.com](mailto:aiacoindia01@gmail.com)

# All India Anti Corruption Organisation (Regd.)-99-

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : msu@ata939@gmail.com

Ref No - AIACO/- /20

AIACO/ATI/54/23

Date:- 27/ 02 /23

That the Court Fee of Rs. 10/- is affixed herewith as per the provisions and rules of Right to Information Act. 2005.

Section 8 of the said Act is not applicable in this regard.

In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You

Yours Faithfully  
All India Anti Corruption Organization

*Subrata Mallick* 27/02/23  
(Sr. Add. Director, Crime)  
(Sr. Subrata Mallick)





# All India Anti Corruption Organisation (Regd.)<sup>100-</sup>

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : msubrata939@gmail.com

Ref No - AIACO/\_\_\_\_/20 AIACO/RTI/56/23

Date: 27/02/23

**TO**  
**THE PUBLIC INFORMATION OFFICER**  
**THE DIRECTOR**  
**WEST BENGAL MINERAL DEVELOPMENT AND TRADING**  
**CORPORATION LIMITED (WBMDTCL)**

3<sup>rd</sup> Floor, DJ-10, (WBHDC Building), DJ Block,  
Sector II, Salt Lake City Kolkata - 700091.



## Sub :- Notice U/S - 6 of Right To Information Act, 2005

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this notice as follows mentioned act for seeking information: -

That the work site of WBHDC at Kalyani - Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. on behalf of WBHDC as a Contractor, over the construction work of Road Silver Sand is mined from the Ganga River and used for filling in the said Road works.

Under the aforesaid circumstances you are requesting to supply me the information(s) asked herein below within the stipulated time from the date of receipt of this notice: -

**Qn. No 1** > Can the said company have any permission for withdrawal Silver Sand from river of Ganga and in which condition the permission was granted also described the per c.ft rate of Silver Sand and quantity of Permission of withdrawl Silver Sand ? Please provide the detail documents in support of your answer.

**Qn. No 2** > Can the permission mention any particular area for Withdrawal Silver Sand From Ganga River? Please provide the required documents in support of your answer all the same.



Page No. 1/2

Main Narela Road, Near Syndicate Bank, Alipur, Delhi - 100 036

E - Mail : [allindiaanticorruptionorg01@gmail.com](mailto:allindiaanticorruptionorg01@gmail.com), [aiacoindia01@gmail.com](mailto:aiacoindia01@gmail.com)



-101-

# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)

Ref No - AIACO/\_\_\_\_/20 AIACO/RTI/56/23

Date: 27/02/23

That the Court Fee of Rs. 10/- is affixed herewith as per the provisions and rules of Right to Information Act. 2005.

Section 8 of the said Act is not applicable in this regard.

In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You

Yours Faithfully  
All India Anti Corruption Organization

*Subrata Mallick* 27/02/23  
Add Director Crime  
(Sri Subrata Mallick)





# All India Anti Corruption Organisation (Regd.)-102

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : msubrata939@gmail.com

Ref No - AIACO/\_\_\_\_\_/20 *AIACO/RTI/57/23*

Date: *29/02/23*

**TO**  
**THE PUBLIC INFORMATION OFFICER**  
**THE SECRETARY**  
**POLLUTION CONTROL BOARD, WEST BENGAL**  
Paribesh Bhawan Canteen, 10A, Broadway Road,  
LA Block, Sector III, Bidhannagar, Kolkata - 700106.



**Sub :- Notice U/S - 6 of Right To Information Act, 2005**

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this notice as follows mentioned act for seeking information: -

That the work site of WBHDC at Kalyani - Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. on behalf of WBHDC as a Contractor, over the construction work of Road Silver Sand is mined from the Ganga River and used for filling in the said Road works.

Under the aforesaid circumstances you are requesting to supply me the information(s) asked herein below within the stipulated time from the date of receipt of this notice: -

**Qn. No 1** > Can the said company have any permission for withdrawal Silver Sand from river of Ganga and in which condition the permission was granted ? Please provide the detail documents in support of your answer.

**Qn. No 2** > Can your concerned authority know the work of withdrawal Silver Sand from the Ganga River in the purpose of Road Construction filling? Please provide the required documents in support of your answer all the same.

That the Court Fee of Rs. 10/- is affixed herewith as per the provisions and rules of Right to Information Act. 2005.



Page No. 1/2

-103-

# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : msubrata939@gmail.com

Ref No - AIACO/\_\_\_\_/20 *AIACO/R 71/57/23*

Date: *27/02/23*

Section 8 of the said Act is not applicable in this regard.

In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You

Yours Faithfully  
All India Anti Corruption Organization

*Subrata Mallick*  
27/02/23  
Add Director Crime  
(Sri Subrata Mallick)





WEST BENGAL MINERAL DEVELOPMENT &  
TRADING CORPORATION LTD.  
(A Govt. of West Bengal Undertaking)

CIN : U14219WB1973SGC028707  
Regd. Office : WBIDC Building, 3rd Floor  
DJ-10, Sector-II, Salt Lake, Kolkata-700091  
Phone : 033-2359-0073  
Email : wbmdtcltd@gmail.com  
Website : mdctl.wb.gov.in

MDTC/RTI/04/653

Date: 15.03.2023

To  
State Public Information Office, (SPIO)  
West Bengal Highway Development Corporation (WBHDC)  
HRBC Bhawan, 4th & 5th Floor, Munshi Premchand Sarani, Kolkata 700 021

Sub: Transfer of Application under section 6(1) (3) of the RTI Act, 2005 of the R.T.I Act, 2005.

Re<sup>d</sup> Letter no. AIACO/\_\_\_/20 AIACO/RTI/56/23, dt. 27.02.2023 (received on 02.03.2023)

Sir,

It may be noted that we are in receipt of the above RTI application of Sri Subrata Mallick [Add. Director Crime, All India Anti Corruption Organisation (Regd.)], **copy enclosed**, having its office at Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206, (which was originally addressed to us) is closely related with the affairs of your esteemed organisation.

In view of above, we are forwarding the copy of the above application under section 6(1)(3) of the RTI Act,2005 for your kind perusal & necessary action (if any).

You are requested to inform the applicant directly with an intimation to this end.

Yours faithfully

*Self*  
Public Information Officer

TC/RTI/04/653/1

Date: 15.03.2023

Copy forwarded for information:

✓ Sri Subrata Mallick  
Add. Director Crime, All India Anti Corruption Organisation (Regd.)  
Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206

*Subrata* 15-03-2023  
Public Information Officer



GOVERNMENT OF WEST BENGAL  
OFFICE OF THE DISTRICT MAGISTRATE & COLLECTOR, HOOGHLY  
[ESTABLISHMENT SECTION: RTI CELL]

Memo No.: 129 / RTI Cell Date: 10/03/2023

To  
The SPIO & Deputy D.L. & L.R.O,  
District Land & Land Reforms Office,  
Hooghly.

Sub.: - Transfer of Petition as per provision of Section 6(3) of the Right to Information Act, 2005.

Ref.: - On the matter of petition submitted Subrata Mallick

With reference to the above noted subject, the Petition submitted by one Subrata Mallick and received by this Section on 09/03/2023 is attached herewith. The subject matter of the petition seems to be closely connected with the functions of your Section/Office. Hence, the petition is hereby transferred to you as per provision of Section 6(3) of the Right to Information Act, 2005. for disposal.

The disposal of the petition made as per provisions of Right to Information Act, 2005 read with West Bengal Right to Information Rules, 2006, may directly be communicated to the applicant as expeditiously as possible

This is for favour of information and necessary action.

  
For District Magistrate,  
Hooghly.

Memo No.: 129/1 / RTI Cell Date: 10/03/2023

Copy forwarded for information and necessary action to:

- ✓ Subrata Mallick. Add Director Crime. All India Anti Corruption Organisation, C/o D.C. Mallick, Qtr No. RH/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman. Pin- 713206 with the request to contact the above mentioned SPIO for the requested information.

  
For District Magistrate,  
Hooghly.  




R/A- AIAACO/32/23 -107-

Government of West Bengal  
Department of Environment

Pranisampad Bhawan, 5<sup>th</sup> Floor, LB-2, Sector-III, Salt Lake, Kolkata-700106

No. EN/ 525/RTI/08/2023

Dated, Kolkata 14, March, 2023

From :: Pausali Mukherjee, WBLS  
Sr. Law Officer, SPIO

To : 1) The SPIO  
West Bengal Highway Development Corporation  
2) The SPIO  
West Bengal Mineral Development & Trading Corporation

**Sub: Information u/s 6(3) of the RTI Act, 2005**

Sir

I am directed to forward the RTI application of Shri Subrata Mallick, under section 6(3) RTI Act 2005, received in this office dated 02.03.23 as the information sought by the applicant is closely related to your office.

You are requested to provide the information directly to the applicant with an intimation of this Department.

Encl: As stated

Yours faithfully

Sd/-

Sr. Law Officer & SPIO

✓ Copy forwarded for information to-

Sri Subrata Mallick, S/o D.C. mallick, Resident of quarter No.R III/81, Bidhannagar Housing Colony, Durgapur, P.S.-New Township, P.O.-A.B.L. Township, District-Paschim Bardhaman, W.B.-713206



Sr. Law Officer & SPIO

R/A. AIDCO/45/23

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GOVERNMENT OF WEST BENGAL  
DEPARTMENT OF INDUSTRIES COMMERCE & ENTERPRISES  
RIGHT TO INFORMATION BRANCH  
4, Abanindranath Tagore Sarani,  
(Formerly 4, Camac Street)  
Kolkata- 7000 016

No. 26(3)-ICE/O/RTI/Gen-APP/12/2023

Kolkata, Dated:20.03.2023

From: The State Public Information Officer &  
Deputy Secretary to the Govt. of West Bengal

- To: 1. The Managing Director,  
West Bengal industria Dev. Corporation Ltd.  
23, Abanindranath Tagore Sarani, Kolkata-700017..
2. The SPIO,  
Director of Mines & Minerals,  
2<sup>nd</sup> Floor, 4, Abanindranath Tagore Sarani,  
Kolkata- 700016.
3. The SPIO,  
W.B.MDTC Ltd.  
Block-DJ, Plot-10, Salt Lake,  
Kolkata- 7000091

Related File No. -- IC&E/O/RTI/Gen-APP/12/2023

Subject : Seeking Information under of RTI Act. 2005 regarding permission to Dr. Agarwal Infracon Pvt. Ltd. On behalf of WBIDC Ltd. at work site of Kalyani for withdrawal of silver sand from river Ganga and its condition & purpose .

Applicant: Subrata Mallick, S/o D.C Mallick, Qtr No-R11/81, Bidhannagar Housing Colony, Durgapur, P.S: New Township, P.O: ABL Township, Dist: Paschim Bardhaman, Pin-713206.

Date of application: 27.02.2023 received on 15.03.2023 in the RTI Branch of this Department.

In terms of sub section 3 of section 6 of the RTI Act, 2005 the undersigned is to transfer herewith the photocopy of the application dated: 27.02.2023 of Sri Subrata Mallick received in the RTI Branch of this Department on 15.03.2023, seeking information as described in detail in the application with the request for providing the requisite information directly to the applicant as the matter is closely related to his office under an intimation to RTI Br. of this Department.

This may kindly be treated as extremely urgent.

Encl: As stated above.

Sdf -

Deputy Secretary to the Govt. of West Bengal  
Kolkata, Dated:20 .03.2023

No. 26(3)/1(3)- ICE/O/RTI/Gen-APP/12/2023

Copy forwarded for information to:

1. The Secretary, West Bengal Information Commission, 11A, Mirza Ghalib St., Kolkata- 700087.
2. Subrata Mallick, S/o D.C Mallick, Qtr No-R11/81, Bidhannagar Housing Colony, Durgapur, Dist: Paschim Bardhaman, Pin-713206.
3. The PIO & SPIO, West Bengal Polution Control Board, Department of Environment, Paribesh Bhavan, 10A, Block-LA, Sector-III, Bidhannagar, Kolkata-700106..

Deputy Secretary to the Govt. of West Bengal





GOVERNMENT OF WEST BENGAL  
DEPARTMENT OF INDUSTRIES COMMERCE & ENTERPRISES  
RIGHT TO INFORMATION BRANCH  
4, Abanindranath Tagore Sarani,  
(Formerly 4, Camac Street)  
Kolkata- 7000 016

No. 26(2)-ICE/O/RTI/Gen-APP/12/2023

Kolkata, Dated:20.03.2023

From: Deputy Secretary to the Govt. of West Bengal

To: 1. The SPIO,

PWD Roads Department, W.B.  
Khadya Bhavan.  
4<sup>th</sup> Floor, Block-A,  
11A, Mirza Ghalib St.,  
Kolkata-87.

2. The SPIO,

West Bengal Highway Dev. Corporation Ltd.  
H82J+MJW, 4<sup>th</sup> & 5<sup>th</sup> Floor, HRBC Bhavan, Vidyasagar Setu. Hastings, Kolkata-700021..

Related File No. - IC&E/O/RTI/Gen-APP/12/2023

Subject : Seeking Information under of RTI Act. 2005 regarding permission to Dr. Agarwal Infracon Pvt. Ltd. On behalf of WBHDC Ltd. at work site of Kalyani for withdrawal of silver sand from river Ganga and its condition & purpose . <u>RTI/81</u>
Applicant: Subrata Mallick, S/o D.C Mallick, Qtr No-RH/81, Bidhannagar Housing Colony, Durgapur, P.S: New Township, P.O: ABL Township, Dist: Paschim Bardhaman, Pin-713206.
Date of application: 27.02.2023 received on 15.03.2023 in the RTI Branch of this Department.

In terms of sub section 3 of section 6 of the RTI Act, 2005 the undersigned is to transfer herewith the photocopy of the application dated: 27.02.2023 of Sri Subrata Mallick received in the RTI Branch of this Department on 15.03.2023, seeking information as described in detail in the application with the request for providing the requisite information directly to the applicant as the matter is closely related to his office under an intimation to RTI Br. of this Department.

This may kindly be treated as extremely urgent.

Encl: As stated above.

Deputy Secretary to the Govt. of West Bengal  
Kolkata, Dated:20.03.2023

No. 26(2)/1(3)- ICE/O/RTI/Gen-APP/12/2023

Copy forwarded for information to:

1. The Secretary, West Bengal Information Commission, 11A, Mirza Ghalib St., Kolkata- 700087.
2. Subrata Mallick, S/o D.C Mallick, Qtr No-RH/81, Bidhannagar Housing Colony, Durgapur, ~~Pin-713206.~~ RTI/81  
~~New Township, P.O: ABL Township, Dist: Paschim Bardhaman, Pin-713206.~~
3. The PIO & SPIO, West Bengal Pollution Control Board, Department of Environment, Paribesh Bhavan, 10A, Block-LA, Sector-III, Bidhannagar, Kolkata-700106..

Deputy Secretary to the Govt. of West Bengal

R/1: AIACO/47/23

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GOVERNMENT OF WEST BENGAL  
DEPARTMENT OF INDUSTRIES COMMERCE & ENTERPRISES  
RIGHT TO INFORMATION BRANCH  
4, Abanindranath Tagore Sarani,  
(Formerly 4, Camac Street)  
Kolkata- 7000 016

No. 25-ICE/O/RTI/Gen-App/12/2023

Kolkata, Dated: 20.03.2023

From: State Public Information Officer &  
Deputy Secretary to the Govt. of West Bengal

To: Subrata Mallick,  
S/o D.C Mallick, Qtr No-R11/81,  
Bidhannagar Housing Colony,  
Durgapur,  
Dist: Paschim Bardhaman,  
Pin-713206.

Subject : Seeking Information under of RTI Act. 2005 regarding permission to Dr. Agoraj Infracon Pvt. Ltd. On behalf of WBIDC Ltd. at work site of Kalyani for withdrawal of silver sand from river Ganga and its condition & purpose .  
Applicant: Subrata Mallick, S/o D.C Mallick, Qtr No-R11/81, Bidhannagar Housing Colony, Durgapur, P.S: New Township, P.O: ABL Township, Dist: Paschim Bardhaman, Pin-713206.  
Date of application: 27.02.2023 received on 15.03.2023 in the RTI Branch of this Department.

With reference to his RTI application dated: 27.02.2023 on the above mentioned subject received on 15.03.2023 in the RTI Br. of this Department, the undersigned is to inform him that the matter has been referred to the concerned Branch and offices, as the matter is closely related to that offices with the request to provide the requisite information to this branch/directly to him as per provision of RTI Act. 2005.

Yours faithfully

Deputy Secretary to the Govt. of West Bengal  
Kolkata, Dated: 20.03.2023

No. 25/1-ICE/O/RTI/Gen-App/12/2023

Copy forwarded for information to:-

The Secretary, West Bengal Information Commission, 11A, Mirza Ghalib St., Kolkata-700087.



Deputy Secretary to the Govt. of West Bengal



- III -

**GOVERNMENT OF WEST BENGAL**  
**DEPARTMENT OF INDUSTRIES COMMERCE & ENTERPRISES**  
**RIGHT TO INFORMATION BRANCH**  
**4, Abanindranath Tagore Sarani,**  
**(Formerly 4, Camac Street)**  
**Kolkata- 7000 016**

No.36(2)-ICE/O/RTI/Gen-APP/09/2023

Kolkata, Dated: 21.03.2023

From: The State Public Information Officer &  
 Deputy Secretary to the Govt. of West Bengal

- To: 1. The SPIO,  
 W.B.MDTC Ltd.  
 Block-DJ, Plot-10, Salt Lake,  
 Kolkata- 700091.
2. The SPIO,  
 Director of Mines & Minerals,  
 2<sup>nd</sup> Floor, 4, Abanindranath Tagore Sarani,  
 Kolkata- 700016.

Related File No. – -IC&E/O/RTI/Gen-APP/09/2023

Subject : Seeking Information under of RTI Act. 2005 regarding companies participate in the tender of D.C.R. of Stone including their terms & conditions.
Applicant: Mr. Subrata Mallick, Qtr No-R III/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman, W.B Pin-713206.
Date of application: 08.01.2023 received on 10.03.2023 by the RTI Branch of this Department.

In terms of sub section 3 of section 6 of the RTI Act, 2005 the undersigned is to transfer herewith the photocopy of the application dated: 08.03.2023 of Sri Subrata Mallick received in the RTI Branch of this Department on 10.03.2023, seeking information as described in detail in the application with the request for providing the requisite information directly to the applicant as the matter is closely related to his office under an intimation to RTI Br. of this Department.

This may kindly be treated as extremely urgent.

Encl: As stated above.

Sd/-  
 Deputy Secretary to the Govt. of West Bengal  
 Kolkata, Dated: 21.03.2023

No.36(2)/1- ICE/O/RTI/Gen-APP/09/2023

Copy forwarded for information to:

1. The Secretary, West Bengal Information Commission, 11A, Mirza Ghalib St., Kolkata- 700087.
2. Applicant: Mr. Subrata Mallick, Qtr No-R III/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman, W.B Pin-713206.
3. Deputy Secretary & SPIO, Deptt. Of P&AR, A.R.Cell, Nabanna, 7<sup>th</sup> floor, 325, Sarat Chatterjee Rd., Howrah: 700102.



Deputy Secretary to the Govt. of West Bengal



GOVERNMENT OF WEST BENGAL  
DEPARTMENT OF INDUSTRIES COMMERCE & ENTERPRISES  
RIGHT TO INFORMATION BRANCH  
4, Abanindranath Tagore Sarani,  
(Formerly 4, Camac Street)  
Kolkata- 7000 016

No. 35-ICE/O/RTI/Gen-App/09/2023

Kolkata, Dated: 21.03.2023

From: State Public Information Officer &  
Deputy Secretary to the Govt. of West Bengal

To: Mr. Subrata Mallick,  
Qtr No-R11/81, Bidhannagar  
Housing Colony, Durgapur,  
Paschim Bardhaman,  
Pin-713206.

Subject : Seeking Information under of RTI Act. 2005 regarding companies participate in the tender of D.C.R. of Stone including their terms & conditions.

Applicant: Mr. Subrata Mallick, Qtr No-R11/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman, Pin-713206.

Date of application: 08.01.2023 received on 10.03.2023 by the RTI Branch of this Department.

With reference to his RTI application dated: 08.01.2023 on the above mentioned subject received on 10.03.2023 in the RTI Br. of this Department, the undersigned is to inform him that the matter has been referred to the concerned Branch and offices, as the matter is closely related to that offices with the request to provide the requisite information to this branch/directly to him as per provision of RTI Act. 2005.

Yours faithfully

Deputy Secretary to the Govt. of West Bengal

No. 35/1-ICE/O/RTI/Gen-App/09/2023

Kolkata, Dated:21.03.2023

Copy forwarded for information to:-

The Secretary, West Bengal Information Commission, 11A, Mirza Ghalib St., Kolkata-700087.

Deputy Secretary to the Govt. of West Bengal





GOVERNMENT OF WEST BENGAL  
OFFICE OF THE ADDITIONAL DISTRICT MAGISTRATE AND  
DISTRICT LAND & LAND REFORMS OFFICER, HOOGHLY  
JIBAN PAUL'S GARDEN, HOOGHLY - 712103  
PH. - (033) 26802097/98, FAX - 91-33-26800578  
Email : [dllrohugli@gmail.com](mailto:dllrohugli@gmail.com)

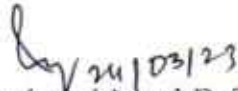
Memo No.: 47(RTI)/ 1688 /2023

Date- 24 .03.2023

To  
✓ Subrata Mallick, Add Director Crime,  
All India Anti Corruption Organisation,  
S/o D. C. Mallick,  
Qtr No. No. RIII/81, Bidhanagar Housing Colony,  
Durgapur, Paschim Bardhaman, Pin.- 713206.

**Sub:** Your application addressed to the District Magistrate & Collector, Hooghly dtd. 27.02.2023 under RTI Act, 2005, received in this office on 15.03.2023.

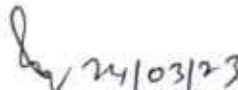
Pursuant to your above referred application submitted under RTI Act, 2005, this is to inform you as per office records that no such mining lease for excavation of silver sand from the river of Ganga is issued from the office of the Additional District Magistrate and District Land & Land Reforms Officer, Hooghly.

  
SPIO & Dy. District Land and Land Reforms Officer,  
Hooghly.

Memo No.: 47(RTI)/ 1688/1 /2023

Date- 24 .03.2023

Copy forwarded to:  
The CA to District Magistrate & Collector, Hooghly for information.

  
SPIO & Dy. District Land and Land Reforms Officer,  
Hooghly.





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# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [aiaco@vsnl.com](mailto:aiaco@vsnl.com)

Ref No - AIACO/\_\_\_\_/20 AIACO/RTI/77/23

Date:-24/03/23

**TO**  
**THE FIRST APPEALATE AUTHORITY**  
**THE REGIONAL CONTROLLER OF MINES**  
**INDIAN BUREAU OF MINES, EASTERN ZONAL OFFICE**  
C.P - 13, Sector V, Salt Lake City,  
Kolkata, West Bengal, Pin Code - 700091

**Subject :- FIRST APPEAL**

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this First Appeal as follows : -

That I am sent a R.T.I vide Ref No. AIACO/\_/20 AIACO/RTI/56/23 dated. 27/02/23 under Section 6 of Right To Right To Information Act, 2005, to the West Bengal Mineral Development and Trading Corporation Limited (WBMDTCL) in connection of the work side of WBHDC at Kalyani-Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. in the matter of construction Silver Sand is mined from the Ganga River, after that the WBMDTCL replied over my said R.T.I vide Ref No. MDTC/RTI/04/653 dated. 15/03/2023 for Transfer the R.T.I application to West Bengal Highway Development Corporation.

**Statement of this Appeal as Follows:-**

1. That I was sent the said R.T.I as per maintaining the Section 6 of the Right to Information Act, 2005.
2. That the WBMDTCL are asked in my R.T.I such required information which is only possible to available in the WBMDTCL office either that the WBMDTCL transfer the said application to the WBHDC who is



Page No. 1/2

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# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [rsubrata939@gmail.com](mailto:rsubrata939@gmail.com)

Ref No - AIACO/\_\_\_\_/20 AIACO/RTI/77/23

Date: 24/03/23

not competent or appropriate to furnished my such question asked in the said R.T.I.

3. That your Good Concerned Authority is the Appropriate Authority as per the Right To Information Act, 2005 for raise First Appeal in connection of the said R.T.I Application.
4. That the Court Fee of Rs. 10/- is already affixed in my R.T.I Application as per the provision of the Right To Information Act, 2005.
5. That the required information is important to receive by the good concerned office in respect of my said R.T.I Application.
6. That I also mention in my R.T.I application that the Section 8 of the Right To Information Act, 2005 is not applicable in connection of the R.T.I Application.
7. That I also mention that the Documents supply matter if any additional cost is required I will bear the same as per the office process.

Thanking You

Yours Faithfully  
All India Anti Corruption Organization

*Subrata Mallick*  
Add-Director Crime

(Sri Subrata Mallick)

24/03/23

### Annexure

- Photocopy of R.T.I Application Ref No. AIACO/\_\_\_\_/20 AIACO/RTI/56/23 dated. 27/02/23.
- Photocopy of Reply Ref No. MDTC/RTI/04/653 dated. 15/03/2023.



Page No. 2/2

Main Narela Road, Near Syndicate Bank, Alipur, Delhi - 100 036

E - Mail : [allindiaanticorruptionorg01@gmail.com](mailto:allindiaanticorruptionorg01@gmail.com). [aiacoindia01@gmail.com](mailto:aiacoindia01@gmail.com)

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# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)

Ref No - AIACO/\_\_\_\_/20 AIACO/RTI/56/23

Date:- 27/02/23

**TO**  
**THE PUBLIC INFORMATION OFFICER**  
**THE DIRECTOR**  
**WEST BENGAL MINERAL DEVELOPMENT AND TRADING**  
**CORPORATION LIMITED (WBMDTCL)**  
3<sup>rd</sup> Floor, DJ-10, (WBIIDC Building), DJ Block,  
Sector II, Salt Lake City Kolkata - 700091.



**Sub :- Notice U/S - 6 of Right To Information Act, 2005**

Dear Sir,

I, **SRI SUBRATA MALICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this notice as follows mentioned act for seeking information: -

That the work site of WBHDC at Kalyani - Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. on behalf of WBHDC as a Contractor, over the construction work of Road Silver Sand is mined from the Ganga River and used for filling in the said Road works.

Under the aforesaid circumstances you are requesting to supply me the information(s) asked herein below within the stipulated time from the date of receipt of this notice: -

**Qn. No 1** > Can the said company have any permission for withdrawal Silver Sand from river of Ganga and in which condition the permission was granted also described the per c.ft rate of Silver Sand and quantity of Permission of withdrawl Silver Sand ? Please provide the detail documents in support of your answer.

**Qn. No 2** > Can the permission mention any particular area for Withdrawal Silver Sand From Ganga River? Please provide the required documents in support of your answer all the same.



Page No. 1/2

Main Narela Road, Near Syndicate Bank, Alipur, Delhi - 100 036

E - Mail : [allindiaanticorruptionorg01@gmail.com](mailto:allindiaanticorruptionorg01@gmail.com), [aiacoindia01@gmail.com](mailto:aiacoindia01@gmail.com)



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# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)

Ref No - AIACO/\_\_\_\_/20 AIACO/ATI/56/23

Date: 27/02/23

That the Court Fee of Rs. 10/- is affixed herewith as per the provisions and rules of Right to Information Act. 2005.

Section 8 of the said Act is not applicable in this regard.

In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You

Yours Faithfully  
All India Anti Corruption Organization

*Subrata Mallick* 27/02/23  
Add Director Crime  
(Sri Subrata Mallick)



Page No. 2/2



WEST BENGAL MINERAL DEVELOPMENT &  
TRADING CORPORATION LTD.  
(A Govt. of West Bengal Undertaking)

CIN : U14219WB1973SGC028707  
Regd. Office : WBHDC Building, 3rd Floor  
DJ-10, Sector-II, Salt Lake, Kolkata-700091  
Phone : 033-2359-0073  
Email : wbmtdcltd@gmail.com  
Website : mdcl.wb.gov.in

MDTC/RTI/04/653

Date: 15.03.2023

To  
State Public Information Office, (SPIO)  
West Bengal Highway Development Corporation (WBHDC)  
HRBC Bhawan, 4th & 5th Floor, Munshi Premchand Sarani, Kolkata 700 021

Sub: Transfer of Application under section 6(1) (3) of the RTI Act, 2005 of the R.T.I Act, 2005.

Ref. Letter no. AIACO/\_\_\_/20 AIACO/RTI/56/23, dt. 27.02.2023 (received on 02.03.2023)

Sir,

It may be noted that we are in receipt of the above RTI application of Sri Subrata Mallick [Add. Director Crime, All India Anti Corruption Organisation (Regd.)], **copy enclosed**, having its office at Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206, (which was originally addressed to us) is closely related with the affairs of your esteemed organisation.

In view of above, we are forwarding the copy of the above application under section 6(1)(3) of the RTI Act, 2005 for your kind perusal & necessary action (if any).

You are requested to inform the applicant directly with an intimation to this end.

Yours faithfully

*Solt*  
Public Information Officer

Date: 15.03.2023

MDTC/RTI/04/653/1

Copy forwarded for information:

✓ Sri Subrata Mallick  
Add. Director Crime, All India Anti Corruption Organisation (Regd.)  
Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206

*RuDP 15-03-2023*  
Public Information Officer





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# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [aiaco23@gmail.com](mailto:aiaco23@gmail.com)

Ref No - AIACO/\_\_\_\_/20 AIACO/RTI/76/23

Date: 24/03/23

**TO**  
**THE FIRST APPEALATE AUTHORITY**  
**STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY**

Prani Sampad Bhawan, 5<sup>th</sup> Floor, LB Block, Sector III,  
Salt Lake City, Kolkata, West Bengal, Pin Code - 700106.

**Subject :- FIRST APPEAL**

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this First Appeal as follows : -

That I am sent a R.T.I vide Ref No. AIACO/RTI/55/23 dated. 27/02/23 under Section 6 of Right To Information Act, 2005, to the State Impact Assessment Authority in connection of the work side of WBHDC at Kalyani-Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. in the matter of construction Silver Sand is mined from the Ganga River, after that the State Impact Assessment Authority replied over my said R.T.I vide Ref No. EN/525/RTI/08/2023 dated. 14/03/2023 for Transfer the R.T.I application to West Bengal Highway Development Corporation and West Bengal Mineral Development & Trading Corporation.

**Statement of this Appeal as Follows:-**

1. That I was sent the said R.T.I as per maintaining the Section 6 of the Right to Information Act, 2005.
2. That the State Impact Assessment Authority are asked in my R.T.I such required information which is only possible to available in the State Impact Assessment Authority office either that the State Impact Assessment Authority transfer the said application to the



+20-

# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)

No - ATACO/\_\_\_/20 AIAACO/RTI/76/23

Date:-24/03/23

West Bengal Highway Development Corporation and West Bengal Mineral Development & Trading Corporation whose are not competent or appropriate to furnish my such question asked in the said R.T.I either that the said two authority are also doing this same kind of job in connection of furnish R.T.I reply.

3. That your Good Concerned Authority is the Appropriate Authority as per the Right To Information Act, 2005 for raise First Appeal in connection of the said R.T.I Application.
4. That the Court Fee of Rs. 10/- is already affixed in my R.T.I Application as per the provision of the Right To Information Act, 2005.
5. That the required information is important to receive by the good concerned office in respect of my said R.T.I Application.
6. That I also mention in my R.T.I application that the Section 8 of the Right To Information Act, 2005 is not applicable in connection of the R.T.I Application.
7. That I also mention that the Documents supply matter if any additional cost is required I will bear the same as per the office process.

Thanking You

Yours Faithfully

All India Anti Corruption Organization  
*Subrata Mallick*  
 Act Director Crime  
 (Sri Subrata Mallick)  
 24/03/23

Annexure



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# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)

No - AIACO/\_\_\_\_/20

Date:- / /

- Photocopy of R.T.I Application Ref No. AIACO/RTI/55/23 dated. 27/02/23.
- Photocopy of Reply Ref No. EN/525/RTI/08/2023 dated. 14/03/2023.



No - AIACO/\_\_\_/20 AIACO/RTI/55/23

Date: 27/02/23

TO  
THE PUBLIC INFORMATION OFFICER  
THE DIRECTOR  
STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY  
Prani Sampad Bhawan, 5<sup>th</sup> Floor, LB Block, Sector III,  
Salt Lake City, Kolkata, West Bengal, Pin Code - 700106.



**Sub :- Notice U/S - 6 of Right To Information Act, 2005**

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this notice as follows mentioned act for seeking information: -

That the work site of WBHDC at Kalyani - Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. on behalf of WBHDC as a Contractor, over the construction work of Road Silver Sand is mined from the Ganga River and used for filling in the said Road works.

Under the aforesaid circumstances you are requesting to supply me the information(s) asked herein below within the stipulated time from the date of receipt of this notice: -

**Qn. No 1** > Can the said company have any permission for withdrawal Silver Sand from river of Ganga and in which condition the permission was granted ? Please provide the detail documents in support of your answer.

**Qn. No 2** > In which quantity of Silver Sand are permitted for mined in Ganga River and what is the area in permission? Please provide the required documents in support of your answer all the same.

That the Court Fee of Rs. 10/- is affixed herewith as per the provisions and rules of Right to Information Act. 2005.

Section 8 of the said Act is not applicable in this regard.



Page No. 1/2

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# All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)

No - AIACO/\_\_\_\_/20 AIACO/ATI/55/23

Date: 27/02/23

In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You

Yours Faithfully  
All India Anti Corruption Organization  
*Subrata Mallick*  
27/02/23  
~~Asst Subrata Mallick~~



Page No. 2/2

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Government of West Bengal  
Department of Environment

Pranisampad Bhawan, 5<sup>th</sup> Floor, LB-2, Sector-III, Salt Lake, Kolkata-700106

No. EN/ 525/RTI/08/2023

Dated, Kolkata 11, March, 2023

From :: Pausali Mukherjee, WBLS  
Sr. Law Officer, SPIO

To : 1) The SPIO  
West Bengal Highway Development Corporation  
2) The SPIO  
West Bengal Mineral Development & Trading Corporation

**Sub: Information u/s 6(3) of the RTI Act, 2005**

Sir

I am directed to forward the RTI application of Shri Subrata Mallick, under section 6(3) RTI Act 2005, received in this office dated 02.03.23 as the information sought by the applicant is closely related to your office.

You are requested to provide the information directly to the applicant with an intimation of this Department.

Encl: As stated

Yours faithfully

Sd/-

Sr. Law Officer & SPIO

✓ Copy forwarded for information to-

Sri Subrata Mallick, S/o D.C. mallick, Resident of quarter No.R III/81, Bidhannagar Housing Colony, Durgapur, P.S.-New Township, P.O.-A.B.L. Township, District-Paschim Bardhaman, W.B.-713206



Sr. Law Officer & SPIO





GOVERNMENT OF WEST BENGAL  
DIRECTORATE OF MINES & MINERALS  
4, CAMAC STREET, 2<sup>nd</sup> FLOOR, KOLKATA-700 016

No. 133 MD/ 1R-402/21

Kolkata, the 31<sup>st</sup> March, 2023.

To  
Sri Subrata Mallick,  
S/o D.C. Mallick,  
Qtr. No. RIII/81, Bidhannagar Housing Colony,  
Durgapur, P.S.-New Township, P.O- ABL Township,  
Dist.- Paschim Bardhaman, Pin- 713206.

Sub: Notice U/S-6 of Right to Information Act, 2005.

Sir,

This office has received a copy of your application No. AIACO/RTI/57/23 dt.27.02.2023 on the above subject under RTI Act, 2005 from the Deputy Secretary & SPIO, IC&E Deptt., vide his Memo No. 26(3)-ICE/O/RTI/Gen-APP/12/2023 dated 20.03.2023 as received on 22.03.2023.

This is to inform you that this Directorate is not involved in granting permission of Lifting Mining Silver sand from River Ganga and the information as sought for by you is not available at this end.

Yours faithfully,

*[Signature]*  
31/03/2023

ASSISTANT DIRECTOR & SPIO  
DIRECTORATE OF MINES & MINERALS

No. /1(1) MD/ 1R-402/21

*S. P. GUPTA*  
31/3/23

Kolkata, the March, 2023.

Copy for information to :

The Deputy Secretary & SPIO to the Govt. Of West Bengal,  
Department of Industry, Commerce & Enterprises, RTI Branch,  
4, Camac Street, Kolkata- 700016.

ASSISTANT DIRECTOR & SPIO  
DIRECTORATE OF MINES & MINERALS



R/A: AIACO/57/23

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**WEST BENGAL MINERAL DEVELOPMENT &  
TRADING CORPORATION LTD.**  
(A Govt. of West Bengal Undertaking)

CIN : U14219WB1973SGC028707  
Regd. Office : WBIIDC Building, 3rd Floor  
DJ-10, Sector-II, Salt Lake, Kolkata-700091  
Phone : 033-2359-0073  
Email : wbmtdcltd@gmail.com  
Website : mdcl.wb.gov.in

MDTC/RTI/04/924

Date: 10.04.2023

To  
State Public Information Office, (SPIO)  
West Bengal Highway Development Corporation (WBHDC)  
HIRBC Bhawan, 4th & 5th Floor, Munshi Premchand Sarani, Kolkata 700 021

Sub: Transfer of Application under section 6(1) (3) of the RTI Act, 2005 of the R.T.I Act, 2005.

Ref. Letter from All India Anti Corruption Organisation vide no. AIACO/ /20 AIACO/RTI/55/23, dt. 27.02.2023, as forwarded by RTI br., IC&E dept, GoWB vide no. 26(3)-ICF/O/RTI/Gen-App/12/2023, dt. 20.03.2023.

Sir,

It may be noted that we are in receipt of the above RTI application of Sri Subrata Mallick [Add. Director Crime, All India Anti Corruption Organisation (Regd.)], **copy enclosed**, having its office at Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206, which is closely related with the affairs of your esteemed organisation.

In view of above, I am directed to forward the copy of the above application under section 6(1)(3) of the RTI Act, 2005 for your kind perusal & necessary action (if any).

You are requested to inform the applicant directly with an intimation to this end.

Yours faithfully

*Sely*  
Public Information Officer

Date: 10.04.2023

MDTC/RTI/04/924/2

**Copy forwarded for information:**

1. Deputy Secretary, RTI br., IC&E Dept, GoWB  
4 Abanindranath Tagore Sarani (Camac Street), Kolkata-700016
2. Sri Subrata Mallick  
Add. Director Crime, All India Anti Corruption Organisation (Regd.)  
Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206

*Rudra* 10.04.23  
Public Information Officer



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GOVERNMENT OF WEST BENGAL  
DEPARTMENT OF INDUSTRIES COMMERCE & ENTERPRISES  
RIGHT TO INFORMATION BRANCH  
4, Abanindranath Tagore Sarani,  
(Formerly 4, Camac Street)  
Kolkata- 7000 016

No. 26(3)-ICE/O/RTI/Gen-APP/12/2023

Kolkata, Dated:20.03.2023

- From: The State Public Information Officer &  
Deputy Secretary to the Govt. of West Bengal
- To: 1.The Managing Director,  
West Bengal industria Dev. Corporation Ltd.  
23, Abanindranath Tagore Sarani, Kolkata-700017..
2. The SPIO,  
Director of Mines & Minerals,  
2<sup>nd</sup> Floor, 4, Abanindranath Tagore Sarani,  
Kolkata- 700016.
3. The SPIO,  
W.B.MDTC Ltd.  
Block-DJ, Plot-10, Salt Lake,  
Kolkata- 7000091

WBIDC LTD.
D-3-10, Block-DJ, 1st Floor, Salt Lake, Kolkata-700091
RECEIVED 21-3-23
ROCKET NO. 1200

CS  
Prd 21/3/23

Related File No. - -IC&E/O/RTI/Gen-APP/12/2023

Subject : Seeking Information under of RTI Act. 2005 regarding permission to Dr. Agarwal Infracon Pvt. Ltd. On behalf of WBIDC Ltd. at work site of Kalyani for withdrawal of silver sand from river Ganga and its condition & purpose .

Applicant: Subrata Mallick, S/o D.C Mallick, Qtr No-R11/81, Bidhannagar Housing Colony, Durgapur, P.S: New Township, P.O: ABL Township, Dist: Paschim Bardhaman, Pin-713206.

Date of application: 27.02.2023 received on 15.03.2023 in the RTI Branch of this Department.

In terms of sub section 3 of section 6 of the RTI Act, 2005 the undersigned is to transfer herewith the photocopy of the application dated: 27.02.2023 of Sri Subrata Mallick received in the RTI Branch of this Department on 15.03.2023, seeking information as described in detail in the application with the request for providing the requisite information directly to the applicant as the matter is closely related to his office under an intimation to RTI Br. of this Department.

This may kindly be treated as extremely urgent.

Encl: As stated above.

*trachly*

Deputy Secretary to the Govt. of West Bengal  
Kolkata, Dated:20 .03.2023

No. 26(3)/1(3)-ICE/O/RTI/Gen-APP/12/2023

Copy forwarded for information to:

1. The Secretary, West Bengal Information Commission, 11A, Mirza Ghalib St., Kolkata- 700087.
2. Subrata Mallick, S/o D.C Mallick, Qtr No-R11/81, Bidhannagar Housing Colony, Durgapur, P.S: New Township, P.O: ABL Township, Dist: Paschim Bardhaman, Pin-713206.
3. The PIO & SPIO, West Bengal Pollution Control Board, Department of Environment, Paribesh Bhavan, 10A, Block-LA, Sector-III, Bidhannagar, Kolkata-700106..

Deputy Secretary to the Govt. of West Bengal



55/202/0/111

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Date - 10/03/2023

50 (RTI)  
15/3/23

RTI MATTER : VERY URGENT



**WEST BENGAL POLLUTION CONTROL BOARD**

(Department of Environment, Government of West Bengal)  
Paribesh Bhawan, 10A, Block - LA, Sector III, Bidhan Nagar, Kolkata - 700106

Ph: (033) 2335-9088, Fax: (033) 2335-2813

Website: www.wbpcb.gov.in, e-mail: net.wbpcb-wb@bangla.gov.in

Memo No. 0656 /1J-6/2024 (Part - VI)

Date: 10 /03/2023

To  
The SPIO  
Department of Industry, Commerce & Enterprises,  
Govt. of West Bengal  
Shilpa Sadan,  
4, Abanindranath Tagore Sarani (Camac Street),  
Kolkata - 700016,

Sub: Information under the "Right to Information Act 2005".

Ref: RTI application of Shri Subrata Mallick (Case No. - 3144).

Sir/ Madam,

With reference to the above, this is to inform you that RTI application of **Shri Subrata Mallick**, S/o. D. C. Mallick, Qtr. No.-R111/81, Bidhannagar Housing Colony, Durgapur, P. S. New Township, P.O. A. B. L Township, Dist. Paschim Bardhaman, West Bengal, PIN-713206, is being transferred to your office under section 6(3) of the RTI Act, 2005 with a request to provide desired information directly to the applicant and a copy of the same to this office.

Thanking you,

Yours faithfully,

(ARUP GUHAIT)

Public Relation Officer &

State Public Information Officer

(Under the Right to Information Act, 2005)

Enclosed: As stated.



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All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office: Qtr No - III/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)



Ref No - AIACO/\_\_\_/20

ALACO/RTI/57/23  
Pet. No. 15782U  
2.3.23

Date: 27/02/23



TO  
THE PUBLIC INFORMATION OFFICER  
THE SECRETARY  
POLLUTION CONTROL BOARD, WEST BENGAL  
Paribesh Bhawan Canteen, 10A, Broadway Road,  
LA Block, Sector III, Bidhannagar, Kolkata - 700106.

Sub :- Notice U/S - 6 of Right To Information Act, 2005

Dear Sir,

I, **SRI SUBRATA MALLICK**, son of D.C Mallick, resident of Quarter No. R III / 81, Bidhannagar Housing Colony, Durgapur, P.S. New Township, P.O. A.B.L Township, Dist. Paschim Bardhaman, West Bengal, 713206, is hereby send this notice as follows mentioned act for seeking information: -

That the work site of WBHDC at Kalyani - Barrackpore Express way which is being constructed by Dr. Agarwal Infracon Pvt. Ltd. on behalf of WBHDC as a Contractor, over the construction work of Road Silver Sand is mined from the Ganga River and used for filling in the said Road works.

Under the aforesaid circumstances you are requesting to supply me the information(s) asked herein below within the stipulated time from the date of receipt of this notice: -

**Qn. No 1** > Can the said company have any permission for withdrawal Silver Sand from river of Ganga and in which condition the permission was granted? Please provide the detail documents in support of your answer.

**Qn. No 2** > Can your concerned authority know the work of withdrawal Silver Sand from the Ganga River in the purpose of Road Construction filling? Please provide the required documents in support of your answer all the same.

That the Court Fee of Rs. 10/- is affixed herewith as per the provisions and rates of Right to Information Act, 2005.

*Subrata Mallik*  
*2/3*



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All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/B1, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman West Bengal, Pin code - 713206, India.

Mobile : +917797546055 | E - mail : [misubrata939@gmail.com](mailto:misubrata939@gmail.com)

Ref No - AIACO/\_\_\_\_/20 AIACO/RTI/57/23

Date: 27/02/23

Section 8 of the said Act is not applicable in this regard.

In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You

Yours Faithfully  
All India Anti Corruption Organization

*Subrata Mallick*  
27/02/23

Add Director Crime  
(Sri Subrata Mallick)



Page No. 2/2



**WEST BENGAL MINERAL DEVELOPMENT &  
TRADING CORPORATION LTD.**  
(A Govt. of West Bengal Undertaking)

CIN : U14219WB1973SGC028707  
Regd. Office : WBIIDC Building, 3rd Floor  
DJ-10, Sector-II, Salt Lake, Kolkata-700091  
Phone : 033-2359-0073  
Email : wbmtdcltd@gmail.com  
Website : mdcl.wb.gov.in

MDTC/RTI/04/925

Date: 10.04.2023

To

State Public Information Office, (SPIO)

West Bengal Highway Development Corporation (WBHDC)

HRBC Bhawan, 4th &amp; 5th Floor, Munshi Premchand Sarani, Kolkata 700 021

Sub: Transfer of Application under section 6(1) (3) of the RTI Act, 2005 of the R.T.I Act, 2005.

Ref. letter from All India Anti Corruption Organisation vide no. AIACO/ /20 AIACO/RTI/55/23, dt. 02.2023, as forwarded by Environment Dept., GoWB vide no. EN/RTI/08/2023, dt. 20.03.2023.

Sir,

It may be noted that we are in receipt of the above RTI application of Sri Subrata Mallick [Add. Director Crime, All India Anti Corruption Organisation (Regd.)], **copy enclosed**, having its office at Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206, which is closely related with the affairs of your esteemed organisation.

In view of above, I am directed to forward the copy of the above application under section 6(1)(3) of the RTI Act, 2005 for your kind perusal & necessary action (if any).

You are requested to inform the applicant directly with an intimation to this end.

Yours faithfully

sd/-

Public Information Officer

MDTC/RTI/04/925/2

Date: 10.04.2023

Copy forwarded for information:

1. Law Officer & SPIO, Department of Environment, GoWB  
Pranisampad Bhawan, 5<sup>th</sup> Floor, I.B-2, Sector-III, Salt Lake, Kolkata-700106

2. Sri Subrata Mallick

Add. Director Crime, All India Anti Corruption Organisation (Regd.)

Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206

Public Information Officer





**WEST BENGAL MINERAL DEVELOPMENT &  
TRADING CORPORATION LTD.**  
(A Govt. of West Bengal Undertaking)

CIN : U14219WB1973SGC028707  
Regd. Office : WBIIDC Building, 3rd Floor  
DJ-10, Sector-II, Salt Lake, Kolkata-700091  
Phone : 033-2359-0073  
Email : wbmtdcltd@gmail.com  
Website : mdcl.wb.gov.in

MDTC/RTI/04/925

Date: 10.04.2023

To

State Public Information Office, (SPIO)

West Bengal Highway Development Corporation (WBHDC)

HRBC Bhawan, 4th & 5th Floor, Munshi Premchand Sarani, Kolkata 700 021

Sub: Transfer of Application under section 6(1) (3) of the RTI Act, 2005 of the R.T.I Act, 2005.

Ref. Letter from All India Anti Corruption Organisation vide no. AIACO/ /20 AIACO/RTI/55/23, dt. 02.2023, as forwarded by Environment Dept., GoWB vide no. EN/RTI/08/2023, dt. 20.03.2023.

Sir,

It may be noted that we are in receipt of the above RTI application of Sri Subrata Mallick [Add. Director Crime, All India Anti Corruption Organisation (Regd.)], **copy enclosed**, having its office at Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206, which is closely related with the affairs of your esteemed organisation.

In view of above, I am directed to forward the copy of the above application under section 6(1)(3) of the RTI Act, 2005 for your kind perusal & necessary action (if any).

You are requested to inform the applicant directly with an intimation to this end.

Yours faithfully

*sd/-*

Public Information Officer

Date: 10.04.2023

MDTC/RTI/04/925/2

**Copy forwarded for information:**

1. Law Officer & SPIO, Department of Environment, GoWB  
Pranisampad Bhawan, 5<sup>th</sup> Floor, I.B-2, Sector-III, Salt Lake, Kolkata-700106

2. Sri Subrata Mallick

Add. Director Crime, All India Anti Corruption Organisation (Regd.)

Qtr No. RIII/81, Bidhannagar Housing Colony, Durgapur, Paschim Bardhaman-713206

*sd/-*  
Public Information Officer



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CS  
Rtd 20/3/23

Government of West Bengal  
Department of Environment

WBSPIC LTD.
5 <sup>th</sup> Floor, Salt Lake Kolkata-700091
RECEIVED ON 20/03/2023
DOCKET NO. 1191

Pranisampad Bhawan, 5<sup>th</sup> Floor, LB-2 Sector-III, Salt Lake, Kolkata-700106

No. EN/ 575 /RTI/08/2023

Dated, Kolkata 14, March, 2023

From :: Pausali Mukherjee, WBLS  
Sr. Law Officer, SPIO

To : 1) The SPIO  
West Bengal Highway Development Corporation  
  
2) The SPIO  
West Bengal Mineral Development & Trading Corporation

**Sub: Information u/s 6(3) of the RTI Act, 2005**

Sir

I am directed to forward the RTI application of Shri Subrata Mallick, under section 6(3) RTI Act 2005, received in this office dated 02.03.23 as the information sought by the applicant is closely related to your office.

You are requested to provide the information directly to the applicant with an intimation of this Department.

Encl: As stated

Yours faithfully

Sr. Law Officer & SPIO





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## All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail :

Ref No - AIACO/\_\_\_\_\_/20 \_\_\_\_\_/50/23

Date: 23/02/23

In this regard of Documents Supply if any additional cost is Required as per the Rules of the Concerned Office, I provide all the required charges.

Thanking You

Yours Faithfully  
All India Anti Corruption Organization  
*Subrata Mallick* 27/02/23  
(Sri Subrata Mallick) -



Page No. 2/2

R/S No. A/1/1/62/23

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# West Bengal Highway Development Corporation Limited ( A Wholly Owned Company of Govt. of West Bengal )

HRBC Bhawan, 4th & 5th Floor, Munshi Premchand Sarani, Kolkata - 700021  
Tel. : (033) 2262 5267, Tele Fax : (033) 2262 5266, E-mail : info@wbhdcl.gov.in  
Corporate Identity Number : U45203WB2012SGC180687

www.wbhdcl.gov.in

[Speed post with A.D.]

Memo No: 672/WBHDCL

Date: 18/04/2023

To,

- 1) Shri.Subrata Mallick  
Quarter No.R III/81,  
Bidhannagar Housing Colony,  
Durapur, P.S. New Township  
P.O.A.B.L Township,  
Dist.Paschim Bardhaman,  
West Bengal-713206

Ref:

- (i) **AIACO/RTI/54/23 dated 27/02/2023** forwarded by The Public Information Officer, The District Magistrate, Nadia through Memo No 52/GL/RTI dated 09/03/2023.
- (ii) **AIACO/RTI/56/23 dated 27/02/2023** forwarded by The Public Information Officer, West Bengal Mineral Development and Trading Corporation Limited (WBMDTCL), through Memo No MDTC/RTI/04/653 dated 15/03/2023.
- (iii) **AIACO/RTI/55/23 dated 27/02/2023** forwarded by The Sr. Law Officer & SPIO, Department of Environment, Government of West Bengal, through Memo No EN/525/RTI/08/2023 dated 14/03/2023
- (iv) Ref No **AIACO/RTI/57/23 dated 27/02/2023** forwarded by:
  - a) The Deputy Secretary, The Department of Industries Commerce & Enterprises, dated 20/03/2023 and the same was forwarded to them by The State Public Information Officer, West Bengal Pollution Control Board, through Memo No 0656/Ij-6/2024 (Part-v) dated 10/03/2023.
  - b) The Assistant Secretary, Public Works Department, Establishment Branch, Government of West Bengal, through memo no 764/PW/O/E-IV/2R-08/2023 dated 28/03/2023 and the same was forwarded to them by The Department of Industries Commerce & Enterprises.
- (v) Ref No **AIACO/RTI/53/23 dated 27/02/2023** from Shri.Subrata Mallick

**Sub: Reply to RTI Applications**

The Applicant has raised the following queries on the above referred Ref No (i) to (iv) so as per the information as available in the records of the company, replies for to the queries are placed in the following table:

Sl.	Query	Reply
1	Can the said company have any permission for withdrawal Sliver Sand from river of Ganga and in which condition the permission was granted? Please provide the detail documents in support of your answer	Yes. Please refer to the following document:- 1) Annexure "1"
2	In which quantity of Sliver Sand are permitted for mined in Ganga River and what is the area in permission what is the Rate are charged for per c.ft Sliver Sand Mined from Ganga River ? Please provide the required documents in support of your answer all the same.	Please refer to the following documents:- 2) Annexure "2"- Details of the quantity and locations. 3) Annexure "3"- Stock permit pertaining rate of royalty etc.



Page 1 of 2

Further, WBHDCL has also received a query from Ref no (v) as stated above, so as per the information as available in the records of the company, reply for to the query is placed in the following table:

Sl.	Query	Reply
1	The said company are permitted for which material in the purpose of filling in space of said Road Work? Please provide the detail documents in support of your answer.	<p>The EPC contractor M/S Dineshchandra R.Agrawal Infracon Pvt Ltd has been engaged for development of Road Construction work from Ch.4+565 to Ch.35+340 by WBHDCL.</p> <p>The filling for the proposed Road Work is being carried out, as per the clause no.305 of MORTH specification 5<sup>th</sup> revision. Relevant details of specifications are enclosed as Annexure "4".</p>

Regards,



(S.K.Paul)

Company Secretary & DGM (Legal), WBHDCL

Encl.: As above



-137-

Ann



WEST BENGAL MINERAL DEVELOPMENT &  
TRADING CORPORATION LTD.  
(A Govt. of West Bengal Undertaking)

CIN : U14219WB1973SGC028707  
Regd. Office : WBIDC Building, 3rd Floor  
DJ-10, Sector-II, Salt Lake, Kolkata-700091  
Phone : 033-2359-0073  
Email : wbdtdcltd@gmail.com  
Website : mdtdl.wb.gov.in

MDTC/SAND/LINEAR/20/654

Date : 1<sup>st</sup> April, 2022

To,  
The General Manager (I),  
West Bengal Highway Development Corporation Ltd.  
HRBC Bhawan, 4<sup>th</sup> & 5<sup>th</sup> floor,  
Munshi Premchand Sarani  
Kolkata: 700021

**Sub** : Regarding permission for dredging/desilting from Hooghly river from  
Chainage 189.8 km and 192.0 km as mentioned in your letter dated: 03.09.2021;  
Memo no: IWAI/KOL/HYSUR-MISC/2018-19/556

Sir,

This is to inform you that the Department of Industry, Commerce & Enterprises has authorized this Corporation (WBMDTCL) to act as State Nodal Agency for carrying out dredging / desilting operations in rivers / water bodies to extract silt / earth / soil to be used as filling materials for all linear projects, guided by Standard Operating Procedure (SOP) approved by the Department vide order no. 100-ICE-12011(99)/8/2022-MINES-SEC-Deptt. of ICE dated 22<sup>nd</sup> February, 2022.

This is also to inform you that the Department of Industry, Commerce & Enterprises, Government of West Bengal has instructed this Corporation vide memo no. 154-ICE-12011(99)/8/2022-MINES dated 21.03.2022 to take up the project as forwarded by your good office vide memo no. 0373/WBHDCL dated 2<sup>nd</sup> March, 2022 as per the approved SOP.

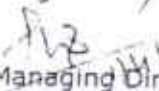
In view of the Test Report recommended by your memo no. 0681/WBHDCL dated 1<sup>st</sup> April 2022, WBMDTCL is pleased to grant you the permission for dredging / desilting from Hooghly river as per the proposal submitted by you.

You are requested to send the filled format (Annex-A) for creation of login in the online portal for making statutory payments & generation of e-challans as stated in the SOP. You are also requested to maintain technical supervision of the work and ensure adherence to the conditions of the SOP at all times.

This is for your information & necessary action please.

Encl : As stated

with regards,

  
Chairman & Managing Director

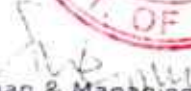
MDTC/SAND/LINEAR/20/654 /1(6)

Date : 1<sup>st</sup> April, 2022

Copy forwarded to:

1. The Secretary, Govt. of West Bengal, Irrigation & Waterways Department.
2. The District Land & Land Reforms Officer, Nadia with instruction to grant excavation permit through the online Portal as per SOP.
3. The Director, Inland Waterways Authority of India-for technical supervision of the work
4. Sr. PS to the Secretary, Govt. of West Bengal, IC&E Dept, to place it before the authority.
5. Sr. PS to the Principal Secretary, Irrigation & Waterways Dept. GoWB to place it before the authority.
6. The General Manager, M/s Dineshchandra R. Agarwal Infracon Pvt Ltd,



  
Chairman & Managing Director

+38-

Annex-2



# West Bengal Highway Development Corporation Limited

(A Wholly Owned Company of Govt. of West Bengal)

HRBC Bhawan, 4th & 5th Floor, Munshi Premchand Sarani, Kolkata - 700021  
Tel: (033) 2262 5267, Tele Fax: (033) 2262 5266, Email: info@wbhdcl.gov.in  
Corporate Identity Number: U45203WB2012SGC180687

www.wbhdcl.gov.in

**Memo No.:** 0715/WBHDCL

**Date:** April 6, 2022

**To:** The Chairman & Managing Director  
West Bengal Mineral Development and Trading Corporation Limited  
WBIIDC Building, 3<sup>rd</sup> Floor, DJ - 10, Sector - II  
Salt Lake, Kolkata - 700091

**Subject:** Upgradation of Kaliyani Expressway to 4/6 lane configuration from Muragacha (Ch. 4+565 KM) to Kampa (Ch. 35+340 KM) including elevated connector with proposed Mogra - Kampa - Barajaguli Road Corridor in the district of North 24 Parganas in West Bengal (Phase-II) on EPC Mode - **Regarding dredging / desilting from Hooghly River from Ch. 189.8 Km & 192.0 Km - Submission of filled format of Annex A**

**Reference:** Your office letter dated MDTC/SAND/LINEAR/20/654 dated 01.04.2022

Sir,

In connection with the subject and letter under reference, please find enclosed the filled format (Annex A) for creation of login in the online portal for making statutory payments & generation of e-challans as stated in SOP.

Further, it is submitted that that the technical supervision of the work and adherence to the conditions of the SOP shall be ensured and strictly monitored during execution of works.

This is for favour of your information & kind necessary action please.

Thanking you,

Enclosure: As stated.

*[Signature]*  
General Manager (I), WBHDCL

**Memo No.:** 0715/1(4)/WBHDCL

**Date:** April 6, 2022

Copy forwarded to:-

1. The Chief General Manager, WBHDCL for kind information.
2. The Project Director (V), WBHDCL for information & necessary action.
3. The Team Leader, M/s LEA Associates South Asia Pvt. Ltd. for information. He is requested to ensure that the technical supervision of the work and strict adherence to the conditions of the SOP at all times.
4. The Authorized Signatory, M/s Dineshchandra R Agrawal Infracon Pvt. Ltd. for information & necessary action. He is requested to ensure that the technical supervision of the work and strict adherence to the conditions of the SOP at all times.

*[Signature]*  
General Manager (I), WBHDCL

**Memo No.:** 0715/2(2)/WBHDCL

**Date:**

Copy forwarded to:-

1. The Director, Inland Waterways Authority of India for kind information & necessary technical supervision of work.
2. The District Land & Land Reforms Officer, Nadia for information please.

*[Signature]*  
General Manager (I), WBHDCL





43976422  
Dineshchandra R. Agrawal  
Infracon Pvt. Ltd.  
Engineers & Contractors

401 The Grand Mall, S. M. Road, Ambawadi, AHMEDABAD - 380015, Gujarat, INDIA  
Phone: 91-79-30701789, 30021789 Fax: 91-79-40022556 Email: drainfra89@gmail.com Website: www.draipl.com

Ref: DRA/WBHDCL/KE/2022-23/1898

11-10-27  
hdf  
4/11  
Date: 06.04.2022

To,  
General Manager-I,  
West Bengal Highway Development Corporation Limited,  
4th & 5th Floor, HRBC Bhawan,  
MunsifremchandSarani,  
Kolkata- 700 021

Sub: Up gradation of Kalyani Expressway to 4/6 lane configuration from Muragacha (Km. 4+365) to Kampa (Km 35+340) including elevated connector with proposed Mogra-Kampa-Barajaguli Road Corridor in the district of North 24 Parganas in West Bengal (Phase-II) on EPC Mode- Reg. Dredging/desilting of soil from River Hooghly-Submission of Annexure-A (Filled format)

Ref: Chairman & Managing Director, West Bengal Mineral Development & Trading Corporation Memo No. MDTC/SAND/LINEAR/20/654 dated 01.04.2022

Dear Sir,

This is with reference to the above letter, we are submitting herewith the filled format (Annexure-A) pertaining to the dredging/desilting of soil from River Hooghly.

This is for your kind information and requesting for further needful action please.

Thanking you and assuring you our best services at all the time.

Yours faithfully,

For, Dinesh Chandra R. Agrawal Infracon Pvt. Ltd.

Umesh Mehrotra  
Vice President Project  
Encl: As above  
Copy to:

1. Project Director-V, WBHDCL, 4th & 5th Floor, HRBC Bhawan, Kolkata-700021
2. Team Leader, LEA Associates South Asia Pvt. Ltd.



Regional Office : Eco Suite Business Tower, Office. 205 & 206, New Town, Kolkata - 700 157  
West bengal, E-mail : draipl.rob@gmail.com

Corporate Office : 401, The Grand Mall, S.M. Road, Ambawadi, Ahmedabad-380015  
E-mail : draipcorp@gmail.com

Site Office : Mouza - Chandua, LR No. - 1942, P.S - Bijpur, Dist - North 24 Parganas.

LIST OF REGISTRATIONS IN A COMPANY FOR SUPPLY OF ELECTRICITY TO THE STATE OF KARNATAKA

No.	Hydro Station	Bus Station	Area Municipality	TP Name	Public Station	Name (Name)	Area (Sq. Km)	Post No.	Quantity in sq. meters (meters square)	Revenue (Rs)	Registration Number (Company Name)	Permit Holder Name	Complete Address	Area (Sq. Km)	Registered Area (Sq. Km)	Area (Sq. Km)
1	Mudha	Kalyani	Kalyani	Kanchrapura	Kalyani	Majherchav	5.4	262	70,00,000.00		Company	M/S Dinesh Chandra R. Agrawal Infracore Pvt. Ltd.	Mudha-Chandiba, T.R. No. 1942, P.S. Bijapur Dist North 28 Pargana	16	16	16
2	Mudha	Kalyani	Kalyani	Kanchrapura	Kalyani	Chau Kanchrapura	5.6	81,34,85,36,47, 51,32,33	70,00,000.00		Company	M/S Dinesh Chandra R. Agrawal Infracore Pvt. Ltd.	Mudha-Chandiba, T.R. No. 1942, P.S. Bijapur Dist North 28 Pargana	16	16	16
3	Mudha	Kalyani	Kalyani	Kanchrapura	Kalyani	Chau Kanchrapura	35	127,8,127,9, 225	70,00,000.00		Company	M/S Dinesh Chandra R. Agrawal Infracore Pvt. Ltd.	Mudha-Chandiba, T.R. No. 1942, P.S. Bijapur Dist North 28 Pargana	16	16	16

Umesh  
 V.P. (DRA)



TYPE COPY

No.	District Name	Sub division	Block/Municipality	G.P./Ward	Police Station	Mouza Name(s)	JL No(s)	Plot No(s)	Quantity in cft dredged/deslited material (earth/soil/silt)	Remark (if any)	Permission Holder Category (Company/Industrial)	Permission Holder Name	Complete address	Pin Code	Registered mobile number	e-Mail ID	PAN	GST
1.	Nadia	Kalyani	Kalyani	Kanchrapara	Kalyani	Majherchar	8-4	9-262	70,00,000.00	11	Company	M/s Dinesh Chandra R Agarwal Infracon Pvt. Ltd	Mauza- Chandua, LR No.1942, PS- Bijpur, Dist- North 24 Parganas	743145	9800284071	17	AABCD9523D	19AAABCD9523DIZ
2.	Nadia	Kalyani	Kalyani	Kanchrapara	Kalyani	Char Kanchrapara	56	83, 84, 85, 86, 87, 91, 92, 93	70,00,000.00		Company	M/s Dinesh Chandra R Agarwal Infracon Pvt. Ltd	Mauza- Chandua, LR No.1942, PS- Bijpur, Dist- North 24 Parganas	743145	9775501934		AABCD9523D	19AAABCD9523DIZ
	Nadia	Kalyani	Kalyani	Kanchrapara	Kalyani	Char Nandan Bati	55	12/13, 12/24, 12/25	70,00,000.00		Company	M/s Dinesh Chandra R Agarwal Infracon Pvt. Ltd	Mauza- Chandua, LR No.1942, PS- Bijpur, Dist- North 24 Parganas	743145	8527208007		AABCD9523D	19AAABCD9523DIZ

Earthwork, Erosion Control and Drainage

Section 300

**305 EMABANKMENT CONSTRUCTION**

**305.1 General**

**305.1.1 Description**

These Specifications shall apply to the construction of embankments including sub-grades, earthen shoulders and miscellaneous backfills with approved material obtained from approved source, including material from roadway and drain excavation, borrow pits or other sources. All embankments sub-grades, earthen shoulders and miscellaneous backfills shall be constructed in accordance with the requirements of these Specifications and in conformity with the lines, grades, and cross-sections shown on the drawings or as directed by the Engineer.

**305.2 Materials and General Requirements**

**305.2.1 Physical Requirements**

**305.2.1.1** The materials used in embankments, subgrades, earthen shoulders and miscellaneous backfills shall be soil, moorum, gravel, reclaimed material from pavement, fly ash, pond ash, a mixture of these or any other material as approved by the Engineer. Such materials shall be free of logs, stumps, roots, rubbish or any other ingredient likely to deteriorate or affect the stability of the embankment.

The following types of material shall be considered unsuitable for embankment:

- a) Materials from swamps, marshes and bogs;
- b) Peat, log, stump and perishable material; any soil that classifies as OL, OI, OH or Pt in accordance with IS:1498;
- c) Materials susceptible to spontaneous combustion;
- d) Materials in a frozen condition;
- e) Clay having liquid limit exceeding 50 and plasticity index exceeding 25; and
- f) Materials with salts resulting in leaching in the embankment.

**305.2.1.2** Expansive clay exhibiting marked swell and shrinkage properties ("free swelling index" exceeding 50 percent when tested as per IS:2720 – Part 40) shall not be used as a fill material. Where an expansive clay having "free swelling index" value less than 50 percent is used as a fill material, subgrade and top 500 mm portion of the embankment just below sub-grade shall be non-expansive in nature.



305.2.1.3 Any fill material with a soluble sulphate content exceeding 1.9 grams of sulphate (expressed as SO<sub>3</sub>) per litre when tested in accordance with BS:1377, Part 3, but using a 2:1 water-soil ratio shall not be deposited within 500 mm distance (or any other distance described in the Contract), of permanent works constructed out of concrete, cement bound materials or other cementitious material.

Materials with a total sulphate content (expressed as SO<sub>3</sub>) exceeding 0.5 percent by mass, when tested in accordance with BS:1377, Part 3 shall not be deposited within 500 mm, or other distances described in the Contract, of metallic items forming part of the Permanent Works.

305.2.1.4 The size of the coarse material in the mixture of earth shall ordinarily not exceed 75 mm when placed in the embankment and 50 mm when placed in the sub-grade. However, the Engineer may at his discretion permit the use of material coarser than this also if he is satisfied that the same will not present any difficulty as regards the placement of fill material and its compaction to the requirements of these Specifications. The maximum particle size in such cases, however, shall not be more than two-thirds of the compacted layer thickness.

305.2.1.5 Ordinarily, only the materials satisfying the density requirements given in Table 300-1 shall be employed for the construction of the embankment and the sub-grade.

Table 300-1 : Density Requirements of Embankment and Sub-grade Materials

S. No.	Type of Work	Maximum laboratory dry unit weight when tested as per IS:2720 (Part 8)
1)	Embankments up to 3 m height, not subjected to extensive flooding	Not less than 15.2 kN/cu.m
2)	Embankments exceeding 3 m height or embankments of any height subject to long periods of inundation	Not less than 16 kN/ cu.m
3)	Subgrade and earthen shoulders/verges/backfill	Not less than 17.5 kN/cu.m

- Notes:**
- 1) This Table is not applicable for lightweight fill material, e.g., cinder, fly ash, etc.
  - 2) The material to be used in subgrade shall be non-expansive and shall satisfy design CBR at the specified dry density and moisture content. In case the available materials fail to meet the requirement of CBR, use of stabilization methods in accordance with Clauses 403 and 404 or by any stabilization method approved by the Engineer shall be followed.

305.2.1.6 The material to be used in subgrade shall conform to the design CBR value at the specified dry density and moisture content of the test specimen. In case the available



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Item No. 03

Court No.1

**BEFORE THE NATIONAL GREEN TRIBUNAL  
EASTERN ZONE BENCH, KOLKATA  
(Through Video Conferencing)**

Original Application No.94/2022/EZ

**In the matter of :**

1. All India Anti Corruption Organization (Regd.),  
Qtr. No.RIII/81, Bidhannagar Housing Colony,  
Durgapur, Paschim Bardhaman,  
West Bengal, Pin-713206.

Applicant(s)

Versus

1. The Government of West Bengal,  
Principal Secretary, Department of Land and land  
Reforms and Refugees Rehabilitation Department,  
Sarat Chatterjee Road, Howrah-711102.
2. The Secretary, Industry Commerce & Enterprises,  
Shilpa Sadan, 6<sup>th</sup> Floor, 4, Abanindranath Tagore Sarani,  
Kolkata-700016.
3. The Director General of Police, "Nabanna" 325,  
Sarat Chatterjee Road, Mandirtala, Shibpur,  
Howrah-711102.
4. The Chairman, Shyama Prasad Mukherjee port Trust (Kolkata)  
Kolkata-700001.
5. The Chairman, The West Bengal Mineral Development & Trading  
Corporation Lt., 3<sup>rd</sup> Floor, DJ-10, WBIIDC Building,  
Sector-II, Salt Lake city, Kolkata-700091.
6. The District Magistrate, Nadia, Krishna Nagar,  
Pin-741235.
7. The Superintendent of Police, Buddha Park,  
Ranaghat Police District, Kalyani , Pin-741235.
8. The Managing Director, West Bengal Highway Development  
Corporation, HEBC Bhawan, 4<sup>th</sup> & 5<sup>th</sup> Floor, Kolkata-700021.
9. Dinesh Chandra R. Agarwal Infracon Private Limited,  
Address-401-403, The Grand Mall, Surendra Mangaldas Road,  
Ambawadi, Gujrat-380015.

Respondent(s)



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Date of hearing: 27.07.2022

**CORAM: HON'BLE MR. JUSTICE B. AMIT STHALEKAR, JUDICIAL MEMBER  
HON'BLE MR. SAIBAL DASGUPTA, EXPERT MEMBER**

For Applicant(s) :Mr. Saheb Banerjee, Advocate

### ORDER

1. Heard Mr. Saheb Banerjee, learned Counsel for the Applicant.
2. This application has been filed on absolute vague allegations that illegal activity regarding sand mining is being carried out by several 'big shots' of the local area who has not obtained any Environmental Clearance but the silver sand is supplied at the work site of West Bengal Highway Development Corporation at Kalyani-Barrackpore Express.
3. The State Environment Impact Assessment Authority has not been made a party in the Original Application. Neither State Environment Impact Assessment Authority which grants Environmental Clearance nor the Central Pollution Control Board nor the West Bengal Pollution Control Board have been impleaded in the array of Respondents. Other than one bald averment that Environmental Clearance has not been granted it has not been shown what other illegality in the sand mining is going on.
4. The allegation that mining is being carried out without Environmental Clearance is a bald allegation and has not been substantiated by information obtained by the applicant through Right to Information Act.
5. It is not even mentioned in the Original Application as to the area over which the sand mining is being carried out and when the mining lease was granted.



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6. It is not even mentioned since when the alleged illegal mining is going on.
7. Mr. Saheb Banerjee, learned Counsel for the applicant prays that he may be permitted to withdraw the Original Application with liberty to file a fresh Original Application giving all particulars.
8. The Original Application is dismissed as withdrawn with aforesaid liberty.

.....  
**B. Amit Sthalekar, JM**

.....  
**Saibal Dasgupta, EM**

July 27, 2022,  
Original Application No.94/2022/EZ  
BD



**MAIN REPORT**





West Bengal Highway Development Corporation Limited

# West Bengal Highway Development Corporation Ltd (A Wholly Owned Company of Government of West Bengal)

**Up-gradation of Kalyani Expressway to 4/6 lane configuration from Muragacha (ch. 4+565 km) to Kampa (ch. 35+340 km) including elevated connection with proposed Mogra-Kampa-Barajaguli Road Corridor in the district of North 24 Parganas in West Bengal on Hybrid Annuity Mode.**



## FINAL DETAILED PROJECT REPORT

### MAIN REPORT

**SEGMENT-C  
(4.565 KM – 34.20 KM)**

Project Consultant :-



**MACKINTOSH BURN LIMITED**  
(A Government of West Bengal Enterprise)  
MBL House, DD-18/8, Sector-I,  
Salt Lake City, Kolkata-700064



August, 2018

Up-gradation of Kalyani Expressway to 4/6 lane configuration from Muragacha (ch. 4+565 km) to Kampa (ch. 35+340 km) including elevated connection with proposed Mogra-Kampa-Barajaguli Road Corridor in the district of North 24 Parganas in West Bengal on Hybrid Annuity Mode.

## FINAL DETAILED PROJECT REPORT

### MAIN REPORT

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## ***Executive Summary***



## EXECUTIVE SUMMARY

### E.1 Introduction

With the rapid socio-economic development in India, there has been tremendous growth in industrialization of the country. This has resulted in a spurt of freight and passenger transport movement and increase in demand for better quality of road and transport system. From the late nineties till last decade India has awakened to the importance of the multiplier effects in economy of highway development for the over-all benefit of the country.

In pursuance to the above, West Bengal Highway Development Corporation Ltd (WBHDCL) has awarded the work of "Preparation of Feasibility Study cum Detailed Project Report for Improvement of Barrackpore – Kalyani Expressway Phase I (From 4.565 km to 34.000 km) from Muragacha crossing to Kampa crossing" to the Consultant, Mackintosh Burn Limited.

### E.2 The Project Stretch (Phase – I)

The project road is located approximately between 22°41'45" N and 22°56'03" N latitude and 88°25'09" E and 88°27'27" E longitude. The project road begins at 577.00 m south of Muragacha Crossing at defined chainage of 4.565 km and ends at Kampa Crossing, near Kanchrapara at km 34.000 and passes entirely through the district of North 24 parganas and is under the jurisdiction of the Barrackpore Police Commissionerate; the various Police stations along the project road are Ghola, Khardah, Titagarh, Jagaddal, Naihati & Bijpur. In general, the project road runs from south to north direction.

Practically the project stretch of Barrackpore – Kalyani Expressway (a part of SH-1) starts from Sodepur Madhyamgram Road at Muragacha Crossing and ends at Kampa More junction with Kanchrapara – Haringhata Road (SH -1) near the ROB at Buddha Park, in the district of Nadia.

The project road passes through rural and semi – urban areas and bypasses the important settlements like Sodepur, Panihati, Khardah, Titagarh, Barrackpore, Ichapur, Garulia, Shyamnagar, Bhatpara, Kakinada, Naihati, Halishahar & Kanchrapara along the project road length of 29.435 km.

### E.3 Deficiencies and Issues

Barrackpore Kalyani Expressway continued with Dumdum Expressway is a major traffic corridor and offers an attractive alternative to the congested NH-34 or B.T. Road (SH-1) corridors. To mitigate the traffic congestion on NH-34 and B.T. Road, this corridor offers better quality of traffic



flow and therefore, is generally preferred by trip makers. However, the major disadvantage of this corridor is that there is no direct connectivity to Belgharia Expressway at present. But, on a good note the State P. W. (Roads) Directorate has taken up the work of connecting the Belgharia Expressway with the Dumdum Expressway and thereafter with Barrackpore – Kalyani Expressway by proposing an elevated corridor which will connect near Nimta near Madhusudan Banerjee Road (M B Road) Intersection i.e. the junction of Dumdum Expressway and M.B. Road at Nimta. So, traffic approaching Kolkata side using Kalyani-Dumdum Expressway finally joins NH-34 using either Madhyamgram-Sodepur Road and Barasat – Barrackpore Road. Furthermore, the entire north bound traffic towards Barasat/ Kalyani etc. will also be connected which presently has to travel through heavily congested urban stretch of NH-34 namely, Birati, Madhyamgram, Barasat etc.

Thus, from the traffic connectivity & mobility the Barrackpore - Kalyani Expressway will have a tremendous importance after the completion of the missing link between the Belgharia expressway and the DumDum – Kalyani at Nimta as it will be a vital link for through traffic towards northern and also as an alternative bypass of congested stretch of NH-34 avoiding Birati, Madhyamgram and Barasat city.

#### **E.4 Project Details**

##### **E.4.1 Importance of the Project**

In the road network of Kolkata Metropolitan Area, Barrackpore - Kalyani Expressway, is one of the most important corridor connecting Sodepur – Madhyamgram Road, Barrackpore-Barasat Road (SH-2), the main corridor connecting NH-34 at Bara Jagulia and B.T. Road and Ghoshpara Road (Both SH-1), in the district of North 24-Parganas & Kampa More junction with Kanchrapara – Haringhata Road (SH -1) near the ROB at Buddha Park, in the district of Nadia. The continuation of this road towards south of Muragacha More which is connecting Sodepore-Madhyamgram Road is known as Dum Dum Expressway and 4 laning of this stretch is being carried out by P.W (Roads) Directorate from M. B Road Junction to Muragacha More (Km 4.565 of our Project Road section). It is being proposed by P.W.D to connect Belghoria Expressway with the M. B Road Junction (Nimta) of the DumDum Barrackpore Expressway, thus providing a through link between Belghoria Expressway and NH -34 via Kampa More. There will be another important line with Saptagram-Tribeni-Kalna-Katwa Road via STKK Road (SH-6) at Bansberia by Iswar Gupta Setu on river Ganges by balance length of 4.00 km of BK Expressway towards North. Thus our project road starts at Muragacha More as km 4.565 and terminates at Kampa More at Km 34.000. Project Preparation of a 2nd bridge on river Ganges at Kalyani parallel with Iswar Gupta Setu is also under preparation of WBHDCL, which will make the direct connection with NH 34 near Bara Jagulia in one end and with NH 2 & STKK road in other end.



#### E.4.2 Demographic Features

The Project Stretches form part of Barrackpore subdivision and Kalyani municipality, which have following demographic features:

- The size of the population of Barrackpore subdivision worked out to be 36,15,356 as per 2011 census covering an area of 308.1 sq km of North 24 Parganas District.
- The density of population (persons per sq km) is 11734 for Barrackpore.
- The size of the population of Kalyani municipality worked out to be 100,620 as per 2011 census covering an area of 29.14 sq km of Nadia District.
- The density of population (persons per sq km) is 3500 for Kalyani.
- The ratio of females per 1000 males worked out to be 978 for Kalyani.
- Literacy rate (above 6 years) is 88.75% for Kalyani.

#### E.4.3 Economic Characteristics

- In Barrackpore the presence of the Hooghly River aided the establishment of a large number of industries on its banks early in India's industrial development, including jute, engineering, paper, and cotton mills. It has also traditionally had a strong small scale cottage industry and handicraft sector. It is also famous for Palta Water Works, its oldest water treatment plant, in the banks of Hooghly River.
- Kalyani has a dedicated industrial zone having numerous industries including Andrew Yule and Company, Kalyani Breweries (UB Group), and Dabur; though many of the industries have closed or stopped production. In June 2015, the Government of West Bengal declared establishment of an "Analytics City" in Kalyani, which is likely to attract investments of more than Rs 3,000 crore in next three years. In the first phase, being developed over 52 acres off Kalyani Expressway, the hub will accommodate academic, residential and commercial centers apart from real estate projects.

#### E.4.4 Existing Features

##### a) Terrain

The project road in this Package traverses through plain/rolling terrain. Accordingly geometric standards to be adopted are for plain/rolling terrain covered by IRC: 73-1990 specified in the "Manual".

##### b) Existing Road Geometric

- i) The existing carriageway configuration is of 2 lane divided carriageway without any paved shoulder having earthen shoulder of 1.00 m to 1.50 m on either side without service road and without any pucca drain in urban / rural areas.



- ii) The existing formation width is varying from 52 m to a maximum of 60 m.
- iii) There are seven major junctions on our project road starting from Muragacha More at the beginning to the Kampa More at the end point. The Kampa More junction need not be upgraded as the project road ends just before the junction and improvement of the junction shall be taken up. Out of the remaining 6 major junctions, at two locations – Muragacha & Barrackpore Wireless More where Vehicular Underpass may be proposed. Turning movement traffic survey has to be carried out at these major junctions.

Sl. No.	Km.	Place	Type of Junction
1	5+142	Muragacha More	Vehicular Under/overpass proposed
2	13+903	Barrackpore Wireless More	Vehicular Under/overpass proposed
3	25+363	Panpur More	4 Legged
4	28+308	Saheb Colony More	4 Legged
5	29+319	Rajendrapur More	4 Legged
6	32+224	Panchmatha More	5 Legged
7	34+385	Kampa More	4 Legged

- iv) Besides, the above major junctions there are 14 minor junctions which are identified for upgradation. The list of such minor junctions is tabulated below.

List of Minor Junction		
Sl. No.	Chainage	Side
1	6+167	Both side
2	6+722	Both side
3	9+142	Both side
4	9+592	Both side
5	11+442	Both side
6	12+142	Both side
7	12+394	Both side
8	14+612	Both side
9	14+876	Left
10	18+212	Both side
11	19+042	Both side
12	20+082	Both side
13	26+842	Both side
14	27+735	Both side

c) Existing Pavement

Inventory and condition survey of the existing pavement have been done. From Muragacha (km 5.142) to Barrackpore Wireless More (km 13.903) the subgrade soil consists of a mixture of fine



sand overlying fly ash. For the remaining section (km 13.903) to Kampa More (km 34.385), the subgrade soil type consists of clayey silt/ silty clay. The pavement thickness varies along the corridor and the average thickness for the section from km 5.142 to km 13.903 is given below.

Bituminous (mm)	WBM (mm)	Old Bituminous (mm)	WBM (mm)	Jhama / Brick Bats Consolidation (mm)	Brick Soling (mm)	Total Thickness (mm)	Total Thickness excluding Top Bituminous Layer (mm)
200	72	0	0	173	108	554	354

Similarly for the section from km 13.903 to km 34.385, the average pavement composition is provided below.

Bituminous (mm)	WBM (mm)	Old Bituminous (mm)	WBM (mm)	Jhama / Brick Bats Consolidation (mm)	Brick Soling (mm)	Total Thickness (mm)	Total Thickness excluding Top Bituminous Layer (mm)
210	66	34	42	169	27	550	339

The existing crust has been found to be heterogeneous, with no similarity to the current IRC standards of required pavement composition and there is an intermediate bituminous layer in the end part from chainage 13+903 km.

#### d) Drainage

In between the main carriageway and the service road, intermediate drain is provided. The drain lies on both the sides of the divided carriageway underlying the median of width 2.50 m & 4.50 m respectively. From km 5.142 to km 13.903 the intermediate median width is 2.50 m and for the remaining length the width is 4.50m. The drain is provided to collect the water from the main carriageway as well as from the service road. At every 30.00 m interval a rectangular inspection pit is being proposed which is connected longitudinally along the road by a hume pipe of 1400 mm diameter to carry the storm water and discharge the same on the nearest culvert.

#### e) Proposed Protective Work

To protect the embankment from road side water bodies, Fisheries (Bheries), ponds and roadside kutchha nullahs, 4020 m of Single and Double Row UC Bullah and 200 m of low height PCC guard wall has been proposed. The top of PCC protective walls are to be provided in a manner that it should be below the level of GSB layers of the embankment. In addition, PCC guard walls are also proposed in the bridge approaches of the RCC Bridge at Chainage 16+634.



**f) Right of Way (ROW)**

The ROW of the Project Road as measured from shown width in the Revenue Maps obtained from Revenue department of North 24 Parganas district averages about 60m which is varying as 52 m from km 5.142 to km 13.903 & from Km 13.903 to km 34.385 the ROW available is 60.00 m. To accommodate the 4-lane ultimate widening of the project stretch, along with service road, the total corridor width required is 32 m (locations without service road), 56 m (locations with service road) & 60 m (at the Toll Plaza location).

The existing project road is proposed to be reconstructed and the 2x2 lane capacity with & without service road have been designed to accommodate the facility within the existing ROW & thus no land acquisition is required.

**Desirable Road Land Widths (Meters) (IRC: 73-1990 / IRC: 52-2001)**

Terrain	Road Classification	Open Areas		Built-up Areas	
		Normal	Range	Normal	Range
Plain	NH & SH	45	30-60	30	30-60

**g) Land Use**

The land adjacent to the road varies from rural agricultural to semi – urban habitation. There are commercial and educational establishments, small-scale industrial units, petrol pumps and many restaurants in built up areas near the junctions of Muragacha More, Wireless more, Panpur More, & Kampa More.

**h) Relocation of Utilities**

The utility services viz., shifting electrical poles, transformer, water pipeline, signaling system as present on the road project length shall be shifted as and when directed by the Engineer and shall be followed, by the clause no. 110 of section 100 of MORT&H'S specification of road and bridge works.

**i) Meteorology**

The climate is hot in summer (March-May) with maximum temperatures up to 40°C and cold in winter (December-February) with minimum temperature going down to 9°C. Monsoon occurs in June-September with moderate temperature. The average Annual rainfall is about 175 cm.

**j) Improvement Proposals**

**Existing Features:** Average width of the existing carriageway has been found as 7.0 m with only 1.00m to 1.5m hard / earthen shoulder on either side.

**Improvement Proposal:** Four (4) lane divided carriageway alongwith 2.00m width paved shoulder with a central median width of 9.00 m and intermediate median of 2.50 m (from km 5.142 to km 13.903) & 5.50 m (from km 13.903 to 34.385) width have been provided in



between main carriageway and service road. The proposed cross-sections are conceived essentially to accommodate the proposed road within the available ROW so that no land acquisition is required. In general, the proposed cross-section comprises of 7.00 m wide carriageway alongwith 2.00m wide paved shoulder having 2.5% one-directional camber separated with a raised median having width of 9.0m. *The central median of 9.00 m is provided to accommodate the provision for future widening to 6 lane standards, so that no further land acquisition is necessitated.*

Ten different typical cross sections have been proposed for upgrading the project road.

The following table presents the proposed cross sections and widening scheme adopted for the project.

**Chainage wise Cross Section Type**

Sl. No.	Design Chainage (km)		Length (km)	TCS Type	Remarks
	From	To			
1	4565	4799	234	Figure 28	Chainages as indicated is as per chainage along proposed Kalyani Expressway considering 0+000 chainage at junction of Belgharia Expressway and Dum Dum - Barrackpur - Kalyani Expressway
2	4799	5487	688	Figure 23	
3	5487	5687	200	Figure 28	
4	5687	6264	577	Figure 18	
5	6264	6464	200	Figure 28	
6	6464	6980	516	Figure 26	
7	6980	7180	200	Figure 28	
8	7180	8216	1036	Figure 19	
9	8216	8650	434	Figure 18	
10	8650	8847	197	Figure 28	
11	8847	9416	569	Figure 26	
12	9416	9979	563	Figure 26	
13	9979	10444	465	Figure 26	
14	10444	10673	229	Figure 28	
15	10673	11131	458	Figure 26	
16	11131	11331	200	Figure 28	
17	11331	11676	345	Figure 20	
18	11676	11876	200	Figure 28	
19	11876	12393	517	Figure 26	
20	12393	12593	200	Figure 28	
21	12593	13344	751	Figure 20	
22	13344	13544	200	Figure 28	
23	13544	14210	666	Figure 24	
24	14210	14628	418	Figure 29	
25	14628	15122	494	Figure 27	



Sl. No.	Design Chainage (km)		Length (km)	TCS Type	Remarks
	From	To			
26	15122	15322	200	Figure 29	
27	15322	15741	419	Figure 22	
28	15741	16441	700	Figure 21	
29	16441	16741	300	Figure 22	
30	16741	17771	1030	Figure 21	
31	17771	17971	200	Figure 29	
32	17971	18435	464	Figure 27	
33	18435	18635	200	Figure 29	
34	18635	19606	971	Figure 21	
35	19606	19806	200	Figure 29	
36	19806	20321	515	Figure 27	
37	20321	20904	583	Figure 29	
38	20904	21393	489	Figure 27	
39	21393	21593	200	Figure 29	
40	21593	23891	2298	Figure 21	
41	23891	24291	400	Figure 25	
42	24291	24818	527	Figure 21	
43	24818	25018	200	Figure 29	
44	25018	25683	665	Figure 27	
45	25683	25883	200	Figure 29	
46	25883	26418	535	Figure 21	
47	26418	26618	200	Figure 29	
48	26618	27080	462	Figure 27	
49	27080	27280	200	Figure 29	
50	27280	27767	487	Figure 21	
51	27767	27967	200	Figure 29	
52	27967	28633	666	Figure 27	
53	28633	29061	428	Figure 29	
54	29061	29562	501	Figure 27	
55	29562	30052	490	Figure 29	
56	30052	30663	611	Figure 27	
57	30663	30863	200	Figure 29	
58	30863	31764	901	Figure 21	
59	31764	31964	200	Figure 29	
60	31964	32471	507	Figure 27	
61	32471	32671	200	Figure 29	
62	32671	34000	1329	Figure 21	



**k) Improvement Proposal**

Under the previous contract of KMDA the project road was being taken up for widening on the right hand side with a 2 lane carriageway at the RHS of the existing carriageway and service roads on both sides were started for about 7.00 km length from 20.642 km in different stretches haphazardly which was finished to the level to either GSB or to WMM layers. Keeping in mind the previous works, in this proposal generally the additional 2 lane (with paved shoulder) is provided at right hand side of the existing 2 lane. In view of a intermediate bituminous layer of 18 mm to 30 mm and having insufficient sub base and base layer of avg. 286 mm to 350 mm (including brick flat soling), reconstruction of the existing carriageway is proposed. This reconstruction is also required to raise the road level in consideration keeping 1.00 m free board over the HFL and with the subgrade which is generally maintained. Considering traffic growth rate, proposal for (4 lane) 2 x 2 lane carriageway along with 2.00m wide paved shoulder both side service roads (length as required as per habitations, markets, petrol pumps etc) and medians in between both carriageways and in between carriageway and service roads have been made in this project. But at places like between km 5.142 to km 9.142 where the MS water pipe (1400 mm dia) line exists on the RHS at a distance of 16.00m to 20.00m from the centre of existing black top, the road is being widened by shifting the centre line of the existing carriageway on the left hand side to avoid interference with the pipe line.

**l) Culverts & Minor Bridge**

There are 57 nos. of CD and 1 no. of Minor bridge at present on the existing carriageway and 21 nos. of existing CDs are proposed to be replaced due to its poor conditions (18 nos.) and 3 nos. for shifting under the viaduct locations.

Considering existing better drainage system of the present road alignment only, 7 no. of box culverts are newly proposed in different chainages.

Prior to handing over the road to WHDCL, KMDA had taken over the improvement of the road providing with another carriageway at RHS and service roads on either side. Accordingly (i) they had taken up 9 nos. CD on the proposed carriageway out of which 6 nos. were completed of 10.00 m wide at the same level of the existing CDs at LHS. (ii) Similarly they had taken up 7 nos. of CD on service roads on either sides; out of these only 5 nos. of CD completed at an average 1.00 m down the CDs on the main carriageway in the same line. Accordingly, the CD completed and incomplete position on service roads are to be dismantled (partly/fully) and to be constructed to keep parity of the FRL as per design and drawing.

All CDs in the same line has been proposed on the full width of the proposed embankment width including both 2x2 lane carriageways, central median and the both median in between.



carriageway and service road and the width of the both service roads if there be. This proposal is thought for considering future provision for 2x3.00 lane carriageway with paved shoulder.

There is an existing minor bridge of RCC continuous slab of 3 x 12.00 m span having 10.00 m total width and only 7.50 m carriageway. Widening of the bridge is required at left side for 3 lane carriageway and footpath on left side. Similarly, one new bridge was completed by the KMDA having 9.60 m carriageway and 10.6 m total width. These two bridges are not taken under for widening or replacement.

**m) Provision of Service Roads:**

In built up areas Service road have been provided in stretches on both side of the main carriageway except few stretches where there is no necessary of providing carriageway. Generally 7.00 m wide carriageway width is provided with one side raised median of 2.50m/ 4.50 m. The width of the carriageway in service road is reduced to 5.50 m at places where sufficient ROW is not available.

**n) Major Vehicular Underpass:**

Vehicular underpass has been provided at the two locations – the major junctions at Murugacha More & Barrackpore Wireless More.

Details of Each Vehicular Underpass (Composite Structure)		
ID. No.	Span – 50.00 m Width: 12.60 m x 2 with 300 mm clearance between two. Vertical clearance = 5.0 m Overall length – 239.150 m (VUP and either side viaduct) Both side viaduct structure of 3 x 30.400 m each RE wall proposed from 5.80 m height to 1.50 m height. Retaining wall proposed from 1.50 m height	
	Chainage	Location
VUP/1	5.142	Murugacha More
VUP/2	13.903	Wireless More

**o) Underpass: VUPs, LVUPs & PUPs:**

Facilities for crossing of pedestrians and through underpass have been provided at locations as detailed below. One pedestrian crossing having size 5.0 m x 3.0 m has been provided specifically for the usage of pedestrian.



i) Vehicular underpass: Vehicular underpass shall be provided at following locations:

Sl. No.	Design Chainage (Km.)	Span Arrangement (m)	Type of Super-structure	Width
1	5+140	1 x 50	Steel Girder with Truss	10.5m x 2
2	13+895	1 x 50	Steel Girder with Truss	10.5m x 2
3	25+359	1 x 24	Steel Girder and RCC Deck Slab	10.5m x 2
4	28+303	1 x 24	Steel Girder and RCC Deck Slab	10.5m x 2
5	30+379	1 x 16	Steel Girder and RCC Deck Slab	10.5m x 2

ii) Light Vehicular underpass: Light Vehicular underpass shall be provided at following locations:

Sl. No.	Design Chainage (Km.)	Span Arrangement (m)	Type of Super-structure	Width
1	6+725	12	RCC Box	10.5m x 2
2	9+136	24	Steel Girder and RCC Deck Slab	10.5m x 2
3	12+141	16	Steel Girder and RCC Deck Slab	10.5m x 2
4	14+875	12	RCC Box	10.5m x 2
5	20+066	12	RCC Box	10.5m x 2
6	29+313	12	RCC Box	10.5m x 2
7	32+212	12	RCC Box	10.5m x 2

iii) Pedestrian underpass: Pedestrian underpass shall be provided at following locations:

Sl. No.	Design Chainage (Km.)	Span Arrangement (m)	Type of Super-structure	Width
1	10+213	10.5	RCC Box	10.5m x 2
2	10+900	10.5	RCC Box	10.5m x 2
3	18+205	10.5	RCC Box	10.5m x 2
4	21+140	10.5	RCC Box	10.5m x 2
5	26+850	10.5	RCC Box	10.5m x 2



### p) History of Submergence

There has been no history of submergence of the project road from km 4.565 to km 34.000 as per the record available from the site and the local irrigation department. In the flood of 2000 & 2015, the adjoining villages and habitations have been inundated, but no submergence of the existing project road at any location has been reported. But as noted during the topographical survey and from enquiries it is found that the HFL or ponding level, adjoining the project road is relatively high and necessary clearance from the existing subgrade is not present. Thus, raising of the existing road level is warranted to maintain a general clearance of 1.00 m and in some stretches, clearance of minimum 0.60 m from the HFL/ adjoining ponding level and the subgrade bottom. This raising is further supplemented by the insufficient crust thickness of the existing pavement crust.

### E.5 Traffic Survey

The analysis of important traffic surveys, in brief, is given below:

#### a) Classified Volume Count

Classified traffic volume count under project stretch, was conducted manually at four locations, at Km. 5+538 (Near Toll Plaza on B.K. Expressway), at Km. 14+508 (Near Toll Plaza on B.K. Expressway), at Km. 8+242 (Ramkrishnapally on Belgharia Expressway) and at Algalia Water Tank on Krishnanagar Road (NH-34) for 24 hrs on 7 consecutive days in both directions. Summary of salient features of the count is indicated in table given below: -

Location / Chainage	Average Daily Traffic (PCU)	
	Fast Moving	Slow Moving
Near Toll Plaza (Km 5+538) on B.K. Expressway	15835 (12033 ADT)	1042 (1507 ADT)
Near Toll Plaza (Km 14+508) on B.K. Expressway	18030 (13681 ADT)	3531 (4280 ADT)
Ramkrishnapally (Km 8+242) on Belgharia Expressway	45252 (31160 ADT)	112 (121 ADT)
Algalia Water Tank on Krishnanagar Road (NH-34)	12437 (9379 ADT)	2049 (2433 ADT)

#### b) Traffic Growth Rate

Traffic growth rates for the project stretch have been analyzed from the traffic survey data for the past few years obtained from the different sources as well as projection of future traffic based on IRC Standards and other traffic projection models etc details are given on Annexure-I, Draft Feasibility Report. Most probable growth of traffic as analyzed up to the year 2036 is given in Table below:



Type of Vehicle	Estimated Growth Rate (%)				
	2015	2016 – 20	2021 – 25	2026 – 30	Beyond 30
Car / Jeep	6.6	5.6	4.5	3.7	3.0
3 Wheeler	4.6	3.7	2.9	2.4	1.8
Bus	3.7	2.9	2.3	1.9	1.4
Goods Vehicle	5.7	4.9	3.9	3.2	2.6
2 Wheeler	7.8	6.7	5.4	4.5	3.6
Tractor and Trailer	6.1	5.0	4.0	3.3	2.6

**c) Axle Load Survey**

The Recommended Vehicle Damage Factor (VDF) assessed for commercial vehicles on the basis of axle load survey for B K Expressway is 2.16 and for Belgharia Expressway 6.25.

**E.6 Design Standards**

The design basis for the Project Road has been adopted with the objective of strengthening and widening the existing 2-lane road to a 4-lane divided carriageway. The General Technical Specification shall be the specification for Road and Bridge works (Fourth Revision August 2001) of MORTH. The relevant provisions for respective design elements in it are quoted below as the ruling guidance for design of the Project Stretch.

**a) Terrain**

The Project Highway lies in plain (0 to 10%) / rolling (10 to 25%) terrain. As such, the geometric standards relevant to plain/rolling terrain as per IRC: 73-1990 has been adopted.

**b) Design speed**

The project road being a National Highway traversing through plain terrain the following design speeds have been adopted:

	<u>Ruling Speed</u>	<u>Limiting speed</u>
Plain Terrain/rolling Terrain	100 km/hr	80 km/hr

In sections where site conditions including costs did not permit adoption of ruling design speed, limiting design speed has been adopted.

**c) Cross Section**

The following road sections have been adopted for 4-lane divided carriageway:

- Main Carriageway width (both new & existing) – 7.00 m each
- Shoulder width (Paved) on either side – 2.00 m each
- Shoulder width (Unpaved) on either side – 2.0 m each



- d) Service Road (where necessary) – 5.50 / 7.0m wide
- e) Embankment Side Slope – 2(H): 1(V) but in high embankment side slope will vary at different level depending upon the stability of embankment.

**d) Horizontal Curves**

Horizontal curves consist of circular portion flanked by spiral transitions at both ends conforming to IRC: 73-1990.

**e) Gradient**

Ruling Gradient - 3.3% (1 in 30): Limiting Gradient – 5% (1 in 20): Exceptional Gradient - 6.7% (1 in 15) conforming to IRC: 73-1990.

**f) Bridges and Cross Drainage Structures**

The Design Standards is primarily based on "Manual" and the provisions made in it in respect of relevant IRC codes of practices (prescribed for design, execution, maintenance and safety during construction & service), IRC specifications, latest guidelines and circulars of NHAI and relevant Bureau of Indian Standards (BIS).

**g) Fly-over / Interchanges / Intersections**

Guidelines given in IRC: SP: 41-1994 for design of at-grade intersection in rural areas has been followed in general. Turning traffic survey for them has been conducted and the flow diagrams for the design traffic for it have been given in the Annexure Volume.

**h) Service Road**

Suitable lengths of service road with 5.50 m or 7.0 m width of carriageway have been provided according to availability of ROW at congested localities as detailed above.

**i) Footpath and Covered drain**

Provision for 2.50 m & 4.50 wide intermediate median is provided between the main carriageway and the service road in the built up areas. Footpaths of paved with chequered tiles has been proposed overlying the covered drain at these locations.

**E.7 Pavement Structure**

Pavement design for both carriageway has been done in accordance with IRC: 37-2012. Flexible pavement option has been proposed for widening the Project Stretch considering ease of construction and subsequent renewal works. Bituminous pavement consisting of following layers has been proposed (design life 15 yrs has been adopted) over a subgrade layer of 500 mm sand



(zone II) & fly ash at 50:50 proportion to achieve effective CBR '12.0 %' For main carriageway & 6.2 % for service Road.

B.C: 50 mm

DBM: 100 mm

WMM: 250 mm

GSB (Grade III): 150 mm (as Drainage layer)

GSB (Grade V): 150 mm (as Separation layer)

**700 mm**

Suitable design of flexible pavement consisting of following layers has been proposed for the Service road for movement of local traffic and the design:

B.C: 40 mm

DBM: 65 mm

WMM: 250 mm

GSB (Grade III): 150 mm (as Drainage layer)

GSB (Grade V): 150 mm (as Separation layer)

**655 mm**

### **E.8 Slope Protection**

Fillings in slopes have been involved in widening the road to four-lane configuration including the high-embankment in bridge approaches. Predominant nature of the soil in the slopes is to be grader-trimmed machined earth of ordinary/heavy type available in the locality. A natural slope of 1:2 and flatter, found stable with adequate factor of safety, has been proposed. Protection of the

cut and fill slopes will be provided with turfs grown by mulching and seeding upto a height of 2m. Tentative Location of Slope Protection is given in following table.



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Tentative Location of Slope Protection:					
SI No.	Chainage (Km)		Length (m)	Side	Height (m)
	From	To			
1	5+232	5+257	25	LHS	2
2	5+282	5+312	30	LHS	2.5
3	5+442	5+477	35	LHS	1.5
4	5+542	5+572	30	LHS	2
5	5+662	5+857	195	LHS	2.75
6	9+182	9+212	30	LHS	3.25
7	9+932	9+962	30	RHS	3
8	10+792	10+902	110	RHS	3
9	11+112	11+142	30	LHS	3.5
10	11+492	11+552	60	LHS	2.5
11	11+812	11+842	30	LHS	3.5
12	12+312	12+362	50	LHS	3
13	16+634	(Bridge Approach)	$2 \times 2 \times 30 = 120$	LHS+RHS	
14	To protect embankment at the side of CDs at this ends		$2 \times 2 \times 60 \times 10 = 2400$	All ends	
Total			2520		

### E.9 Environment Impact Assessment Study

A good no. of trees have already been uprooted prior of taking over from KMDA and a very small no. of trees are still lying within the project corridor and these are to be cut, for the widening and improvement of the road to 2 x 2 lane carriageway along with either side service road instead of present 2 lane roadway. Compensatory plantation in 1:5 ratio with the guidelines of MoEF and Department of Forest, Govt. of West Bengal has been proposed in the DPR.

Adjoining ponds, bheries, water bodies will be protected properly and will be taken care of the fishes and other aquatic animals and in consideration of the use of ponds by local neighborhood. Considering the environmental conditions, use of fly ash has been proposed for constructions of the embankment in view of less excavation of borrow area earth.

From the point of environment, proposal for Arboriculture and Beautification of the medians, Islands, earthen shoulders has been provided.

To protect the slopes of the embankment in some locations, provision of jute geotextiles has been proposed.



The Bituminous hot mix plant and concrete batching plant will be installed in the free locations where no vicinity of residence, agricultural fields and local fisheries.

Labour camps / hutments will be located in such a way that sanitary safeguards are maintained without disturbing nearest residential areas and agricultural fields.

The constructors should be abided by the reasonable steps to minimize dust pollution during the construction works following clause no. 111.1, 111.4, 111.5, 111.6, 111.8.4, 111.9, 111.10, 111.11 and 111.12 of section 10 of MORT&H'S specification the road and bridge works.

#### **E.10 Social Screening and Social Assessment**

It is apprehended that in the previous scheme implemented by KMDA, between Barrackpore Wireless More (km 13+903) & end chainage at Kampa (34+385) many utilities have been identified, shifted and relocated.

But, during the course of the present study, many utilities have been identified which are to be shifted and relocated. This covers various overhead utility services like overhead electric & telephone pole, High Tension Tower, Junction Box, OFC service lines, Transformers, Junction Box, Hand Pumps, water pipe line, taps & wells.

A major utility which lies along the project corridor is a M.S. water pipe line (1400 mm Ø dia) running from km 0.00 upto km 4.00 along the right side. This pipe line is being layed by Kolkata Municipal Water Supply Authority (KMWSA) for the supply of water for Madhyamgram, Barasat & New Barrackpore Municipalities under the water supply scheme under JnNURM scheme implemented by Water Supply sector of KMDA. The laying of the pipe line is under progress at a distance of 16.0 m to 20.0 m from the centre of the existing carriageway. On interaction with the officials of KMWSA and keeping in mind the availability of the land in this stretch, the 2x2 lane divided carriageway have been accommodated with a shifting of the centre line towards the left side, so that the corridor width does not foul with the pedestal / trestle of the water pipe line.

#### **E.11 Signs & Road markings**

Adequate provision for signs viz. and overhead gantry signs at locations of Interchanges and at Corridor Management Structures like Toll Plaza, Rest Area etc. Besides, post-mounted direction / information boards etc. as per IRC: 67-2012 have been proposed as required for the entire project reach including those required for the Service Roads and entry exit points for the main-line traffic. Besides, suitable provision has been proposed for road markings as per IRC: 35-2015 for center/line, shoulder and median side edge lines for the entire length. Painting of median



kerbs and provision of reflective posts/bollards, at the intersections and median openings, have been proposed to ensure road safety conforming to the "Manual".

#### E.12 Crash barrier, Guardrails.

Concrete Crash Barriers are to be provided to prevent vehicles going out of control at bridge locations as per MOST specifications. Suitably designed vehicle crash barriers have been proposed for the VUPs, CDs, toll plaza etc. as per Cl. 115.4 of IRC: 5-1998. R.C.C. crash barriers with M-40 grade concrete are designed for normal containment and minimum design resistance as per Cl.209.7 of IRC: 6-2014.

#### E.13 Safety Aspects

The entire consultancy services comprising Feasibility Study and Preliminary Project preparation are being carried out adopting the "Manual" and connected IRC Codes and Standards, Specifications, Guidelines, other Manuals and Circulars of MORTH as well as International Standard and Practices, wherever required, to ensure quality/safety in Feasibility-cum-Preliminary Design. Also, adequate emphasis has been given on "Manual" for Safety in Road Design and the accuracy of field survey, hydraulic and sub-soil investigations and analyses of data to develop a fairly accurate and cost-effective Report for implementation of the project.

Adequate provision conforming to the "Manual" has been made in the project proposal for service roads in the built up areas, under-passes / flyovers at major intersections with high volume of traffic, smaller underpasses for movement of local people and smaller vehicles, drainage measures in the built up areas, minimum median openings etc. as ordained by the "Manual" to be followed for implementing the Project with forgiving Highway. It also makes suitable provisions for ensuring safety during construction by outlining the minimum requirements to be fulfilled by the contractors during implementation of the project.

#### E.14 Economic Analysis

Economic analysis has been conducted through HDM-IV. The results of the analysis, for the base case and three sensitivity tests, varying the costs and benefits are presented below:

**Results of Sensitivity Analysis - EIRR (%)**

Sensitivity Cases	EIRR (%)	NPV@12% (Rs. Millions)
Base Case	23.6	8289.68
Cost Increase by 15%	20.7	7073.95
Benefit Decrease by 15%	18.8	4778.53
Cost Increase by 15% & Benefit Decrease by 15%	16.4	3562.81

The project road clears all the sensitivity cases.



### E.15 Conclusions

The following are the major conclusions of this Detailed Project Report for Project Highway Alignment and Proposals:

- Existing ROW in the entire project reach generally varies from 52 m and 60 m. Land take of 52 m and 60 m (26 m and 30 m on either side of C/L of proposed road) has been proposed considering 4 laning of the Project Highway. Numbers of encroachments exist within the ROW, which are to be removed.
- The alignment for 4-laning is proposed mostly eccentric except at some stretches, where concentric widening is proposed due to less ROW and problems of L.A and other lateral constrained. Median width generally proposed is 9.0 m.
- Service road is proposed in the built up areas, wherever found essential and required.
- Slip roads of required width have been provided at the Interchanges.
- The main cross sectional elements of the 2x2-lane road are proposed as under:  
2 x 7.0 m wide each carriageway (excluding curve shyness 2 x 0.5 m)  
9.0 m wide raised median in between the main carriageway  
2.50 m to 4.50 m wide raised intermediate between main carriageway & service roads.  
2.0 m wide paved shoulders  
2.0 m wide granular shoulders (where no service road)  
1.50 m to 2.00 m wide R.C. Drain at either end to serve the purpose of raised footpath.  
600 mm dia H.P. underground drain along the Intermediate Median.
- Flexible pavement is proposed for the Project Highway except for the length toll plaza.
- Rigid pavement only for the toll plaza area.
- Service road on either side of 5.50 m or 7.00 m according to availability of ROW.
- Improvement of junctions with at-grade / grade separated intersections.
- Provision of signs and road markings proposed to ensure road safety.
- Provision of crash barriers/W-type metal beam guardrails on embankments of CD/ bridge approaches.
- Provision of rest areas / motel for the benefit of the road users.

### E 16 Cost Estimate

The estimated total cost of the project (including centage charges) works out to Rs.940.82 crores for the Project Highway for the project stretch of 29.435 Km. This project cost includes (i) utility shifting, (ii) Illumination of roads, VUPs & PUPs along with signaling, (iii) Environmental Mitigation charges and (iv) Cost towards affected structures within the ROW.



## **Chapter -1 : Introduction**



## CHAPTER-1

## INTRODUCTION

- 1.1 **Name of the Project:** Up-gradation of Kalyani Expressway to 4/6 lane configuration from Muragacha (ch. 4+565 km) to Kampa (ch. 35+340 km) including elevated connection with proposed Mogra-Kampa-Barajaguli Road Corridor in the district of North 24 Parganas in West Bengal on Hybrid Annuity Mode.
- 1.2 **Authority:** West Bengal Highway Development Corporation Limited (WBHDCL) (A wholly Owned Company of Government of West Bengal).
- 1.3 **Site Appreciation**

The project road is located approximately between  $22^{\circ}41'45''$  N and  $22^{\circ}56'03''$  N latitude and  $88^{\circ}25'09''$  E and  $88^{\circ}27'27''$  E longitude. The project road begins at Muragacha Crossing at km 4.565 and ends at Kampa Crossing, near Kanchrapara at km 34.000 and passes entirely through the district of North 24 Parganas and is under the jurisdiction of the Barrackpore Police Commissionerate; the various Police stations along the project road are Ghola, Khardah, Titagarh, Jagaddal, Naihati & Bijpur. In general, the project road runs from south to north direction.



The project road is shown in **Figure 1.1: Index Map**. Practically the project stretch of Barrackpore – Kalyani Expressway (a part of SH-1) starts from Sodepur Madhyamgram Road at Muragacha Crossing and ends at Kampa More junction with Kanchrapara – Haringhata Road (SH -1) near the ROB at Buddha Park, in the district of Nadia.

The project road passes through rural and semi – urban areas and bypasses the important settlements like Sodepur, Panihati, Khardah, Titagarh, Barrackpore, Ichapur, Garulia, Shyamnagar, Bhatpara, Kakinada, Naihati, Halishahar & Kanchrapara along the project road length of 29.435 km.



#### 1.4 Existing Road Connectivity

In the road network of Kolkata Metropolitan Area, Barrackpore - Kalyani Expressway, is one of the most important corridor connecting Sodepur – Madhyamgram Road, Barrackpore-Barasat Road (SH-2), the main corridor connecting NH-34 at Bara Jagulia and B.T. Road and Ghoshpara Road (Both SH-1), in the district of North 24-Parganas & Kampa More junction with Kanchrapara – Haringhata Road (SH -1) near the ROB at Buddha Park, in the district of Nadia. The continuation of this road towards south of Muragacha More which is connecting Sodepore-Madhyamgram Road is known as Dum Dum Expressway and 4 laning of this stretch is being carried out by P.W (Roads) Directorate from M. B Road Junction to Muragacha More (Km 4.565 of our Project Road section). It is being proposed by P.W.D to connect Belghoria Expressway with the M. B Road Junction (Nimta) of the DumDum Barrackpore Expressway, thus providing a through link between Belghoria Expressway and NH -34 via Kampa More. There will be another important line with Saptagram-Tribeni-Kalna-Katwa Road via STKK Road (SH-6) at Bansberia by Iswar Gupta Setu on river Ganges by balance length of 4.00 km of BK Expressway towards North. Thus our project road scheduled to be starting at Muragacha More – which practically started at 577 m ahead of the Muragacha More laying the southern approach of the VUP at "0" chainage and for that reason the project road length now stands at chainage 4.565 km to 34.000 km i.e. of 29.435 km in total length. Project Preparation of a 2<sup>nd</sup> bridge on river Ganges at Kalyani parallel with Iswar Gupta Setu is also under preparation by WBHDCL. The inter connectivity of the Project road and its surrounding road network is shown in **Figure 1.2: Schematic Line Diagram.**

##### 1.4.1 Area Details

The Project road passes through the two Blocks of Barrackpore I & Barrackpore II. **Barrackpore**, is the headquarter of the Barrackpore subdivision in the North 24 Parganas district, and is situated in North of Kolkata. **Barrackpore subdivision** is a subdivision of the North 24 Parganas district in the state of West Bengal, India. It consists of sixteen municipalities and has one Cantonment Board. **The population of Barrackpore as per 2011 census is 36,15,356.**

#### BARRACKPORE

Barrackpore Sub-Division, under the district of North 24 Parganas in the state of West Bengal, is an old and famous administrative territory, dotted with people from almost all provinces of India. The area of Barrackpore is 308.1 Sq. Km. Basically this is an



urbanised Sub-Division with roads, railways and airport, passing through it along with other important State Highways. It is an important well connected road in the district of North 24 parganas. It is also a well connected road practically in between Barrackpore and Barasat Civil Sub-Division which is head quarter of the North 24 Parganas District where two National Highways NH 34 and NH 35 also passes through Kolkata metropolis, and other important urban and commercial centres of the state. Barrackpore Trunk Road (B. T. Road) is one of the oldest metal roads in India connecting Barrackpore to Kolkata.

Being located in Suburban region of Kolkata, most municipalities of Barrackpore are connected by Sealdah – Ranaghat Main Railway under eastern Railway and with Kolkata which was setup in the year 1862. The railway line from Sealdah Section extends through this Sub-Division to Ranaghat, Bongaon, Dankuni, Howrah, Burdwan, Bandel. Circular and Metro Railway also extends easy communication facility of the Sub-Division. In January, 2002 the Rail connection to Bangladesh was reopened for goods movement to Benapole. In the road sector, connectivity is being improved further with the KMDA by developing the Barrackpore-Dum Dum Expressway and the PWD having undertaken projects for widening of Jessore Road, widening and strengthening of B. T. Road. NHAI has also taken up widening of NH-34 from Kolkata to Dalkhola. The Belghoria Expressway and the Nivedita setu also lie in the vicinity. The only International Airport in West Bengal located within the Sub-Division, Netaji Subhas International Airport at Dum Dum. Barrackpore is well connected with Shrirampur and Sheoraphuli in Hooghly District by ferry service from Dhobighat and Sheoraphuli ghat. The subdivision also has a strong presence of many colleges and technical institutions, universities. It offers an attractive destination for new industries/ investment in the emerging areas. The subdivision has a glorious history of cultural, religious and social developments.

The Municipalities which are served alongside the project corridor are Kanchrapara, Halisahar, Naihati, Bhatpara, Garulia, Barrackpore, Titagarh, Kamarhati and Panihati. There is one census town (Ichhapur Defence Estate) and two community development blocks: Barrackpore-I and Barrackpore-II. These two blocks contain nine census towns and 14 Gram panchayats. Upto Kalyani from Kolkata is the area covered by the Kolkata Metropolitan Development Authority in the Indian state of West Bengal. Historically, the Barrackpore town was a military and administrative center under British rule, and was the scene of several acts of rebellion against Britain during the 19th century. The oldest cantonment in India and the Police Training Academy



In West Bengal are both located in Barrackpore. It is also the seat for the Sub-Divisional Court of Northern 24 Parganas District. The Barrackpore Police Commissionerate is responsible for law enforcement in the area.

**ECONOMY**

Barrackpore Sub Division benefits from the Hooghly River, which flows through the western part of this subdivision. The presence of the river aided the establishment of a large number of industries on its banks early in India's industrial development, including jute, engineering, paper, and cotton mills. Barrackpore has also traditionally had a strong small scale cottage industry and handicraft sector.

The Army/Air force cantonment is the biggest landscape of the town of Barrackpore and also in two locations of the project road. There is an Army base at Jafarpur at 9<sup>th</sup> km of the project road. The Ichapore Rifle Factory is one of the most important arms factories of India, supplying the requirements of the security forces located nearby the project road. There is one Engineering Institute of Agriculture within a distance of 1.00 km from Wireless More of the road. Bidhan Chandra Krishi Vishwa Vidyalaya is also located at Kanchrapara nearby the project road. Agriculture is the main base of the subdivision's economy producing a variety of 2 (two) seasonal paddy crops and variety of vegetables which feeds the district and also the northern city of Kolkata. Floriculture, pisciculture and horticulture have also flourished in the town. Central Inland Fisheries Research Institute has been established at Barrackpore to promote production of fishes mainly from ponds, roadside water bodies and rivers. A well-developed irrigation system has been constructed in the subdivision to promote agriculture. Low interest loans have also been used to encourage the expansion of farming and the development of agricultural infrastructure.

After the independence, Barrackpore is primarily known as an industrial town. The primary industry in Barrackpore is jute processing, centered in a number of jute mills on the side of the river Ganges. Dry cells produced by Exide, and cables produced by Nicco are other industrial products are also situated in this sub-division along with other different industries in and around Barrackpore sub-division and Kalyani Town.

Barrackpore is also famous for Palta Water Works under Kolkata Municipal Corporation. It is an oldest water treatment plant, in the banks of Hooghly River. The plant was constructed in between 1864-1870, and is situated on 480 acres (1.9 km<sup>2</sup>) of land. It was the first intake point for generation and supply of water and lately due to



high demand of water to city of Kolkata. The Kolkata Municipal Corporation has commissioned the Indira Gandhi Water Treatment Plant near the same locality to augment the capacity of supply of water to Tallah at North Kolkata.

Barrackpore is one of the most developed regions in West Bengal. The literacy rate in the sub-division is above the average standard of the state and district. With a strong human resource and a large nos. of educated youth and high literacy, nearby salt Lake and Rajarhat Industrial complexes, there is also a new thrust of industrialisation in new areas of IT, food Processing and service industries.

### **KALYANI**

Kalyani is located in the Nadia district of West Bengal, within the Kolkata metropolitan area. It lies along the east bank of the Hooghly River, within the upper Ganges Delta. Kalyani being a planned town, it is characterised by underground sewerage system, paved roads forming rectangular grids, tree-lined avenues and community parks paved roads intersecting each other at 90-degree angles. The city itself is divided into four blocks — Block A, Block B, Block C and Block D, which are further divided into sub-blocks. Block A is mostly residential in character, Block B, which has residential as well as mixed use patterns. Block C and Block D are located north of the Kalyani Simanta branch line. Block C is reserved for institutional use and is largely occupied by the Kalyani University and Kalyani Government Engineering College. Block D is the industrial zone, consisting of many small and medium-sized industries. Kalyani quickly registered itself as a self-sufficient township. Its gradual development continued as a notified area. In 1995, it was upgraded to a municipality. Kalyani has an average literacy rate of 88.75%, higher than the national average of 59.5%. Healthcare system in Kalyani consists of both government and private healthcare facilities. The Army hospital, Netaji Subhash Sanatorium, Jawaharlal Nehru Memorial Hospital, College of Medicine & JNM Hospital, Gandhi Memorial Hospital, ESI Hospital are the major hospitals in the town. In June 2014, the central government gave in-principle clearance for setting up All India Institute of Medical Sciences (AIIMS) at Kalyani.

The project road starting at Muragacha More ends at Kampa More, near Kanchrapara and from the locality Kalyani is at a distance of 4 km and Iswar Gupta Setu (Kalyani Bridge) at a distance of 5 km only. It is an important municipality in the Indian state of West Bengal. It is located around 50 km from Kolkata — the capital of West Bengal, forming the northern most boundary of Kolkata metropolitan area.



Kalyani is the administrative headquarters of Kalyani subdivision, a part of Nadia district. It consists of Chakdaha, Haringhata, Kalyani Municipality and two community development blocks: Chakdaha & Haringhata. The two blocks contain 27 Gram Panchayats and three census towns. The three census towns are: Darappur, Madanpur & Nagarukhra. Situated on the banks of Hooghly River, the city is spread over an area of 29.14 square kilometres (11.25 sq mi). According to the 2011 census, Kalyani had a population of 100,620.

Kalyani has a dedicated industrial zone having numerous industries including Andrew Yule and Company, Kalyani Breweries (UB Group), and Dabur; though many of the industries have closed or stopped production. It is an important center of education in West Bengal, with two universities — University of Kalyani and Bidhan Chandra Krishi Viswavidyalaya; three engineering colleges; one medical college and other institutes of higher education and research. Kalyani Stadium has emerged as an alternative location to Kolkata for holding numerous I-League football matches and other sporting events. The Bengal Cricket Academy and a stadium has been established by Cricket Association of Bengal in Kalyani for promotion and development of cricket. There is a major hospital i.e. Gandhi Hospital within the centre governing the Central Govt. Moreover, recently the Central Government have accorded the sanction for the construction of the Super Specialty Health facility, All India Institute Medical Sciences (AIIMS) at Kalyani.

In June 2015, the Government of West Bengal declared establishment of an "Analytics City" in Kalyani, which is likely to attract investments of more than Rs 3,000 crore in next three years. In the first phase, being developed over 52 acres off Kalyani Expressway, the hub will accommodate academic, residential and commercial centers apart from real estate projects.

With the construction of the project corridor & connectivity with Belgharia Expressway both Barrackpore & Kalyani and all the municipalities will be benefitted.

#### **1.4.2 Present Traffic, Growth Rate & Development**

The Consultants have carried out traffic survey along the corridor and also on NH 34 & Belgharia expressway, the details of which is given in latter part of the report in Chapter 3.



The present traffic volume on the corridor expressed in terms of numbers of vehicles is commonly expressed as Annual Average daily Traffic (AADT) and is **18283** conducted near the existing Toll Plaza at km 9+370; and at km 0+400 the ADT is **13860**. The corresponding PCUs are **22217 & 17463** respectively.

With the completion of the connectivity of the Dum Dum (Nimta) Muragacha section of Kalyani Expressway (presently 4 laning work under construction by KMDA) & Belgharia Expressway, diverted traffic will be there towards NH 34 as well as towards Kalyani and further towards north. The diverted traffic will follow this route as found out from the origin destination survey conducted on Belgharia expressway.

In totality there will be an overall development of the whole region covering the districts of Kolkata, North 24 parganas, Nadia and Hooghly. The benefits of the development may be summarized below.

1. Barrackpore Kalyani and Dumdum Expressway is a major traffic corridor and offers an attractive alternative to the congested NH-34 or B.T. Road (SH-1) corridors.
2. A direct connectivity from NH – 6 and NH 2 will be established primarily with NH - 34 with the completion of the whole stretch from Belgharia Expressway – Dum Dum Barrackpore - Muragacha – Wireless More (SH-2) – Kampa More – Buddha Park – Ishwar Gupta Setu – SH – 13 going via Saptagram – Memari – via NH – 2 to Burdwan; another route plying to Jirat – Kalna – Nabadwip (via SH – 6).
3. On the side, the road is connected with NH-34 at Baro Jagulia with a short link from Kampa Crossing on the project corridor within Kanchrapara area which is an alternative and short corridor of NH-34 from the NH-2 and NH-6 via Belgharia Expressway. A fast hassle free corridor access to the various municipalities in the vicinity of the Kolkata Metropolitan Area (KMA) and Kalyani city, where an AIIMS is proposed to be built. Besides, Kalyani is a strong contender for being a smart city in the coming years.
4. A major socio economic development of the whole region covering the districts of Kolkata, North 24 Parganas, Nadia & Burdwan. With the completion of the corridor as a whole on a macro basis there will be tremendous impetus to growth and development of the southern & eastern part of the state of West Bengal and will act as a catalyst for the growth of industry, housing, employment and most importantly social upliftment in life of the common people of the state of West Bengal.



### **1.4.3 Specification & Standards**

The relevant standards and codes of Indian Roads Congress (IRC) & Indian Standards (IS) were followed for the field studies, analysis of data, interpretation thereof, preparation of drawings & design for the highway geometrics, pavement & structures and accordingly the Preliminary Project Report has been framed. Some of the relevant codes are IRC: 38-1998, IRC: 37 – 2012, IRC:64-1990, IRC:73-1980, IRC:SP:23-1983, IRC:SP:42-2014, IRC:SP:44-1996, IRC:SP:19-2001, IRC:SP:73-2015, IRC:SP:87-2013 and IRC:SP:84-2014 etc.

The field investigation has been carried out as per the guidelines spelt out in IRC: SP: 19-2001.

### **1.5 Objectives & Need of the Project**

The consultants have carried out a detailed study of the project road and its vicinity and have earmarked the following project corridors which also have a direct / indirect impact on the project road. The corridors which are of significance are as follows:

- Barrackpore - Kalyani Expressway (Project Corridor)
- Madhyamgram Sodepur Road ( Intersects the project road at Muragacha Crossing)
- Barasat-Barrackpore Road (SH-1) (Intersects the project road at Wireless Crossing at Mohanpur)
- Belgharia expressway (runs on the southern side and a proposal to link the same by an elevated corridor is being planned by the state P.W.(Roads) Directorate.
- National Highway No. 34 (runs parallel to the project road on the eastern side) and connected by all main roads intersect the project road and ends with NH-34 in different locations.
- Barrackpore Trunk Road which continued towards Kalyani as Ghoshpara Road (which runs parallel to the project road through the major urban settlements on the western side of the Sealdah Ranaghat railway line (in between two roads) upto the Iswar Gupta Setu).

#### **1.5.1 Importance of the Corridor**

Barrackpore Kalyani continued with Dum Dum Expressway is a major traffic corridor and offers an attractive alternative to the congested NH-34 or B.T. Road (SH-1) corridors. To mitigate the traffic congestion on NH-34 and B.T. Road, this corridor offers better quality of traffic flow and therefore, is generally preferred by trip makers.



The road acts as a bypass avoiding the congested roads along the towns and cities, like Sodepur, Barrackpore, Naihati, and on other sides viz., Madhyamgram, Barasat, Amdanga which developed along the Hooghly River. The road has significantly brought down the communication time between the cities from two hours to one hour. The road has important connecting feeder roads with Sodepur, Barrackpore, Naihati, Barasat, Madhyamgram, Kankinara, Khardaha and Kanchrapara, apart from roads which connects other small towns and localities on the way. The road has intersection with State Highway 1 and State Highway 2 and connects with National Highway 34 at different places. An extension of Kalyani Expressway connects the State Highway 6 at its starting point.

However, the major disadvantage of this corridor is that there is no direct connectivity to Belgharia Expressway at present. But, on a good note the State P. W. (Roads) Directorate has taken up the work of connecting the Belgharia Expressway with the Dumdum Expressway and thereafter with Barrackpore – Kalyani Expressway by proposing an elevated corridor which will connect near Nimta near Madhusudan Banerjee Road (M B Road) Intersection i.e. the junction of Dumdum Expressway and M.B. Road at Nimta. So, traffic approaching Kolkata side using Kalyani-Dumdum Expressway finally joins NH-34 using either Madhyamgram-Sodepur Road or Barasat – Barrackpore Road. Furthermore, the entire north bound traffic towards Barasat/ Kalyani etc. will also be connected which presently has to travel through heavily congested urban stretch of NH-34 namely, Birati, Madhyamgram, Barasat etc.

Thus, from the traffic connectivity & mobility the Barrackpore - Kalyani Expressway will have a tremendous importance after the completion of the missing link between the Belgharia expressway and the Dum Dum – Kalyani at Nimta as it will be a vital link for through traffic towards northern and also as an alternative bypass of congested stretch of NH-34 avoiding Birati, Madhyamgram and Barasat city.

Moreover, in the past, over the years considerable amount of development activity has been taken up by KMDA and the various Municipalities in the region, & there has been a high level of economic and population growth in all the municipalities adjoining the project corridor. As a result, the project corridor may be truly called a trans municipality expressway and up gradation and development of this corridor from present day 2-lane configuration to 6 -lane alongwith paved shoulder and by raised medians divided carriageway standard is absolutely essential considering the socio – economic development, the region has experienced in the past & present decade, and also to cater to the semi - urban population residing all across the corridor distributed in the municipalities from Barrackpore to Kachrapara and to Kalyani where an AIIMS have



been proposed already. Kalyani is also supposed to be declared as a SMART CITY in the upcoming years. Moreover, there is an ever growing flow of daily commuters coming from all across the region to Kolkata Metro and of proposed Dum Dum – Barasat Metro for employment & business activities which has resulted in congestion in the urban space of Kolkata Metro and there are visible occurrences & tendency for a convergence towards the city periphery all along the BT Road from Sodepur to Barrackpore. Alternatively, with the realization of the 4 lane project corridor will encourage de-urbanisation and will attract the investment & development of business activities which in turn will relieve the stress off the commuters and indirectly benefit the urban infrastructure of Kolkata Metro with a major socio economic development of the semi – urban population. Moreover, the region has reached a strategic threshold in terms of concentration of population, education and job opportunities that is favorable for future growth.

#### **1.6 Consulting Services**

In pursuance of the above, West Bengal Highway Development Corporation Ltd (WBHDCL) has awarded the work of "Up-gradation of Kalyani Expressway to 4/6 lane configuration from Muragacha (ch. 4+565 km) to Kampa (ch. 35+340 km) including elevated connection with proposed Mogra-Kampa-Barajaguli Road Corridor in the district of North 24 Parganas in West Bengal on Hybrid Annuity Mode." to Mackintosh Burn Limited. Notice to proceed to undertake the consultancy services was issued by WBHDCL vide their Memo no. 776/1/WBHDCL dated 08.07.2015. The services are on-going and this Final Feasibility Report is submitted herewith.

#### **1.7 Scope**

The scope and objectives of the Consultancy Services to be provided is set out in Terms of Reference (TOR) prepared by the WBHDCL. As per TOR, the scope of this Preliminary Project Report for Up-gradation of Kalyani Expressway to 4/6 lane configuration from Muragacha (ch. 4+565 km) to Kampa (ch. 35+340 km) including elevated connection with proposed Mogra-Kampa-Barajaguli Road Corridor in the district of North 24 Parganas in West Bengal on Hybrid Annuity Mode.

At present, the road is of 2-lane carriageway with earthen shoulder only. As per TOR and traffic capacity, the road is now proposed to be of 4-lane divided carriageway with a raised central median along with paved shoulders and to provide both side service road for the required length.



## **Chapter -2 : Approach & Methodology**



**CHAPTER 2  
APPROACH & METHODOLOGY**

**2.1 GENERAL APPROACH**

The general approach of the Consultants would be to comprehensively address the various issues involved in the project, to carry out all the field and design office activities as set out in the TOR, and finally to develop economically and financially viable improvement proposals satisfying the objectives of the project. For successful and efficient rendering of services, the Consultant proposes to take a sound engineering approach based on a clear understanding of the Terms of Reference and the relevant planning and systems approach.

The TOR for the project lays down in details all the activities to be carried out by the Consultants.

**2.1.1 PROJECT OBJECTIVE**

The main objectives of the consultancy services are:

Up-gradation of Kalyani Expressway to 4/6 lane configuration from Muragacha (ch. 4+565 km) to Kampa (ch. 35+340 km) including elevated connection with proposed Mogra-Kampa-Barajaguli Road Corridor in the district of North 24 Parganas in West Bengal on Hybrid Annuity Mode; 4 – lane with paved shoulder configuration in most economical manner but consistent with the requirements of safe and high speed travel and to establish the technical, economical, environmental, social and financial viability of the project envisaged to be implemented through EPC basis.

To establish the viability of the project section taking into account the investment requirements with regard to rehabilitation, up gradation and improvement based on the following criteria vis-à-vis the financial returns through toll and other revenues:

- ◆ Highway Design
- ◆ Pavement Design
- ◆ Provision of service roads wherever necessary and feasible, intersections, underpasses if required etc along with side drains.
- ◆ Rehabilitation and widening of existing culverts
- ◆ Construction of new structures
- ◆ Providing Vehicular underpass
- ◆ Road safety features



- ◆ Environmental and Rehabilitation costs
- ◆ Cost of land acquisition if any

It is proposed to identify possible Toll Plaza locations and collect fees from as much of the motorized vehicle users of the improved facilities as economically feasible.

To finalise locations of weighing station, parking and rest areas.

To finalize tender documents including PQ documents for tendering.

To provide project reports and economic analysis suitable for appraisal.

### **2.1.2 SCOPE OF CONSULTANCY SERVICES**

The detailed project Report would inter-alia cover the following:

- i. Review of all available reports and published information about the project road and the project influence area;
- ii. Environmental and social impact assessment, including such as related to cultural properties, natural habitants, involuntary resettlement etc.
- iii. Detailed reconnaissance;
- iv. Identification of possible improvements in the existing alignment and realignment at stretches for geometric improvements so as to maintain the design speed.
- v. Traffic studies including traffic surveys and Axle load survey, turning movement surveys and demand forecasting for next twenty years;
- vi. Inventory and condition surveys for road;
- vii. Inventory and condition surveys for cross-drainage structures and drainage provisions;
- viii. Detailed topographic surveys using Total Stations and GPS;
- ix. Pavement investigations;
- x. Sub-grade characteristics and strength: investigation of required sub-grade and subsoil characteristics and strength for road and embankment design and sub soil investigation;
- xi. Identification of sources of construction materials;
- xii. Detailed design of road, its x-sections, horizontal and vertical alignment and design of embankment of height more than 6m and also in poor soil conditions and where density consideration require, even lesser height embankment. Detailed design of structures preparation of construction drawings of cross-drainage structures
- xiii. Identification of the type and the design of intersections;
- xiv. Design of complete drainage system
- xv. Economic analyses;



- xvi. Contract packaging and implementation schedule.
- xvii Strip plan indicating the scheme for carriageway widening, location of all existing utility services (both over- and underground) and the scheme for their relocation, trees to be felled and planted and land acquisition requirements including schedule for LA: reports documents if there be any proposal for LA and drawings arrangement of estimates for cutting of trees and shifting of utilities from the concerned department;
- xix. Preparation of detailed project report, cost estimate, approved for construction drawings, rate analysis, detailed bill of quantities, bid documents for execution of civil works through budgeting resources.
- xx. Design of toll plaza and identification of the location
- xxi. Any other user oriented facility enroute toll facility.
- xxii. Vetting of all structural design & pavement design from IIT Kharagpur.

**2.1.3 EXISTING ROW, ROAD FORMATION & PAVEMENT**

**ROW:**

The information regarding available ROW of the Project Road as gathered varies from 52m to 60m. However, exact ROW will be obtained from the Revenue maps to be collected from the Office of the Special Land Acquisition Officer, Barasat, North 24 Parganas.

**FORMATION WIDTH:**

The formation width of the existing carriageway varies from 8.0 m to 12.0 m, which will be measured location-wise and the Road Inventory data sheets.

**PAVEMENT AND SHOULDER WIDTH**

The existing road has 7.0 m wide bituminous carriageways with about 1.0 m to 1.5 m wide unpaved shoulders. The height of embankment varies from 1.0 m to 2.0 m and in few culvert / bridge - approaches it is about 3.0 m.

These are 11.50 km length of on-going 2 – lane carriageway and alongwith low level service roads on filling sides from Chainage 20+642 to 33+142 in stretches. KMDA contractors left the works long time back before the road is handed over to the WBHDCL in incomplete statge. The works are upto the level of WMM/GSB in to a level of earthwork.



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**2.1.4 BRIDGES & CROSS DRAINAGE STRUCTURES****BRIDGES:**

There is only one no. minor bridge on the project road of length 37.3 m (2x12.3 + 1x12.7). KMDA completed the 2<sup>nd</sup> Bridge of same type and same span arrangement just right side of the bridge on existing carriageway.

**CROSS DRAINAGE STRUCTURES:**

The existing culverts in the project road are as follows: -

- ◆ Slab Culvert - 02 Nos.
- ◆ Box Culverts - 50 Nos.
- ◆ Box Culverts - 04 Nos. (Skew) as detailed in the list attached at the end of this chapter under Annexure – I.

Besides the above, there are following culverts left under construction on proposed carriageway and on either side of service roads.

- ◆ Box culvert completed on proposed carriageway – 5 Nos.
- ◆ Box culvert incomplete on proposed carriageway – 4 Nos.
- ◆ Box culvert completed on service road (LHS) – 1 No.
- ◆ Box culvert completed on service road (RHS) – 4 Nos.
- ◆ Box culvert incomplete on RHS service road – 2 Nos.

These culverts on service roads are constructed in sufficiently low level as of KMDA's service road level.

**2.1.5 EXISTING HORIZONTAL AND VERTICAL ALIGNMENT**

The road in the Project Stretch contains a number of horizontal and vertical curves, which are found more or less standard as per code. The extent of shortfall if any for proper correction will be known precisely from the Topographic Survey data which have been already completed for the Project Stretch. These will be corrected during Geometric Planning of alignment as per IRC: 73-1980 in the Detailed Project Report.

**2.1.6 INTERSECTION**

There are seven (07) Nos. major important junctions that contribute maximum number of traffic along this highway as detailed hereunder.

List of Major Junctions

Chainage (Km)	Type	Remarks.
Km 5.142	4 - Legged	Muragacha More
Km 13.903	4 - Legged	Barrackpore Wireless More



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Chainage (Km)	Type	Remarks.
Km 25.363	4 – Legged	Panpur more
Km 28.308	4 – Legged	Naihati More (Saheb Colony More)
Km 29.319	4 – Legged	Rajendrapur More
Km 32.224	5 – Legged	Paanch Matha
Km 34.385	4 – Legged	Kampa More

**Minor Junctions:** There are also some minor Junctions along the stretch detail of which will be provided in the Detailed Project Report. These Junctions are of minor nature and at grade Intersection to be designed for them as per IRC: SP: 41–1994.

**Underpasses / Pedestrian crossings:** There are no underpasses/ pedestrian crossing along the project road; however necessity for providing the same if felt will be provided in discussion with the officials of WBHDCL on the basis of traffic survey analysis.

### 2.1.7 TOLL COLLECTION CENTER

Presently there are two (02) nos. Toll Collection Center exists along the project stretch set up by KMDA before handing over the project road to WBHDCL. The respective locations are at km 5.542 & Km 14.672. We may have to consider for Toll Plaza at one appropriate location in consultation with WNHDCCL keeping in view the volume of traffic.

## 2.2 METHODOLOGY

### 2.2.1 GENERAL APPROACH AND METHODOLOGY

- Based on the objectives and scope of the Consultancy Services, an appropriate approach and methodology has been developed as discussed in the succeeding paragraphs so as to address the various issues involved in the project.
- All the provisions of various IRC, BIS codes and MOST specifications shall be followed wherever required in the project preparation activities. All laboratory and field tests for soil and other materials etc. shall be done in accordance with the relevant IRC, BIS codes, etc.
- As per the requirements of TOR, a competent team of suitably qualified Key personnel duly approved by the Client along with other supporting staff has been deployed for this project for carrying out the required services.
- It has been proposed to adopt a task approach to carryout the entire work



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comprehensively and accurately to the complete satisfaction of the client.

- ♦ The assignment has been broken into different tasks as indicated in the annexed sheets. The methodology of each task has been described hereunder.

## **2.2.2 TOPOGRAPHIC SURVEY**

### **2.2.2.1 GENERAL**

The specific objective of the topographical survey in the highway project is to delineate accurately the complete existing natural and man-made features, so as to study and develop the existing road to 4-lane with paved shoulder configuration; creating an accurate Digital Terrain Model, which is also a fundamental requirement to design the highway in the latest computerized road surface design. Longitudinal and cross sections at suitable interval as per TOR will be obtained for the purpose of developing the DTM base for design. Data shall be obtained to design the cross drainage system allowing the storm water/ floodwater to flow out smoothly. The topographical survey from km 4.565 at Muragacha crossing to km 34.385 at Kampa crossing of Barrackpore - Kalyani expressway has been taken up for DTM using most modern Survey technique with the help of GPS, Total Station, and Auto level and approved commercial software.

The topographical survey work includes:

- Establishment of a network of geodetic plan metric control points, as well as, height control points.
- Detailed topographical survey.
- Detailed height control work taking longitudinal and cross sections all along the stretch for creating a mathematical base for development.
- Transfer of the designed road alignment on to the ground in mathematical data system.

Reconnaissance survey will be taken up to fix appropriate location for GPS Pillars and reference pillars, considering correct and optimum use of them during further surveys.

### **2.2.2.2 GEODETIC CONTROL SURVEY**

Dual frequency GPS instruments will be used to obtain absolute values of points in spherical co-ordinate, that is, in Longitude and Latitude. Prefabricated pillars at 250 m intervals will be established, whose Longitude and Latitude values will be fixed by GPS instrument; and the GPS pillars will be established at about 5.0 to 6.0 km apart throughout



the length of the highway and proposed diversion. These values of GPS pillars will thereafter be converted to its metric components. These points will form the base of absolute values to which Total station traverse using these co-ordinate system will be tied.

These pillars will be located near the edge of right of way or near about, so that these are not disturbed during project activities.

These pillars will have correct BM values on them so that they will be serially numbered and their description will be duly provided to ensure easy identification and accessibility in future.

During geodetic control surveys, height control survey will also be taken up and reduced levels referred to Mean Sea Level will be marked / assigned to all pillars, GPS pillars and reference pillars as per TOR. Prior to detailed survey, XYZ values will be distributed to all reference pillars and all permanent objects on the highway.

These control survey pillars would form the basic data system, the mathematical base on which the crucial test of three dimensional topographic survey will be founded. The major task of delineating the total highway stretch in 3D system along with all bridges / culverts and all features within the ROW, trees, plantations etc., and the surrounding natural landscape would be planned for future environment.

### 2.2.2.3 TOPOGRAPHIC SURVEY WORKS

It shall consist of:

- GPS traverse about 5 km apart with a pair of points consisting of absolute values in global terms and with height by Auto level.
- Total Station traverse for awarding 3 dimensional digital values to each and every feature within the ROW.
- Assigning Reduced levels / heights to all roadside features referred to MSL. Also, long section at regular interval and cross sections at an interval as per TOR to delineate the exact existing road surface along the alignment. In hilly terrain the cross-sections will be taken at 20m or closer interval as required.
- Ground verification of the Terrain Modeling, with reduced level values.
- Total mapping of the alignment, in digitized geodetic co-ordinates.



- Check terrain modeling by drawing sections at all required places, on the mathematically created model of the road.
- The pillars will be established along the road within the ROW at suitable places at 250m intervals. These pillars with details will be documented in a table and painted: (i) Reference pillars YELLOW (ii) GPS pillars WHITE. Both the pillars will have serial numberings in red. They will be constructed to facilitate detailed survey.

#### **2.2.2.4 TOTAL STATION TRAVERSE**

Along the edge of the pavement of the existing road a GPS value controlled, geodetically closed traverse by Total Station will be run, connecting the absolute value running on GPS traverse completed earlier. This total station traverse will have sufficient number of survey-controlled points for using during detailed survey.

All these total station traverse points will bear the controlled and checked values of XYZ for further use during detailed survey. All the Total Station Survey points will bear the closed circuit, double tertiary controlled levels referred to the GTS-BM.

#### **2.2.2.5 DETAILED SURVEY**

All over ground / underground topographical features, utility service lines, existing on the road will be surveyed; which will bear the controlled geodetic value on each data in XYZ system. Existing road will be surveyed in detail, taking XYZ values at Road center, Road edges, Road shoulders, Toes and normal ground away from toe line. Trees above 600m girths will be surveyed separately and social forestry plantations will be surveyed giving the number of trees in each such plantation. Buildings, hutments, Goomties and all existing features, natural or man made will be surveyed, and each point will have XYZ values. Road curves will be surveyed with special attention for development of proper existing geometrics and cross roads will be surveyed with proper weightage on the type of road, keeping in view for improved junctions and or intersections.

#### **2.2.2.6 LONGITUDINAL AND CROSS-SECTIONS**

Levels will be taken at 25m intervals longitudinally or closer at curves or if the topography demands and cross-sections will be taken at 50m/20m apart transversely covering full extent of survey corridor depending upon the nature of terrain i.e. plain/ rolling and



mountainous/ hilly. Levels along the cross sections will have the following points recorded specifically.

- ◆ Existing road center (carriageway)
- ◆ Edges of the carriageway
- ◆ Edges of the shoulders (Paved & Unpaved)
- ◆ Edges of berm
- ◆ At rut points / Quarter point of carriageway
- ◆ At every 5m intervals beyond embankment berms on both sides up to ROW boundary.
- ◆ On the proposed incomplete carriageway
- ◆ On the service roads which have been carried out under the previous contract and executed by KMDA

The closer intervals of taking cross sections will be chosen according to topographical condition at the point.

Longitudinal and cross sections for major and minor streams will be obtained as per recommendations contained in IRC special publication No. 13 and IRC-5-1985 which will be followed in totality.

Coding and matching of different topographical features between Total Station and Computer Software have been finalized in compatible terms.

#### **2.2.2.7 GROUND VERIFICATION**

On completion of topographical survey by Total Station and Auto Level, the drawing will be prepared by using Auto-Cad software and PC compatible data of total station. Ground verification of a few check plots and all details of the detailed survey will guard

#### **2.2.2.8 DIGITAL TERRAIN MODELING**

All digital data in XYZ format from the ground survey by Total Station will be used for mapping by means of Auto-Cad at site and also at the Design Office, using the Highways Design software: "INROADS". Software will be used for Digital Terrain Modeling of the proposed 4-lane divided carriageway of the Highway.

Elevations of all control points and all traverse stations have been referred to the GTS Benchmarks available along the road stretch, and have to be fixed by closed circuit height



traverse and have to be distributed to all the control and reference pillars fixed in the stretch, by using Auto Level.

In addition to control points established, as mentioned in the aforesaid paragraphs, a number of intermediate temporary benchmarks will be established using auto levels and awarding XYZ values to them and these will be: bridges and culverts, exposed rock outcrop, Ring wells or other permanent features available along the road.

The prefixed accuracy, as have been desired from the network of above control points will be:

- Planimetric control points by GPS: 1:30000
- Total Station traverse accuracy: 1:25000
- Auto-level traverse accuracy: 12K in mm, where, 'K' is the distance covered by the traverse.

#### **2.2.2.9 DATA EVALUATION AND PROCESSING**

The raw data obtained direct from field observations will be evaluated and processed in with the requisite software. Ground checking and pin pointing the missing data, if any, will be picked up immediately.

The raw data in XYZ (i.e. 3D) format will be processed for preliminary strip plan drawing in field and sent to corporate office for scrutiny and final design with all complete parameters.

#### **2.2.3 TRAFFIC STUDY**

The objective of traffic study is to provide basic input for the following part of the Feasibility Study:

- Design Traffic assessment of existing corridor based on traffic demand on the corridor for next 15 years by applying proper forecasting technique.
- Identification of zone of influence of the project stretch as per O-D Survey and commodity movement characteristics survey.
- Pavement design based on design msa obtained from traffic volume count data, axle load data, and CBR value.
- Intersection design.
- Providing Vehicle underpass (VUP)
- Provision of Service Road.
- Providing Pedestrian underpass (PUP)
- Possible location & design of toll plaza.



- Economic analysis.

### 2.2.3.1 METHODOLOGY BASED ON TOR & RECONNAISSANCE SURVEY OF THE PROJECT STRETCH:

a) Secondary Data Collection

i) Previous Traffic Count Data

P. W. (Roads) Directorate, Govt. of West Bengal will be constructing the elevated corridor between Belgharia Expressway & Dum Dum – Barrackpore -Kalyani Expressway, which when completed will be an extension of our project road on the southern side. The outcome of the traffic studies conducted by P. W. (Roads) Directorate for the said project will be tried to be obtained with the help of officials of WBHDCL.

ii) Statistical Information:

- Economic Indicators: Statistical information such as Population, Per Capita Income, Net State Domestic Products (NSDP) & Gross Domestic Product (GDP) for the areas of influence as per O-D survey will be collected from Census, Directorate of Economics and Statistics of Government of West Bengal and Economic Survey of Government of India.
- Vehicle Registration: Classified vehicle registration figures for the areas of influence as per O-D survey will be collected for last 5 years from Regional Transport Authorities, Public Vehicles Directorate of Orissa.

iii) Seasonal Variation:

The Seasonal Variation will be worked out based on the traffic count data collected from some *Control Points* or from other reliable sources, where previous record of daily traffic plying on that stretch in every season i.e. around the year traffic count will be available in a systematic manner.

iv) Accident Statistics:

Previous accident information will be collected from the police stations along the stretch for last 3 years to identify accident-prone areas, if any, cause and frequency of accidents etc to identify black spots.

v) Data on Fuel Sales:

Efforts would be made to collect previous sales data from some of the fuel stations - to get an idea of growth trend, required for forecast and to verify the



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traffic figures.

b) Primary Data Collection:

Primary data have been collected from Traffic Surveys comprising of Classified Traffic Volume count survey ( both 7days x 24 hours & 3 days x 24 hours), Origin – Destination Survey, Axle Load Survey & Turning Movement Survey at various locations on the project road and its vicinity which is detailed in table below.

SI No.	Description	Duration	Location	Chainage	Jurisdiction of Local PS.
1.	Classified Traffic Volume Count Survey	7 days x 24 hours	Between Muragacha More & Barrackpore Wireless more.	Ch. 0.400	Ghola
			Between Barrackpore Wireless more & Kampa More.	Ch. 9.530	Titagarh
2.	Classified Traffic Volume Count Survey	3 days x 24 hours	On Belgharia Expressway	Ch. Between 3.00Km to 3.50km	Belgharia
			On NH-34 (Jessore Road) near Birati Junction	-	Nimta
3.	Origin Destination Survey	1 day x 24 hours	Between Barrackpore Wireless more & Kampa More.	Ch. 9.530	Titagarh
			On Belgharia Expressway	Ch. Between 3.00Km to 3.50km	Belgharia
			On NH-34 (Jessore Road) near Birati Junction	-	Nimta
4.	Axle Load Survey	1 day x 24 hours	Between Barrackpore Wireless more & Kampa More.	Ch. 9.530	Titagarh
			On Belgharia Expressway	Ch. Between 3.00Km to 3.50km	Belgharia
5.	Turning Movement Survey	Morning	Muragacha More	Ch. 0.00	Ghola
		Peak Hours – 8.00 AM to 12.00 PM	Barrackpore Wireless More	Ch. 8.750	Titagarh
			Panpur more	Ch. 20.224	Jagaddal
		Afternoon Peak Hours - 4.00 PM to 8.00 PM	Naihati More (Saheb Colony More)	Ch. 23.170	Naihati
			Rajendrapur More	Ch. 24.181	Naihati
		Kampa More	Ch. 29.255	Bizpur	



c) Methodology of Analysis and Traffic Demand Estimates:

Traffic forecast will be made for the period of 20 years for all categories of vehicles based in O-D survey & growth factor technique. Traffic growth factor for the present year and every 5 years interval up to 20<sup>th</sup> year based on:

- Past traffic growth rate on the project stretch based on the data on past years.
- Vehicle registration figures in different years and its growth.
- Population growth rate.
- NSDP/ GDP growth for Regional/National level respectively
- Vehicle Ownership.
- Elasticity of Road Transport Demand in relation to GNP/ GDP.
- Industrial Growth.

All available traffic reports and forecasts will be reviewed to compare with established growth factor.

2.2.3.2 Methodology of conducting Traffic Survey:

Sample forms for different types of traffic survey to be undertaken is given in the Annexure to this report..

2.2.3.3 List of IRC Codes:

The list of IRC codes is given below, stipulations of which will be adhered to in survey, analysis and future demand analysis: -

IRC: 108-1996	- Guidelines for Traffic Prediction on Rural Highways
IRC: 106-1996	- Guidelines for Capacity of Urban Roads in Plain Areas
IRC: 64-1990	- Guidelines for Capacity of Roads in Rural Areas
IRC: 102-1998	- Traffic Studies for Planning Bypasses around Towns
IRC: 9-1972	- Traffic Census on Non-Urban Roads
IRC: 92-1985	- Guidelines for the Design of interchanges in Urban Areas.
IRC: 93-1985	- Guidelines for Design and Installation of Road Traffic Signals.
IRC: 65-1976	- Recommended Practice for Traffic Rotaries
IRC: 37-2001	- Guidelines for the Design of Flexible Pavements.
IRC: 53-1982	- Road Accident Forms A-1 and A-4
IRC: SP-19-2001	- Guidelines for Traffic Survey and analysis
IRC: SP-41-1994	- Guidelines for Design of At Grade intersections in Rural and Urban Areas



## 2.2.4 SOIL & MATERIAL INVESTIGATION

### 2.2.4.1 ALONG ROAD ALIGNMENT ON EXISTING CARRIAGEWAY

The team will carry out the investigation by excavating trial pits at the interface between the pavement and the shoulder, extending through the pavement layers and to the level of sub grade. The test pit shall be dug at every 1.00 km interval to obtain pavement composition.

- Test pits are to be dug at every 1.00 km interval (staggered left/right) along the pavement at the pavement shoulder interface to investigate the soil to a depth of 1 m below the sub grade level.

The sequence of test operations for each large pit is as follows:

- Manual excavation of 1m x 1m size to the bottom of pavement layers/sub grade level.
- Thickness of different pavement layers and type of material and level of compaction will be determined and logged.
- Field density test using sand replacement method as per IS 2720 (Part XXVIII) will be carried out.
- Field CBR using DCP will be conducted.
- 40 kg sample will be collected for soil classification testing from the subgrade level to 400mm depth for carrying out detailed laboratory tests listed below. A small sealed sample will be also collected for determination of natural moisture content:

Sieve Analysis	:	IS: 2720 Part 4
Natural Moisture Content	:	IS: 2720 Part 2
Liquid Limit & Plastic Limit	:	IS: 2720 Part 5
Moisture Density Relationship (Modified Proctor)	:	IS: 2720 Part 8
CBR (Soaked) at three different Compaction energy levels	:	IS: 2720 Part 16

### 2.2.4.2 ALONG ROAD ALIGNMENT ON PROPOSED NEW CARRIAGEWAY

#### **Earthwork & Subgrade**

- > Test Pits will also be excavated on the existing earthwork of the proposed new carriageway portions of size 1.0 m x 1.0 m upto a minimum depth of 1.0 m. Existing thickness of the earthwork and the sub-base works (if any) will be noted.



- FDD by sand replacement method will be conducted at a suitable depth (Subgrade level) on the trial pit in consultation with the Engineer – in – charge.
- DCPT test will be conducted at the bottom of the test pit (subgrade level) to evaluate the strength of the underlying embankment layers.
- Soil Samples will be collected from the test pits for classification & conductance of the following laboratory tests as per IS: 2720
  - Field moisture content (as per IS: 2720 (Part 2) – 1973)
  - Grain size analysis (as per IS: 2720 (Part 4) – 1985)
  - Atterberg limits (as per IS: 2720 (Part 5) – 1985)
  - Moisture-Density test (Heavy Compaction) (as per IS: 2720 (Part 8) – 1983)
  - CBR (4 days soaked) (as per IS: 2720 (Part 16) – 1985)

**Existing Sub-base Works on New carriageway**

Existing Sub-base samples will be collected from the test pits for classification & conductance of the following laboratory tests. Existing FDD and DCPT test will also be evaluated on the test pits.

- Gradation of the sub –base material laid in the new carriageway portion
- Aggregate Impact Value of aggregates as per IS: 2386 (Part -IV)
- Liquid Limit & Plasticity Index as per IS: 2720 (Part – 5)
- Specific Gravity & Water absorption of the aggregates as per IS: 2386 (Part -III)
- Wet AIV (if required) as per IS: 5640
- CBR at 98% Dry Density as per IS: 2720 Part – 8 & Part -16

**2.2.4.3 ALONG ROAD ALIGNMENT ON SERVICE ROAD SECTION**

It is being observed some stretches of service roads on either side here taken up by the KMDA authority in between chainage km 20.642 to km 33.142 which are lying incomplete stages.

Trial test pits will be excavated on these service road stretches to evaluate the thickness of the individual component layers. Samples will also be collected from the incomplete WMM, Sub base and subgrade layers to evaluate the properties of each laid layers.

Following tests will be conducted on the samples collected from pavement layers.

*On existing WMM course level of service road*



- Gradation of the WMM (base course material) layer laid on both the service roads done in few stretches.
- Aggregate Impact Value of aggregates as per IS: 2386 (Part -IV)
- Atterberg limits of aggregates passing 425 micron sieve as per IS: 2720 (Part - 5)
- Specific Gravity & Water absorption of the aggregates as per IS: 2386 (Part -III)
- Combined Flakiness and Elongation Index as per IS: 2386 (Part - I)
- Density of compacted layer to be evaluated

*On existing Sub-base course level of service road*

Tests and operation as similar to the sub - base course on the new carriageway portions will be carried out for the sub - base layer samples collected from both the service road stretches

*On existing Subgrade level of service road*

On the subgrade level existing FDD will be conducted by sand replacement method and in-situ moisture content will be evaluated. DCPT test will be conducted at the bottom of the excavated test pit on the service road to evaluate the in-situ CBR of the underlying layers. Samples will be collected and laboratory tests as similar to the tests mentioned above for embankment and subgrade materials for existing carriageway and new carriageway portions will be conducted and tested.

**BORE HOLES:**

Some boreholes will be excavated on the earthen shoulder adjacent to the existing carriageway upto a depth of 10 m from the top surface. Boring in overburden soil will be carried out in accordance with IS: 1892.

Tests in the borehole will include standard penetration test (SPT). Disturbed and / or undisturbed samples will be collected from boreholes at 1.5m intervals, or at every identifiable change of strata, whichever is met earlier.

The following tests will be conducted in accordance with the latest applicable IS: 2720 code:

- ◆ Natural Moisture Content
- ◆ Sieve and Hydrometer Analysis
- ◆ Atterberg Limits



- ◆ Specific Gravity
- ◆ Bulk and Dry Density
- ◆ Unconfined Comprehensive Strength
- ◆ Triaxial Test (unconsolidated untrained test)
- ◆ Direct Shear Test

A chemical analysis of water samples for pH, Sulphate, Chloride and Organic matter if required shall also be carried out.

There is only one minor bridge on the project road and the new bridge on the proposed new carriageway (RHS) has already been constructed upto the deck level .

So, no further sub – soil investigation is envisaged for the bridges on the project road.

But boreholes to a depth upto 40.0 m have to be taken up at Muragacha crossing and at Wireless crossing for geotechnical investigation for providing vehicular underpass in the above 2 locations.

#### **2.2.4.4 FOR QUARRIES AND OTHER POTENTIAL EXTRACTION SITES**

The Consultant will investigate the quarries and other potential extraction sources of material. The initial reconnaissance will include a review of geological maps, data published by various authorities, soil maps by the agricultural departments, and soil profile maps.

The field investigation will include the following activities:

- ◆ Identification of borrow areas for sub grade and fill material and collection of representative samples from each source for appropriate laboratory tests.

Tests on these representative samples will be carried out in accordance with IRC/ MOST / BIS requirements to evaluate the quality of the materials and to assess their suitability for use as ordinary fill material for new construction of road embankment & selected fill material for use at sub grade level.

The following tests will be carried out on soil and quarried stone / aggregates:

- ◆ Soil:
  - Grain Size Analysis : IS: 2720: Part 2
  - Liquid Limit and Plastic Limit : IS: 2720: Part 5
  - Moisture Density Relationship : IS: 2720: Part 8  
(Modified Proctor tests)
  - C.B.R. (soaked) at three : IS: 2720: Part 16  
different compaction energy level



Manufactured materials, e.g. bitumen, cement, and reinforcing steel, will be checked for their availability and quality from the manufacturers' brochures / test certificates / mill certificates in accordance with requirements of the latest applicable IS code.

## 2.2.5 HYDRAULIC, HYDROLOGICAL AND DRAINAGE STUDIES

### 2.2.5.1 GENERAL

In general, data and information regarding catchment area and its characteristics, flood and design discharge parameters etc. collected from concerned authorities and CWC publications will form the basis of hydrological and hydraulic studies for all existing cross-drainage structures along the project road. These studies will be carried out in accordance with IRC Special Publication No. 13 (Guidelines for Design of Small Bridges and Culverts) and IRC:5-1998 (Standard Specifications and code of Practice for Road Bridges, Section-I). Collecting data required for discharge computations will carry out hydrological studies and visualization of the existing site condition as discussed below. Discharge computations and recommendations will be available at the end of the DPR study.

### 2.2.5.2 SURVEYS FOR CROSS DRAINAGE STRUCTURES

Surveys will be carried out at bridge and culvert sites for information/data relating to:

- ◆ Topographical features
- ◆ Outline of banks and channels
- ◆ Direction of flow of water at maximum and at lower discharges
- ◆ Alignment of existing road approaches to culvert location site
- ◆ Angle of skew
- ◆ Dimensional details of the existing cross drainage structures
- ◆ Flood Levels
- ◆ Overtopping /submergence and duration, if any
- ◆ Breaches of embankment / out flanking, if any

### 2.2.5.3 DRAINAGE STUDIES AND DESIGN

The entire drainage system covering surface drainage and cross-drainage of the existing highway as well as the additional requirement consequent to widening of the highway will be studied in detail and suitable recommendations made to have proper integration between road-side drainage system with proposed cross-drainage system. Special attention will be given for providing adequate drainage system for road sections passing through urban areas and road segments having super elevated



carriageways and high embankments. For drainage design, IRC: SP: 42 -2014 "Guidelines on road Drainage" and MOST Specifications for Road and Bridge works (Fifth Revision) will be followed.

- ◆ Adequate drainage of the pavement structure would form an essential part of pavement design. Boxed type pavements housed in earth shoulders (verges) will not be considered. Sub-base /base will have self-draining provision by extending granular drainage layer fully over the road formation width. In addition, care will be exercised to provide cross fall appropriate to the drainage layer to guard against any sluggish flow on account of inadequate cross fall than needed for the type of material used in that layer. Road sub grade will also be provided with a cross fall appropriate to the draining characteristics of the material with which it is built so that there is no accumulation of water at the top of the sub grade due to sluggish flow at that level.
- ◆ System functioning of various pavement structures built with pavement courses of different specifications will also be kept in mind while designing them in order to ensure that there is no problem of interfacial drainage between two pavement layers. In case of existing pavement where such a situation might become unavoidable from other considerations, layers having larger voids to drain off laterally to be provide.
- ◆ The entire drainage system of the existing road, with the addition of suitable provisions for the 4-lane highway, will be studied in detail during the DPR Study and suitable proposals for drainage will be recommended in the report. In built-up areas, service roads will be provided on either side of the four lane divided carriageway, side drains will be suggested between the main carriageway and service roads and covered drains will be suggested at the
- ◆ The project road is mainly in "plain terrain" which suggests that most problems will be related to confined water, resulting in ponding during the rainy season. In order to limit the risk of the ponding along the highway, it will be necessary in some areas to provide suitable outfalls for the drains.

## **2.2.6 HIGHWAY PLANNING & DESIGN**

### **2.2.6.1 PREPARATION OF PLAN & PROFILE**

Topographic Survey with Total Station will obtain the strip maps of each kilometer showing all physical elements on the Project Stretches for 30m widths on the either side of existing



road. Digital Terrain Model (DTM) for the entire stretches will be developed with the help of XYZ Survey data for the different cross & long sections using the "HEADS" Software. On the basis of information from Survey drawings, knowledge of existing problems & constraints and inputs from Traffic Engineers, the geometric deficiencies of the horizontal and vertical alignment will be corrected to IRC Standards and requirements of TOR. The plan & Profile drawings for entire stretch will be designed and developed with the help of DTM and "Inroads" software.

Multi-disciplinary approach will be taken in finalizing the Highway Planning & Design. For this inputs from Pavement specialist, Geotechnical Engineer, will be given consideration after due interaction with them.

### 2.2.6.2 DESIGN OF INTERSECTIONS

An intersection is most critical element of a highway because, to a great extent, the efficiency, safety, speed, cost of operation, and capacity depends on its design. Each intersection involves through or cross traffic movements on one or more of the highways concerned and may involve turning movements between these highways.

The main objective of intersection design is to reduce the severity of potential conflicts between motor vehicles, buses, trucks, bicycles, pedestrians and facilities while facilitating the convenience, ease and comfort of people traversing the intersections. The design should be fitted closely to the natural transitional paths and operating characteristics of the users.

#### AT-GRADE INTERSECTIONS

Four basic elements enter into design considerations of at-grade intersections.

A	Human factors
	1. Driving habits
	2. Ability to make decisions
	3. Driver Expectancy
	4. Decision and reaction time
	5. Conformance to natural paths of movement
	6. Pedestrian use and habits
	7. Bicycle traffic use and habits
B	Traffic considerations
	1. Design and actual capacities
	2. Design-hour turning movements
	3. Size and operating characteristics of vehicle
	4. Variety of movements (diverging, merging, weaving and crossing)
	5. Vehicle speeds
	6. Transit involvement



	7.	Accident experience
	8.	Bicycle movements
C	Physical Elements	
	1.	Character and use of abutting property
	2.	Vertical alignments at the intersection
	3.	Sight distance
	4.	Angle of the intersection
	5.	Conflict area
	6.	Speed change lanes
	7.	Geometric features
	8.	Traffic control devices
	9.	Lighting equipment
	10.	Safety features
	11.	Bicycle traffic
	12.	Environmental factors
D	Economic factors	
	1.	Cost of improvements
	2.	Effects of controlling or limiting rights-of-way on abutting residential or commercial properties where channelization restricts or prohibits vehicular movements.
	3.	Energy consumption

## 2.2.7 PAVEMENT DESIGN

### 2.2.7.1 GENERAL

The project envisages construction of 4 lane divided carriageway with paved shoulders and granular shoulder. The strengthening activities will include:

- ◆ Assessing the sufficiency of the existing crust composition with respect to the forecasted design traffic and analysis of the subgrade material to evaluate the suitability of the same for use in the proposed 4 lane corridor.
- ◆ Construction of new carriageway on the proposed new pavement which is incomplete from the works executed previously by KMDA.
- ◆ Reconstruction of the existing carriageway if required depending upon the suitability of the existing subgrade material, presence of drainage layer in the existing pavement crust, and insufficient crust thickness.

### 2.2.7.2 PAVEMENT DESIGN OPTIONS

A pavement option study will be done on the basis of optimum designs of:

- ◆ Overlay / Reconstruction of the existing pavement
- ◆ Construction of New pavement for:
  - Reconstruction part or whole of the existing carriageway



- New construction of the new carriageway which is incomplete from past works.
- ◆ Construction of either side Service Road as and where necessary, considering habitation areas, markets and for other road side amenities.

The design process will typically involve the following steps:

◆ **EVALUATION OF HOMOGENOUS SECTIONS**

Based on the pavement condition survey, the project road will be divided into homogenous sections of equal performance with respect to traffic, subgrade characteristics for which BBD tests may be conducted.

◆ **CHARACTERISTIC DEFLECTION**

The BBD test data for each homogeneous section of equal performance after correction for temperature and seasonal variation will be analyzed to determine the characteristics deflection.

◆ **DESIGN LIFE - PERFORMANCE AND ANALYSIS PERIODS**

The design life, in accordance with the Terms of Reference, will be at least 20 years for flexible pavement. Two options of design, as indicated below, are to be considered:

- **FULL DESIGN LIFE**

	Flexible Pavement	Rigid Pavement
Performance Period	15years	30 years
Analysis Period	15 years	30 years

◆ **DESIGN TRAFFIC**

Based on the results of traffic projections and axle load survey, design traffic in terms of equivalent million standard axles (msa) will be computed for the performance and analysis periods of the various design options.

**2.2.7.3 PAVEMENT EVALUATION FOR DESIGN OF OVERLAY**

- Pavement Evaluation is a technique of assessing the surface distress and ride quality of pavement along with structural capacity. The study investigates the pavement condition and its structural adequacy at a time and also the requirement for providing safe and comfortable traffic operations.

Pavements are evaluated for a number of reasons:



- ◆ To provide input for calculating the pavement performance
- ◆ To provide input to pavement design for overlay
- ◆ To check the stages of certain pavement conditions to ensure that they remain within the acceptable limits and to initiate preventive/ corrective treatment.

#### **2.2.7.4 DESIGN OF NEW PAVEMENT**

Design of new pavement will be done for flexible pavement and rigid pavement to enable pavement option study.

#### **DESIGN OF FLEXIBLE PAVEMENT**

Guidelines in IRC: 37-2012 will be used for the design of flexible pavement. The design process will include:

#### ◆ **HOMOGENEOUS SECTIONS**

The section of homogeneous sections for the existing carriageway & new construction in proposed carriageway will be based on type of existing subgrade soil foundation soil for embankment, height of embankment, design traffic.

#### ◆ **EFFECTIVE CBR OF SUBGRADE**

Based on the results of tests from the existing subgrade material, and the guideline as mentioned in the flexible pavement design code IRC:37-2012, the effective CBR value of sub grade soil to be used for the design of pavement will be selected for each of the above homogeneous section. In stretches where reconstruction is warranted, the soil in the sub-grade will be tested to ascertain CBR value, and the effective CBR will be arrived at based on IRC:37-2012 and will be further adopted for design of pavement. For existing subgrade soils of CBR<7, cushion of sand (Zone II) or a layer of sand (Zone II) with pond ash at suitable proportions as per test result to a thickness of 500 mm may be laid to arrive at an effective CBR of >7.

#### ◆ **DESIGN LIFE**

In accordance with the Terms of Reference, the design life of the flexible pavement will be at least 20 years.



◆ **DESIGN TRAFFIC**

Based on the projections of future traffic on the project road, and also the results of axle load survey, design traffic in terms of equivalent million standard axles (msa) will be computed for the performance and analysis periods of the various design options.

**DESIGN THICKNESS OF PAVEMENT LAYERS**

Using appropriate values for design traffic (msa) and subgrade CBR, the thickness of component layers of the pavements will be calculated for various homogeneous sections of the project road, the stretches of the existing road for reconstruction.

Layer thickness of different type will be determined in accordance with IRC: 37-2012.

**DESIGN OF RIGID PAVEMENT**

The design of rigid pavement will be based on IRC:15-2011 and the latest guidelines of MOST and will be applied for the use at the Toll Plaza location.

The design process will include the following steps:

◆ **MODULUS OF SUBGRADE REACTION**

Based on the results of tests on subgrade soil, the values of the Modulus of Subgrade Reaction will be obtained for rigid pavement design from CBR values by correction from Table 3 of IRC:58-2011

◆ **DESIGN LIFE**

In accordance with the Terms of Reference, the design life of the rigid pavement will be 30 years. No design for stage construction is envisaged for this type of pavement.

◆ **DESIGN TRAFFIC**

From the traffic data, the intensity of the projected future traffic will be determined in accordance with IRC: 58 guidelines. The maximum wheel load for design will be taken from the Axle Load Spectrum Study.

◆ **DESIGN OF SLAB THICKNESS**

The design thickness of concrete slab will be determined as per the guidelines given in IRC:58-2011, using appropriate values of design traffic and Modulus of Sub grade Reaction obtained as described above. Appropriate strength parameters for the concrete mix proposed for construction, will also be used, e.g. Modulus of Rupture, Modulus of Elasticity and Poisson's Ratio.



◆ **DESIGN OF JOINTS**

The joints in the cement concrete pavement will be designed in accordance with the guidelines given in IRC:15-2011 and IRC:58-2011.

**2.2.8 DESIGN OF SURFACE DRAIN**

Surface drainage plays a very important role in performance of pavement. Design of surface drain in built-up and semi urban areas will be done for 2 year return period of rainfall of maximum intensity for appropriate duration following IRC:SP:42-2014, "Guidelines on Road Drainage."

Peak run off will be calculated following the rational formula. For obtaining velocity of flow, Manning's equation  $V = \frac{1.49}{n} S^{1/2} R^{2/3}$  m /second; where V, n, S & R are, standard notations that will be followed. To keep self-cleansing velocity, the velocity of flow will be kept more than 1.50m/second.

**2.2.9 CROSS DRAINAGE STRUCTURES:**

**2.2.9.1 EXISTING CULVERTS**

There is 01 minor bridge and 56 nos. of culverts in the road segment. Out of the 56 nos. of culverts, only one no. is slab culvert and the rest are box culverts.

All these cross drainage structures have 2-lane carriageway. The condition of some of these structures is poor or very poor needing their repair or replacement and the remaining culverts may be retained with necessary repairs as may be found necessary. Some new culverts may be required to be provided for improving the cross drainage of the area.

**2.2.9.2 APPROACH & METHODOLOGY**

The following approach and methodology will be used for the design and drawings of bridge and culvert structures proposed for this project:

**REVIEW OF PAST STUDIES, REPORTS AND DATA**

In order to obtain complete background information about the structural and hydraulic performance of existing bridges, a review of all pertinent reports, data and past studies will be carried out. Appropriate documents will be collected from the concerned government



departments, e.g. Public Works Department, Flood Control and Irrigation Department etc. of West Bengal and also from KMDA.

The following data will be collected wherever possible:

- ◆ Details of repair / rehabilitation, if any, carried out for the existing culverts.
- ◆ Details of repair / rehabilitation proposals already framed by Public Works Departments / Consultants and under consideration of Public Works Departments.
- ◆ Nature and extent of damage observed during floods to any of the existing culverts.
- ◆ Any other engineering data found suitable for the detailed engineering of the proposed cross drainage structures.

### **RETENTION OF EXISTING CULVERTS**

Based on the above condition survey, an assessment will be made whether these can be effectively retained after carrying out economical repairs.

In case any culvert is found to be beyond economical repair, then the structure will be recommended for reconstruction. Standard details of various types of culverts given in IRC-SP-13 will be adopted wherever appropriate

### **2.2.9.3 DESIGN STANDARDS FOR NEW STRUCTURES**

The structural planning of new bridges or culverts should be aesthetically pleasing and the form selected for design will be that considered being the most suitable and cost effective.

Design of all proposed structures will be in accordance with the provisions of the following IRC Codes:

◆ IRC: 5-1998	-	Section I, General Features of Design
◆ IRC: 6-2000	-	Section II, Loads and Stresses
◆ IRC: 18-2000	-	Design Criteria for Prestressed Concrete, Road Bridges
◆ IRC: 21-2000	-	Section III, Cement Concrete (Plain & Reinforced)
◆ IRC: 22-1986	-	Section VI, Composite Construction
◆ IRC: 40-2002	-	Section IV, Brick, stone & Block Masonry
◆ IRC: 45-1972	-	Recommendations for estimating the resistance of soil below maximum scour level in the design of well foundation of bridges.
◆ IRC: 78-2000	-	Section VII, Foundations and Structure
◆ IRC: 83-1999	-	Section IX, (Part I), Metallic Bearings
◆ IRC: 83-1987	-	Section IX, (Part II), Elastomeric Bearings
◆ IRC: 83-2002	-	Section IX, (Part III), POT Bearings



◆ IRC: 87-1984	-	Guidelines for the Design & Erection of false work for road bridges.
◆ IRC: SP-33-1989	-	Guidelines on Supplemental Measures for design, detailing and durability of important bridge structures
◆ IRC: 89-1997	-	Guidelines for design and construction of river training and control works for road.

Wherever IRC codes are silent BIS codes shall be followed. In any case where even BIS codes are silent, MOST's guidelines / other suitable international codes will be adopted.

### **LOADING**

Various components of new structures will be designed for one lane of IRC Class 70R loading, two / three lanes of IRC Class A loading, whichever governs with due considerations to reduction allowed for multi lane loadings. Effects of temperature changes, wind etc will be considered as per IRC:6-2014.

### **SEISMIC ANALYSIS**

The proposed bridges and culverts fall in seismic Zone III / IV, as per the classification specified in IRC:6-2014.

### **SOIL PARAMETERS FOR BACKFILL**

Soil parameters proposed for the back-fill material behind abutments are:

$$\begin{aligned}\phi &= 30^\circ \\ \delta &= 20^\circ \\ \gamma_d &= 18\text{kN/m}^3 \\ \gamma_{\text{sub}} &= 10\text{kN/m}^3\end{aligned}$$

Suitable filters will also be used.

### **FOUNDATIONS**

Depending upon the hydraulic & soil data, collected from subsoil investigations, the foundations can be open, shallow or deep and design will be in accordance with the provisions of IRC-78. Where appropriate MORT&H's Standard Plans and Drawings will be adopted



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### **WEARING COURSE**

A layer of 25 mm of Mastic Asphalt wearing course, will be provided over a layer of 40 mm thick bituminous concrete.

### **APPROACH SLAB**

Reinforced concrete approach slabs, 3.5m long and 300 mm thick, in M30 grade concrete at either end of the bridge or culvert will be proposed, with one end supported on the reinforced concrete bracket projecting out from the dirt wall and the other end resting over the soil, in accordance with the guidelines issued by MOST. A leveling course, 15 cm thick, in M-15 grade concrete will also be laid under the approach slab.

### **TMT REINFORCEMENT**

Grade designation Fe-415 / Fe – 500 / Fe – 500D, conforming to IS: 1786 will be provided.

Repair and rehabilitation proposals will be prepared in accordance with the guidelines contained in IRC: SP: 40, "Guidelines on techniques for Strengthening and Rehabilitation of Bridges".

#### **2.2.10 DETAILED SURVEY**

A detailed survey shall then be carried out to collect primary and secondary data relevant for the study. Preparation of strip plan should be completed within this period showing various relevant details like details of trees within ROW, details of utility lines, structures, culverts, religious places, land use details etc.

- Identification of any major impact issues, such as involuntary resettlement, dense urban clusters, community severance and vulnerable groups at particular risk of project impacts.
- Current usage of land in existing right of way, fixed and movable structures, trees, wells and other assets.
- Nature and extent of potential impact of the project- loss of productive resources, loss of access to services, like, markets, education, health care facilities, loss of fishing, grazing and forest areas, loss of customers and supplies, and disruption of social, cultural and economic ties and networks.



### **2.2.11 PREPARATION OF LAND PLAN**

Land Plan has already been prepared by KMDA on the mouza maps from the LA Department, and accordingly land for construction of the road has been acquired for Barrackpore – Kalyani road and also for DumDum Barrackpore road for a total width of 2 x 30.00 m and 2x 26.00 m respectively. It is expected that proposed improvement i.e., 2x2 laning of the road will be met up within the acquired land.

### **2.2.12 ECONOMIC ANALYSIS**

Economic analysis of proposed Improvement of existing road from Barrackpore to Kalyani (length 30 Km) to 4-lane with paved shoulder configuration would be carried out to assess the viability of the project, keeping in view the objectives and scope of the present consultancy services.

**2.2.12.1** Objective of economic analysis is to facilitate the project appraisal. The analysis will, as such, be based on:

- Cost-benefit analysis of the project by comparing the existing condition of the 2-lane highway, i.e. "without project" situation with the proposed improvement by widening and upgrading to 4-lane with paved shoulder i.e. "with project" situation. This will be done by
- Estimating net savings/benefits arising from proposed improvement.

**2.2.12.2** Net savings/benefits of the project will be worked out on the basis of following:

- Savings in capital cost and recurring cost over the period of analysis,
- Savings in vehicle operation cost,
- Savings in travel time,
- Other benefits like reduction in accident cost.

**2.2.12.3** For economic assessment, main indicators to be derived by analysis, based on

Economic cost benefit streams will be:

- Economic internal rate of return (EIRR) and
- Net present value (NPV) at a specified discount rate of 12%.
- EIRR<sub>s</sub> and NPV<sub>s</sub> will be worked out "with" and "without" time and accident savings.

**2.2.12.4** Initial analysis will consider Base Costs and Base Benefits to work out the economic indicators (Scenario - I)



Sensitivity analysis will be carried out to assess the likely effects of project risks and uncertainties on economic indicators under following scenarios:

- Assuming Base Costs plus 15% and Base Benefits, (Scenario - II)
- Assuming Base Costs and Base Benefits minus 15%, (Scenario - III)
- Assuming Base Costs plus 15% and Base Benefits minus 15%, (Scenario - IV)

**2.2.12.5 Using the HDM IV computer program, analyzing total transportation cost of**

Alternative road improvement and maintenance strategies through life cycle Economic analysis will carry out economic analysis.

Important input data to be used in HDM-IV program will be adopted / worked out as follows:

- Project cost-This will be based on estimated costs as would be worked out in course of project preparation. Project cost will take into account, inter alia, the costs of construction of proposed 2 - lane road (new) road, bridges/culverts and structures, cost of strengthening and widening or cost of re-sectioning the relevant portion of existing carriageway, cost of service road for the required length on either side of the carriageway including bridges / culverts on it, cost of providing drains, providing toll plaza, road safety measures plus centage charges towards contingencies, supervision charges, quality control, work charged establishment, escalation, IDC, Financial charges etc as per MCA. In addition, costs of environmental and social safeguards, land acquisition, shifting of utilities, trees planting and maintenance of road during construction period will also be taken into account to work out total project cost.
- To convert financial cost to economic cost standard conversion factor (SCF) of 0.9 will be taken for all items except land. In case of land, economic cost will be taken same as financial cost, because of practical and conceptual problem in determining the opportunity cost of land.
- Discount rate will be taken at 12%.
- Total analysis period will be up to 30 years from the start-in year of construction.
- Input-data on existing road and pavement characteristics will be as obtained from surveys / investigation to be carried out in course of project preparation. Input data on base year classified traffic volume; traffic growth rate etc. will be taken as would be worked out for Traffic Study.



- Deterioration factors – like cracking initiation, cracking progression, raveling initiation, pothole progression, rut depth progression, roughness progression – to be used in the program will be within recommended range.
- Economic costs of vehicles, tires, etc. will be taken excluding duties and taxes from financial costs, as worked out for updated Road User Cost Data (2001) by the CRRI – indexed to present level with WP1.
- Economic costs of petrol; diesel will be based on information given by the Petroleum Ministry recently in the Parliament.
- Economic unit costs of road-maintenance items will be obtained after converting respective financial costs by a SCF of 0.9.
- Value of travel time (Cost/passenger-hour) and cargo time (cost/vehicle-hour) will be taken on the basis of values given in the "Manual on Economic Evaluation of Highway Projects in India" (IRC Special Publication 30, 1993) after updating the values with current price index.
- Input data on vehicle utilization like "Km Driven per Year", 'Hours Driven per Year' will be based on findings of "Road User Cost Study" (RUCS), 1982 and RUCS, 1992, and updated RUCS data (CRRI, 2001) and also by observing the specific situation.

## **2.2.13 LAND ACQUISITION PLAN AND UTILITY LOCATION / RE-LOCATION PLAN**

### **2.2.13.1 LAND ACQUISITION**

This shall include the following:

Preparation of LA plans on Revenue Maps (Scale 1:4000). The LA plan shall indicate the following:

- ◆ Proposed centerline of the road
- ◆ ROW limits
- ◆ Buildings / wells / trees / any other obstruction affected by road alignment
- ◆ Type of land (e.g. irrigated, wet, dry fishery, barren, hilly, forest etc.)
- ◆ Nature of crops



**2.2.13.2 UTILITY LOCATION/RE-LOCATION**

This shall include the following:

- ◆ Location of each utility along the proposed alignment shall be marked. It shall be ensured that proper space is provided for each utility in such a manner that none of these utilities shall interfere with other services
- ◆ Formal meetings and consultations shall be held with the concerned utility agencies to arrive at mutually acceptable locations for the various utilities
- ◆ Utility lines shall be grouped under the following four categories, each having distinct characteristics:
  - Drainage lines if any
  - Water supply lines
  - Electricity / wires, posts, transformers etc.

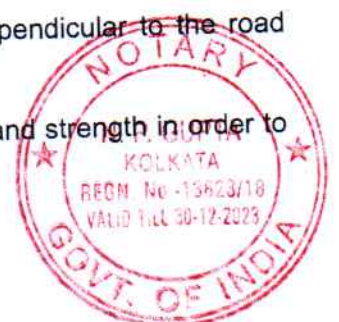
The following aspects shall be given due consideration while locating these utility lines:

- ◆ Water supply lines carrying water under pressure may damage the road pavement due to any leakage. These shall be provided at one side of the road, as far as possible. Existing water pipe lines of the municipalities will be taken care.
- ◆ Electricity cables shall not be placed close to the water supply lines so as to avoid short-circuit
- ◆ Ducts shall be provided to carry utilities in groups across the road if any required / proposed at sufficient depth so as to minimize the frequent digging of road for repair and maintenance
- ◆ Depth of laying services lines along the road shall be provided as per requirement of IRC: 98-1997
- ◆ Utility lines shall be laid along the alignment parallel to the road at both ends.
- ◆ Service lines requiring frequent access shall be located in a manner that the access shall be readily available at minimum cost

**2.2.13.3 ACCOMMODATION OF UTILITY LINES ACROSS THE ROAD**

The following shall be kept in view for locating utility lines across the road:

- ◆ The service line shall cross beneath the road along a line perpendicular to the road alignment
- ◆ The service lines shall be taken through ducts of sufficient size and strength in order to



facilitate future repairs/additions without resorting to cutting open of the road

- ◆ The installation shall be strong enough to withstand all loads coming on it
- ◆ The installation shall be laid in such manner that there shall be no undue interference to traffic movement or damage to road pavement
- ◆ Lines shall be laid at such depths so as to provide adequate cover beneath the pavement

## **2.2.14 PREQUALIFICATION AND TENDER DOCUMENTS FOR EXECUTION OF CIVIL WORKS**

### **2.2.14.1 CONTRACT PACKAGING**

The project has been envisaged to be constructed for the follows.

- ◆ Factors that would make the package optimum to attract competition from big reputed and experienced construction companies, may be including international contractors or joint ventures of international and domestic contractors.
- ◆ Factors that would make the package optimum to encourage the use of modern equipment for construction.
- ◆ The construction company should have sufficient no. of Civil / Mechanical Engineers and technical personnel having required and sufficient experienced for execution of the Expressways / National Highways.

### **2.2.14.2 BIDDING DOCUMENT**

The bidding documents will be prepared assuming that prequalification has taken place. The documents will be prepared for Contract Document as and when required and approval of the Detailed Project Report.

### **2.2.14.3 EPC CONTRACTS**

Bid documents for the Contracts are proposed to be in 4 Volumes:

#### **VOLUME I**

- Invitation for Bids
- Instructions to Bidders
- General Conditions of Contract
- Conditions of particular applications

#### **VOLUME 2**

- Technical Specifications



**VOLUME 3**

- Form of Bid, Appendix to Bid and form of Bid Security (Bank Guarantee)
- Form of contract Agreement
- Bill of Quantities
- Model Forms
- Forms of Performance Security (Bank Guarantee)
- Forms of Mobilization Advance Loan (Bank Guarantee)
- Schedule of Supplementary Information

**VOLUME 4: GENERAL CONDITIONS**

- Notice to invite proposals for short-listing of the entrepreneurs stipulating eligibility and evaluation criteria for the short-listing of the entrepreneurs
- Notice for invitation of bids from short-listed entrepreneurs indicating the criteria for evaluation of the bid
- Instruction to bidders
- Form of bank guarantee
- Bid Security
- Performance Security

The amount for securities will also be suggested

- Concession agreement to ensure proper control of the authorities on the agreements between concessionaire and other parties
- General and special conditions of contract
- Technical details outlining the detailed specifications and drawings
- Bill-of-Quantities (BOQ)
- Maintenance, Operation and Transfer requirements
- Other related document as required by WBHDCL

**FINANCIAL**

- Form of bid
- Fee structure and revision formula
- Pro-forma for details of bidders bid
- Pro-forma for annual cash-flow statements
- Pro-forma for schedule showing projected annual toll collection
- Alternative proposals



## **2.2.15 COST ESTIMATES**

### **2.2.15.1. PRELIMINARY COST ESTIMATE**

The process of cost estimating at feasibility study stage will involve the following steps:

- ◆ Development of basic unit rates for individual BOQ items, based on prices of basic materials like cement, steel, bitumen, and labor.

Each will be assessed at current market rates, taking quantities of labor, materials and equipment in accordance with the MOST Standard Data Book and calculated haul distance. The current schedule of rates from NH, wings under P.W. (Roads) Directorate for project stretch may be used if the analyzed rate of major items based on the present day market price do not vary to a great extent.

Since they are a major cost item, the unit rates for the earthwork items will be calculated as realistically as possible, taking proper account of the expected haul distances from each source. The fact that the construction techniques will be expected to be equipment intensive will be kept in view for adding the appropriate cost of equipment usage in unit rates.

- ◆ Development of Standard Costs for various road components, on the basis of the calculated unit rates and quantities above, for a typical road component e.g., the cost of 4 - lane roads with paved shoulder, widened on one side.
- ◆ Assessments of actual quantities of road components for various project alternatives e.g., the actual length of a 4 - lane divided carriageway with paved shoulders.
- ◆ Estimation of actual length of cross drainage works to be reconstructed or widened.
- ◆ Estimation of land acquisition, resettlement and rehabilitation costs, utility relocation quantities and costs, and other costs for each road section.
- ◆ Estimation of allowances for contingencies and engineering supervision and administration, as percentages of total costs.
- ◆ Summation of project costs including:
  - Road construction costs, based on the unit costs of various road components and the quantities of these components
  - Land acquisition costs, if any
  - Utility relocation costs



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- Other known costs
- Contingencies
- Engineering supervision
- Administration costs

The unit cost estimates, will be prepared on the basis of MORT&H Data Book taking into account by basic rates followed by Schedule of Rates, National Highway wing and Schedule of Rates of P.W. (Roads) Directorate, Govt. of West Bengal in force.

The Bill of Quantities for each package will be prepared supported by detailed calculations.

**2.2.16 ARBORICULTURE & LANDSCAPING**

Roadside arboriculture and landscaping as required will be provided by planting appropriate species of shrubs and bushes. The type of plantation will be specified. The existing trees/plants will be retained to the extent possible. Also, proper land use and landscaping will be suggested at the grade-separated interchanges, if any, to avoid any unauthorized or undesirable development. This work will be done as per the Policy Guidelines for tree plantation issued by GM (Env), NHAI vide his no. 11013/17/2K/GM (Env)/257 dated 24.7.2003 and Social Forestry Department, Govt. of West Bengal.

The issues regarding the maintenance of landscaping will also be adequately dealt with.



**Chapter -3 : Engineering Surveys &  
Investigations**



**CHAPTER - 3**

**ENGINEERING SURVEYS & INVESTIGATIONS**

**3.1 General**

A detailed ground reconnaissance of the project road was undertaken after study of maps and preliminary data collected from the office of WBHDCL responsible for widening and strengthening of the project road. Thereafter, separate teams were deployed along the highway section to conduct surveys and investigations, as enumerated in the Terms of Reference (TOR). A summary of these surveys and investigations are given in succeeding paragraphs.

**3.2 Topographic Survey**

**Objective**

The objective of the topographical survey in the highways is to delineate accurately the existing natural and man-made features along the road, creating an accurate Digital Terrain Model, which is also a main requirement of design of the highway as per the latest computerized road surface design method. Longitudinal and cross sections at suitable interval as per TOR were taken for the purpose of developing the DTM base for design. The topographical survey of the project road from 577 m south of Muragacha More (km 5.142) to Kampa More (km 34.385) along Barrackpore – Kalyani Expressway, was done using most modern Survey technique with the help of GPS, Total Station, Auto level and approved commercial software.



The topographical survey work done includes:

- Establishment of a network of geodetic plan metric control points, as well as, height control points
- Detailed topographical survey
- Detailed height control work taking longitudinal and cross sections all along the stretch for creating a mathematical base for development of the road
- Transfer of the designed road alignment on to the ground in mathematical data system

Reconnaissance survey was done to fix appropriate locations for GPS Pillars and reference pillars, considering correct & optimum use of them during further surveys.



### **3.3 Geodetic Control Survey**

Dual frequency GPS instruments were used to obtain absolute values of points in spherical co-ordinate, i.e., Longitude & Latitude. Pucca pillars were erected about 250m away and their coordinates were fixed by GPS instrument; for which GPS pillars were erected at about 5km interval throughout the section of the project road under development. These coordinates of GPS pillars were thereafter converted to their metric components. These points formed the base of absolute values, to which Total station traverse using this co-ordinate system were tied.

These pillars have been given serially numbered and their descriptions given in Survey Report to ensure easy identification and accessibility in future.

During geodetic control surveys, height control survey was also done and reduced levels corrected to Mean Sea Level marked and assigned to GPS pillars and reference pillars as per TOR. Prior to detailed survey, XYZ coordinate values were given to all reference pillars and all permanent objects on the highway.

These control survey pillars formed the main part of the basic data system, the mathematical base on which the crucial test of three-dimensional topographic survey was founded. The major task comprises of delineating the total highway stretch along with all bridges/culverts and all features within the ROW, the fisheries, structures etc.

### **3.4 Methodology for Topographic survey**

It consisted of:

- ◆ GPS traverse about 5 km apart with a pair of points having absolute values in global terms and height by Auto level.
- ◆ Total Station traverse for assigning 3 dimensional digital values to each and every feature within the ROW.
- ◆ Assigning Reduced levels / heights to all road side features with reference to MSL. Also, long section at regular interval and cross sections at an interval as per TOR to delineate the existing road surface along the entire alignment.
- ◆ Ground verification with reduced level values.
- ◆ Total mapping of the alignment, in digitized geodetic co-ordinates.
- ◆ Check terrain modeling by drawing sections at all required places, on the mathematically created model of the road.

The pillars were established along the road within the ROW at suitable places at 250m intervals and 1.00km intervals. These pillars with details have been



documented in a table and painted: (i) Reference pillars yellow (ii) GPS pillars white. Both the pillars have serial numberings in red. They were constructed to facilitate detailed survey.

### 3.5 Total Station Traverse

Along the edge of the pavement of the existing road a GPS value controlled, geodetically closed traverse by total station was run, connecting the absolute values running on GPS traverse completed earlier. These total station traverses have sufficient number of survey control points for using during detailed survey.

All these total station traverse points bear the controlled & checked values of X,Y,Z coordinate for further use during detailed survey. All the Total Station Survey points bear the closed circuit, double tertiary controlled levels referred to the GTS-BM.

The reference GTS bench mark Level for the present project corridor has been carried from that located at South East corner of Judges Court at Hooghly (now BT College) (Coordinate:22°54'40.26"N, 88°23'53.53"E). Value of the GTS bench mark = 10.4563m.

Details lists of GPS & BM Pillar are given in **Table 3.1** & **Table 3.2** respectively.

**Table 3.1: List of GPS Pillar Co-ordinate**

GPS NO	EXISTING CH. (KM)	EASTING (M)	NORTHING (M)	ELEVATION (M)	SIDE
GPS1	5.072	645775.364	2510557.624	4.824	(R/S)
GPS1A	5.228	645713.469	2510712.775	4.986	(L/S)
GPS6	11.248	643242.282	2516113.032	6.010	(L/S)
GPS6A	11.45	643241.769	2516318.657	4.990	(R/S)
GPS10	15.079	642629.728	2519606.057	6.713	(L/S)
GPS10A	15.25	642593.218	2519775.483	7.035	(R/S)
GPS15	20.19	644106.982	2524252.361	6.887	(R/S)
GPS15A	20.441	644138.959	2524504.457	6.830	(L/S)
GPS21	26.088	646794.355	2529347.005	8.272	(L/S)
GPS21A	26.331	646829.734	2529587.771	8.344	(L/S)



GPS NO	EXISTING CH. (KM)	EASTING (M)	NORTHING (M)	ELEVATION (M)	SIDE
GPS25	29.979	647408.325	2533188.153	8.894	(R/S)
GPS25A	30.144	647402.249	2533359.582	8.613	(L/S)
GPS4C	34.295	649376.066	2536789.440	10.250	(R/S)
GPS4D	Near Pipe Culvert after Kampa Junc.	649458.392	2537001.707	10.433	(L/S)

Table 3.2: List of TBM Pillars Co-ordinate

EXISTING CH. (KM)	SIDE	TBM NO	NORTHING (m)	EASTING (m)	RL (m)
5.067	RHS	P1	2510553.772	645788.322	4.639
5.159	LHS	P2	2510637.398	645731.911	5.602
5.577	RHS	P3	2511060.399	645700.011	5.303
6.142	RHS	P4	2511524.191	645387.107	5.411
6.61	LHS	P5	2511943.343	645177.176	4.628
7.708	RHS	P6	2512933.238	644713.495	6.307
8.163	LHS	P7	2513335.843	644501.225	5.989
9.342	LHS	P10	2514377.484	643958.692	6.426
9.577	LHS	P11	2514606.961	643917.282	6.468
10.069	RHS	P12	2515084.343	643815.029	5.784
10.481	LHS	P13	2515437.277	643599.846	6.530
11.105	LHS	P14	2515983.390	643293.320	6.361
11.703	LHS	P15	2516505.350	643073.528	6.234
12.442	RHS	P16	2517113.661	642679.181	6.398
12.89	RHS	P17	2517479.397	642423.299	6.110
13.906	RHS	P19	2518454.651	642540.271	5.967
14.228	RHS	P20	2518764.295	642628.249	6.434
14.39	RHS	P21	2518924.023	642658.040	7.447
14.574	LHS	P22	2519106.073	642686.626	7.364
15.15	RHS	P23	2519683.249	642633.992	7.241
15.972	RHS	P24	2520405.112	642641.416	6.450
16.457	RHS	P25	2520749.216	642974.014	6.233
16.654	RHS	P26	2520894.379	643111.163	7.194
16.862	RHS	P27	2521044.962	643255.821	7.152



**Annexure - 3**

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EXISTING CH. (KM)	SIDE	TBM NO	NORTHING (m)	EASTING (m)	RL (m)
17.187	LHS	P28	2521351.819	643353.181	7.280
18.107	RHS	P29	2522255.849	643514.328	7.375
18.39	RHS	P30	2522528.694	643585.444	7.662
19.082	LHS	P33	2523198.873	643763.537	7.396
19.642	RHS	P34	2523731.892	643932.720	6.534
20.06	RHS	P35	2524134.132	644050.626	6.910
20.576	RHS	P36	2524628.486	644192.042	7.048
21.473	LHS	P38	2525377.583	644662.439	6.159
21.862	RHS	P39	2525674.310	644912.914	6.062
22.307	LHS	P40	2526019.471	645191.871	6.654
22.57	LHS	M1	2526221.149	645365.645	6.699
23.493	LHS	M2	2526957.611	645919.012	7.651
23.808	RHS	M3	2527221.473	646088.500	7.504
24.104	RHS	M4	2527479.077	646237.624	7.406
24.702	RHS	M5	2527998.343	646533.259	7.793
25.042	LHS	M6	2528310.949	646655.255	7.530
25.367	LHS	M7	2528632.756	646696.784	7.678
25.942	LHS	M8	2529205.606	646774.820	8.415
26.542	RHS	M9	2529793.769	646871.275	8.366
26.846	RHS	M10	2530096.908	646915.290	8.332
27.327	RHS	M11	2530572.559	646991.693	8.382
27.763	RHS	M12	2531002.797	647057.740	8.674
28.208	LHS	M13	2531445.995	647110.423	8.312
28.424	RHS	M14	2531653.500	647152.994	8.009
29.006	RHS	M15	2532230.134	647243.545	8.504
29.689	RHS	M17	2532902.221	647358.402	8.797
30.033	LHS	P41	2533246.872	647405.942	8.992
30.767	LHS	P42	2533867.663	647775.389	10.047
31.502	LHS	P43	2534441.175	648232.773	10.695
31.749	RHS	P44	2534564.328	648448.907	9.889
32.405	LHS	P45	2535062.386	648878.982	10.406
32.717	LHS	P46	2535294.496	649076.555	9.873
33.319	LHS	P47	2535842.897	649288.355	9.948
Near Kampa More	LHS	A18	2536511.116	649858.238	10.044
	RHS	A17	2537281.806	649551.446	9.226



**3.6 Detailed Survey**

All topographical features, utility service lines, existing on the road were surveyed; which bear the controlled geodetic value on each data in X,Y,Z coordinate system. Existing road has been surveyed in detail, taking X,Y,Z values at Road centre, Road edges, Road shoulders, Toes and normal ground away from toe line. Trees above 600mm girth were surveyed separately. Buildings, hutments and all existing features, natural or man made, have been surveyed, and each point have XYZ values. Road curves were surveyed with special attention for improvement and cross roads surveyed with proper weightage on the type of road, keeping in view the need for improved junctions and or intersections.

**3.7 Survey Procedure**

A G.T.S. (Great Trigonometrical Survey) benchmark is a permanently fixed reference survey station (or point), having known elevation with respect to a standard datum (mean sea level). These are established all over India by Survey of India department with greater precision. Level for the present project corridor has been carried from GTS bench mark located at South East corner of Judges Court at Hooghly (now BT College) (Coordinate:22°54'40.26"N, 88°23'53.53"E). Value of the GTS bench mark = 10.4563m.

**3.8 Longitudinal and Cross-Sections**

Levels have been taken at 50m intervals longitudinally and at curves and cross-sections were taken at 10m intervals and 50m apart transversely covering full extent of survey corridor. Levels along the cross sections have the following points recorded specifically.

- ◆ Existing road centre (carriageway)
- ◆ Edges of the carriageway
- ◆ Edges of the shoulders
- ◆ Edges of berm / in field / in *kutch*a drain / in *Bherri*

Coding and matching of different topographical features between Total Station and Computer Software have been finalized in compatible terms.

**3.9 Ground Verification**

On completion of topographical survey by Total Station and Auto Level, the drawings have been prepared by using Auto-Cad software and PC compatible data of total station. Ground verification of a few check plots and all details of the detailed survey guard against omissions or discrepancies.



### **3.10 Digital Terrain Modeling**

All digital data in XYZ format from the ground survey by Total Station have been used for mapping by means of Auto-CAD at site and also at the corporate office, using the proprietary software: "AutoCAD Civil 3D & AutoCAD". Software's have been used Digitally.

Elevations of all control points and all traverse stations have been related to the GTS Benchmarks available along the road stretch, and have been fixed by closed circuit height traverse and have been distributed to all the control and reference pillars fixed in the stretch, by using Auto Level.

In addition to control points established, as mentioned in the aforesaid paragraphs, a number of intermediate temporary benchmarks were established using auto levels and awarding XYZ values to them, for bridges and culverts.

### **3.11 Pavement Investigation**

#### **Sub grade Characteristics and Strength**

To assess the existing pavement composition including subgrade soil properties, test pits of size 1.00 m x 1.00 m were excavated at pavement shoulder interface down to the subgrade level ensuring minimum damage to the original pavement and no disruption of the traffic.

The following sequence of operation was followed in each test pit:

- Manual excavation of 1.0 m x 1.0 m pit upto the subgrade level. After reaching the subgrade level, the thickness of the pavement component layers were measured and type of material examined and the details of the pavement compositions as noted is provided in **Annexure A**.
- A field (in-situ) dry density using sand replacement method as per IS 2720: Part 28 was carried out at the subgrade level.
- Adequate sample were collected from the top 300 mm of subgrade for classification & the following laboratory tests as per IS: 2720
  - Field moisture content (as per IS: 2720 (Part 2) – 1973)
  - Grain size analysis (as per IS: 2720 (Part 4) – 1985)
  - Atterberg limits (as per IS: 2720 (Part 5) – 1985)
  - Moisture-Density test (Heavy Compaction) (as per IS: 2720 (Part 8) – 1983)
  - CBR (4 days soaked) (as per IS: 2720 (Part 16) – 1985)



After the completion of field tests and collection of samples, the pits were backfilled with the excavated materials and compacted suitably so as not to jeopardize the smooth movement of traffic of the existing road.

One sample @ 1 km interval for the total project stretch, as directed, has been collected for testing in laboratory. Thus total 91 number samples have been collected from Main Carriageway, Proposed Carriageway, Left Service Road and Right Service Road.

Sub-grade soil samples collected were taken to the laboratory and tested for L.L., P.L., gradation, modified Proctor.

Remolded soil samples were made by compacting at the field density and field moisture content. The samples were then soaked for 4 days and then tested for CBR value. For each location remolded samples were prepared and tested for soaked CBR and the value of CBR at each location determined.

The details of these tests are contained in **Volume III for Materials Report**.

### **3.12 Existing Pavement Composition**

The existing pavement thickness as observed from the pit investigations carried out in a no. of locations at the paved shoulder & earthen shoulder interface. The detailed pavement composition data is presented graphically in **Figure 3.1 to Figure 3.4**.



### **3.13 Pavement Condition Survey & Benkelman Beam Deflection testing**

Pavement Condition survey have been carried out as per the guidelines set out in IRC:SP:19-2001 & IRC:82:1982 and the pavement defects such as cracks, ruts, raveling, pot holes, edge drop, edge breaks have been noted and tabulated. The details of the pavement condition survey carried out is provided in **Annexure B**.

Benkelman Beam Deflection (BBD) testing was also carried out as per the guidelines set out in IRC:81-1997 @ 50.00m interval in staggered manner and as stipulated in the contract. However, the data cannot be utilized for the bituminous overlay because the full width of the carriageway have been proposed to be reconstructed and raised.

The details of the characteristic deflect testing is provided in **Annexure C**.



### 3.14 Inventory of Bridge, Culverts and Structures

An inventory of bridge, culverts along the project road have been prepared as per guideline of IRC: SP-19-2001 and guidelines contained in IRC-SP:35-1990. The detailed Bridge and Culverts and Structures inventory is presented in the **Chapter 7: Improvement Proposal**.



### 3.15 Condition Survey for Bridges and Culverts

Physical inspections have been carried out of following existing bridge and culverts along the project road.

- (i) on existing 2-lane road – 57 nos. (one minor Bridge)
- (ii) on new 2-lane project proposed and taken up by KMDA – 9 nos.(4 nos. incomplete stage & these are to be dismantled).
- (iii) on service roads proposed & taken up by KMDA – 7 nos. ( 2 nos. incomplete stage & these are to be dismantled).



### 3.16 Material Investigations

Soil and material investigations have been conducted to assess the characteristics of soil. It also aimed at evaluating sub soil characteristics of existing pavement by collecting samples by digging test pits along the road.

The investigations were carried out by visiting the site, collection of materials for testing both in the field and the laboratory and checking with local WBHDCL officials. The engineering properties of the following materials which are to be used during execution are to be determined:

- a) Sub grade soil of existing road pavement
- b) Sub grade soil of proposed widening of the road
- c) Sub grade soil of left service road
- d) Sub grade soil of right service road

Fly ash samples have been collected from Bandel Thermal power station and tested in laboratory. Sand has also been collected from Kotulpur near Arambag and tested for its suitability for using the pavement. Besides, borrow area samples were also collected from 10 nos. of borrow areas along the vicinity of the project road.

The details of these tests are contained in **Volume III for Materials Report**.



**3.17 Geotechnical Investigation**

Geotechnical investigations have been carried out at the two nos. of Vehicular under pass locations – Muragacha More & Barrackpore Wireless More. Besides, 14 nos. of short bore holes have been carried out upto a depth of 10.00 m; 6 nos. at the culvert and bridge locations and 8 nos. at embankment locations to assess the suitability of the soil below embankment founding level. The details are provided in **Volume III**. The sub-soil investigation work has been done by Constell Consultants Pvt. Ltd, Salt Lake, Kolkata. The locations of borehole have been selected in consultation with the engineers of WBHDCL.

Geotechnical investigation has been carried out as per IRC 78-2014. The tests results and recommendations are detailed in **Volume III for Materials Report**.

**3.18 History of Submergence**

There has been no history of submergence of the project road from km 0.00 to km 29.200 as per the record available from the site and the local irrigation department. In the flood of 2000 & 2015, the adjoining villages and habitations have been inundated, but no submergence of the existing project road at any location has been reported. But as noted during the topographical survey and from enquiries it is found that the HFL or ponding level, adjoining the project road is relatively high and necessary clearance from the existing subgrade is not present. Thus, raising of the existing road level is warranted to maintain a clearance of 1.00 m from the HFL/ adjoining ponding level and in some places it is proposed as minimum 0.60 m from the HFL / adjoining ponding level. This raising is further supplemented by the insufficient crust thickness of the existing pavement crust.

A statement of HFL / Highest ponding level in different chainages along with proposed RTL (Road Top level) and showing therein proposed minimum raising is provided in **Annexure I**.



**Chapter -4 : Traffic Studies & Demand  
Forecasts**



**CHAPTER - 4**

**TRAFFIC STUDIES & DEMAND FORECASTS**

**4.1 General**

The objective of the traffic studies carried out was to understand the characteristics and the volume of traffic likely to use the project road. Traffic volume plying on existing road network and also on the project road were collected through primary surveys. For this purpose, a detailed reconnaissance survey was conducted to identify appropriate locations for primary traffic surveys. The details on the types of primary traffic surveys carried out on the Project Road and their locations are given in the following sections, followed by findings from the analysis of this data.

The Project road alignment of Barrackpore Kalyani Expressway starts from Muragacha More (km 5.142) on Sodepore – Madhyamgram Road which links NH-34 with Barrackpore Trunk Road (BT road) at Birati and Panihati respectively. The Project road is proposed to be extended towards south to connect with Belghoria Expressway which is one of the most important links between NH-34 & NH-2 via Nivedita Bridge over river Hooghly. The proposed link of about 1.50 km between Belgharia Expressway and Nimta More is being proposed to be constructed by State P.W. (Roads) Directorate and DPR for 4-laning has been prepared by the state P.W.(Roads) Directorate. From the Nimta More to Muragacha crossing, the DumDum – expressway portion is being widened from its present 2- lane configuration to 4 – lane divided carriageway with service roads & raised central median by P.W.(Roads) Directorate. On completion of the connectivity from Belgharia Expressway – Nimta More – Muragacha – Kanchrapara and on extension upto Buddha Park on SH – 2, and after crossing river Hooghly via Ishwar Gupta Setu, the corridor will finally join with NH-2. Furthermore, the project corridor as a whole will also act as an alternative route for the vehicles which are plying presently via the congested NH – 34 via Belgharia Expressway to Barasat and beyond.

**4.2 Traffic Characteristics**

Barrackpore Kalyani Expressway is basically a trans municipality highway and at the same time it also connects NH-2 and NH-34. This is the reason that the corridor is used by both passenger and goods vehicle.



**4.3 Traffic Surveys – Type Location and Duration**

The survey, their locations and duration have been detailed in **Table 4.1** and the Traffic survey location map is given in **Figure 4.1**.

**Table 4.1: Details of Traffic survey**

Sl. No.	Type of Survey and Duration	Location / Chainage	Survey Dates	Duration (Hours/Day)
1	Classified Traffic Volume Counts for seven days	Near Toll Plaza (Km 5+538) on B.K. Expressway	28/08/2015 – 04/09/2015	24
2		Near Toll Plaza (Km 14+508) on B.K. Expressway	29/08/2015 – 05/09/2015	24
3	Classified Traffic Volume Counts for three days	Ramkrishnapally (Km 8+242) on Belgharia Expressway	08/09/2015 – 11/09/2015	24
4		Algaria Water Tank on Krishnanagar Road (NH-34)	22/09/2015 – 25/09/2015	24
5	Turning Movement Survey at 4 legged Intersection for the morning & the evening peak hours (08.00 am – 12.00 pm) (04.00 pm – 08.00 pm)	Muragacha More (Km 5+142)	29/08/2015	8
6		Wireless More (Km 13+897)	31/08/2015	8
7		Panpur More (Km 25+362)	01/09/2015	8
8		Saheb Colony More (Km 28+306)	03/09/2015	8
9		Rajendrapur More (Km 29+317)	10/09/2015	8
10		Kampa More (Km 34+361)	12/09/2015	8
11	Turning Movement Survey at 5 legged Intersection for the morning & the evening peak hours (08.00 am – 12.00 pm) (04.00 pm – 08.00 pm)	Panchmatha More (Km 32+222)	12/09/2015	8
12	Origin Destination Survey	Ramkrishnapally (Km 8+242) on Belgharia Expressway	08/09/2015 – 09/09/2015	24
13		Algaria Water Tank on Krishnanagar Road (NH-34)	24/09/2015 – 25/09/2015	24
14		Near Toll Plaza (Km 14+508) on B.K. Expressway	04/09/2015 – 05/09/2015	24
15	Axle load Survey	Ramkrishnapally (Km 8+242) on Belgharia Expressway	08/09/2015 – 09/09/2015	24
16		Near Toll Plaza (Km 14.508) on B.K. Expressway	04/09/2015 – 05/09/2015	24



#### 4.3.1 Justification of Selection of Traffic Locations

Classified Traffic Volume Counts were carried out at four locations. Two nos. locations are on the existing alignment at km 5+538 & km 14+508 near the existing Toll Plaza where KMDA is collecting Toll from the plying vehicles. Seven (07) days 24 hours CTVC were carried out at these locations. An Origin Destination Survey had also been carried out at km 14+508 where the traffic volume is more. The OD survey is carried out to have an idea regarding the different areas / zones from which the vehicles are originating and terminating. Both passenger and goods OD survey have been carried out. Similarly, one day axle load survey was also carried out near the Toll Plaza location at Km 14+508 to have an idea regarding the loading spectrum of the plying vehicles along the project road.

Besides, there is a proposal of the State PWD for the construction of an elevated corridor from the Belgharia Expressway, after which a full connectivity will be established for the vehicles plying from NH 6 & NH 2 through the project road right upto Kalyani and then via Ishwar Gupta Setu to the districts of Hooghly, Burdwan & Nadia and also to NH 34 from Kampa Crossing avoiding the congestion of Madhyamgram & Barasat towns and moving to North Bengal. Thus, to assess the quantum of the projected diverted traffic from Belgharia Expressway, a CTVC, OD Survey & Axle load Survey have been conducted on the Belgharia Expressway near km 8+242.

Moreover, further north of the Barasat town, at 29<sup>th</sup> km of NH 34, near Algaria water tank, a CTVC & OD survey have been conducted to assess the willingness of the vehicles plying presently along NH 34 to follow the project road after completion of the corridor with connection to belgharia expressway.

#### 4.4 Traffic Survey Methodology

##### 4.4.1. Classified Traffic Volume Counts Survey:

The 7 days & 3 days traffic data have been collected from field, compiled and thereafter analyzed and presented in tabular form. The details of all the directions of traffic survey is given in **Table 4.2.**



Table 4.2: Details of Classified Traffic Count Stations

Sl.No.	Location	Road	Direction Particular	Direction Index
1.(a)	Near Toll Plaza (Km 5+538)	B.K. Expressway	Muragacha More to Wireless More	UP
(b)			Wireless More to Muragacha More	Down
2.(a)	Near Toll Plaza (Km 14+508)	B.K. Expressway	Wireless More to Kampa More	UP
(b)			Kampa More to Wireless More	Down
3.(a)	Ramkrishnapally (Km 8+242)	Belgharia Expressway	NH-34 to Dakshineswar	UP
(b)			Dakshineswar to NH-34	Down
4.(a)	Algaria Water Tank	Krishnanagar Road (NH-34)	Barasat to Barajaguli	UP
(b)			Barajaguli to Barasat	Down

Traffic volume count were conducted as per the guidelines outset in IRC:SP:19-2001. The traffic count stations were manned by trained enumerators and supervisors under the guidance and monitoring of Senior Traffic Engineer. All the traffic safety norms were adhered to during the entire period of conducting the census.

#### 4.4.2 Compilation and Analysis of the Survey Data

The survey data have been analyzed and the following have been evaluated for each direction at each count stations on the Project road.

- Classified hourly traffic volume for each direction
- Hourly average classified traffic volume
- Peak hour classified traffic data
- Traffic composition (Pi diagram)
- Total vehicle per hour (Bar diagram)
- Total average PCU per hour (Bar diagram)



The Equivalency Factors for different types of vehicles have been taken as per IRC:64:1990 and are shown in **Table 4.3**.

**TABLE 4.3: Recommended Equivalency Factors For Various Vehicle Types**

Sl. No.	Vehicle Type	Equivalency Factors
1	Motor Cycle or Scooter	0.50
2	Passenger Car, Pick up Van or Auto Rickshaw	1.00
3	Agricultural Tractor, Light Commercial Vehicle	1.50
4	2-Axle Truck or Bus	3.00
5	3-Axle & Multi-Axle Truck, Truck-trailer, Agricultural tractor-trailer	4.50
6	Cycle	0.50
7	Cycle Rickshaw	2.00
8	Horse Drawn Vehicle	4.00
9	Bullock cart	6.00

The **ADT (Vehicle /day & PCU/ day)**, **Total Commercial Vehicle/day (Nos.)** and the **Peak Hr Traffic (Vehicle/Hr & PCU/Hr)** as observed in various locations along Project road in UP, DOWN & UP+DOWN directions are given in **Table 4.4**. The traffic volumes were counted in 15-minute intervals and were aggregated to one-hour volumes. These are presented in **Annexure D**.

Sl No.	Location	Direction of Flow	ADT per day	PCU per day	Commercial vehicle Per day	Peak Hr Vehicle per hour	Peak Hr PCU per hour
1. (a)	B K Expressway (7 days CTVC) At 5+538	Up (Muragacha More to Wireless More)	6707	8590	1894		
(b)		Down (Wireless More to Muragacha More)	6831	8283	1730		
(c)		Up + Down	13540	16877	3625	1051	1112



Table 4.4: Summary of Classified Traffic Volume Count Survey							
SI No.	Location	Direction of Flow	ADT per day	PCU per day	Commercial vehicle Per day	Peak Hr Vehicle per hour	Peak Hr PCU per hour
2. (a)	B K Expressway (7 days CTVC) At 14+508	Up (Wireless More to Kampa More)	9768	11614	2130		
(b)		Down (Kampa More to Wireless More)	8195	9955	1880		
(c)		Up + Down	17961	21561	4009		
3. (a)	Belgharia Expressway (3 days CTVC) At 8+242	Up (NH-34 to Dakshineswar)	15266	22304	4450		
(b)		Down (Dakshineswar to NH-34)	16015	23060	4605		
(c)		Up + Down	31282	45371	9057		
4. (a)	Near Barasat (Algaria) on NH-34 (3 days CTVC) At 8+142	Up (Barasat to Barajaguli)	6055	7302	1579		
(b)		Down (Barajaguli to Barasat)	5757	7187	1556		
(c)		Up + Down	11812	14486	3134		

Note: At km 8+142 from Helabattala Crossing near Barasat (at Algaria Water Tank) on NH-34 the PCU value seems low; the possible reason being attributed to the low traffic volume as on the day of 25.09.2015 it was Id-uz-Zoha festival.

#### 4.4.3 Temporal Variation

Analyses were carried out to determine the following:

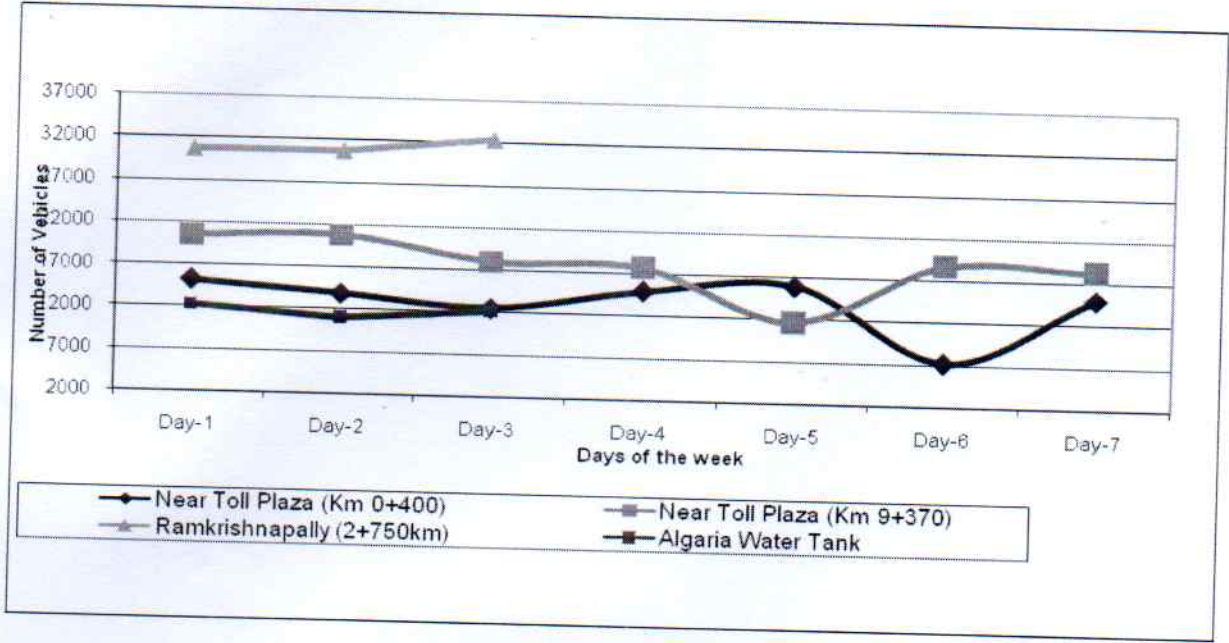
- Daily variation of traffic,
- Hourly variation of traffic, and
- Peak Hour Factor (PHF)

The results and findings from the above analysis are given below.



**A. Daily Variation**

Figure 4.2 present daily variations in traffic in terms of no. of vehicles per day at all the count locations combined.



**Figure 4.2: Daily Variation of Traffic at different TVC locations**

It is observed that the number of vehicles at Ramkrishnapally (2+750km) is the highest followed by location at (Km 14+508) and location at (Km 5+538) & Algaria Water Tank respectively.

**B. Peak Hour Factors**

Hourly variations observed in traffic at all the four count locations have been analyzed for PHFs (Peak Hour Flow as a percentage of the total day flow), and are summarized in Table 4.5.

**Table 4.5: Peak Hour Factors Observed at different locations**

S. No:	Count Location	Peak Hour	PHF (%)
1	B K Expressway At Km 5+538	18:00 – 18:00	7.19%
2	B K Expressway At Km 14+508	10:00 – 11:00	6.66%



S. No:	Count Location	Peak Hour	PHF (%)
3	Belgharia Expressway At Km 8+242	19:00 – 20:00	6.94%
4	Near Barasat (Algaria) At Km 8+142	12:00 – 13:00	6.90%

The above PHFs at all the locations indicate uniform traffic distribution.

#### 4.4.4 Directional Distribution

Directional distribution of traffic at all the locations was evaluated and the details are provided in **Annexure D**. The summary of the directional distribution observed at the 4 count stations are presented in **Table 4.6**.

**Table 4.6: Directional Distribution**

Location	Direction	Traffic (PCU)	Directional Distribution (%)
B K Expressway At Km 5+538	Muragacha to Wireless	8596	50.9
	Wireless to Muragacha	8303	49.1
B K Expressway At Km 14+508	Wireless to Kampa	11622	53.8
	Kampa to Wireless	9984	46.2
Belgharia Expressway At Km 8+242	NH-34 to Dakshineswar	22335	49.2
	Dakshineswar to NH-34	23072	50.8
Near Barasat (Algaria) At Km 8+142	Barasat to Barajaguli	7297	50.3
	Barajaguli to Barasat	7204	49.7



4.4.5 Vehicle Composition

From Fig 4.3 to Fig 4.10 the Vehicle Composition Pattern in ADT and PCU are shown.

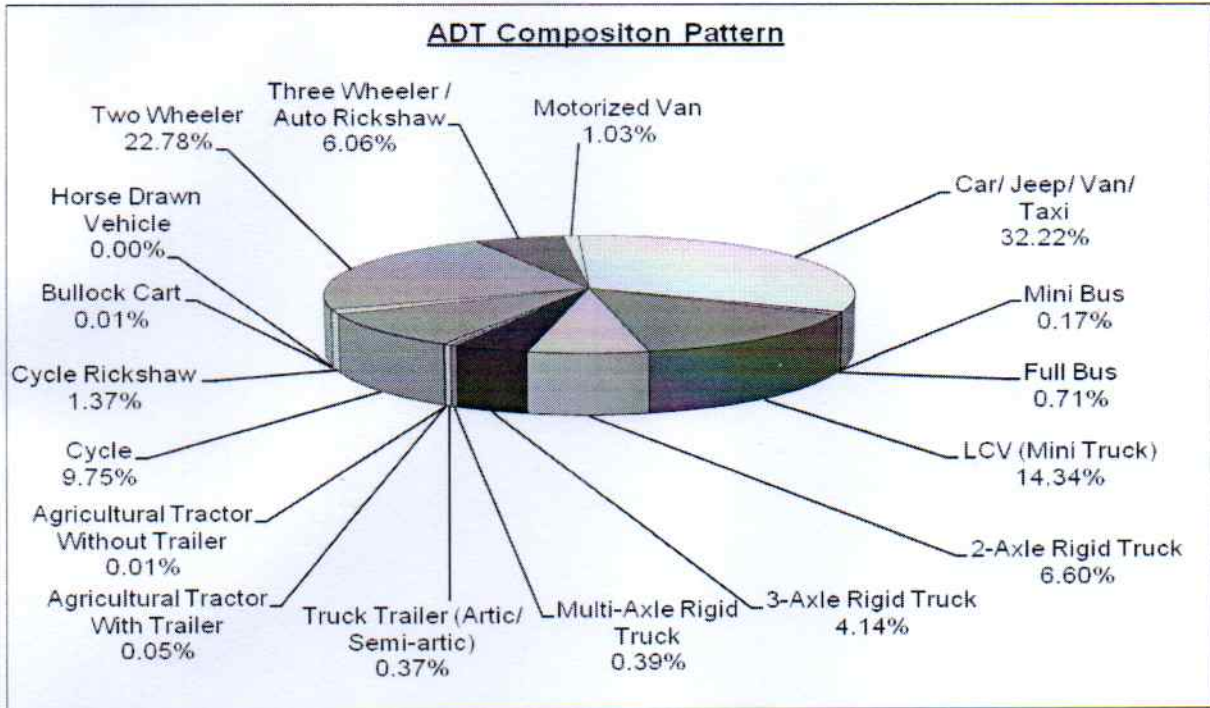


Figure 4.3: Vehicle Composition Pattern in ADT near Toll Plaza (Km 5+538)

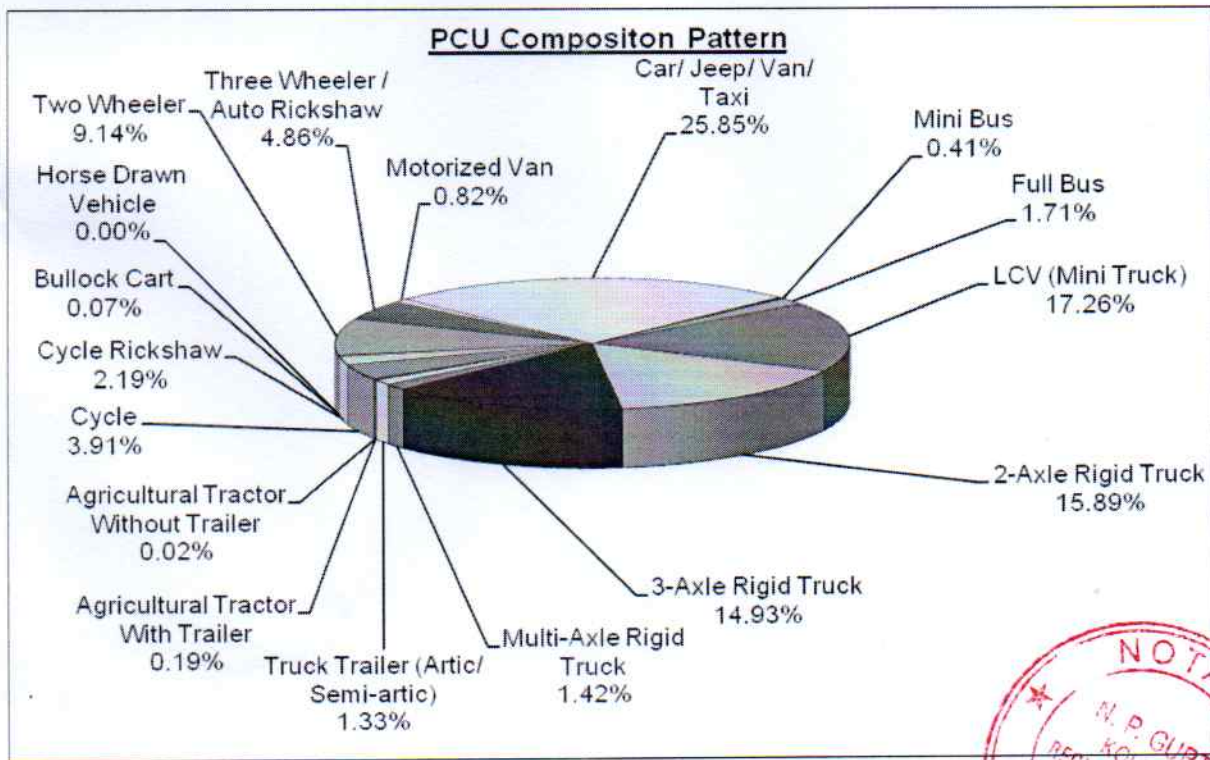


Figure 4.4: Vehicle Composition Pattern in PCU near Toll Plaza (Km 5+538)



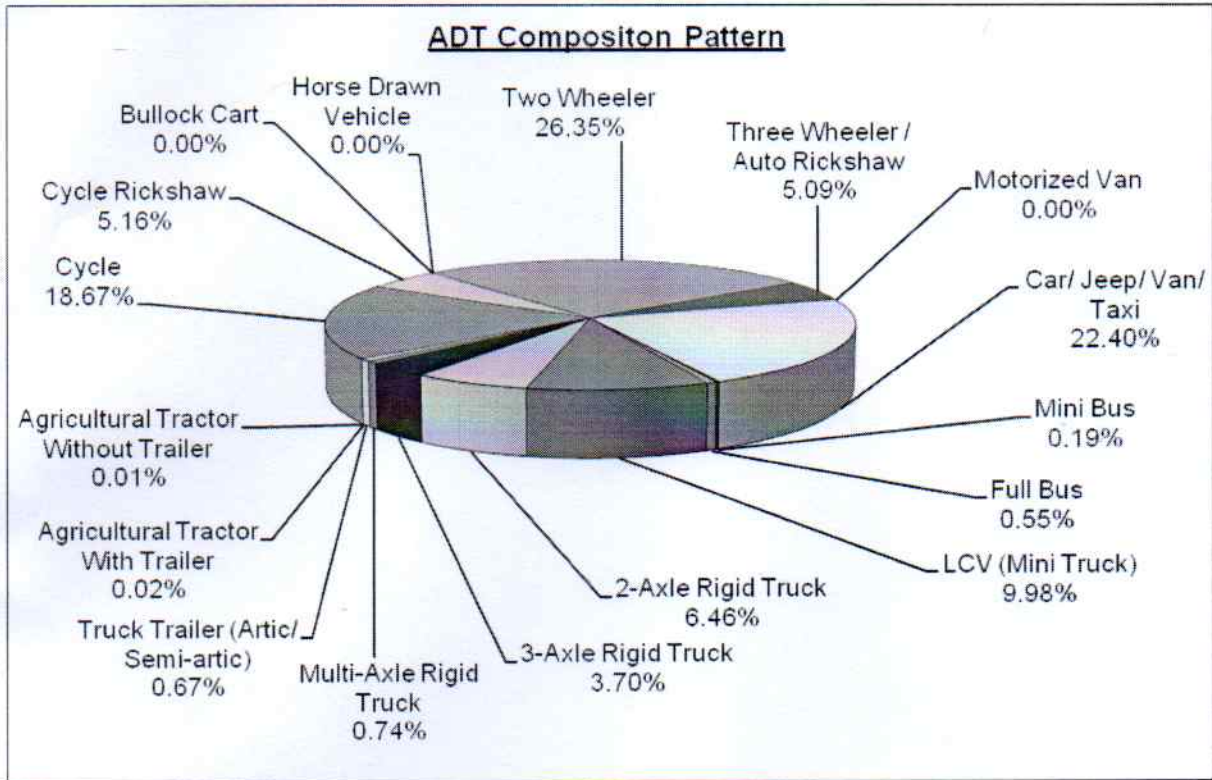


Figure 4.5: Vehicle Composition Pattern in ADT near Toll Plaza (Km 14+508)

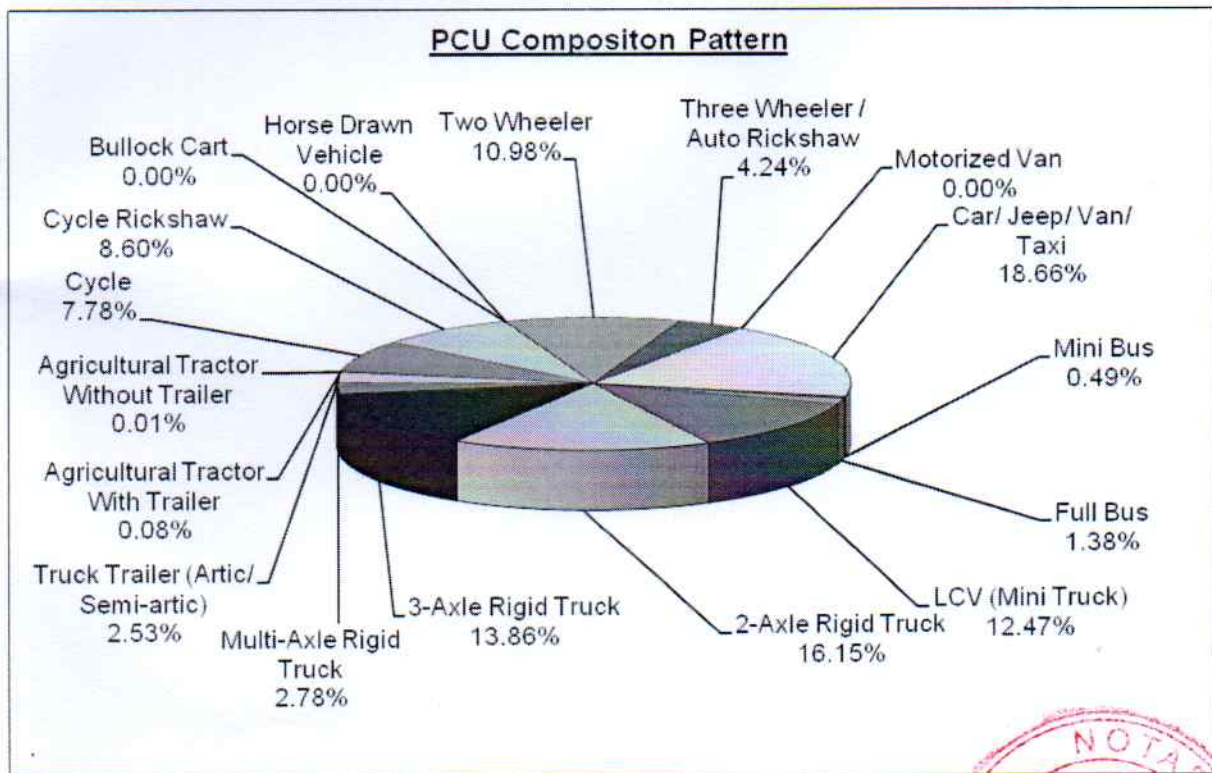


Figure 4.6: Vehicle Composition Pattern in PCU near Toll Plaza (Km 14+508)



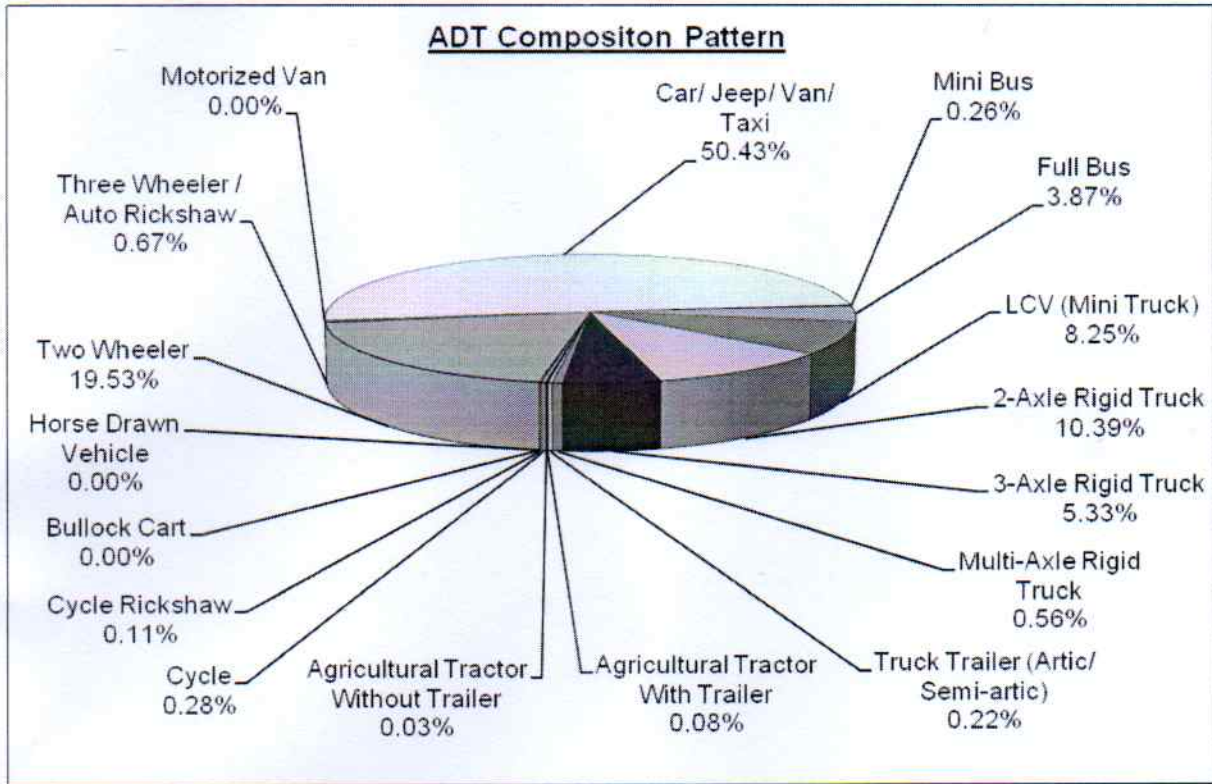


Figure 4.7: Vehicle Composition Pattern in ADT at Ramkrishnapally (8+242km)

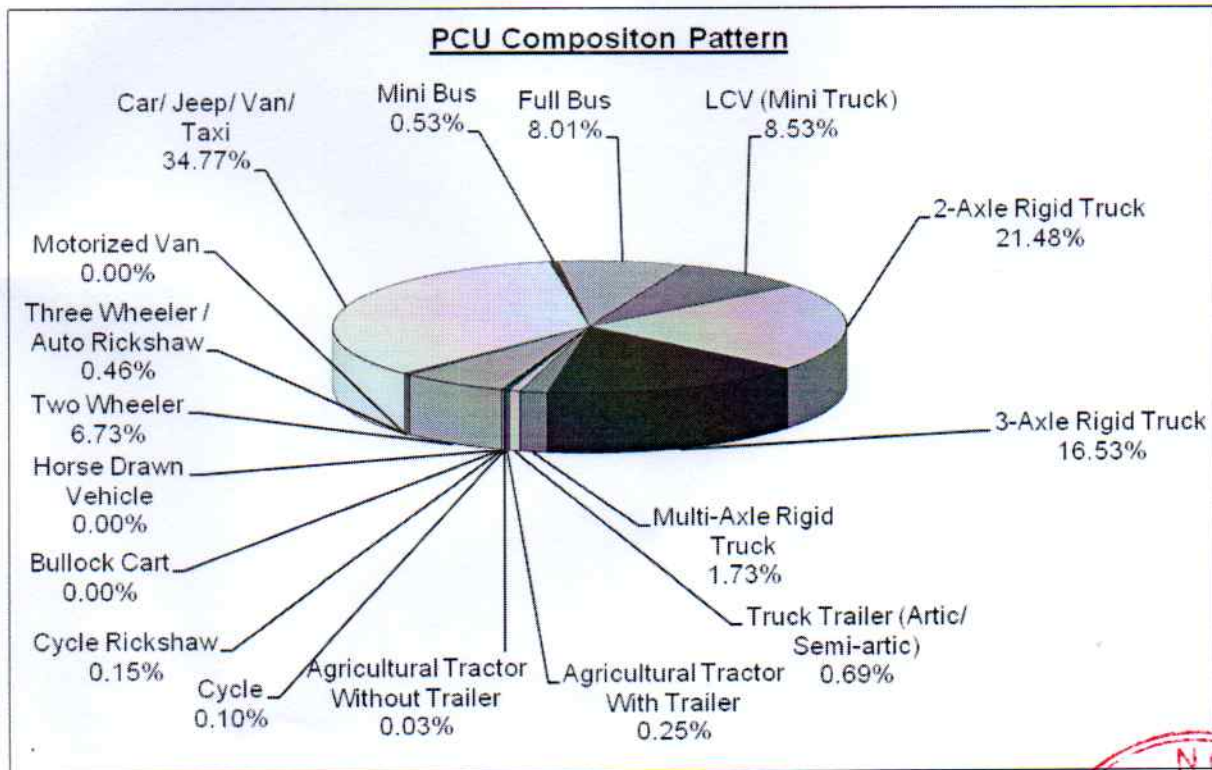


Figure 4.8: Vehicle Composition Pattern in PCU at Ramkrishnapally (8+242km)



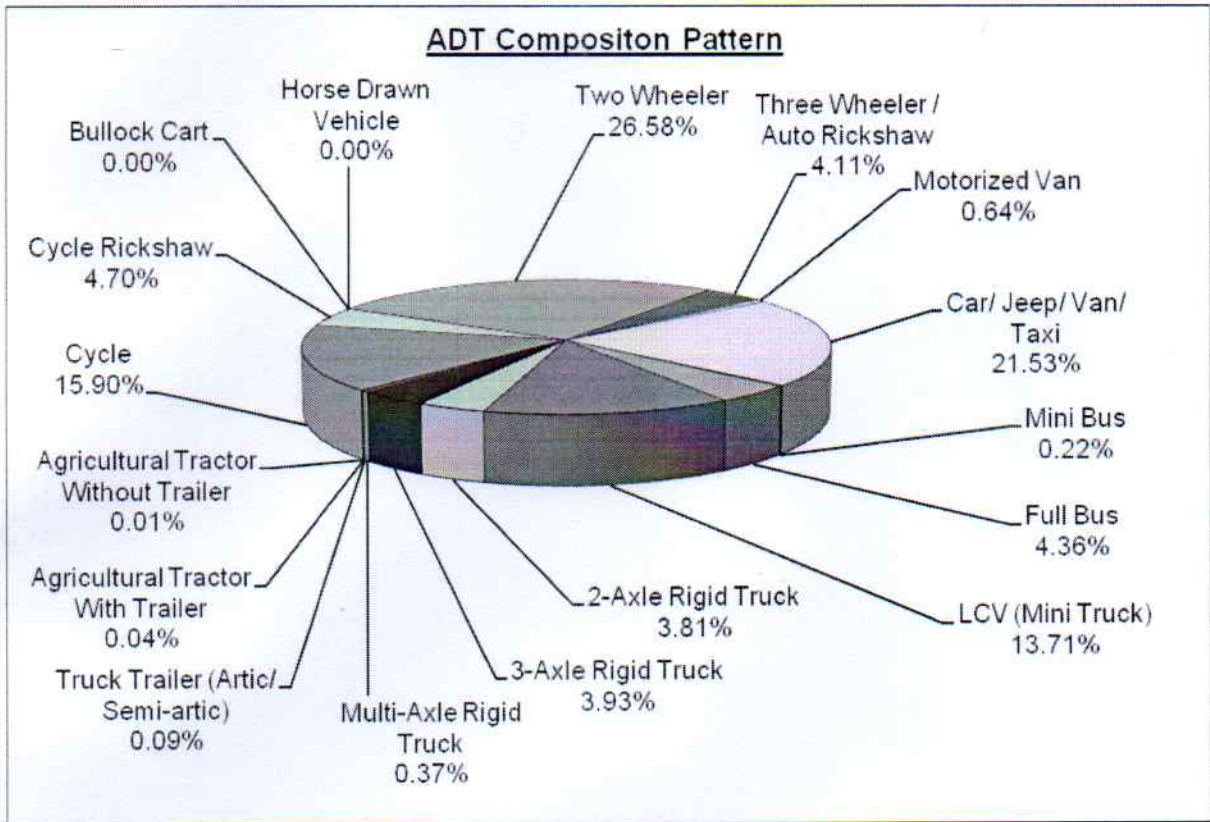


Figure 4.9: Vehicle Composition Pattern in ADT at Algaria Water Tank

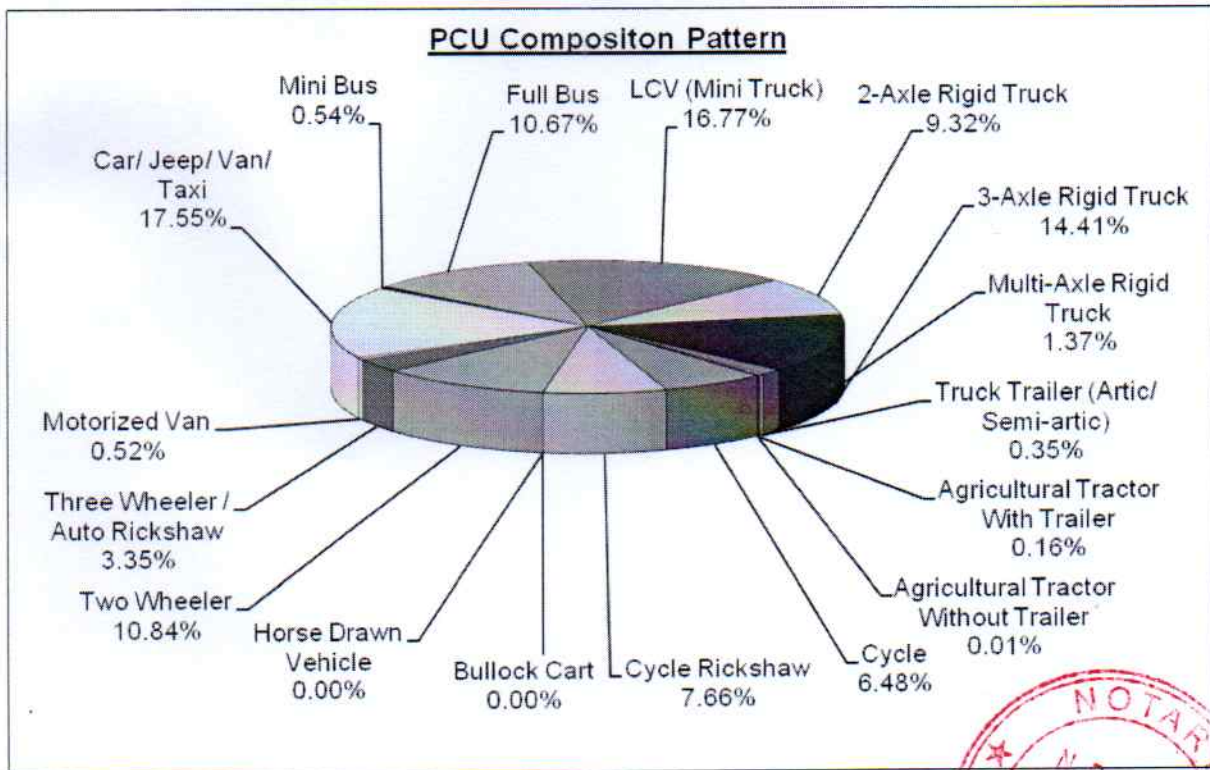


Figure 4.10: Vehicle Composition Pattern in PCU at Algaria Water Tank



4.4.6 Existing Traffic Pattern

From Figure 4.11 to Figure 4.14 the average variation of traffic during 24 hours are shown.

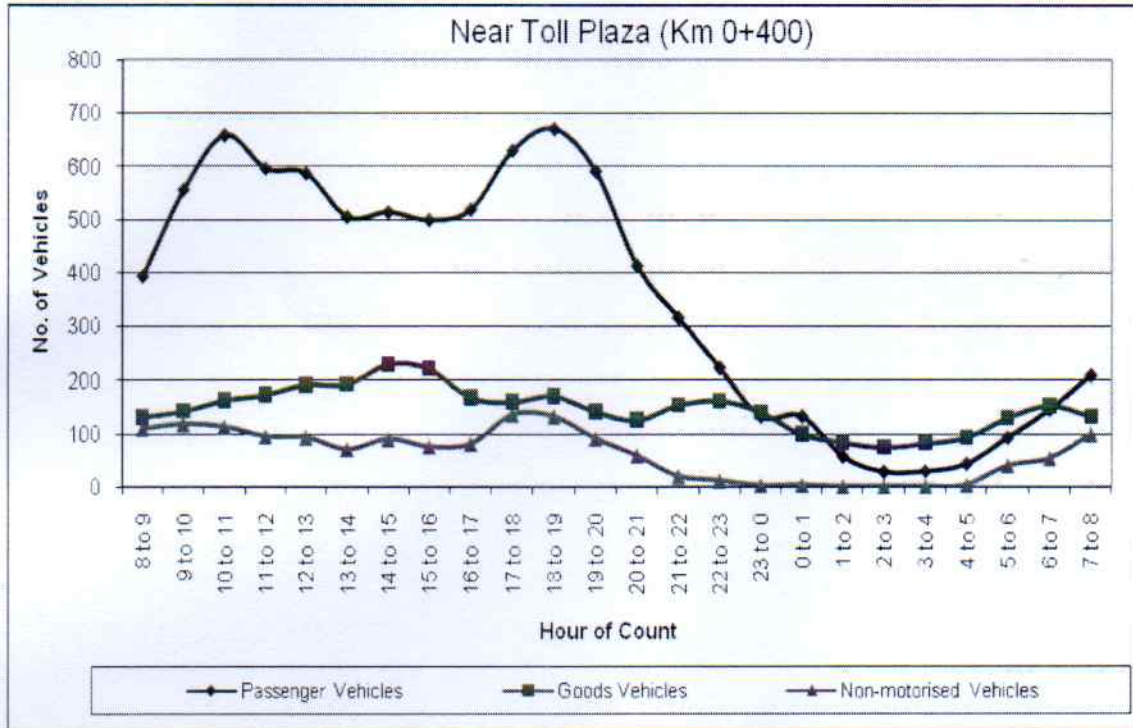


Figure 4.11: Hourly Variation of Traffic near Toll Plaza (Km 5+538) in Vehicles per Day

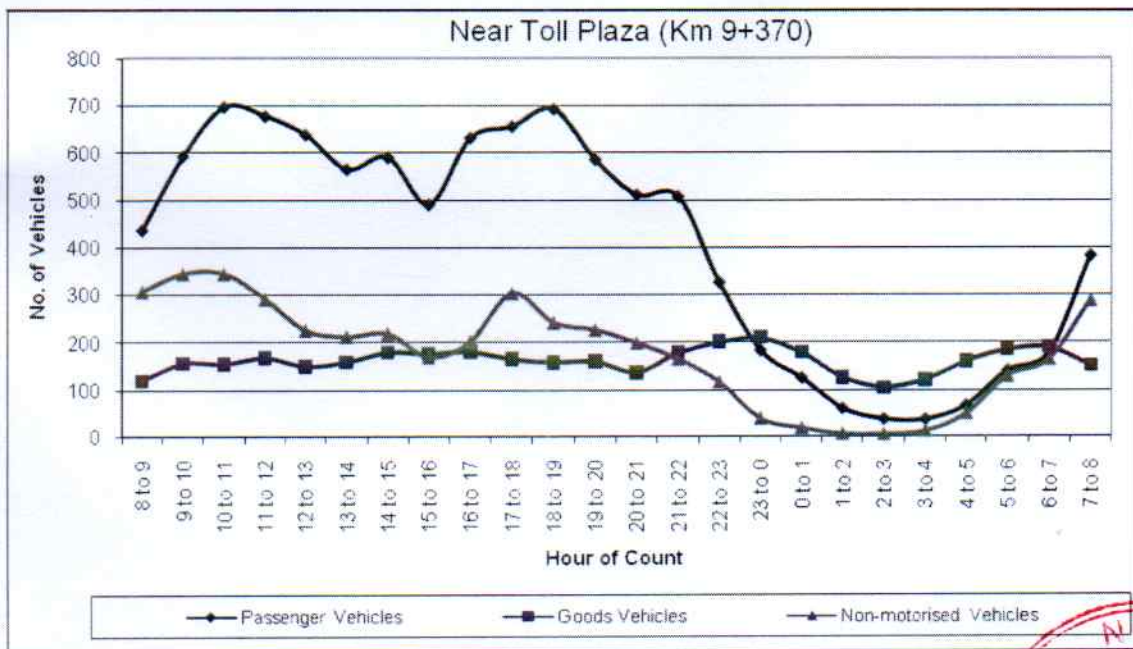


Figure 4.12: Hourly Variation of Traffic near Toll Plaza (Km 14+508) in Vehicles per Day



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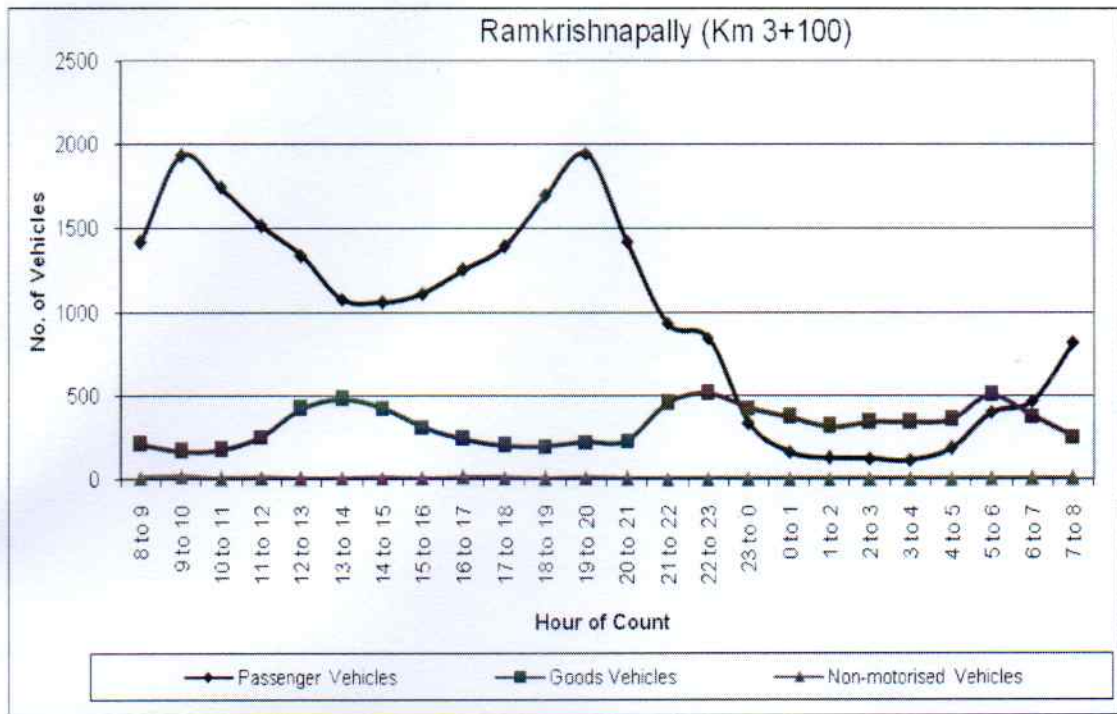


Figure 4.13: Hourly Variation of Traffic at Ramkrishnapally (Km 8+242) in Vehicles per Day

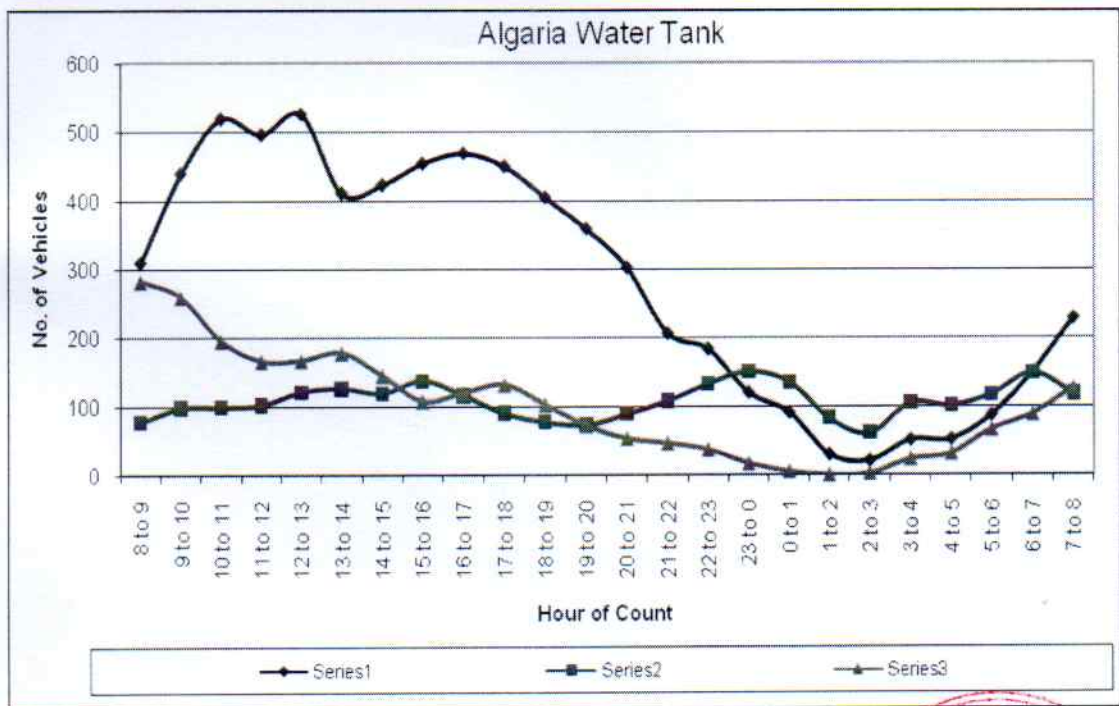


Figure 4.14: Hourly Variation of Traffic at Algalia Water Tank in Vehicles per Day



**4.4.7 Seasonal Correction**

Traffic plying on any road generally varies over different periods of a year depending on the cycle of different socio-economic activities in the region through which it passes. Therefore, in order to have more realistic picture of the traffic on the project influence area, it is required to assess seasonal variation in traffic to estimate Annual Average Daily Traffic (AADT) and Peak Season ADT. The ADT observed during the survey duration is multiplied by a Seasonal Correction Factor (SCF) to derive AADT and Peak season ADT. The seasonal correction factor is generally derived from secondary data sources such as past month-wise traffic data of any project road, monthly toll revenues from existing tolled highways in the immediate influence area, sales of fuel at different filling stations along the project highway etc.

In the absence of any other data, either on the proposed alignment or in the project influence area, only the monthly figures of fuel sales collected from ten (10) petrol pumps on and in the vicinity of the project road, was considered for the estimation of seasonal variation & seasonal correction factors. The fuel sales data record is presented in **Annexure E**.

**A. Seasonal Correction Factor**

For the present study, petrol and diesel sales data for the years 2013, 2014 and 2015 were collected. Thereafter the average sales of petrol and diesel were calculated month wise for the three years and analyzed for estimation of Average Seasonal Correction Factor (ASCF) and Peak Seasonal Correction Factor (PSCF). As the traffic surveys were conducted in the month of September, the above three factors for the month September was considered. The average fuel sales figures obtained from the fuel stations in the region and the subsequent seasonal factors derived are presented in **Table 4.7**.



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Table 4.7 Summary of Seasonal Correction Factor

Month	Diesel				Petrol				Combined	
	Sale (in litre)	SI *	Average Seasonal Correction Factor	Peak Seasonal Correction Factor	Sale (in litre)	SI	Average Seasonal Correction Factor	Peak Seasonal Correction Factor	Avg. Seasonal Correction Factor	Avg. Peak Seasonal Correction Factor
1	2	3	4	5	6	7	8	9	10 = (4+8)/2	11 = (5+9)/2
January	145,266	1.00	0.92	1.00	28,531	0.91	1.02	1.09	0.97	1.05
February	136,189	0.94	0.99	1.07	26,920	0.86	1.09	1.16	1.04	1.11
March	142,738	0.98	0.94	1.02	29,606	0.95	0.99	1.05	0.96	1.04
April	137,918	0.95	0.97	1.05	28,348	0.91	1.03	1.10	1.00	1.08
May	142,032	0.98	0.95	1.02	31,220	1.00	0.94	1.00	0.94	1.01
June	131,508	0.91	1.02	1.10	30,056	0.96	0.97	1.04	1.00	1.07
July	125,938	0.87	1.07	1.15	29,548	0.95	0.99	1.06	1.03	1.11
August	130,747	0.90	1.03	1.11	29,774	0.95	0.98	1.05	1.00	1.08
September	<b>127,800</b>	<b>0.88</b>	<b>1.05</b>	<b>1.14</b>	<b>29,112</b>	<b>0.93</b>	<b>1.00</b>	<b>1.07</b>	<b>1.03</b>	<b>1.10</b>
October	117,336	0.81	1.14	1.24	30,952	0.99	0.94	1.01	1.04	1.12
November	136,557	0.94	0.98	1.06	29,317	0.94	1.00	1.06	0.99	1.06
December	137,421	0.95	0.98	1.06	27,519	0.88	1.06	1.13	1.02	1.10
Average		<b>0.92</b>				<b>0.94</b>			<b>1.00</b>	<b>1.08</b>

The **Average Seasonal Correction Factor (ASCF)** was applied to the ADT observed at the count location to derive **AADT** which will be used for **pavement design and Economic Analysis**. On the other hand **Peak Seasonal Correction Factor (PSCF)** has been applied on the ADT to derive **Peak Season ADT**, which will be used for the **Capacity Assessment**.

Thus for this project stretch Average Seasonal Correction Factor for diesel operated vehicle = 1.05

Thus for this project stretch Average Seasonal Correction Factor for petrol operated vehicle = 1

Thus for this project stretch Average Seasonal Correction Factor for vehicle operated on both petrol & diesel = 1.03

Thus for this project stretch Peak Seasonal Correction Factor for diesel operated vehicle = 1.14

Thus for this project stretch Peak Seasonal Correction Factor for petrol operated vehicle = 1.07

Thus for this project stretch Peak Seasonal Correction Factor for vehicle operated on both petrol & diesel = 1.1

For the vehicles running on diesel particularly commercial vehicles SCF is adopted for diesel : 1.05 & 1.14

For the vehicles running on petrol particularly 2 wheelers SCF is adopted for petrol : 1.00 & 1.07

For the vehicles running on diesel & petrol such as cars SCF is adopted for combined : 1.03 & 1.1



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The summary of AADT and peak season ADT, are shown in Table 4.8 and Table 4.9.

**Table 4.8: AADT as observed at various locations**

Vehicle Type	B K Expressway At Km 5+538	B K Expressway At Km 14+508	Belgharia Expressway At Km 8+242	Near Barasat (Algeria) At Km 8+142
Two Wheeler	3084	4733	6110	3140
Three Wheeler / Auto Rickshaw	820	915	209	485
Motorized Van	146	0	1	80
Car/ Jeep/ Van/ Taxi	4494	4144	16248	2619
Mini	24	37	84	27
Full	101	104	1273	541
LCV (Mini Truck)	2039	1882	2710	1700
2-Axle Rigid Truck	939	1219	3411	473
3-Axle Rigid Truck	588	697	1749	487
Multi-Axle Rigid Truck	56	140	183	46
Truck Trailer (Artic/ Semi-artic)	53	127	72	12
Tractor With Trailer	7	4	25	5
Tractor Without Trailer	2	1	11	1
Cycle	1320	3353	87	1878
Cycle Rickshaw	185	927	34	555
Bullock Cart	2	0	0	0
Horse Drawn Vehicle	0	0	0	0
<b>Total Fast Moving Vehicles (Number)</b>	<b>12353</b>	<b>14003</b>	<b>32086</b>	<b>9616</b>
<b>Total Slow Moving Vehicles (Number)</b>	<b>1507</b>	<b>4280</b>	<b>121</b>	<b>2433</b>
<b>TOTAL AADT</b>	<b>13860</b>	<b>18283</b>	<b>32207</b>	<b>12049</b>
<b>Total Fast Moving Vehicles (PCU)</b>	<b>16421</b>	<b>18686</b>	<b>47036</b>	<b>12905</b>
<b>Total Slow Moving Vehicles (PCU)</b>	<b>1042</b>	<b>3531</b>	<b>112</b>	<b>2049</b>
<b>Total PCU per day</b>	<b>17463</b>	<b>22217</b>	<b>47148</b>	<b>14954</b>
<b>Total Commercial Vehicle per day</b>	<b>3625</b>	<b>4009</b>	<b>9055</b>	<b>3134</b>



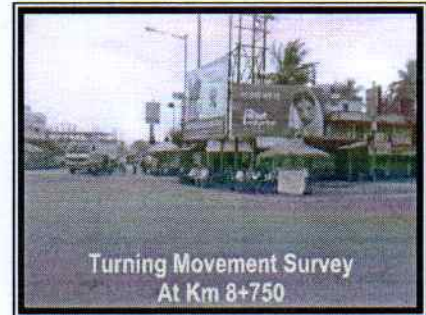
Table 4.9: Peak Season ADT as observed at various locations

Vehicle Type	B K Expressway At Km 5+538	B K Expressway At Km 14+508	Belgharia Expressway At Km 8+242	Near Barasat (Algaria) At Km 8+142
Two Wheeler	3300	5064	6538	3360
Three Wheeler / Auto Rickshaw	877	979	224	519
Motorized Van	158	0	1	87
Car/ Jeep/ Van/ Taxi	4799	4425	17353	2797
Mini	26	40	91	30
Full	109	113	1382	587
LCV (Mini Truck)	2214	2043	2942	1846
2-Axle Rigid Truck	1019	1324	3704	513
3-Axle Rigid Truck	638	757	1899	529
Multi-Axle Rigid Truck	60	152	198	50
Truck Trailer (Artic/ Semi-artic)	57	138	79	13
Tractor With Trailer	8	5	27	6
Tractor Without Trailer	2	1	11	1
Cycle	1320	3353	87	1878
Cycle Rickshaw	185	927	34	555
Bullock Cart	2	0	0	0
Horse Drawn Vehicle	0	0	0	0
<b>Total Fast Moving Vehicles (Number)</b>	<b>13267</b>	<b>15041</b>	<b>34449</b>	<b>10338</b>
<b>Total Slow Moving Vehicles (Number)</b>	<b>1507</b>	<b>4280</b>	<b>121</b>	<b>2433</b>
<b>TOTAL Peak Season ADT</b>	<b>14774</b>	<b>19321</b>	<b>34570</b>	<b>12771</b>
<b>Total Fast Moving Vehicles (PCU)</b>	<b>17710</b>	<b>20164</b>	<b>50730</b>	<b>13932</b>
<b>Total Slow Moving Vehicles (PCU)</b>	<b>1042</b>	<b>3531</b>	<b>112</b>	<b>2049</b>
<b>Total PCU per day</b>	<b>18752</b>	<b>23695</b>	<b>50842</b>	<b>15981</b>
<b>Total Commercial Vehicle per day</b>	<b>3625</b>	<b>4009</b>	<b>9055</b>	<b>3134</b>



**4.4.8 Turning Movement Survey:**

At the existing major intersections, peak hour traffic volume has been established for the road intersection design. The survey has been conducted on a 15-minute interval for 8 hours for the morning & the evening peak hours (08.00 am – 12.00 pm) and (04.00 pm – 08.00 pm) at seven locations and are presented in the **Table 4.10**.



Out of the seven intersections where turning movement surveys have been conducted, the junctions at Muragacha More (Km 5+142) and at Barrackpore Wireless More (Km 13+903) crosses over the Madhyamgram – Sodepur Road and Barasat – Barrackpore Road (SH-2). The Madhyamgram – Sodepur Road although being presently of MDR category serves as an important link route connecting NH-34 at Madhyamgram More and the Barrackpore Trunk Road (BT Road) near Sodepur which is a vibrant and developing municipality along the project road vicinity.

It is to be noted that as per the guidelines spelt out in IRC:SP:84-2014 – “Manual of Specifications & Standards for Four laning of Highways through Public Private Partnership (First Revision)” clause no. 2.13.2 page 21, wherein it is stated that vehicular under/overpass structures shall be provided at the intersection of the project highway with all the NH and SHs.

Thus in compliance to the IRC Codal Provision and commuter safety consideration **vehicular under/overpass is being proposed at Muragacha and Barrackpore Wireless More** for this high speed corridor.

The details on the turning movement counts are given in **Annexure F**.

The peak hour flows (in PCUs) are presented from **Figure 4.15** to **Figure 4.28**.



Table 4.10: TOTAL PCU'S AND PEAK HOUR FLOW AT INTERSECTIONS

Sl No.	Location	Chainage (Km)	Peak Hour	Period of Survey	Morning Peak Hour (08.00 AM to 12.00 PM)		Evening Peak Hour (04.00 PM to 08.00 PM)		Total PCU (Morning + Evening)
					Peak Hour No.	Peak Hour PCU	Peak Hour No.	Peak Hour PCU	
1	Muragacha More (4 leg)	5+142	Morn: 10.00 AM to 11.00 AM Even: 7.00 PM to 8.00 PM	29.08.2015	2374	2342	2452	2271	16303
2	Wireless More (4 leg)	13+903	Morn: 9.00 AM to 10.00 AM Even: 5.00 PM to 6.00 PM	31.08.2015	3580	3175	2840	2179	20528
3	Panpur More (4 leg)	25+363	Morn: 9.00 AM to 10.00 AM Even: 5.00 PM to 6.00 PM	01.09.2015	1878	1744	1340	1308	11208
4	Saheb Colony More (4 leg)	28+308	Morn: 10.00 AM to 11.00 AM Even: 6.00 PM to 7.00 PM	03.09.2015	2566	2191	2163	1932	14663
5	Rajendrapur More (4 leg)	29+319	Morn: 10.00 AM to 11.00 AM Even: 6.00 PM to 7.00 PM	10.09.2015	1489	1356	1342	1435	10560
6	Panchmatha More (5 leg)	32+224	Morn: 8.00 AM to 9.00 AM Even: 6.00 PM to 7.00 PM	12.09.2015	1168	1304	1073	1203	9648
7	Kampa More (4 leg)	34+385	Morn: 10.00 AM to 11.00 AM Even: 6.00 PM to 7.00 PM	12.09.2015	2830	2523	2552	2350	17358



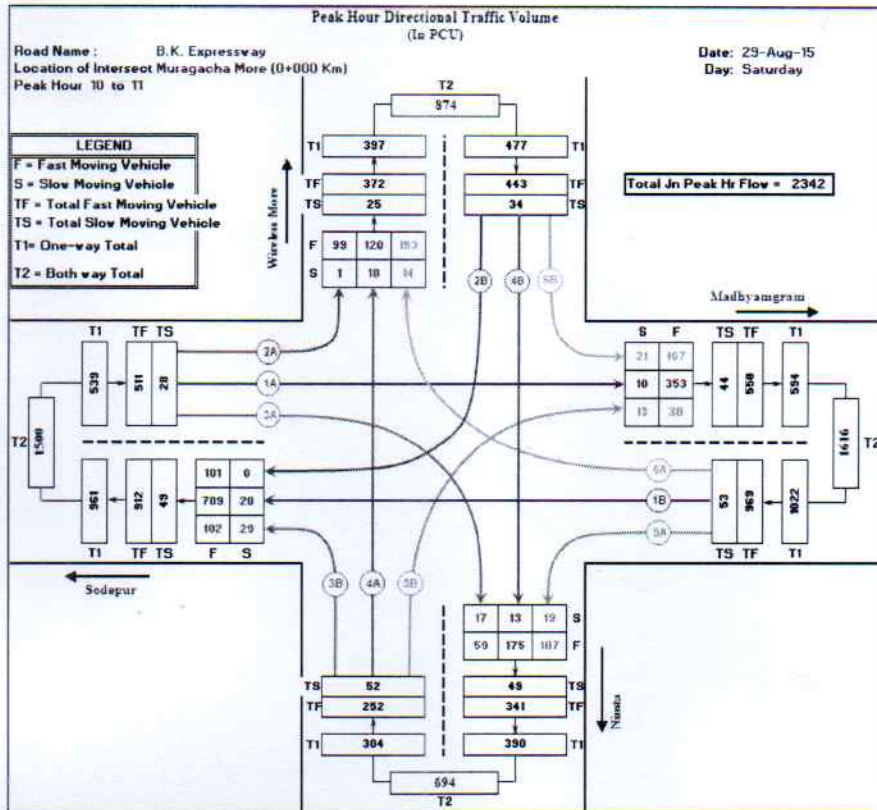


Figure 4.15: Peak Hour Flow Diagram in PCUs per Hour in the morning at Muragacha More (5+142 Km)

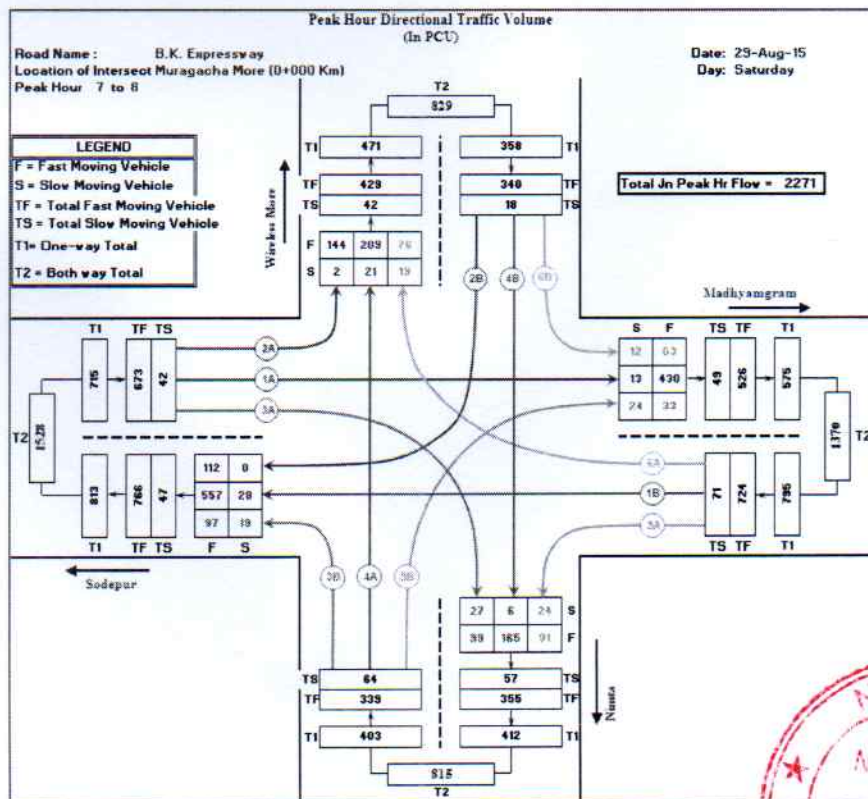


Figure 4.16: Peak Hour Flow Diagram in PCUs per Hour in the evening at Muragacha More (5+142 Km)



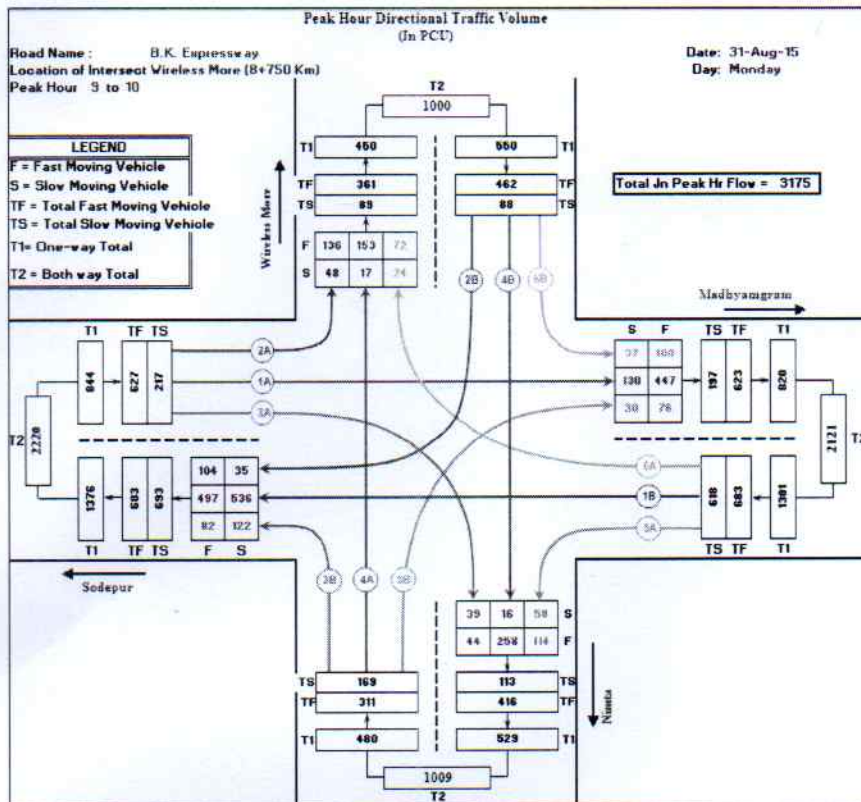


Figure 4.17: Peak Hour Flow Diagram in PCUs per Hour in the morning at Wireless More (13+903 Km)

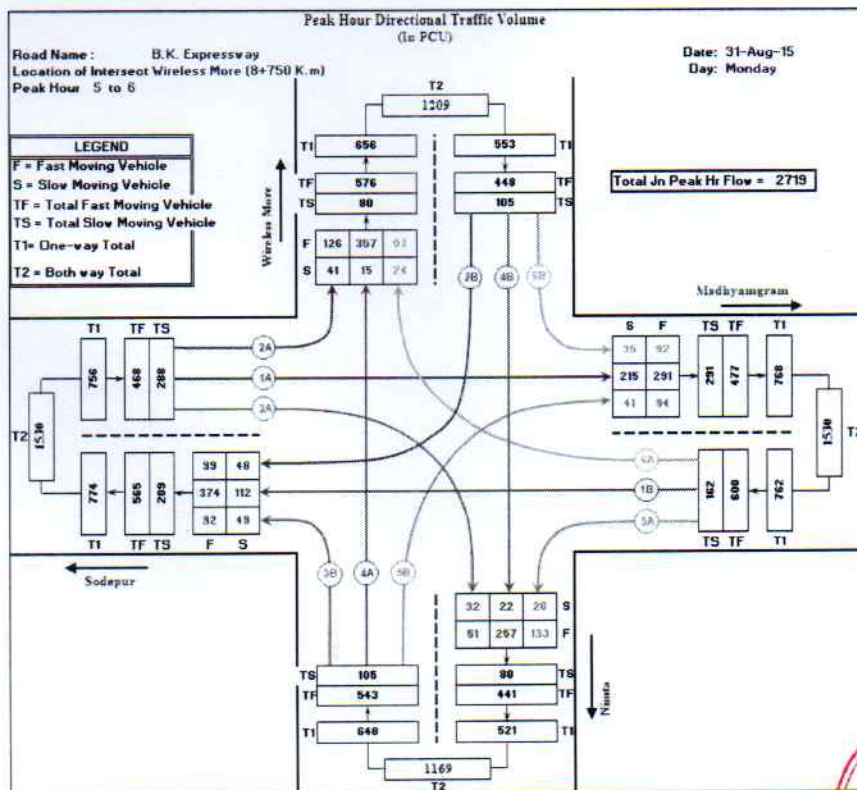


Figure 4.18: Peak Hour Flow Diagram in PCUs per Hour in the evening at Wireless More (13+903 Km)



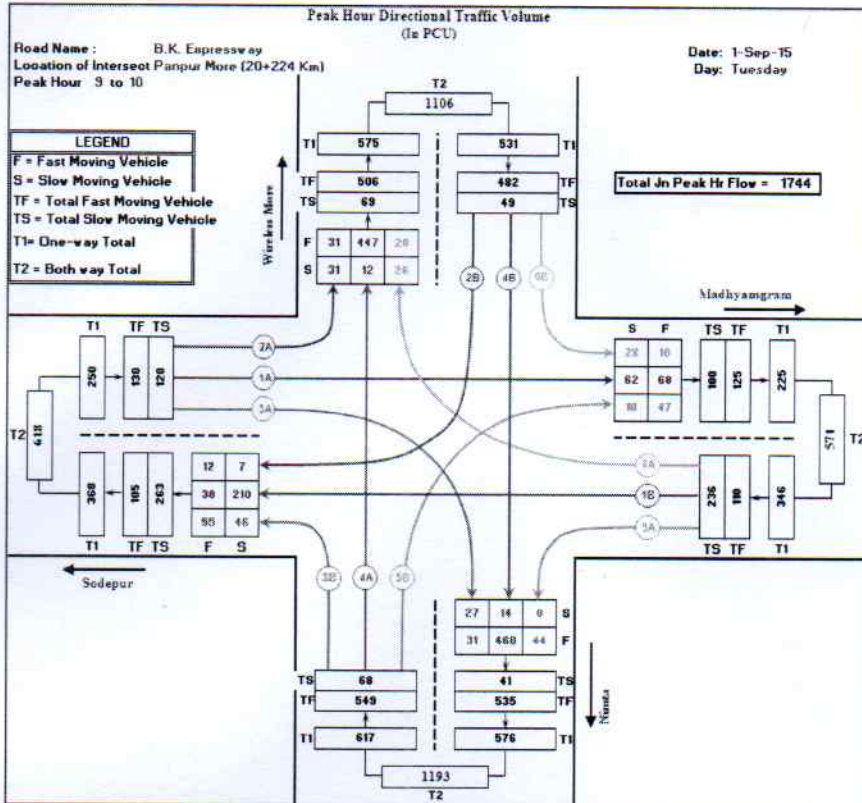


Figure 4.19: Peak Hour Flow Diagram in PCUs per Hour in the morning at Panpur More (25+363 Km)

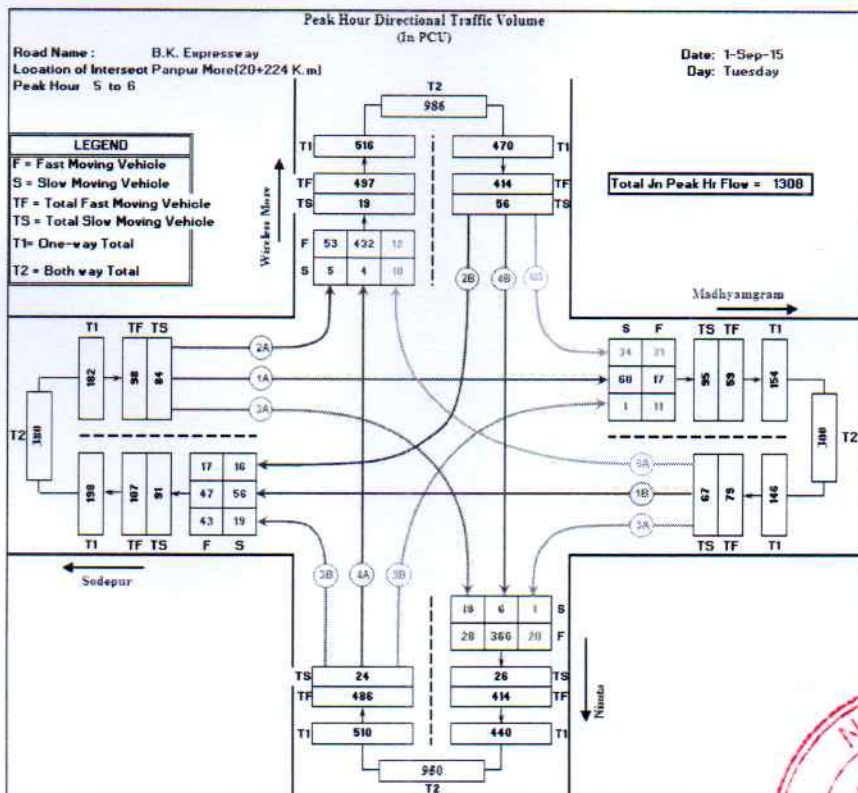


Figure 4.20: Peak Hour Flow Diagram in PCUs per Hour in the evening at at Panpur More (25+363 Km)



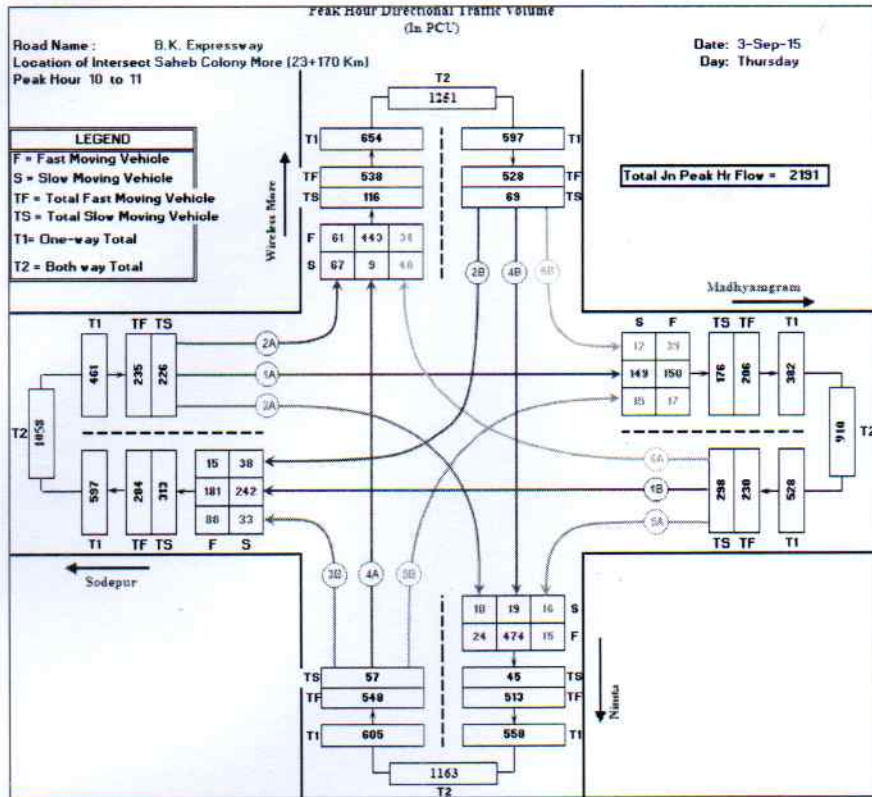


Figure 4.21: Peak Hour Flow Diagram in PCUs per Hour in the morning at Saheb Colony More (28+308 Km)

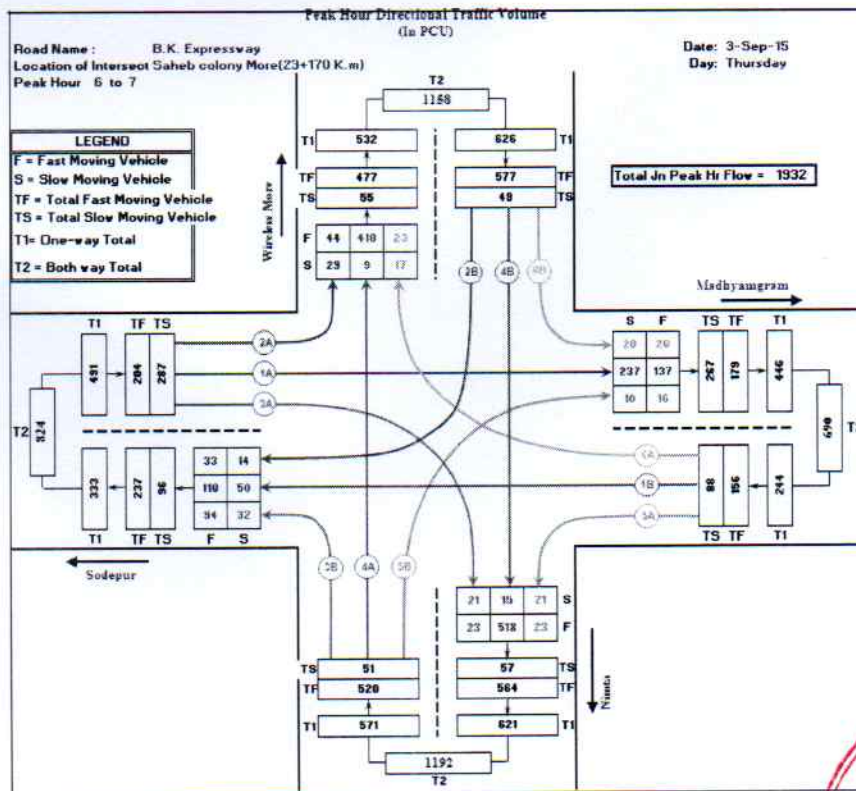


Figure 4.22: Peak Hour Flow Diagram in PCUs per Hour in the evening at Saheb Colony More (28+308 Km)



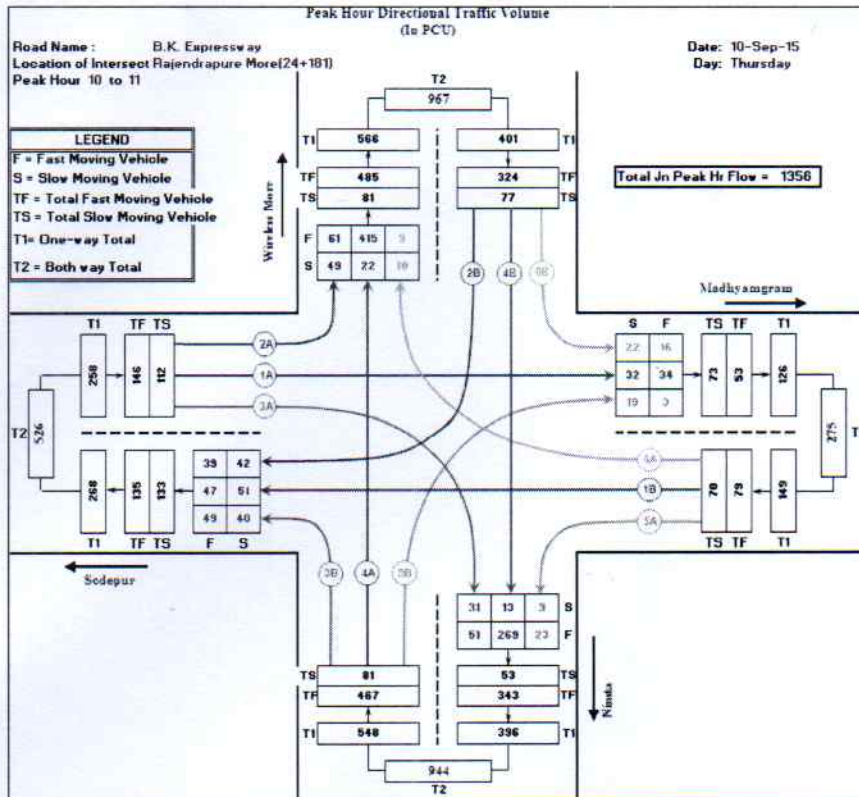


Figure 4.23: Peak Hour Flow Diagram in PCUs per Hour in the morning at Rajendrapur More (29+319 Km)

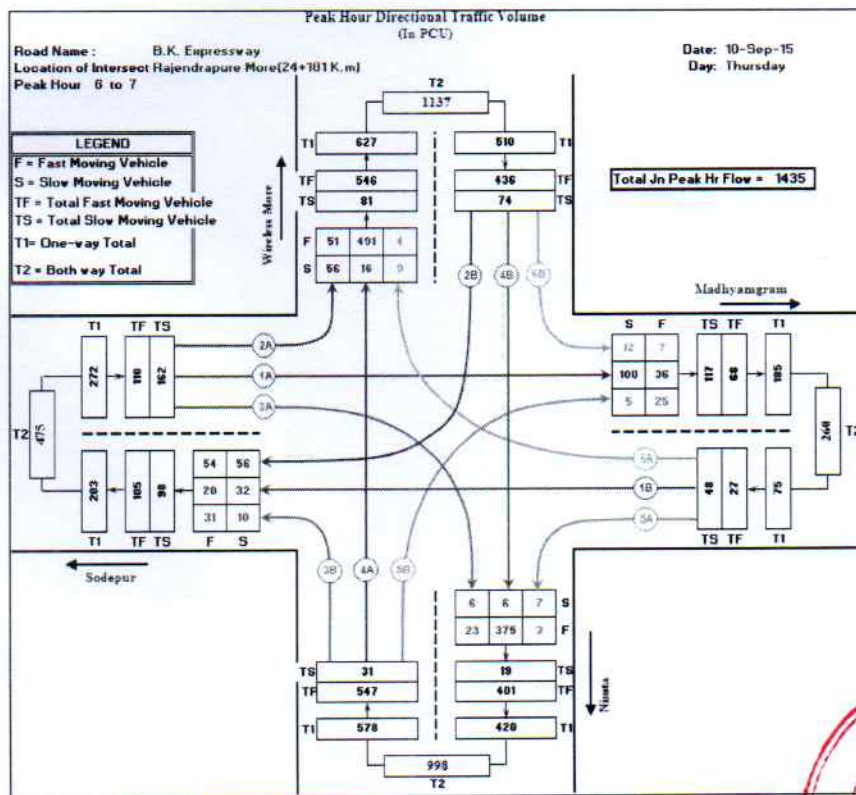


Figure 4.24: Peak Hour Flow Diagram in PCUs per Hour in the evening at Rajendrapur More (29+319 Km)



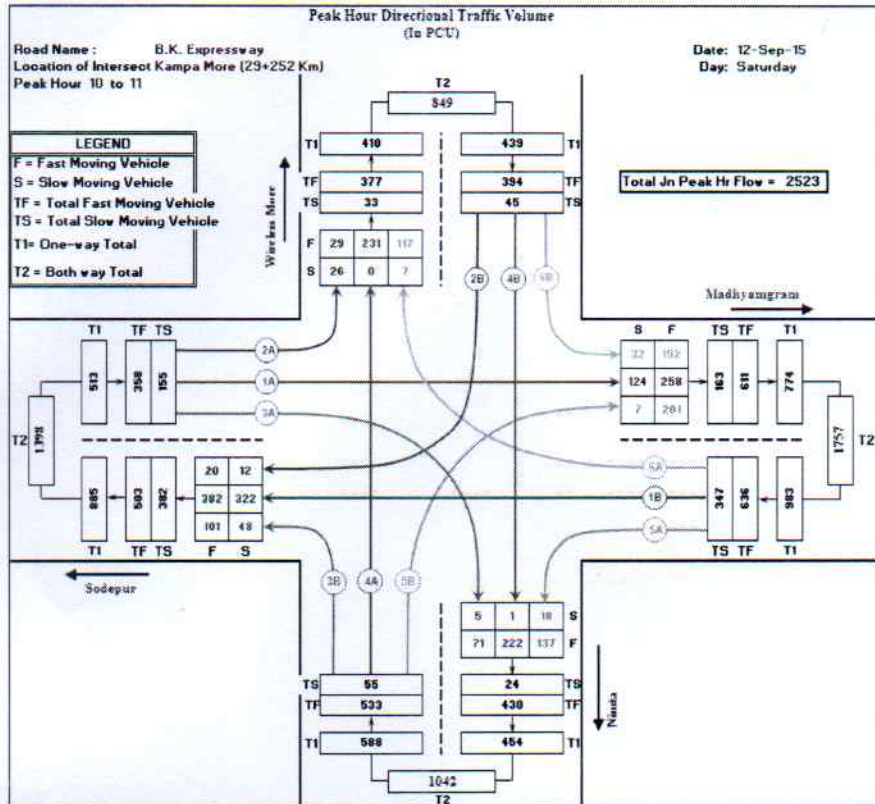


Figure 4.25: Peak Hour Flow Diagram in PCUs per Hour in the morning at Kampa More (34+385 Km)

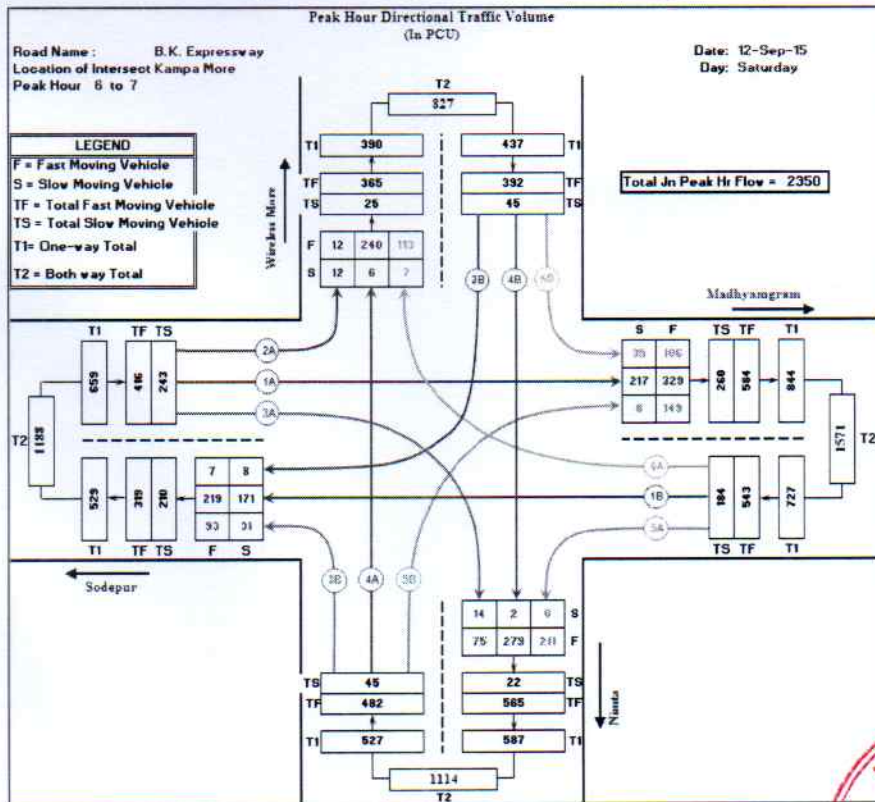


Figure 4.26: Peak Hour Flow Diagram in PCUs per Hour in the evening at Kampa More (34+385 Km)



## 4.4.9

**Origin-Destination Survey for 1 Day (24 hrs)****General**

3 nos. 24 hrs O-D surveys were conducted at Ramkrishnapally (Km 8+242) on Belgharia Expressway, at Algaria Water Tank (At km 8+142 from Helabattala Crossing near Barasat) on NH-34 (Krishnanagar Road) and Near Toll Plaza (Km 14+508) on B.K. Expressway where the Classified Traffic Volume Count has also been conducted.



The O-D surveys on the project road were carried out based on the roadside interview method as per IRC: 102-1988. Both passenger and commercial vehicles plying on the project road were stopped on a random sampling basis and interviewed. Police assistance was arranged at the survey



locations for successfully carrying out these surveys. The travel characteristics obtained by O-D survey facilitate the determination of the percentage of traffic intended to use the proposed elevated corridor.

Trained enumerators collected the trip characteristics using the survey forms designed for this purpose. The O-D survey elicited characteristics mainly origin, destination, etc. both for passenger and goods vehicles. The information collected during roadside interviews was analyzed to obtain



the percentage of through traffic and local traffic in terms of passenger vehicle and goods vehicles.

**Sample Size Considered for O-D Surveys**

As described earlier, the vehicles for the OD survey were interviewed on a random sample basis.



**Table 4.11** shows the ADT and the sample size (both in absolute numbers and in percentage terms) captured during the survey, for passenger and goods vehicles respectively.

**Table 4.11: Sample Size Considered for O-D Survey**

Sl. No.	Location / Chainage	Vehicle Type	As per CTVC	Sample Size	Sample %
1	Ramkrishnapally (Km 8+242) on Belgharia Expressway	Passenger	16825	1087	6.46%
2		Goods	7367	574	7.79%
3	Algaria Water Tank on Krishnanagar Road (NH-34)	Passenger	2982	801	26.86%
4		Goods	2367	694	29.32%
5	Near Toll Plaza (Km 14+508) on B.K. Expressway	Passenger	4106	653	15.90%
6		Goods	4192	772	18.42%

In the Belgharia expressway, which is a high speed corridor the sampling percentage of the OD survey couldn't be achieved upto the IRC codal norms as the police assistance was minimal.

As given in **Table 4.11** these percentages are sufficient to obtain clear idea about the travel pattern of various modes of traffic.

### Zoning System

For understanding the spatial dimensions of the trip characteristics of the vehicles interviewed during the O-D survey, a scientifically derived zoning system was adopted. Two major types of areas were identified on a broad basis, i.e.

- **Immediate Influence Area (IIA) of the Project Road:** This region contributes to most of the trips observed on the Project Road, and primarily includes the towns/cities and districts around and near the Project Road.
- **Project Influence Area (PIA) of the Project Road:** This region contributes trips, but to a lesser degree when compared to IIA.

While defining zone boundaries, the following were considered:

- Important towns and industrial centers along the project road and competing roads in the region.
- Administrative boundaries of sub-divisions, districts and state boundaries.

The travel pattern observed on the project road is fairly simple; with most of the traffic is Local bound. Accordingly, a total of 13 zones were defined.

The Zoning System considered in this study has been presented in **Table 4.12**.



Table 4.12: Zoning System Considered for the Study

Zone Code	Zone Name
1	BARASAT
2	BIRATI / MADHYAMGRAM
3	SODEPUR / BARRACKPORE
4	NAIHATI / KANCHRAPARA
5	REST OF NORTH 24 PARGANAS DISTRICT
6	AIRPORT / SALLAKE / RAJARHAT / NEW TOWN / SALT LAKE SECTOR V / DUMDUM / NAGER BAZAR / BAGUIHATI / ULTADANGA / SHYAMBAZAR
7	DUNLOP / DAKSHINESWAR / BARANAGAR / B T COLLEGE
8	SOUTH KOLKATA / CENRAL KOLKATA / SOUTH 24 PARGANAS DISTRICT
9	KALYANI / KRISHNANAGAR / RANAGHAT / CHAKDAH / SHANTIPUR / NABADWIP
10	REST OF NADIA DISTRICT
11	HOWRAH / PURBA MEDINIPUR / PASCHIM MEDINIPUR DISTRICT
12	HOOGHLY / BARDHAMAN / BIRBHUM / BANKURA / PURULIA DISTRICT
13	MURSHIDABAD / MALDA / UTTAR DINAJPUR
14	NORTH BENGAL / SIKKIM / BHUTAN / ASSAM / NEPAL
15	OTHERS STATE OF INDIA

**Travel Pattern – OD matrices**

The origins and destinations of various types of vehicles were analyzed. The vehicle category wise O-D matrices are presented in **Annexure G**.

The combined O-D matrices for passenger and goods vehicles (expanded to AADT) are presented in **Table 4.13 & Table 4.14**.



Table 4.13: Combined O-D of Passenger Vehicles (Expanded to AADT)

		DESTINATION ZONES													
OID	1	2	3	4	5	6	7	8	9	10	11	12	13	Total	
ORIGIN ZONES	1		135	654	32	81	16	302	55	145	101	82	13	16	1632
	2	38	396	168	645	81	161	179	6	61	19		13		1767
	3	32	237	246	754	371	161	65	13	271	32			16	2198
	4	48	179	310	339	1644	271	567	162	2095	1177	110	61	77	7040
	5	48	64	142	613	32	242	16		48					1205
	6	32	48	214	419	451	64	160	47	548	596	34	13	8	2634
	7	51	109	51	281		128	13	6	48	16				703
	8	6	38	6	77	6	26			19	6				184
	9	129	32	182	919	16	239	78	33	16	19	4	13		1680
	10	32	64	97	1273		387		17	16	16				1902
	11		16		32		6			32					86
	12														0
	13			13			6								19
Total	416	1318	2083	5384	2682	1707	1380	339	3299	1982	230	113	117	21050	

Table 4.14: Combined O-D of Goods Vehicles (Expanded to AADT)

		DESTINATION ZONES													
OID	1	2	3	4	5	6	7	8	9	10	11	12	13	Total	
ORIGIN ZONES	1			718				878	80		319	319	80		2394
	2			239				80		80			80		479
	3		80	479	80			159		80					878
	4			797			80	399	319			80	319	80	2074
	5			80											80
	6			319				479	80			80	80		1038
	7														0
	8														0
	9			319			80	319	159		80		80		1037
	10								80						80
	11														0
	12														0
	13			80											80
Total	0	80	3031	80	0	160	2314	718	160	399	479	639	80	8140	



**Analysis of Combined OD matrix for passenger & commercial vehicles.**

Zone Influence Factors (ZIF) explains the relative contributions of various zones to trip generation. The ZIF are calculated as:

$$ZIF_i = \frac{O_i + D_i}{2 \sum_{i=1, n, j=1, n} T_{ij}}$$

Where,

$ZIF_i$  is the Zone Influence Factor of Zone  $i$

$O_i$  is the number of trip productions from Zone  $i$

$D_i$  is the number of trip attractions from Zone  $i$

$T_{ij}$  is the number of trips between Zones  $i$  &  $j$

The zone influence factors for the passenger cars, buses, 2 axle trucks, 3 axle trucks were evaluated and are presented in **Annexure G**. For the passenger cars the ZIF (%) for Zone No. 4, 3, 2, 7, 6 & 9 are 25.9%, 12.8%, 10.9%, 8.8%, 8.7% & 8.4 % respectively and contributes to more than 75% of the total passenger cars.

For buses, the zone share for the regions of Zone No. 1, 2, 4, 3, 6 & 9 are 25.0%, 19.4%, 16.2%, 8.8%, 7.1% & 6.0 % respectively and contributes to about 83% of the total bus traffic.

For 2 axle trucks the ZIF(%) for Zone No. 10, 4, 3, 7, 2, 1, 9 & 6 are 20.4%, 16.4%, 15.4%, 10.5%, 8.9%, 8.0%, 6.5% & 6.0 % respectively and contributes to about 92% of the total 2 axle trucks.

For 3 axle trucks the ZIF(%) for Zone No. 3, 4, 2 & 10 are 22.4%, 14.5%, 10.8% & 10.8% respectively and contributes to about 59% of the total 3 axle trucks.

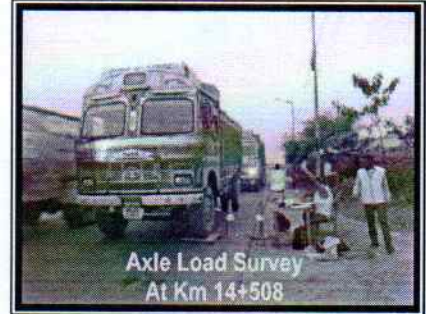
The desire lines considering the combined OD matrices for the passenger vehicles and goods vehicles encompassing the different zones thereby depicting the project influence area is provided in **Figure 4.29 & Figure 4.30** respectively.



#### 4.5 Axle Load Surveys and Vehicle Damage Factors

For the purpose of preliminary pavement design required for the project, axle load survey has been carried out on the project road.

The survey was carried for one day (24 hrs) on a working day at Ramkrishnapally (Km 8+242) on Belgharia Expressway and Near Toll Plaza (Km 14+508) on B.K. Expressway. The axle load spectrum observed on the project road, along with the



derivation of vehicle damage factors (VDFs) as per the relevant IRC Codes are given from **Table 4.15 to Table 4.17** which summarizes the VDF observed on the Project Road. The details of the axle load survey are given in **Annexure H**.

##### 4.5.1 Calculation of VDF

**Table 4.15: Calculation of Axle Load Survey at Near Toll Plaza (14+508 Km)**

Category of Vehicle	Up				Down				Maximum VDF (Up & Down)	UP (VDF X ADT)	Combined VDF (UP)	DOWN (VDF X ADT)	Combined VDF (DN)
	No. of Samples	Total Damaging Effect	VDF	ADT	No. of Samples	Total Damaging Effect	VDF	ADT					
Bus	5	0.69	0.138	74	2	0.556	0.278	60	0.278	10.212		16.680	
LCV	104	4.784	0.046	971	120	28.08	0.234	821	0.234	44.666		192.114	
2-Axle Truck	178	147.206	0.827	611	129	519.225	4.025	550	4.025	505.297		2213.750	
3-Axle Truck	90	140.67	1.563	354	61	177.876	2.916	311	2.916	553.302		906.876	
Multi-axle Vehicle	14	38.92	2.780	118	7	37.688	5.384	136	5.384	328.040		732.224	
<b>SUM</b>				2128				1878		1441.517	0.677	4061.644	2.163



Table 4.16: Calculation of Axle Load Survey at Ramkrishnapally (8+242 Km)

Category of Vehicle	Up				Down				Maximum VDF (Up & Down)	UP (VDF X ADT)	Combined VDF (UP)	DOWN (VDF X ADT)	Combined VDF (DN)
	No. of Samples	Total Damaging Effect	VDF	ADT	No. of Samples	Total Damaging Effect	VDF	ADT					
Bus	2	0.258	0.129	650	1	0.686	0.686	642	0.686	83.850		440.412	
LCV	169	301.496	1.784	1211	39	35.919	0.921	1370	1.784	2160.424		1261.770	
2-Axle Truck	101	236.946	2.346	1620	198	2246.31	11.345	1629	11.345	3800.520		18481.005	
3-Axle Truck	46	64.124	1.394	840	101	840.623	8.323	826	8.323	1170.960		6874.798	
Multi-axle Vehicle	2	0.468	0.234	118	17	225.59	13.270	125	13.270	27.612		1658.750	
<b>SUM</b>				4439				4592		7243.366	1.632	28716.735	6.254

Table 4.17: Summary of Axle Load Survey

Sl No.	Type of Comm. Vehicle	Axle Load Location	Chainage (Km)	Date of Survey	Duration of Survey	VDF		Maximum VDF (Up + Down)	Combined Weighted VDF (Adopted)	Remarks (if any)
						Up	Down			
1	LCV	B K Expressway (Near Toll Plaza)	14+508	04.09.2015	24 Hours	0.046	0.234	0.234	2.160	Up: From Wireless More to Kampa More Dn: From Kampa More Wireless More
2	2-Axle Truck					0.827	4.025	4.025		
3	3-Axle Truck					1.563	2.916	2.916		
4	Multi-axle Vehicle					2.78	5.384	5.384		
1	LCV	Belgharia Expressway (Near Ramkrishnapally) (Km 8+242)	8+242	08.09.2015	24 Hours	1.784	0.921	1.784	6.250	Up: From NH-34 to Dakshines war Dn: From Dakshines war to NH-34
2	2-Axle Truck					2.346	11.345	11.345		
3	3-Axle Truck					1.394	8.323	8.323		
4	Multi-axle Vehicle					0.234	13.27	13.270		



#### 4.6 Collection of Accident Data

The Constants have visited all the police stations under which sections of the project road lies and have also interacted with the Barrackpore Police Commissionerate.

There are six nos. police stations which are present alongside the project stretch and the names are Ghola, Khardah, Titagarh, Jagaddal, Naihati, Bizpur.

Accident data have been collected from the Office of The Assistant Commissioner of Police, Traffic, located at Barrackpore. The summarized data is presented below in **Table 4.18.**

**Table 4.18: Summary of Accident Data  
(Obtained from different Police Stations)**

Sl No.	Name of Police Station	Jurisdiction of P.S.	Year	No. of Accident	No. of Injured	No. of death
1	Ghola	5.142km to 8.142km	2013	3	0	3
			2014	8	5	3
			2015	1	0	1
2	Khardah	8.142km to 12.642km	2013	1	2	0
			2014	12	4	8
			2015	4	2	2
3	Titagarh	12.642km to 16.642km	2013	3	1	2
			2014	12	14	4
			2015	7	5	2
4	Jagaddal	16.642km to 26.842km	2013	18	22	6
			2014	50	48	19
			2015	21	16	9
5	Naihati	26.842km to 30.942km	2013	6	6	2
			2014	21	16	10
			2015	12	13	2
6	Bizpur	30.942km to End Point	2013	23	13	9
			2014	77	64	41
			2015	33	20	16



**Accident Black Spots**

Some of the accident black spots as identified by the Police Department are Wireless More, Babanpur Khatal, Keotia, Panpur More, Kampa More. A list depicting the locations is provided in the **Annexure I**.

The mitigative measures are presented in the Chapter 10: Improvement and Construction Proposals Safety Measures.

**a) Major Vehicular Underpass:**

Vehicular underpass has been provided at the two locations – the major junctions at Muragacha More & Barrackpore Wireless More.

Details of Each Vehicular Underpass (Composite Structure)		
ID. No.	Span – 50.00 m Width: 12.60 m x 2 with 300 mm clearance between two. Vertical clearance = 5.0 m Overall length – 239.150 m (VUP and either side viaduct) Both side viaduct structure of 3 x 30.400 m each RE wall proposed from 5.80 m height to 1.50 m height. Retaining wall proposed from 1.50 m height	
	Chainage	Location
VUP/1	5.142	Murugacha More
VUP/2	13.903	Wireless More

**b) Underpass: VUPs, LVUPs & PUPs:**

Facilities for crossing of pedestrians and through underpass have been provided at locations as detailed below. One pedestrian crossing having size 5.0 m x 3.0 m has been provided specifically for the usage of pedestrian.

**i) Vehicular underpass: Vehicular underpass shall be provided at following locations:**

Sl. No.	Design Chainage (Km.)	Span Arrangement (m)	Type of Super-structure	Width
1	5+140	1 x 50	Steel Girder with Truss	10.5m x 2
2	13+895	1 x 50	Steel Girder with Truss	10.5m x 2
3	25+359	1 x 24	Steel Girder and RCC Deck Slab	10.5m x 2
4	28+303	1 x 24	Steel Girder and RCC Deck Slab	10.5m x 2
5	30+379	1 x 16	Steel Girder and RCC Deck Slab	10.5m x 2



ii) Light Vehicular underpass: Light Vehicular underpass shall be provided at following locations:

Sl. No.	Design Chainage (Km.)	Span Arrangement (m)	Type of Super-structure	Width
1	6+725	12	RCC Box	10.5m x 2
2	9+136	24	Steel Girder and RCC Deck Slab	10.5m x 2
3	12+141	16	Steel Girder and RCC Deck Slab	10.5m x 2
4	14+875	12	RCC Box	10.5m x 2
5	20+066	12	RCC Box	10.5m x 2
6	29+313	12	RCC Box	10.5m x 2
7	32+212	12	RCC Box	10.5m x 2

iii) Pedestrian underpass: Pedestrian underpass shall be provided at following locations:

Sl. No.	Design Chainage (Km.)	Span Arrangement (m)	Type of Super-structure	Width
1	10+213	10.5	RCC Box	10.5m x 2
2	10+900	10.5	RCC Box	10.5m x 2
3	18+205	10.5	RCC Box	10.5m x 2
4	21+140	10.5	RCC Box	10.5m x 2
5	26+850	10.5	RCC Box	10.5m x 2

#### 4.7 Estimation of Traffic on Barrackpore Kalyani Expressway

It has been derived that 30% of total traffic on Belgharia Expressway will be diverted towards the project road when the proposed elevated corridor, linking Belgharia Expressway and Kalyani Expressway, would be constructed. The basis of consideration of adopting 30% is from the diversion analysis which is being carried out considering with and without the upgraded project road facility. Therefore this diverted volume of traffic should be considered on the project road for evaluating the capacity of the highway facility as well as Design ESA.

##### 4.7.1 Traffic estimation on the Project Road

Estimation of the likely traffic on the project road is based on the following:

- OD matrices for goods and passenger traffic – for likely diverted traffic

For ascertaining the base year (2015) traffic, the following process was followed:

1. Pair of zones, traffics between which have trends to avail the project corridor, have been identified for cars & trucks (both light & heavy).
2. Those zones are considered as Effective Zones.
3. It is observed from the study that diverted traffic will be generated from the two major roads say, NH-34 & Belgharia Expressway (locations are shown in the Index



Map). Effective zones thus are identified only for two no. OD locations, one on NH-34 and the other on Belgharia Expressway. A list of Effective Zones are presented in **Table 4.20** for different category of vehicles.

**Table 4.20: List of Effective Zones**

Car		Light Trucks		Heavy Trucks	
Originating Zone	Destination Zone	Originating Zone	Destination Zone	Originating Zone	Destination Zone
Barasat (NH-34)					
1	4	1	9	1	9
1	9	1	10	1	12
1	10	1	12	5	7
1	12	2	4	5	12
2	9	2	9	7	14
3	5	2	13	8	4
4	1	3	5	8	9
4	5	3	9	9	1
4	8	3	10	9	6
5	3	4	1	9	8
5	4	4	5	9	11
5	12	4	6	10	11
6	4	5	3	12	1
6	9	5	7	12	5
6	10	5	12	12	9
8	9	6	9		
8	10	6	10		
9	1	7	5		
9	2	7	9		
9	6	8	9		
9	8	8	10		
9	11	9	1		
10	1	9	2		
10	2	9	3		
10	6	9	6		
10	8	9	8		
10	12	9	11		
11	9	10	1		
12	1	10	6		
12	5	10	8		
		10	11		
		10	12		
		11	9		
		12	1		
		12	5		



Car		Light Trucks		Heavy Trucks	
Originating Zone	Destination Zone	Originating Zone	Destination Zone	Originating Zone	Destination Zone
Belgharia Expressway					
1	12	1	12	1	12
2	12	2	12	2	12
3	6	4	5	4	5
4	6	5	7	4	6
4	8	5	12	5	12
5	7	6	10	6	3
5	12	7	5	7	5
6	3	7	10	12	1
6	4	8	10	12	2
6	9	10	6	12	5
7	5	12	1		
7	9	12	2		
9	6	12	5		
9	8	12	9		
9	11				
9	12				
11	9				
12	1				
12	2				
12	5				

4. Diversion analysis was carried out to estimate the percentage of traffic likely to get diverted to the project corridor. Product of divertible traffic and percentage diversion gave the diverted traffic for each category of vehicle.
5. The opening year of project road has been considered as 2019.

The estimated traffic is presented in **Annexure J**.

#### **Diversion analysis**

The process followed for diversion analysis to estimate the percentage of traffic likely to divert from the present route to the project corridor is as follows:

- (i) Demarcation of alternative route between the Effective Zones.
- (ii) Calculation of the Vehicle Operating Cost (VOC) form IRC: SP: 30-2009 for each category of the vehicle – cars & trucks.
- (iii) Calculation of Travel Time Cost (TTC) for each category of vehicle.
- (iv) Calculation of Generalized Cost (GC) as  
GC = VOC + TTC + Toll Cost.



- (v) Diversion Curves considered for computing the % diversion for the cars & trucks. The equations are presented in **Table 4.21** as follows.

**Table 4.21: % Diversion for Car, Bus & trucks**

Vehicle	CR Interval	Relationship for % Diversion (%d)
Car	< 0.64	$\%d = 98.75 - ((CR / 0.634) * 8.125)$
	$0.64 = CR < 1.465$	$\%d = 90.625 - ((CR - 0.634) / 0.831) * 84.375$
	$1.465 \leq CR \leq 2.0$	$\%d = 6.25 - ((CR - 1.465) / 0.535) * 5.25$
Trucks	$\leq 0.75$	$\%d = 100 - (CR / 0.75) * 5$
	$0.75 \leq CR \leq 1.25$	$\%d = 95 - ((CR - 0.75) / 0.5) * 90$
	$1.25 \leq CR \leq 2.0$	$\%d = ((2 - CR) / 0.75) * 5$

- (vi) The calculation for diversion analysis is shown in **Annexure J**.
- (vii) The % diversion for the various types of vehicles at different locations is given in **Table 4.22**.

**Table 4.22: % Diversion of various types of vehicles**

Survey Location	Car	Small Trucks	Heavy Trucks	Average for the Location
Algaria Water Tank on Krishnanagar Road (NH-34)	43%	22%	14%	26%
Ramkrishnapally on Belgharia Expressway (Km 8+242)	47%	24%	29%	33%

Percentage diversion for the OD result on the project road at Km 9+366 was not done, as there is no question of the present traffic not to continue using the project corridor after completion of the project.

Therefore taking the percentage of diversion of the aforesaid two locations from the above table, i.e. 26% & 33% the average percentage of diversion for the entire project stretch comes as 30%.

**Thus 30% diverted traffic has been considered for estimation of the future traffic.** The calculated AADT on the project road is derived as the summation of the existing AADT on the project road at Km 9.370 (higher of the 2 CTVC locations) plus 30% of the AADT calculated on Belgharia Expressway. The derived AADT for the project road is provided in **Table 4.23**.



Table 4.23: Proposed Annual Average Daily Traffic (AADT) on Project Road

Type of Vehicle		AADT at 14.508 km of B.K. Expressway		AADT Belgharia Exp.way		Proposed Annual Average Daily Traffic (AADT)		
		No.	PCU	No.	PCU	No.	PCU	
		Col. 1	Col. 2	Col. 3	Col. 4	Col. 5= Col. 1+(Col. 3x30%)	Col. 6= Col. 2+(Col. 4x30%)	
Fast / Motorised Vehicles	Two Wheeler	4733	2367	6110	3056	6566	3284	
	Three Wheeler / Auto Rickshaw	915	915	209	209	978	978	
	Motorized Van	0	0	1	1	0	0	
	Car/ Jeep/ Van/ Taxi	4144	4144	16248	16248	9018	9018	
	Bus	Mini	37	110	84	252	62	186
		Full	104	312	1273	3818	486	1457
		LCV (Mini Truck)	1882	2822	2710	4066	2695	4042
	Truck	2-Axle Rigid Truck	1219	3657	3411	10234	2242	6727
		3-Axle Rigid Truck	697	3137	1749	7872	1222	5499
		Multi-Axle Rigid Truck	140	629	183	822	195	876
		Truck Trailer (Artic/ Semi-artic)	127	572	72	327	149	670
	Agricultural Tractor	Tractor With Trailer	4	19	25	114	12	53
		Tractor Without Trailer	1	2	11	17	4	7
Slow / Non-motorised Vehicles	Cycle	3353	1677	87	44	3379	1690	
	Cycle Rickshaw	927	1854	34	68	937	1874	
	Bullock Cart	0	0	0	0	0	0	
	Horse Drawn Vehicle	0	0	0	0	0	0	
<b>Total</b>		<b>18283</b>	<b>22217</b>	<b>32207</b>	<b>47148</b>	<b>27945</b>	<b>36361</b>	

Thus the proposed traffic on the project road as calculated is summarized and presented in terms of number and PCU per day in **Table 4.24**.



**Table 4.24: Calculation of Proposed Traffic on Barrackpore Kalyani Expressway**

	Volume per day (No.)	PCU per day	Commercial Vehicle Per Day (CVPD)
Annual Average Daily Traffic (AADT)	32207	47148	9507
Adopted % of Diverted Traffic from Belgharia Expressway	30.00%	30.00%	30.00%
Total (Up+Dn) Diverted Traffic from Belgharia Expressway	9662	14144	2852
Add : AADT 14+508 Km Location	18283	22217	4210
<b>Total Proposed Traffic on Project Road</b>	<b>27945</b>	<b>36361</b>	<b>7062</b>

From the above **Table 4.24** it is observed that the proposed traffic on the project corridor considering the diverted traffic from Belgharia Expressway is **36361 PCU per day**. This is less than the IRC Codal Specifications limit of 40000 PCU per day for (i) 4 lane Divided Carriageway with paved shoulder and (ii) Culverts and Bridge of 3-lane Carriageway each.

**Thus, upgradation of B K Expressway to 4 lane divided carriageway is required along with paved shoulders and 3 lane culverts and Bridges..**

#### 4.8 Traffic Growth Rates

##### 4.8.1 Approach

Forecasting of traffic are made taking into account the traffic flow pattern and changes in vehicles mix expected during the study period. Since transport demand changes due to shifts in pattern of economic activities, both temporally and spatially, consideration has been paid to the potential of generation of transportation services. In view of this, projection of future traffic incorporates consideration of basic socio-economic characteristics and rate of change expected during the study period in the project influence area.

##### 4.8.2 Project Influence Area (PIA)

Outlining the project influence area is essential for the estimation of traffic growth rates; because the socio-economic indicators of the project influence area, influence the traffic growth on the project road. The project influence area has been assessed based on the O-D data. From the O-D analysis results, it is seen that mainly the trips by different modes are being generated mostly in North 24 Pgs, Kolkata, Nadia, Howrah, Hooghly and Rest of West Bengal districts and states respectively. The contribution of the other parts of India towards the same is marginal.



#### 4.8.3 Methodology

Traffic growth rate, by vehicle type has been determined at 5 yearly intervals, up to the horizon year 2030 and beyond. The growth rates of different modes have been computed using elasticity approach. In this method, the relationship between traffic and causative factors, which influence the growth and volume of traffic, is determined from the growth of observed past traffic volume and the growth of major economic indicators of the influence zone. This method takes into account both the past growth and the future perspective of major economic indicators like Net State / District Domestic Product (NSDP / NDDP), population and per capita income (PCI). The tables below represents the economic indicators and number of registered vehicle used for forecasting.

#### 4.8.4 Economic Indicators of Project Influence Area

The economic indicators of PIA is presented in the following tables.

**Table 4.25: Economic Indicators (Rest of West Bengal) at constant price (2004-2005)**

Year	Net Domestic Product (Crore)	Population (number)	Per-capita Income (Rs.)
2007	133278	55911285	23837
2008	142397	56342006	25274
2009	146895	56720512	25898
2010	159442	57072891	27937
2011	168659	57410695	29378
2012	174295	57746198	30183
2013	184436	58059108	31767
<b>CAGR (%)</b>	<b>5.56</b>	<b>0.63</b>	<b>4.90</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013 -14

**Table 4.26: Economic Indicators (North 24 Pgs) at constant price (2004-05)**

Year	Net Domestic Product (Crore)	Population (number)	Per-capita Income (Rs.)
2007	26233	10015000	26194
2008	29034	10221899	28403
2009	30994	10433102	29707
2010	32907	10648598	30903
2011	35026	10868701	32227
2012	36821	11093200	33192
2013	39696	11322399	35060
<b>CAGR (%)</b>	<b>7.15</b>	<b>2.07</b>	<b>4.98</b>

Source: Ministry of Statistics and program implementation



Table 4.27: Economic Indicators (Kolkata) at constant price (2004-05)

Year	Net Domestic Product (Crore)	Population (number)	Per-capita Income (Rs.)
2006	19678	4654500	42278
2007	21403	4672500	45806
2008	23103	4690500	49255
2009	24548	4708600	52135
2010	24612	4726800	52069
2011	25735	4745100	54236
2012	27585	4763500	57909
<b>CAGR (%)</b>	<b>6.99</b>	<b>0.46</b>	<b>6.49</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013 - 14

Table 4.28: Economic Indicators (Nadia) at constant price (2004-05)

Year	Net Domestic Product (Crore)	Population (number)	Per-capita Income (Rs.)
2007	11056	5087399	21732
2008	11987	5179001	23145
2009	12543	5272299	23790
2010	13362	5367199	24895
2011	13787	5463900	25232
2012	14341	5562299	25782
2013	15279	5662400	26983
<b>CAGR (%)</b>	<b>4.73</b>	<b>1.54</b>	<b>3.14</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013 -14

Table 4.29: Economic Indicators (Howrah) at constant price (2004-05)

Year	Net Domestic Product (Crore)	Population (number)	Per-capita Income (Rs.)
2007	12237	4610300	26543
2008	13120	4673399	28074
2009	13581	4737401	28668
2010	15249	4802299	31754
2011	17236	4868100	35406
2012	17424	4934701	35308
2013	18542	5002300	37068
<b>CAGR (%)</b>	<b>7.17</b>	<b>1.37</b>	<b>5.72</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013 -14



Table 4.30: Economic Indicators (Hooghly) at constant price (2004-05)

Year	Net Domestic Product (Crore)	Population (number)	Per-capita Income (Rs.)
2007	13642	5471500	24933
2008	15157	5552200	27300
2009	15702	5634099	27869
2010	17658	5717199	30886
2011	18747	5801500	32315
2012	18970	5887100	32223
2013	20169	5973900	33761
<b>CAGR (%)</b>	<b>5.74</b>	<b>1.26</b>	<b>4.43</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013-14

#### 4.8.5 Vehicle Registration in PIA

The vehicle registration data has been collected for various regions of PIA. These are presented in the subsequent Table 4.31, 4.32, 4.33, 4.34, 4.35, 4.35 & 4.36.

Table 4.31: Number of Registered Vehicle (Rest of West Bengal)

Year	Tractor/Trailer	Goods
2007	48448	89045
2008	51361	113448
2009	42691	121015
2010	50725	116923
2011	61477	118760
2012	73373	142855
2013	86059	200009
<b>CAGR (%)</b>	<b>10.05</b>	<b>14.44</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013-14

Table 4.32: Number of Registered Vehicle (North 24 Pgs)

Year	Tractor/Trailer	Goods
2007	1203	52172
2008	1480	56274
2009	1526	59386
2010	3108	64557
2011	3230	84994
2012	3286	87921
2013	3488	93139
<b>CAGR (%)</b>	<b>19.41</b>	<b>10.14</b>

Source: Ministry of Statistics and program implementation



Table 4.33: Number of Registered Vehicle (Kolkata)

Year	Tractor/Trailer	Goods
2006	4854	71055
2007	4856	72576
2008	4609	74350
2009	4609	35356
2010	4609	36983
2011	4633	38455
2012	4854	41208
<b>CAGR (%)</b>	<b>-0.62</b>	<b>-7.49</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013-14

Table 4.34: Number of Registered Vehicle (Nadia)

Year	Tractor/Trailer	Goods
2007	5075	3360
2008	5472	4273
2009	5791	5453
2010	6328	6011
2011	7122	6714
2012	7941	7571
2013	8829	9915
<b>CAGR (%)</b>	<b>9.67</b>	<b>19.76</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013-14

Table 4.35: Number of Registered Vehicle (Howrah)

Year	Tractor/Trailer	Goods
2007	992	20684
2008	1010	21743
2009	1016	22509
2010	1012	13248
2011	1015	14630
2012	1016	15369
2013	1023	16225
<b>CAGR (%)</b>	<b>0.51</b>	<b>-3.97</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013-14

Table 4.36: Number of Registered Vehicle (Hooghly)

Year	Tractor/Trailer	Goods
2007	2858	18235
2008	2949	18930
2009	3006	19412
2010	3189	20352
2011	3571	22180
2012	3927	23649
2013	4590	25528
<b>CAGR (%)</b>	<b>7.00</b>	<b>4.92</b>

Source: Bureau of Applied Economics & Statistics, West Bengal, 2013-14



#### 4.8.6 Elasticity of Traffic Growth

The existing transport demand elasticity has been estimated using both time trend analysis fitting log-log equation and point to point compounded annual average growth rate. In case of point to point estimation, the Consultants took into account of the two points of the vehicular data (e.g., 2007 and 2013) as basis, for further extrapolation and in determination of the future transport demand elasticity. Corresponding growth rates of the explanatory variables i.e. net state domestic product, district domestic product, per capita income and population are considered. The estimated elasticity values for different category of vehicles are presented in the following Table 4.37, 4.38, 4.39, 4.40 & 4.41.

**Table 4.37: Estimated Transport Demand Elasticity (Rest of West Bengal)**

Vehicle category	Explanatory variable	Estimated Elasticity	R Square	Expected Elasticity	Growth Rate (%)
Car / Jeep	PCI	1.13	0.93	1.1	24.4
2 Wheeler	PCI	25.6	0.61	5.0	29.3
3 Wheeler	NSDP	30.0	0.90	5.0	-1.7
Bus	Popn	1.83	0.75	1.6	14.4
Goods Vehicle	NSDP	2.39	0.98	2.4	13.7
Tractor	NSDP	1.83	0.74	1.8	10.1

**Table 4.38: Estimated Transport Demand Elasticity (North 24 Pgs)**

Vehicle category	Explanatory variable	Estimated Elasticity	R Square	Expected Elasticity	Growth Rate (%)
Car / Jeep	PCI	3.53	0.93	3.5	17.1
2 Wheeler	PCI	15.9	0.76	5.0	24.6
3 Wheeler	NSDP	12.6	0.90	4.0	6.2
Bus	Popn	1.59	0.91	1.6	1.1
Goods Vehicle	NSDP	3.92	0.98	3.9	20.1
Tractor	NSDP	2.99	0.84	3.0	19.1

**Table 4.39: Estimated Transport Demand Elasticity (kolkata)**

Vehicle category	Explanatory variable	Estimated Elasticity	R Square	Expected Elasticity	Growth Rate (%)
Car / Jeep	PCI	1.80	0.84	1.80	0.54
2 Wheeler	PCI	17.50	0.71	5.00	12.52
3 Wheeler	NSDP	19.29	0.91	5.00	-3.99
Bus	Popn	1.14	0.96	1.10	7.49
Goods Vehicle	NSDP	2.42	0.89	2.40	10.38
Tractor	NSDP	0.33	0.84	0.05	-0.62



Table 4.40: Estimated Transport Demand Elasticity (Howrah)

Vehicle category	Explanatory variable	Estimated Elasticity	R Square	Expected Elasticity	Growth Rate (%)
Car / Jeep	PCI	0.63	0.39	0.65	6.2
2 Wheeler	PCI	10.3	0.69	5.00	-7.4
3 Wheeler	NSDP	2.79	0.91	2.75	-0.3
Bus	Popn	1.03	0.96	1.10	-4.0
Goods Vehicle	NSDP	1.5	0.93	1.50	10.4
Tractor	NSDP	0.04	0.6	0.05	0.5

Table 4.41: Estimated Transport Demand Elasticity (Hooghly)

Vehicle category	Explanatory variable	Estimated Elasticity	R Square	Expected Elasticity	Growth Rate (%)
Car / Jeep	PCI	1.57	0.85	1.5	7.6
2 Wheeler	PCI	4.26	0.87	4.0	5.0
3 Wheeler	NSDP	3.4	0.88	3.4	3.9
Bus	Popn	0.83	0.89	0.8	4.9
Goods Vehicle	NSDP	1.75	0.89	1.7	8.2
Tractor	NSDP	1.11	0.81	1.1	7.0

#### 4.8.7 Expected Transport Demand Elasticity

Looking at the past and future anticipated development thrusts in the project influence area, it is expected that the existing pattern of demand elasticity will be operative. The stable socio-political environment is another influencing factor for this sustained high level of transport demand elasticity. The expected elasticity values for different category of goods vehicles are presented in the following Table 4.42, 4.43, 4.44, 4.45, 4.46 & 4.47.

Table 4.42: Expected Transport Demand Elasticity (Rest of West Bengal)

Vehicle category	2016-20	2021-25	2026-30	Beyond 30
Tractor/Trailer	1.62	1.46	1.31	1.18
Goods Vehicle	1.59	1.43	1.32	1.15

Table 4.43: Expected Transport Demand Elasticity (North 24 Pgs)

Vehicle category	2016-20	2021-25	2026-30	Beyond 30
Tractor/Trailer	2.25	2.03	1.82	1.64
Goods Vehicle	1.44	1.30	1.17	1.05



**Table 4.44: Expected Transport Demand Elasticity (Kolkata)**

Vehicle category	2016-20	2021-25	2026-30	Beyond 30
Tractor/Trailer	0.36	0.32	0.29	0.26
Goods Vehicle	1.08	0.97	0.87	0.79

**Table 4.45: Expected Transport Demand Elasticity (Nadia)**

Vehicle category	2016-20	2021-25	2026-30	Beyond 30
Tractor/Trailer	0.93	0.85	0.77	0.67
Goods Vehicle	0.81	0.73	0.66	0.59

**Table 4.46: Expected Transport Demand Elasticity (Howrah)**

Vehicle category	2016-20	2021-25	2026-30	Beyond 30
Tractor/Trailer	0.45	0.41	0.36	0.33
Goods Vehicle	0.83	0.75	0.62	0.55

**Table 4.47: Expected Transport Demand Elasticity (Hooghly)**

Vehicle category	2016-20	2021-25	2026-30	Beyond 30
Tractor/Trailer	0.81	0.73	0.66	0.59
Goods Vehicle	0.90	0.81	0.73	0.66

**4.8.8 Perspective Growth rate of the Economy**

The perspective growth of the economy of states as whole and specific districts within the project influence zone has been studied. Secondary data and information during the period 2007 to 2013 has been used to understand the past trend and pattern of the economy and predict the future probable growth possible in the light of recent developmental issues. The finding of the trend and pattern of the economy is used to predict rationally the transport demand elasticity applicable to the study road. Thus the perspective growth rate of the economy is predicted and presented in the following Table 4.48, 4.49, 4.50, 4.51, 4.52 & 4.53.

**Table 4.48: Perspective Growth Rate of the Economy (Rest of West Bengal)**

Explanatory Variables	2016-20	2021-25	2026-30	Beyond 30
NSDP	5.0	4.5	4.0	3.6
PCI	4.4	3.9	3.6	3.2
Population	0.6	0.5	0.5	0.4



Table 4.49: Perspective Growth Rate of the Economy (North 24 Pgs)

Explanatory Variables	2016-20	2021-25	2026-30	Beyond 30
NSDP	5.8	5.2	4.7	4.2
PCI	4.0	3.6	3.3	2.9
Population	1.8	1.6	1.4	1.3

Table 4.50: Perspective Growth Rate of the Economy (Kolkata)

Explanatory Variables	2016-20	2021-25	2026-30	Beyond 30
NSDP	6.3	5.7	5.1	4.6
PCI	5.9	5.3	4.8	4.3
Popn (000')	0.4	0.3	0.3	0.3

Table 4.51: Perspective Growth Rate of the Economy (Nadia)

Explanatory Variables	2016-20	2021-25	2026-30	Beyond 30
NSDP	4.5	4.1	3.6	3.3
PCI	3.2	2.8	2.6	2.3
Popn (000')	1.4	1.2	1.1	1.0

Table 4.52: Perspective Growth Rate of the Economy (Howrah)

Explanatory Variables	2016-20	2021-25	2026-30	Beyond 30
NSDP	5.8	5.2	4.7	4.2
PCI	4.6	4.1	3.7	3.3
Popn (000')	1.2	1.1	1	0.9

Table 4.53: Perspective Growth Rate of the Economy (Hooghly)

Explanatory Variables	2016-20	2021-25	2026-30	Beyond 30
NSDP	5.0	4.5	4.0	3.6
PCI	3.8	3.4	3.0	2.7
Popn (000')	1.2	1.1	1	0.9

#### 4.8.9 Expected Future Growth Rate of Traffic

Future growth rate of traffic along the project road is estimated based on expected elasticity values, perspective growth rates of the economies, origin – destination matrix, commodity analysis and proportion of traffic moving from each zone. These factors have all been accounted in derivation of the combined growth factor and utilized for the project sections. The expected future growth rates of traffic are presented in form of three scenarios optimistic, most likely and pessimistic in

Table 4.54



Table 4.54: Expected Future Growth Rates Optimistic, Most Likely &amp; Pessimistic Scenario

Optimistic Scenario					
Vehicle Category	2015	2016 - 20	2021 - 25	2026 - 30	Beyond 30
Car / Jeep	8.3	7.1	5.7	4.6	3.8
3 Wheeler	5.8	4.6	3.6	2.9	2.3
Bus	4.6	3.7	2.9	2.3	1.8
Goods Vehicle	7.2	6.1	4.9	4.0	3.2
2 Wheeler	9.8	8.4	6.8	5.6	4.5
Tractor and Trailer	7.6	6.2	5.0	4.1	3.3
Most Likely Scenario					
Vehicle Category	2015	2016 - 20	2021 - 25	2026 - 30	Beyond 30
Car / Jeep	6.6	5.6	4.5	3.7	3.0
3 Wheeler	4.6	3.7	2.9	2.4	1.8
Bus	3.7	2.9	2.3	1.9	1.4
Goods Vehicle	5.7	4.9	3.9	3.2	2.6
2 Wheeler	7.8	6.7	5.4	4.5	3.6
Tractor and Trailer	6.1	5.0	4.0	3.3	2.6
Pessimistic Scenario					
Vehicle Category	2015	2016 - 20	2021 - 25	2026 - 30	Beyond 30
Car / Jeep	5.3	4.5	3.6	3.0	2.4
3 Wheeler	3.7	2.9	2.3	1.9	1.5
Bus	3.0	2.3	1.8	1.5	1.1
Goods Vehicle	4.6	3.9	3.1	2.6	2.1
2 Wheeler	6.3	5.4	4.3	3.6	2.9
Tractor and Trailer	4.9	4.0	3.2	2.6	2.1

The future traffic is computed based on the growth rates as calculated from the above table.

The traffic forecast based on the most likely scenario is being adopted. However, the traffic for the optimistic & pessimistic scenario is also provided. The traffic forecast based on most likely scenario growth rates is provided in **Table 4.55**.

Table 4.55: Projections of AADT - Most Likely Scenario

Year	Two Wheeler	Three Wheeler / Auto Rickshaw	Car/ Jeep/ Van/ Taxi	Mini	Full	LCV (Mini Truck)	2-Axle Rigid Truck	3-Axle Rigid Truck	Multi-Axle Rigid Truck	Truck Trailer (Artic/ Semi-artic)	Tractor With Trailer	Tractor Without Trailer	Cycle	Cycle Rickshaw	Bullock Cart	Horse Drawn Vehicle	Total Vehicle	Total PCU
2015	6566	978	9018	62	486	2695	2242	1222	195	149	12	4	3379	937	0	0	27945	36361
2016	7006	1014	9523	64	500	2827	2352	1282	205	156	13	4	3548	984	0	0	29477	38225
2017	7475	1052	10056	66	515	2966	2467	1345	215	164	13	4	3725	1033	0	0	31096	40186
2018	7976	1091	10619	68	530	3111	2588	1411	225	172	14	5	3912	1085	0	0	32805	42249
2019	8511	1131	11214	70	545	3263	2715	1480	236	180	15	5	4107	1139	0	0	34610	44420
2020	9081	1173	11842	72	561	3423	2848	1552	248	189	15	5	4313	1196	0	0	36517	46706
2021	9571	1207	12375	73	574	3557	2959	1613	257	197	16	5	4528	1256	0	0	38187	48675
2022	10088	1242	12932	75	587	3695	3074	1676	267	204	17	6	4755	1318	0	0	39936	50729
2023	10633	1278	13514	77	600	3840	3194	1741	278	212	17	6	4992	1384	0	0	41766	52871
2024	11207	1315	14122	78	614	3989	3319	1809	289	221	18	6	5242	1454	0	0	43682	55107
2025	11812	1353	14757	80	628	4145	3448	1879	300	229	19	6	5504	1526	0	0	45688	57439
2026	12344	1386	15303	82	640	4278	3559	1940	310	236	19	6	5779	1603	0	0	47484	59494
2027	12899	1419	15870	83	652	4414	3672	2002	319	244	20	7	6068	1683	0	0	49352	61625
2028	13480	1453	16457	85	665	4556	3790	2066	330	252	21	7	6372	1767	0	0	51297	63836
2029	14086	1488	17066	86	677	4701	3911	2132	340	260	21	7	6690	1855	0	0	53322	66129
2030	14720	1523	17697	88	690	4852	4036	2200	351	268	22	7	7025	1948	0	0	55428	68507
2031	15250	1551	18228	89	700	4978	4141	2257	360	275	22	7	7376	2045	0	0	57281	70570
2032	15799	1579	18775	91	710	5107	4249	2316	370	282	23	8	7745	2148	0	0	59200	72700
2033	16368	1607	19338	92	720	5240	4359	2376	379	290	24	8	8132	2255	0	0	61188	74899
2034	16967	1636	19918	93	730	5377	4473	2438	389	297	24	8	8539	2368	0	0	63246	77169
2035	17567	1666	20516	94	740	5516	4589	2501	399	305	25	8	8965	2486	0	0	65379	79514
2036	18200	1695	21131	96	750	5660	4708	2566	410	313	26	9	9414	2610	0	0	67588	81934



#### 4.9 Capacity

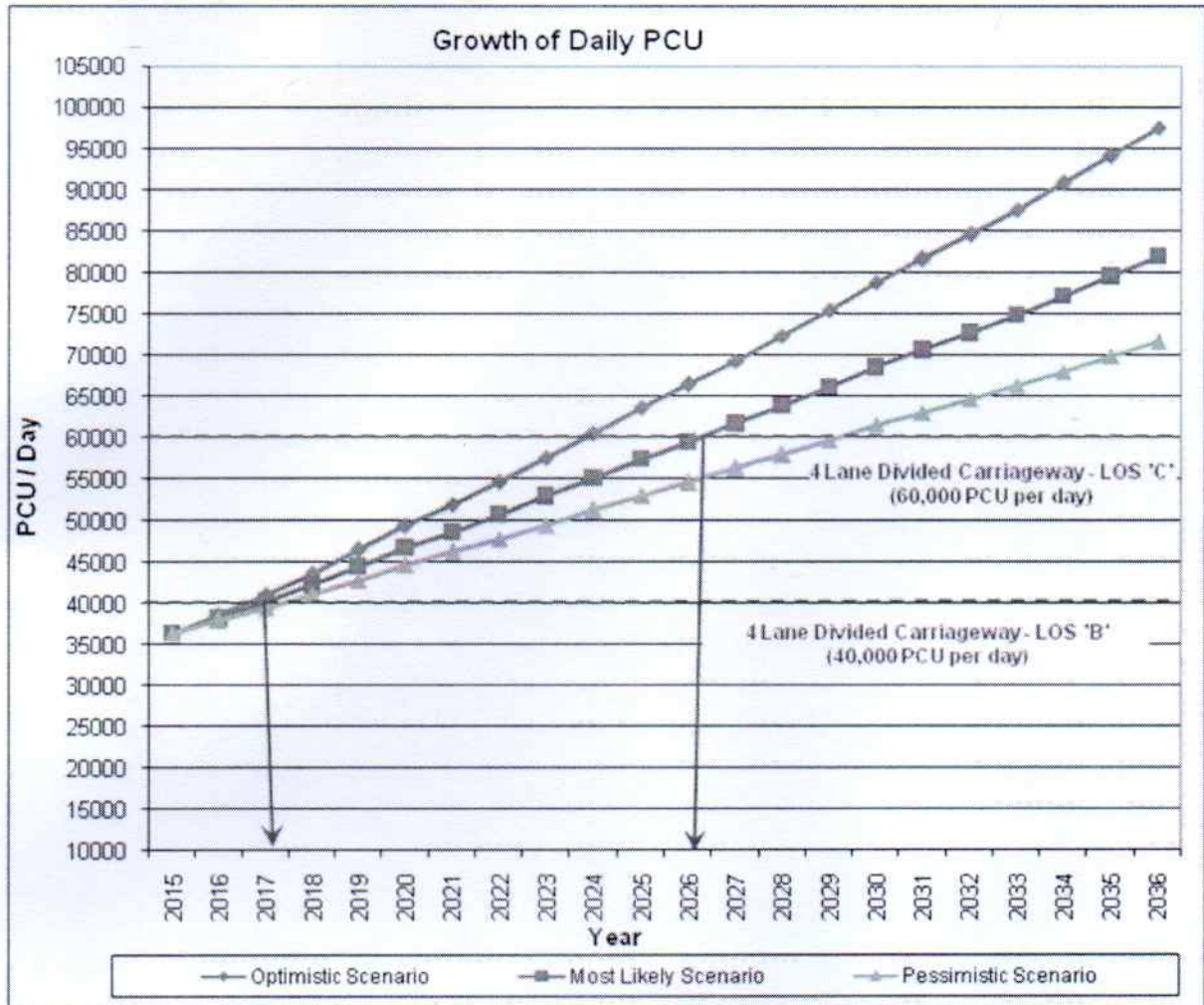
Traffic forecast for the proposed road was based on the Peak Season ADT. For the optimistic scenario, most likely scenario and pessimistic scenario, year wise traffic in PCU is presented in Table 4.56.

**Table 4.56: Summary of Traffic Forecasting on Proposed Road**

Year	Average Daily PCU		
	Optimistic Scenario	Most Likely Scenario	Pessimistic Scenario
2015	36361	36361	36361
2016	38653	38225	37887
2017	41091	40186	39477
2018	43689	42249	41136
2019	46454	44420	42866
2020	49400	46706	44671
2021	51965	48675	46217
2022	54666	50729	47818
2023	57511	52871	49478
2024	60508	55107	51198
2025	63664	57439	52980
2026	66424	59494	54572
2027	69307	61625	56215
2028	72317	63836	57912
2029	75462	66129	59664
2030	78747	68507	61472
2031	81592	70570	63045
2032	84544	72700	64664
2033	87607	74899	66330
2034	90785	77169	68045
2035	94082	79514	69811
2036	97504	81934	71630

The traffic figures on the proposed road for optimistic scenario, most likely scenario and pessimistic scenario, in terms of PCU is presented graphically in Figure 4.31.





**Figure 4.31: Projection of Traffic Volume on Project Road in terms of PCU/Day**

#### 4.10 Conclusion and Recommendations

1. The volume of traffic on the Project Corridor considering diverted traffic from Belgharia Expressway comes to **36361 PCU per day**.
2. **Upgradation of Barrackpore Kalyani Expressway to 2x2 lane divided carriageway with paved shoulders** is proposed as per IRC Codal Specifications.
3. 2x3 lane Two nos. vehicular underpass is proposed at Muragacha More & Barrackpore Wireless More (Mohanpur) with Sodepur – Madhyamgram Road and Barrackpore – Barasat Road respectively.
4. Two nos. major vehicular underpass have been proposed at the junctions locations, viz., Murugacha More (Km 5+142) and Wireless More (Km 13+903). Five nos. vehicular underpass have been proposed at Km 5+140, Km 13+895, Km 25+359,



Km 28+303 and Km 30+379. Seven nos. light vehicular underpass have been proposed at Km 6+725, Km 9+136, Km 12+141, Km 14+875, Km 20+066, Km 29+313 and Km 32+212. Besides. Five nos. pedestrian underpass have also been proposed at Km 10+213, Km 10+900, Km 18+205, Km 21+140 and Km 26+850 due to the schools present at the places.

5. Combined weighted VDF adopted of B K Expressway & Belgharia Expressway is 2.160 & 6.250 respectively.
6. Traffic analysis shows that six lanes may be required in the near future. To reduce the cost of the project at the beginning, four lane facility is proposed. Space has been reserved for future expansion to six lanes. The structures are proposed to be for six lanes. This way, long term sustainability can be maintained.
7. Toll plaza is proposed to be of five lanes in each direction. Manual toll collection in open system is proposed. Over time, one lane in each direction can be converted to electronic toll collection (ETC). Currently, MoRTH is asking for tolled highways to provide ETC. Gradual introduction of ETC will not add to the upfront cost and improvement can be made incrementally.
8. All the culverts are proposed to the full width of the proposed embankment for providing 2 x2 lane carriageway alongwith paved shoulders and both sides service lanes and all medians width in view of future provision of 2 x 3 lane carriageway.

# **Chapter -5 : Engineering Analysis & Design**



## CHAPTER - 5

## ENGINEERING ANALYSIS &amp; DESIGN

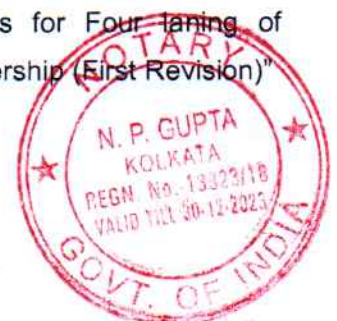
## 5.1 Geometric Design

The project road lies in plain terrain and passing through generally rural as well as urban areas. As such, the geometric standards relevant to plain terrain as per IRC: 73-1990 and IRC: 86-1983 have been adopted.

## 5.1.1 Guiding Standards for Highways

The design of various elements of highways for 6-laning of existing 2-lane road will be governed by the provisions of the following IRC Codes / Guidelines / Manual.

- |       |   |  |
|-------|---|--|
| i)    | IRC: 37-2012 –  | Design of Flexible Pavements for New Carriageway   |
| ii)   | IRC: 38-1998 –  | Guidelines for Design of Horizontal Curves for Highways and Design Tables  |
| iii)  | IRC:62-1976 –   | Guidelines for Control of Access in Highways   |
| iv)   | IRC:64-1990 –   | Guidelines for capacity of Roads in Rural Areas (1 <sup>st</sup> Revision)   |
| v)    | IRC:66-1976 –   | Recommended Practice for Sight Distance in Rural Highways  |
| vi)   | IRC:67-2012 –   | Code of Practice for Road Signs (1 <sup>st</sup> Revision)   |
| vii)  | IRC: 73-1990 –  | Geometric Design Standards for Rural (Non-Urban) Highways.   |
| viii) | IRC: 86-1983 –  | Geometric Design Standards for Urban Roads in Plains.  |
| ix)   | IRC:106-1990 –  | Guidelines for Capacity of Urban Roads in Plain Areas  |
| x)    | IRC:SP:23-1993 –  | Vertical curves for Highways   |
| xi)   | IRC: SP: 41-1994 –  | Guidelines for the Design of At-Grade Intersections in Rural & Urban Areas.  |
| xii)  | MORT & H –  | Pocket book for Highway Engineers, 2002 (2 <sup>nd</sup> Revision)   |
| xiii) | IRC:SP:50-2013 –  | Guidelines on Urban Drainage   |
| xiv)  | IRC:SP:44-1996 –  | Highways Safety Code   |
| xv)   | IRC:SP:19-2001–   | Manual for Survey, Investigation and Preparation of Road Projects  |
| xvi)  | MOST Type Designs for Intersections on National Highways, 1992. |  |
| xvii) | IRC:SP:84-2014 –  | "Manual of Specifications & Standards for Four laning of Highways through Public Private Partnership (First Revision)" |



### 5.1.2 Design Speed

Proposed horizontal alignment mostly follows the existing alignment as far as possible to maintain a design speed of 100 km/hr excepting a few locations where design speed cannot be maintained and the ruling minimum speed of 80 km/hr is maintained. The horizontal and vertical curves have been designed maintaining the codal provision.

The design speed shall be as under depending on site condition and other considerations:

SI Nr	Terrain Type	Design Speed	Ruling Minimum
1.	Plain	100 kmph	80 kmph

### 5.1.3 Horizontal Alignment

Uniformity of design standards is one of the essential requirements of any road alignment. In a given section, there must be consistent application of design criteria to avoid creation of unexpected situations for the drivers. As a general rule, the horizontal alignment should be fluent and blend well with the surrounding topography.

### 5.1.4 Horizontal Curves

The horizontal curves for this project road has been designed in accordance with the requirements as stipulated in IRC:38-1998. Horizontal curves consist of a circular curve flanked by spiral transition curves at both ends.

The transition curves will facilitate gradual application of super-elevation and will ensure smooth entry of vehicles from straight to the circular curve without causing any discomfort to the driver.

Where horizontal and summit vertical curves overlap, the design would provide for required sight distance both in vertical direction along the road and in the horizontal direction on the inside of the curve.

### 5.1.5 Vertical Alignment

The vertical alignment should provide for a smooth longitudinal profile. Grade change shall not be too frequent as to cause kinks and visual discontinuities in the profile. In this regard, directions given in IRC:73 has been kept in view. For design of vertical curves, reference has been followed to IRC:SP:23.

#### 5.1.5.1 Gradient

The vertical alignment will be provided with a smooth longitudinal profile consistent with the terrain through which the road passes. Gradients upto the "ruling gradient" will be used as far as possible in the design. Grade steeper than the "ruling gradient" will be used for a length "as short as possible".



**Table 5.1 : Gradients to be adopted for Roads in Different Terrains (IRC:73-1990)**

Sl. No.	Terrain	Ruling Gradient	Limiting Gradient	Exceptional Gradient
1	Plain or Rolling	3.3% (1 in 30)	5.0% (1 in 20)	6.7% (1 in 15)

**5.1.5.2 Vertical Curves**

Vertical curves will be introduced for smooth transition at grade changes. For satisfactory appearance, the minimum length of vertical curves will be provided based on design speed as detailed below:

**Table 5.2: Minimum Length of Vertical Curves (IRC: 73-1990)**

Design Speed (km/hr)	Maximum grade change (per cent) NOT requiring a vertical curve	Minimum length of Vertical Curve (meters)
100	0.5	60
80	0.6	50

In the approaches of the bridges suitable vertical curves will be provided as per provisions of relevant IRC Codes. Decks of small cross-drainage structures (i.e. culverts and minor bridges) will be given the same profile as the flanking road section with no break in the grade line.

**5.2 Pavement Design****5.2.1 General**

The project envisages widening to 4 lane divided carriageway alongwith Paved Shoulders from the existing two-lane carriageway.

The pavement design activities include Design of new pavement for the additional 2 lane carriageway alongwith Paved Shoulder and reconstruction of the existing carriageway 2 lane standards alongwith Paved Shoulder with a central Median in between both carriageway. Service roads are also to be constructed in built up areas and as per site requirement.



## 5.2.2. Design of Flexible Pavement for New Construction

### i) CBR of Subgrade

As per Clause 5.1.1.2 of IRC:37-2012 the design CBR should be 90th percentile value of the sub-grade CBR values. For the existing main carriageway, proposed carriageway and left service road, where soil have been found during the trial pit investigation & after laboratory testing the 90th percentile of CBR values is calculated and the values are provided in Table 18 & graphically presented in Figure 4.

Table : Calculation of the Percentile CBR Value

CBR Values in Ascending Order	No. of Values that are greater than or equal to corresponding CBR value	Percentile Value
4.1	21	100.0
4.1	21	100.0
4.2	19	90.5
4.3	18	85.7
4.3	18	85.7
4.3	18	85.7
4.4	15	71.4
4.4	15	71.4
4.4	15	71.4
4.4	15	71.4
4.5	11	52.4
4.6	10	47.6
4.6	10	47.6
4.6	10	47.6
4.7	7	33.3
4.7	7	33.3
4.7	7	33.3
4.9	4	19.0
5.0	3	14.3
5.3	2	9.5
5.8	1	4.8



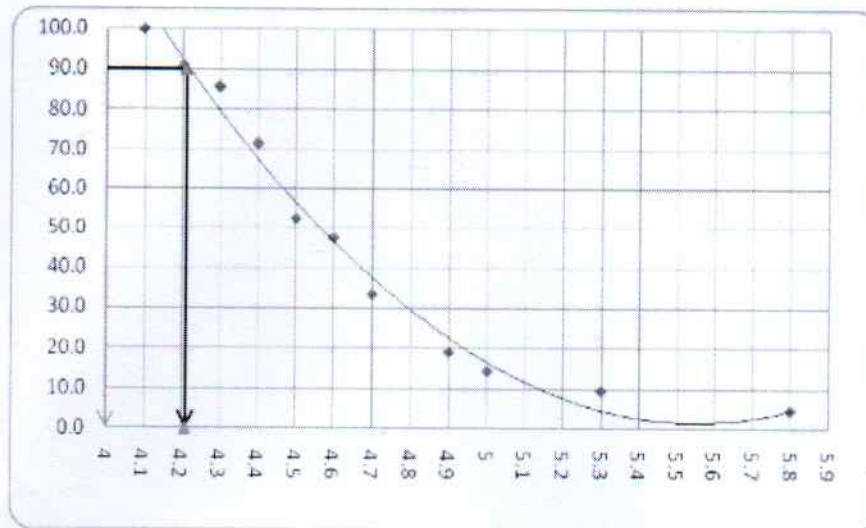


Figure 4 : Determination of 90<sup>th</sup> Percentile of CBR Values for Subgrade Soil

**Sand fly –Ash Mixture for the proposed Subgrade:**

It is being observed from the laboratory test results of the subgrade soil that the CBR at 90th percentile is less than 8. Thus the possibility of blending the fly ash / pond ash with sand is being explored.

The Consultants have collected samples of pond ash from the Bandel Thermal Power station. For the construction of the embankment and subgrade works, the possibility of the use of flyash had been explored. This is because as per MoRT&H letter no. RW/NH-33044/30/2001 – S&R (R) dated 30.07.2003 Letter No. RW/NH-33044/30/2001 – S&R (R) dated 4th December 2003, the use of pond ash within a radius of 100 km is mandatory. Accordingly, the Consultants have collected samples from Bandel Thermal Power Station (BTPS) at Triveni at a distance of approximately 20 kms from the project end point. Maximum use of pond ash in embankment and also in the subgrade works by blending with sand has been proposed. Use of fly-ash is suggested from environmental point of view also. The laboratory properties of the same are given below in Table 19.

Table 19 : Laboratory Properties of Fly-ash

Sample No	Max Dry Density (gm/cc)	Optimum Moisture Content (%)	Soaked CBR at 97% of MDD (%)
1	1.18	9.00	8.0
2	1.19	8.50	9.0
3	1.20	8.00	10.0

90<sup>th</sup> percentile of these CBR values will be used as the CBR value for fly-ash. We get it from the Figure 5.



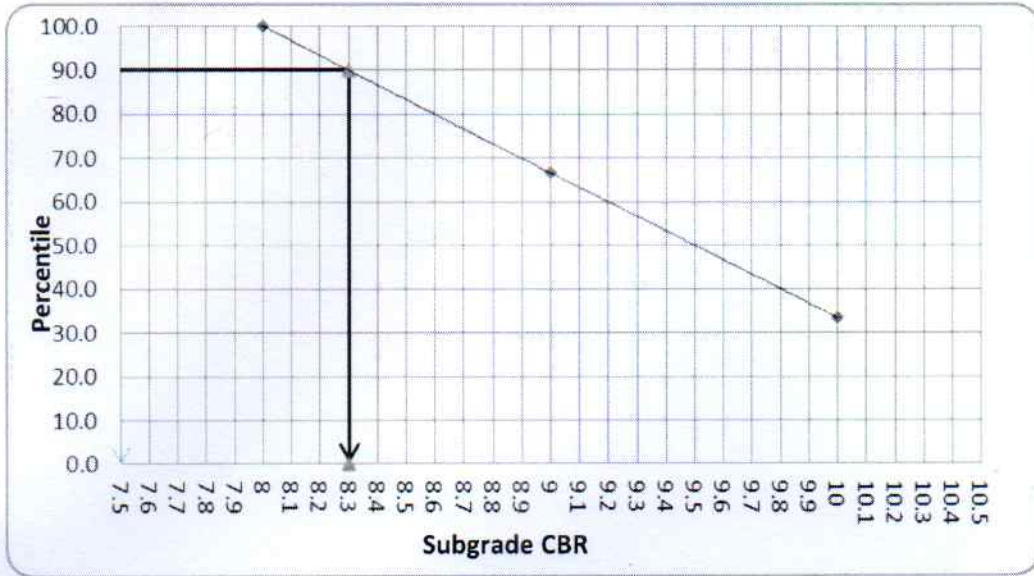


Figure 5 : Determination of 90<sup>th</sup> Percentile of CBR Values for Fly-ash

Thus CBR of fly-ash is adopted as 8.3%.

Sand has also been collected from the Kotulpur near Arambagh and the Zone type observed is Zone- II.

Table 20 : Determination of Fineness Modulus of Sand

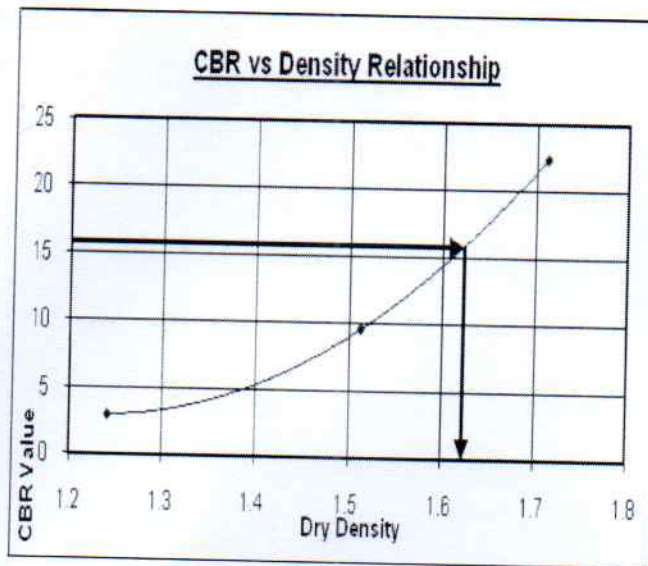
SIEVE SIZE (mm.)	WEIGHT OF SAND RETAINED (gm.)	% OF WEIGHT RETAINED (%)	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
10.000	0.00	0.00	0.00	100.00
4.750	32.58	32.58	6.52	93.48
2.360	74.11	106.69	21.34	78.66
1.180	98.28	204.97	40.99	59.01
0.600	86.89	291.86	58.37	41.63
0.300	83.85	375.71	75.14	24.86
0.150	42.50	418.21	83.64	16.36
0.075	15.70	433.91	86.78	13.22
SUM (Excluding 0.075mm) =			286.00	

$$\text{FINENESS MODULUS} = \frac{\text{SUM}}{100} = 2.86$$

CUMULATIVE % PASSING AT  
600 micron = 41.63%  
Thus, its zone = zone - II

Blending of the fly ash and Sands (Zone II) in different proportions and trials have been carried out and finally the ratio of 50 % sand and 50 % fly ash have been adopted.





97% of 1.672 = 1.622 gm/cc

CBR at 97% Dry Density = 15.8

Thus the 4 days soaked CBR calculated for **Fly-ash : Yellow Sand (50:50)** Mixture is **15.8%**. This blending of fly ash and sand in the derived ratio is being proposed for use in the subgrade material of the proposed project corridor.

### iii) Calculation of Effective CBR:

Design of flexible pavement for new construction will be done based on **effective CBR** between following layers

- For Main Carriageway
  - i) Fly-ash (8.3% CBR) and
  - ii) Fly-ash & Yellow Sand mixture (50:50) (15.8% CBR).
- For Service Road
  - i) Subgrade soil (4.2% CBR) and
  - ii) Fly-ash (8.3% CBR).

This will be done following "IRC: 37:2012, Tentative Guidelines for the Design of Flexible Pavement) "with the latest MORTH circulars. As per Clause 5.2 of IRC:37-2012 effective CBR has been calculated from the **Figure 7**.



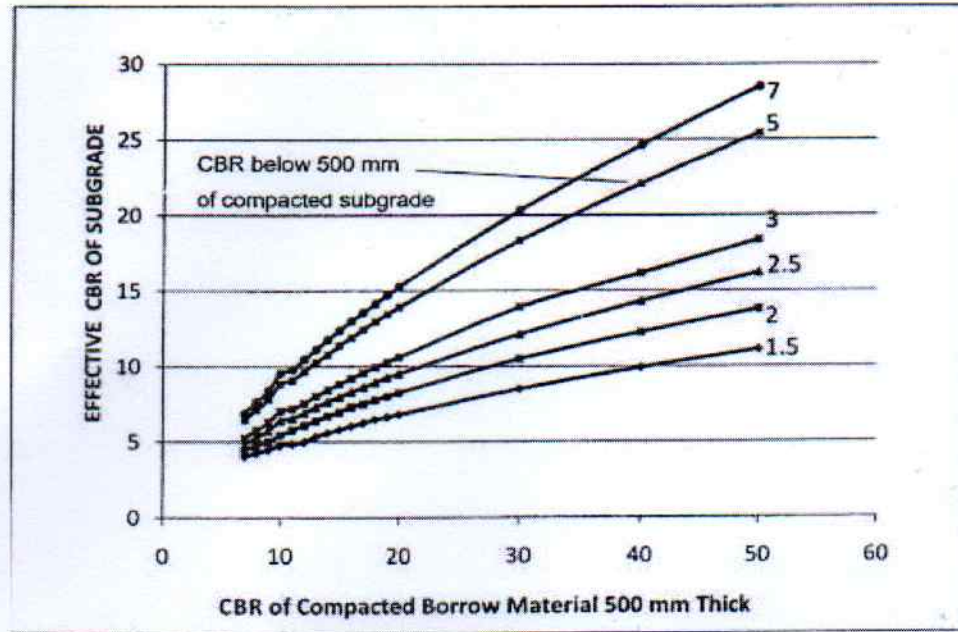


Figure 8 : Effective CBR of Subgrade

Effective CBR found from Figure 7 has been adopted as Design CBR as follows.

- ✓ Thus Design CBR adopted for the proposed Main Carriageway is 12.0%.
- ✓ Thus Design CBR adopted for the proposed Service Roads is 6.2%.

### iii) Design Life

The design life for flexible pavement is considered 15 years.

### Homogeneous Sections

The Project road can be broadly divided into two homogeneous sections from the Traffic Volume & Subgrade Soil type criteria. From the starting point, Muragacha More at km 4.565 km to Barrackpore Wireless More (km 13.903) is Homogeneous Section I & from Barrackpore Wireless More (km 13.903) to Kampa More (Km 34.000) is Homogeneous Section II. These are two different sections having separate existing Toll plaza operated by at present.

From the subgrade soil criteria, the subgrade soil type in the Homogeneous Section I consisted of silver sand and in Homogeneous Section II as soil (clayey silt).

Homogeneous Sections (HS)	From (km)	To (km)	Length (km)
HS - I	Km 4.565	km 13.903	9.338
HS - II	km 13.903	Km 34.000	20.097



However, considering the diverted traffic from Belgharia Expressway, and to maintain an uniformity of in construction, a single homogeneous section has been considered for the whole stretch of the project corridor length of 29.435 km. Moreover, the whole project corridor over the full formation width requires a raising from the HFL point of view. The raise in the embankment portion is done by flyash and the new subgrade is to be constructed by sand – flyash mixture. Thus, from soil subgrade point of view also, a single homogeneous section is being adopted.

### Calculation of Design MSA

The Design MSA is summation of MSA for (a) the Project Road and (b) MSA from Diverted Traffic from the Belgharia Expressway after completion of the connectivity.

#### A. For Project Road:

##### Computation of Design Traffic [As per Cl. 4.6.1 of IRC:37-2012] :

Design traffic in terms of Cumulative Number of Standard Axles to be carried during the design life of the road in terms of MSA,

##### Calculated MSA without considering Induced Traffic

$$N = \frac{365 \times [(1 + r)^n - 1]}{r} \times A \times D \times F$$

Where :

**N = Cumulative number of standard axles to be catered for the design in terms of MSA.**

**A =** Initial traffic in the year of completion of construction in terms of the number of Commercial Vehicles Per Day (CVPD). = 4663

**D =** Lane Distribution Factor (LDF). (For Dual two-lane carriageway) = 0.375

**F =** Vehicle Damage Factor (VDF). = 2.16

**n =** Design life in years. = 15

**r =** Annual growth rate of commercial vehicles (5.24%) in decimal. = 0.0524

The Traffic in the year of completion (A) is estimated using the following formula :

$$A = P (1 + r)^x = 4210 \times (1 + 0.0524)^2 = 4663$$

Where :

**P =** CVPD as per last count. = 4210



$$x = \text{Number of years between the last count and the year of completion of construction.} = 2$$

Therefore :

$$\begin{aligned} N &= \frac{365 \times [(1 + 0.0524)^{15} - 1]}{0.0524} \times 4663 \times 0.375 \times 2.16 \\ &= 30291600 \text{ ESA} \\ &= 30.29 \text{ MSA} \\ \text{Say} & \quad \quad \quad \mathbf{31 \text{ MSA}} \end{aligned}$$

#### B. For Diverted Traffic from Belgharia Expressway:

Computation of Design Traffic [As per Cl. 4.6.1 of IRC:37-2012] :

Design traffic in terms of Cumulative Number of Standard Axles to be carried during the design life of the road in terms of MSA,

#### Calculated MSA considering Diverted Traffic

$$N = \frac{365 \times [(1 + r)^n - 1]}{r} \times A \times D \times F$$

Where :

<b>N</b>	=	<b>Cumulative number of standard axles to be catered for the design in terms of MSA.</b>	
<b>A</b>	=	Initial traffic in the year of completion of construction in terms of the number of Commercial Vehicles Per Day (CVPD).	= 3159
<b>D</b>	=	Lane Distribution Factor (LDF). (For Dual two-lane carriageway)	= 0.375
<b>F</b>	=	Vehicle Damage Factor (VDF).	= 6.25
<b>n</b>	=	Design life in years.	= 15
<b>r</b>	=	Annual growth rate of commercial vehicles (5.24%) in decimal.	= 0.0524

The Traffic in the year of completion (**A**) is estimated using the following formula :

$$A = P (1 + r)^x = 2852 \times (1 + 0.0524)^2 = 3159$$

Where :

<b>P</b>	=	CVPD as per last count.	= 2852
<b>x</b>	=	Number of years between the last count and the year of completion of construction.	= 2

Therefore :

$$\begin{aligned} N &= \frac{365 \times [(1 + 0.0524)^{15} - 1]}{0.0524} \times 3159 \times 0.375 \times 6.25 \\ &= 59378975 \text{ ESA} \\ &= 59.38 \text{ MSA} \\ \text{Say} & \quad \quad \quad \mathbf{60 \text{ MSA}} \end{aligned}$$

#### i) Design of Flexible Pavement



Design of flexible pavement for new construction will be done following "IRC: 37:2012 Tentative Guidelines for the Design of Flexible Pavement), "with the latest MORTH circulars. The Design Traffic as achieved is **31 MSA** for the Project Road & **60 MSA** for Diverted Traffic from Belgharia Expressway. The design traffic is summation of Traffic of the Project Road & contribution from Belgharia Expressway and adopted as  $(60 + 31 = 91 \text{ MSA})$  say **100 MSA**.

**Table 5.3: Pavement Composition of Main Carriageways (as per IRC: 37:2012)**

**A) For Main Carriageway**

- Design CBR : 12%
- Design Traffic : 100 MSA

The thickness of different pavement layers are shown in **Plate 7 & Plate 8** under Clause 10 of IRC:37-2012. The values are as follows:

As per Plate 7		As per Plate 8	
CBR	10 %	CBR	15 %
Traffic	100 MSA	Traffic	100 MSA
BC (VG-40)	50 mm	BC (VG-40)	50 mm
DBM (VG-40)	110 mm	DBM (VG-40)	80 mm
Base course	250 mm	Base course	250 mm
Sub-base course	200 mm	Sub-base course	200 mm

By interpolating these data pavement thickness for 12% CBR and 100 MSA comes as:

BC (VG-40)	50 mm
DBM (VG-40)	98 mm
Base course	250 mm
Sub-base course	200 mm
Total	598 mm

However considering drainage criteria IRC code recommends sub-base layer of minimum 300 mm. Also to provide a separation layer (below the drainage layer), a layer of 150mm Grade V is proposed to prevent intrusion of sub grade soil into the pavement and to protect the sub grade from overstressing and this layer will act as filter layer. As a result 100 mm additional thickness in GSB has been involved for providing 2x150 GSB instead of 200mm as suggested in Plate 6 under Clause 10 of IRC37-2012.

**Hence the proposed pavement composition for the main carriageways adopted is given in Table 24.**



Table 24 : Pavement Composition of Main Carriageways

Total Pavement Thickness (mm)	Pavement Composition				
	Bituminous Surfacing		Granular Base - WMM	Granular Sub-base GSB	
	BC (VG 40)	DBM (VG 40)		Drainage Layer (Grading III)	Separation Layer (Grading V)
700 mm	50 mm	100 mm	250 mm	150 mm	150 mm

Table 5.4: Pavement Composition for Service Roads (as per IRC: 37:2012)

## B) For Service Roads

- Design CBR : 6.2%
- Design Traffic : 10 MSA

The thickness of different pavement layers are shown in Plate 4 & Plate 5 under Clause 10 of IRC:37-2012. The values are as follows:

As per Plate 4		As per Plate 5	
CBR	6 %	CBR	7 %
Traffic	10 MSA	Traffic	10 MSA
BC (VG-30)	40 mm	BC (VG-30)	40 mm
DBM (VG-30)	65 mm	DBM (VG-30)	60 mm
Base course	250 mm	Base course	250 mm
Sub-base course	260 mm	Sub-base course	230 mm
By interpolating these data pavement thickness for 6.2% CBR and 10 MSA comes as:			
	BC (VG-30)	40 mm	
	DBM (VG-30)	64 mm	
	Base course	250 mm	
	Sub-base course	254 mm	
	Total	608 mm	

Hence the proposed pavement composition for the service roads adopted is given in Table 25.

Table 25 : Pavement Composition for Service Roads

Total Pavement Thickness (mm)	Pavement Composition				
	Bituminous Surfacing		Granular Base - WMM	Granular Sub-base GSB	
	BC (VG 30)	DBM (VG 30)		Drainage Layer (Grading III)	Separation Layer (Grading V)
655 mm	40 mm	65 mm	250 mm	150 mm	150 mm

## C) Design of Rigid Pavement

Rigid Pavement Design has been done as per IRC:58-2011 for proposed toll plaza area. A comparative Fatigue Damage values for different trial thicknesses is given in Table 26.



Table 26 : Comparative Cumulative Fatigue Damage Values for Different Trial Thicknesses

Trial Thickness of Slab (m)	CFD for BUC Case			CFD for TDC Case				Remarks
	Due to Rear Single Axles	Due to Rear Tandem Axles	Total CFD	Due to Rear Single Axles	Due to Rear Tandem Axles	Due to Rear Tridem Axles	Total CFD	
0.250	14.1607	0.1287	14.2893	0.0300	0.0100	0.0000	0.0400	Design is Unsafe
0.275	1.1439	0.0098	1.1537	0.0027	0.0008	0.0000	0.0035	Design is Unsafe
0.277	0.9572	0.0077	0.9649	0.0022	0.0006	0.0000	0.0028	Design is Safe

Hence proposed slab thickness for rigid pavement is adopted as 0.300 m.

### 5.3 Bridges & Culverts

#### (a) Culvert Width

The overall width of the culverts shall be of full width of the embankment including main carriageways and service roads, median etc.

#### (b) Loading Standard

- i) All structures will be designed for 2 lanes of IRC class A and single lane of class 70-R whichever produces worst effect.
- ii) LL on footpath will be taken as 5 kN/m<sup>2</sup>
- iii) Environmental loadings such as earth pressure, water current, seismic forces and wind load effect etc. will be taken as per relevant IRC/BIS Codes.

#### (c) Guiding Standards for Structures

The Structural planning of new bridges or culverts will be dominantly guided by the existing structures.

The designs of proposed structures will be carried out in accordance with the provisions of the following IRC Codes/guidelines.

- i) IRC-SP-13 Guidelines for the design of small bridges and culverts.
- ii) IRC-5-1998 Section I, General Features of Design
- iii) IRC-6-2014 Section II, Loads and Stresses
- iv) IRC-21-2000 Section III, Cement Concrete (Plain & Reinforced)
- v) IRC-78-2000 Section VII, Foundations and Substructures
- vi) IRC-83-2002 Section IX (Part III), POT Bearings
- vii) IRC-89-1997 Guidelines for design and construction of river training works for road bridges.



viii) MoRTH's Standard drawings for RCC T-beam Slab Type Superstructure & RCC Solid slab Type Superstructure.

**(e) Sub Soil Parameters**

The subsoil parameters used in the design of foundations for the culverts & the proposed 2 nos. vehicular underpasses will be adopted from the sub soil investigation currently conducted by the Consultant.

**(f) Hydraulic Design :**

For the cross drainage structures, both the empirical and rational analytical approach as detailed out in **IRC-SP-13** will be used to check the adequacy of the waterways provided.

**(g) Foundations:**

All the culverts to be newly constructed will be Box type.

**(i) Superstructure:**

i) CD/ Box structures of same type and same span will be adopted for all the new culverts, for widening and for replacement.

**ii) Crash barrier:**

Reinforced concrete of M-40 grade concrete will be provided.

**iii) Expansion joints:**

Strip-seal type expansion joints as per MOST standard will be used.

**iv) Wearing Course :**

Wearing coat shall consist of 40mm thick Bituminous concrete in single layer followed by 25 mm thick mastic asphalt layer.

**v) Approach slab :**

R.C. approach slabs, 3.50m long and 300mm thick in M-30 concrete will be provided at either end of the culverts to ensure riding comfort and reduce vehicular surcharge on the abutment walls. A leveling course of 150mm thick in M-15 grade concrete will be provided under the approach slab.

**vi) Drainage Spouts**

100mm  $\phi$  drainage spouts will be provided for deck slab on either side of the carriageway in each span in a staggered manner as per MORTH standard drawing.

**vii) HYSD Reinforcement**

Fe-415/Fe 500 high yield strength deformed bars conforming to IS-1786 & mild steel of grade Fe-250 conforming to IS-432(Part-II) will be used as



reinforcement in all R.C. works. All structural steel shall be conformed to Fe 410 WA confirming to IS-2062:1999.

#### 5.4 Design of Vehicular Underpass

Design Standards have been clearly identified and enumerated for evolving a comprehensive design philosophy, which has covered all aspects of design for various parts of the Vehicular Underpass structures viz. Superstructure, substructure, foundation, R.E. Wall & R.C. Retaining Wall. The design philosophy is primarily based on relevant IRC codes of practices (prescribed for design, execution, maintenance and safety during construction & service), IRC specifications, latest guidelines and circulars of NHAI and relevant Bureau of Indian Standards (BIS).

The design philosophy has included but not limited to the following:

- Width of carriage and number of lanes
- Design speed
- Materials – concrete, steel, etc.
- Live loads
- Seismic effect
- Wind effect
- Temperature gradient and climatic condition
- Safe bearing capacity and soil parameters
- Methodology for Analysis & Design
- Bearings, Expansion joints and wearing coarse

##### (a) Broad Features

- The overall width of the VUP have been kept such that the outer most edge of the VUP be in the same line with the outer most edge of the approach roadway. Width of carriageway on each VUP have been kept 2 x 10.5 m (excluding 2 x 0.30 m channel) with 0.75 m for crash barrier etc at both sides making over all width of VUP 12.00 meter. Two nos. of such width of VUP are running parallel having a clearance of 0.60 m to match with the existing roadway width.

##### (b) Loading Standard

- iv) All bridge/VUP structures have been designed for 3 lanes of IRC class A or one lane of class 70-R Track/Wheel with one lane of IRC Class A (as per IRC: 6) whichever produces worst effect.
- v) Environmental loadings such as earth pressure, seismic forces and wind load effect etc. have been taken in to account as per IRC: 6 – 2014.



**(c) Guiding Standards for Structures**

The designs of proposed structures have been carried out in accordance with the provisions of the following IRC Codes/guidelines.

- ix) IRC-5-2015 Section I, General Features of Design
- x) IRC-6-2014 Section II, Loads and Stresses
- xi) IRC-112 - 2011 , Cement Concrete design
- xii) IRC : SP: 105 -2015, Explanatory Hand Book of IRC: 112
- xiii) IRC-21-2000 Section III, Cement Concrete (Plain & Reinforced)
- xiv) IRC:22- 1986 Section VI , Composite construction
- xv) IRC-24-2001 Section V , Steel Road Bridges
- xvi) IRC-78-2014 Section VII, Foundations and Substructures
- xvii) IRC-83-2002 Section IX (Part III), POT Bearings
- xviii) MoRT&H's Standard drawings for drainage spout, etc.
- xix) P.W.(R) Department, N.H. wing , GOWB's schedule of Rates for Road & Bridge works.

**(d) Seismic Design**

The VUP falls in Seismic Zone III, as per the classification specified in IRC-6-2014. So, the VUP has been designed for seismic forces as per criteria mentioned in the IRC-6-2014.

**(e) Sub Soil Parameters**

The subsoil parameters used in the design of foundations for the VUPs have been taken from the Geotechnical Investigation Report.

**(f) Foundations:**

For the portion of the VUP with arch span of 50.0 metre, cast-in-situ R.C.C bored piles of 1200 mm dia have been used and for others the same of 1000 dia have been used. The loads from superstructure and substructure have been assessed from various load cases and combinations to arrive at a critical condition for design. The stability and safety design has been done as per guide line of relevant IRC / IS codal provisions.

**(g) Substructure:**



For the arch span three nos. of pier of size 2.0 m x 2.0 m each, over three nos of separate pile caps with common pier cap have been used. Maximum cantilever length of pier cap is 3.05 metre. Others piers are with single pier supporting one 12.0 metre width superstructure over pile cap. Two nos of such piers over separate pile cap run parallel to each other. The abutments are too in the similar fashion like piers with one side having composite span of 30.40 metre each and the other side is supporting the approach slab of 3.50 metre each. The approach slab being supported over bracket of abutment at one side is supported over the filling behind R.E. wall on the other side.

**(h) Superstructure:**

All superstructures, except approach slab, are of composite style with RCC deck over structural steel long & cross girders in addition to arch truss at the mid 50.0 m span only. The mid span of 50.0 metre is having a clear vertical clearance of 5.50 metre above FRL of the road below VUP. The remaining spans are of 30.40 m each with necessary vertical curve.

**5.4.1 Salient features of the Proposed Structure:**

A salient features and section of proposed VUP have been summarized as follows.

**Table : 5.5- Salient features of the Proposed Vehicular Underpass**

1.	Location of VUP	Muragacha & at Wireless More
2.	<b>Vehicular Underpass Details:</b>	
	(A) Chainage	Km 0.00 & Km 8.754
	(B)Span Arrangements	Bridge proper 1 x 50.96 m (c/c support) with Structural Steel Arch Superstructure. Viaduct 2x 3x 31.36 ( c/c of supports)
	(C)Type of Superstructure. (i) Carriageway width (ii) Width of crash barrier etc (iii) Over all width of VUP	Composite superstructure with structural steel girders with RCC slab at top. 10.5m x 2 0.75 m x 2x 2 24.0 m
	(D)Substructure	Pier I : 2m x 2 m 3 nos. of pier with common pier cap Pier II : 2 x 2 m pier two nos. with separate pier cap Abutment cum pier : 2.0m x 2..0m pier two nos. with separate pier cap
	(E)Foundation	With cast-in-situ RCC bored piles of 1200 mm/1000 mm dia piles with pile caps individual for each pier.



	(F) Bearing	POT cum PTFE bearing
	(G) Wearing course	65 mm WC consisting of 25mm thick Bituminous Mastic over 40mm thick Bituminous macadam.
	(H) Expansion joint	Slab seal/Strip seal expansion joint
	(I) Grade of concrete	All RCC except RC retaining wall – M35 , R.C retaining wall – M25 , PCC – M15 (1:2:4)
	(J) Grade reinforced steel	Fe 500
	(K) Grade of structural steel	E250 (Fe410 WB)
3.	Approach ramp	Reinforced Earth Retaining wall with maxm. ht of 6.395 m & minm. ht of 2.0 m. The remaining length of approach ramp is of RCC retaining wall.

The GAD of the 02 nos. proposed VUPs is presented in **Figure 5.1 (4 sheets)**.

### 5.5 Design of Pedestrian Underpass

To provide facility to pedestrians at major intersections and at locations of the present schools beside the road, ten (10) pedestrian underpasses (PUPs) have been proposed in this report. The length of the PUP is generally from one side footpath (Beside service road) to other side footpath i.e. of 49.00 m / 55.00 m length of each. Size of the PUP of 5.00 m x 3.00 m each along with stairs at entry and exit end.

The list of the locations of the PUPs is provided below in **Table 5.6**

**Table 5.6 – List of locations of PUPs chainage wise.**

Sl. No.	Design Chainage (Km.)	Span Arrangement (m)	Type of Super-structure	Width
1	10+213	10.5	RCC Box	10.5m x 2
2	10+900	10.5	RCC Box	10.5m x 2
3	18+205	10.5	RCC Box	10.5m x 2
4	21+140	10.5	RCC Box	10.5m x 2
5	26+850	10.5	RCC Box	10.5m x 2

The GAD of the PUPs is provided in **Figure 5.2 (2 sheets)**.



## **Chapter -6 : Improvement Proposal**



## IMPROVEMENT PROPOSAL

## 6.0. General

This chapter essentially brings out the project development proposals are presented in detail in subsequent paragraphs.

## 6.1. Project Development Proposal

## ➤ Typical Cross section

**Existing Features:** Average width of the existing carriageway has been found as 7.0 m with 1.00m to 1.5m hard / earthen shoulder on either side.

**Improvement Proposal:** Four (4) lane divided carriageway along with 2.00m width paved shoulder with a central median width of 9.00 m and intermediate median of 2.50 m (from km 0.00 to km 8.00) & 4.50 m (from km 8.00 to 29.230) width have been provided in between main carriageway and service road. The proposed cross-sections are conceived essentially to accommodate the proposed road within the available ROW so that no land acquisition is required. In general, the proposed cross-section comprises of 7.00 m wide carriageway alongwith 2.00m wide paved shoulder having 2.5% one-directional camber separated with a raised median having width of 9.0m. *The central median of 9.00 m is provided to accommodate the provision for future widening to 6 lane standards, so that no further land acquisition is necessitated.*

Eight different typical cross sections have been proposed for upgrading the project road. The following **Table 6.1** presents the proposed cross sections and widening scheme adopted for the project.

Table 6.1: Chainage wise Cross Section Type

Sl. No.	Design Chainage (km)		Length (km)	TCS Type	Remarks
	From	To			
1	4565	4799	234	Figure 28	Chainages as indicated is as per chainage along proposed Kalyani Expressway considering 0+000 chainage at junction of
2	4799	5487	688	Figure 23	
3	5487	5687	200	Figure 28	
4	5687	6264	577	Figure 18	
5	6264	6464	200	Figure 28	
6	6464	6980	516	Figure 26	
7	6980	7180	200	Figure 28	
8	7180	8216	1036	Figure 19	



Sl. No.	Design Chainage (km)		Length (km)	TCS Type	Remarks
	From	To			
9	8216	8650	434	Figure 18	Belgharia Expressway and Dum Dum - Barrackpur - Kalyani Expressway
10	8650	8847	197	Figure 28	
11	8847	9416	569	Figure 26	
12	9416	9979	563	Figure 26	
13	9979	10444	465	Figure 26	
14	10444	10673	229	Figure 28	
15	10673	11131	458	Figure 26	
16	11131	11331	200	Figure 28	
17	11331	11676	345	Figure 20	
18	11676	11876	200	Figure 28	
19	11876	12393	517	Figure 26	
20	12393	12593	200	Figure 28	
21	12593	13344	751	Figure 20	
22	13344	13544	200	Figure 28	
23	13544	14210	666	Figure 24	
24	14210	14628	418	Figure 29	
25	14628	15122	494	Figure 27	
26	15122	15322	200	Figure 29	
27	15322	15741	419	Figure 22	
28	15741	16441	700	Figure 21	
29	16441	16741	300	Figure 22	
30	16741	17771	1030	Figure 21	
31	17771	17971	200	Figure 29	
32	17971	18435	464	Figure 27	
33	18435	18635	200	Figure 29	
34	18635	19606	971	Figure 21	
35	19606	19806	200	Figure 29	
36	19806	20321	515	Figure 27	
37	20321	20904	583	Figure 29	
38	20904	21393	489	Figure 27	
39	21393	21593	200	Figure 29	
40	21593	23891	2298	Figure 21	
41	23891	24291	400	Figure 25	
42	24291	24818	527	Figure 21	
43	24818	25018	200	Figure 29	
44	25018	25683	665	Figure 27	
45	25683	25883	200	Figure 29	
46	25883	26418	535	Figure 21	
47	26418	26618	200	Figure 29	



Sl. No.	Design Chainage (km)		Length (km)	TCS Type	Remarks
	From	To			
48	26618	27080	462	Figure 27	
49	27080	27280	200	Figure 29	
50	27280	27767	487	Figure 21	
51	27767	27967	200	Figure 29	
52	27967	28633	666	Figure 27	
53	28633	29061	428	Figure 29	
54	29061	29562	501	Figure 27	
55	29562	30052	490	Figure 29	
56	30052	30663	611	Figure 27	
57	30663	30863	200	Figure 29	
58	30863	31764	901	Figure 21	
59	31764	31964	200	Figure 29	
60	31964	32471	507	Figure 27	
61	32471	32671	200	Figure 29	
62	32671	34000	1329	Figure 21	

The proposed typical cross sections (TCS) for the different stretches of the project road are provided in **Figure 6.1 to Figure 6.8**.

#### > Widening Proposal

Under the previous contract of KMDA the project road was being taken up for widening on the right hand side with a 2 lane carriageway at the RHS of the existing carriageway and service roads on both sides were started for about 7.00 km length from 15.5 kmp in different stretches haphazardly which was finished to the level to either GSB or to WMM layers. Keeping in mind the previous works, in this proposal generally the road is widened concentrically. Considering traffic growth rate, proposal for (4 lane) 2 x 2 lane carriageway along with 2.00m wide paved shoulder both side service roads (length as required as per habitations, markets, petrol pumps etc) and medians in between both carriageways and in between carriageway and service roads have been made in this project. But at places like between km 5.142 to km 9.142 where the MS water pipe (1400 mm dia) line exists on the RHS at a distance of 16.00m to 20.00m from the centre of existing black top, the road is being widened by shifting the centre line of the existing carriageway on the left hand side to avoid interference with the pipe line. Similarly, there is 2.50m wide 700m long kutcha drain at LHS prior to the junction with Barrackpore – Barasat Road with a lock gate at starting point for which the alignment has been proposed by shifting the centre line of the existing carriageway to RHS. Similarly, the kutcha drain is proposed to RC pucca drain of 2.50 m wide with RCC cover for using it as



footpath there. For improvement of the intersection, lock gate is proposed to be shifted to a suitable location and necessary cost of shifting of the lock gate is included in the DPR as lump sum cost.

Extra widths of pavement in each carriageway have been provided at two locations where the length of the curve is less than or nearly 300 m. The details of the locations are provided in **Table 6.2**.

**Table 6.2 - Location of Extra Width of Pavement in Each Carriageway**

Chainage (Km)		Length (m)	Extra Widening (m)	Side	Length of Radius (m)
From	To				
11+392	11+707	315	0.6	Both	240
15+407	15+882	475	0.6	Both	325
<b>Total</b>		<b>790</b>			

➤ **Horizontal & Vertical Alignment**

Proposed horizontal alignment mostly follows the existing alignment as far as possible to maintain a design speed of 100 km/hr. The horizontal and vertical curves have been designed maintaining the codal provision. The profile has been raised through out the alignment as it is found necessary from the high flood level / ponding level along the road.

➤ **Construction of the Service Road**

In built up areas, 25775 metre (Both side) Service road have been provided in stretches on both side of the main carriageway except few stretches where there is no necessary of providing carriageway. Generally 7.00 m wide carriageway width is provided with one side raised median of 2.50m/ 4.50 m. The width of the carriageway in service road is reduced to 5.50 m at places where sufficient ROW is not available.

➤ **Improvement of the At Grade Intersection**

Vehicular underpass of width 2 m x 12.60 m & having 600 mm clearance between two and Vertical clearance of 5.0 m has been provided at the two locations – the major junctions at Muragacha More & Barrackpore Wireless More. Facilities for crossing of pedestrians and through underpass of width 5.00 m and Vertical clearance of 3.00 m have been provided at locations as detailed in **Table 6.3**. Ten pedestrian crossings having size 5.0 m x 3.0 m each have been provided specifically for the usage of pedestrian in other major intersections and in the locations of roadside schools on either sides.



**Table 6.3: Details of Important Junction and Schools**

SI No.	Chainage	Location
VUP/1	5+142	Murugacha More
PUP/1	12+142	Xavier Institution
PUP/2	12+707	STM World School
VUP/2	13+897	Wireless More
PUP/3	14+642	DAV Public School Barrackpore
PUP/4	21.142	Purba Rauta Sishu Sikhsha Kendra
PUP/5	25+366	Panpur More
PUP/6	26+842	Maradona High School
PUP/7	28+312	Saheb Colony More
PUP/8	29+323	Rajendrapur More
PUP/9	29+842	Naihati Apex blind School
PUP/10	32+228	Panchmatha More

➤ Besides, the above major junctions there are 14 minor junctions which are identified for upgradation. The list of such minor junctions is given below in **Table 6.4**.

List of Minor Junction		
SI. No.	Chainage	Side
1	6+167	Both side
2	6+722	Both side
3	9+142	Both side
4	9+592	Both side
5	11+442	Both side
6	12+142	Both side
7	12+394	Both side
8	14+612	Left
9	14+876	Both side
10	18+212	Both side
11	19+042	Both side
12	20+082	Both side
13	26+842	Both side
14	27+735	Both side

➤ **Pavement type**

Pavement design has been done in accordance with IRC: 37-2012. Flexible pavement option has been proposed for widening the Project Stretch considering ease of construction and subsequent renewal works. Bituminous pavement consisting of following layers has been proposed (design life 15 yrs has been adopted) for widening as per design standards given in "Chapter – 6: Indicative Design Standards": Concrete pavement has been proposed for Toll Plaza length of 400 m only at 19<sup>th</sup> km as per TCS 8.



**Pavement composition for Main Carriageways**

The pavement thickness as found from the pavement design is **720 mm** for the main carriageways.

The pavement composition as used for the both main carriageway replacement of (Existing and for Proposed new) widening part are as follows over the subgrade of 500 mm thick sand (Zone II) mixed with flyash (50:50 proportion).

**Wearing Coat** as BC – 50 mm

**Bituminous Base** as DBM – 120 mm

**Non Bituminous Base** as WMM – 250 mm

**Sub base** as GSB (Grade V) -150 mm as drainage layer

**Sub base** as GSB (Grade III) -150 mm as separation layer

**Pavement composition for Service Roads**

The pavement thickness as found from the pavement design is **640mm** for the carriageway over earthen subgrade.

**Wearing Coat** as BC – 30 mm

**Bituminous Base** as DBM – 60 mm

**Non Bituminous Base** as WMM – 250 mm

**Sub base** as GSB (Grade V) -150 mm as drainage layer

**Sub base** as GSB (Grade III) -150 mm as separation layer

The length of the service road is given below in **Table 6.5**.

**Table 6.5 - Location of Proposed Service Road**

Left Hand Side			Right Hand Side		
Chainage (Km)		Length (m)	Chainage (Km)		Length (m)
From	To		From	To	
4+567	4+767	200	4+567	4+767	200
4+767	5+517	750	4+767	5+517	750
5+517	7+042	1525	5+517	7+042	1525
8+217	9+142	925	8+217	9+142	925
9+142	13+512	4370	9+142	13+512	4370
13+512	14+322	810	13+512	14+322	810
14+322	15+142	820	14+322	15+142	820
15+742	16+442	700	15+742	16+442	700
16+742	23+892	7150	16+742	23+892	7150
24.292	34+342	10050	24.292	34+342	10050
	<b>Total</b>	<b>27300</b>		<b>Total</b>	<b>27300</b>



KMDA was taken up some length of service road on both sides up to the stage of GSB level generally. Considering no sequence and parity of levels of the existing GSB with the proposed GSB layers, the existing GSB layers are proposed to be dismantled.

➤ **Cross Drainage Structures**

There are 57 nos. of CD on the existing carriageway and 18 nos. of the same are to be replaced due to its very poor condition and 3 nos. to be replaced as existing CDs under the foundation territory of the proposed VUP in 2 locations as a result the existing 3 nos. to be shifted to nearest location to serve the purposes.

Similarly, balance 36 nos. of CD on existing carriageway alongwith 5 nos. culverts constructed on the new carriageway are to be widened to the full width of the embankment as per TCS. In spite of these, there is 5 nos. of CD completed by KMDA on proposed carriageway which will within the widened length of the CD of existing carriageway. The 4 nos. work taken up by the KMDA which are incomplete (upto foundation level) and in disturbed state and these 4 nos. are also proposed for replacement.

KMDA took up 7 nos. of CD on service road alignment and 5 nos. of the same have been completed upto the deck level and 2 nos. are in incomplete stage and these are also to be replaced as these are remarkably in low levels and these have no parity to the proposed levels of service road.

A list of cross drainage (CD) exists on the present 2 lane carriageway and the proposed CD on the 2 x 2 lane carriageway and on the service roads is furnished in **Table: 6.6**

Due to providing 2 x 2 lane carriageway alongwith paved shoulder instead of present 2-lane carriageway and for realigning the road, widening of the each culvert is required on either side to the end of the embankment as per different TCS. Besides, the necessity of raising deck of the existing culverts are required to the proposed FRL in different chainages.

➤ **Improvement of Minor Bridge at Chainage 11+492**

There is an existing minor bridge of RCC continuous slab of 3 x 12.00 m span having 10.65 m total width and only 7.50 m carriageway and another new bridge at RHS of the old has also been constructed by KMDA of same span and same type having total width of the minor bridge of 11.3 m. The old bridge is almost in a good condition. As there is no service road is required in that stretch, no replacement and dismantling of the bridges are required. As such the 2 minor bridges in that same locations are kept and the alignment on that stretch is proposed accordingly and this will serve the purpose of 2 x 2 lane carriageway with paved shoulders.



➤ **Providing Pedestrian underpass (PUPs)**

To provide facility to pedestrians at major intersections and at locations of the present schools beside the road, ten (10) pedestrian underpasses (PUPs) have been proposed in this report.

The length of the PUP is generally from one side footpath (Beside service road) to other side footpath i.e. of about of 50.00 m or 57.00 m length of each. Size of the PUP of 5.00 m x 3.00 m each along with stairs at entry and exit end.

The location of the PUPs are given below stating their chainages in **Table 6.7**

**Table 6.7 – Location of Pedestrian Underpass**

Sl. No.	Design Chainage (Km.)	Span Arrangement (m)	Type of Super-structure	Width
1	10+213	10.5	RCC Box	10.5m x 2
2	10+900	10.5	RCC Box	10.5m x 2
3	18+205	10.5	RCC Box	10.5m x 2
4	21+140	10.5	RCC Box	10.5m x 2
5	26+850	10.5	RCC Box	10.5m x 2

➤ **Improvement of Drainage**

RCC Concrete drains have been proposed in the following locations at the end of the right side service road to facilitate the habitation area. The details chainage of this drains have been provided in the **Table No 6.8.**

**Table 6.8: Chainages of Concrete Drains**

Chainage (Km)		Length (m)	Side
From	To		
4+767	5+517	750	Both
5+517	7+042	1525	Right
8+217	9+142	925	Right
13+512	14+322	810	Both
23+892	24+292	400	Both
<b>Total</b>		<b>4410</b>	

For drainage of water from the either carriageways, and from service roads, an underground drain along the medians between carriageway and service road has been proposed providing with 600 mm dia HP (NP4) with outlet to the nearest CDs. There will be inspection pits, gulley and gulley pits for the drain at 30 m interval.



Similarly, some arrangement / provision have been proposed for draining out rain water from one carriageway at curves through the underground 600 mm dia HP along the central median. The list of such chainages for the drains at the curve locations is provided in **Table 6.9**.

**Table 6.9 – Proposed Drainage along Central Median in Super- elevation position**

Sl. No.	Chainage		Length from chainage to chainage (m)	Additional Length taken for discharging water to Culvert where no culvert exist (m)	Chainage to Chainage Length plus additional length (m)	No. of Inspection Pits and Gully Pits	Culverts at Nearest or Intermediate location
	From	To					
1	5+622	6+097	475	-	475	16	5+653
2	6+702	7+262	560	-	560	19	6+942
3	8+497	9+042	545	107	652	22	8+681
4	9+142	10+267	1125	-	1125	38	9+149
5	10+987	13+442	2455	-	2455	82	11+707, 12+444, 12+889 and 13+439
6	14+397	14+732	335	6	341	11	14+391
7	14+987	15+322	335	-	335	11	15+152
8	15+372	15+917	545	-	545	18	15+542
9	16+722	17+182	460	-	460	15	16+863
10	17+792	18+042	250	66	316	11	18+108
11	20+642	20+992	350	-	350	12	20+687
12	24+742	25+142	400	-	400	13	25+041
13	30+002	30+392	390	-	390	13	30+033
14	31+377	32+032	655	-	655	22	31+750
15	32+702	34+212	1510	-	1510	50	33+320 and 34+015
Total Length required for drainage					<b>10569</b>	<b>353</b>	

➤ **Proposed Bus bays and Bus Passenger Shelter**

At present on the project road there are bus stoppages at 30 nos. of locations, some having bus shade and some without. As per the guidelines stated out in the manual, bus bays are provided near to the PUPs locations. In addition, where there is land availability, bus bays were also provided on both side of the carriageway. The details of the locations and the list of



the designed bus bays are given in Table 6.10.

**Table 6.10 - Location & List of Designed Bus Bays**

➤ SL. No.	Chainage (Km)	Side	SL. No.	Chainage (Km)	Side
➤ 1	9+072	RHS	19	20+212	LHS
➤ 2	9+130	LHS	20	21+262	LHS
➤ 3	10+310	RHS	21	21+327	RHS
➤ 4	10+362	LHS	22	22+957	RHS
➤ 5	10+867	RHS	23	23+087	LHS
➤ 6	10+907	LHS	24	25+227	RHS
➤ 7	12+417	LHS	25	25+517	LHS
➤ 8	12+572	RHS	26	26+727	RHS
➤ 9	14+859	LHS	27	27+012	LHS
➤ 10	14+872	RHS	28	27+582	RHS
➤ 11	16+092	LHS	29	27+877	LHS
➤ 12	17+467	LHS	30	28+132	RHS
➤ 13	17+702	RHS	31	28+462	LHS
➤ 14	18+262	LHS	32	29+152	RHS
➤ 15	18+272	RHS	33	29+467	LHS
➤ 16	18+932	RHS	34	32+107	RHS
➤ 17	19+067	LHS	35	32+372	LHS
➤ 18	19+977	RHS			

➤ **Location of Bus Shelters**

Other than the location of the bus bays as mentioned above, bus shelters are provided at all the existing bus stoppages of the project road. At some locations bus sheds are existing today, but modernized bus shelters with seating amenities have been proposed. The list of



such locations is given in **Table 6.11**.

**Table 6.11 - List of Additional Bus Stop without designed Bus Bays (Due to shortage of space)**

SL. No.	Chainage (Km)	Name of Bus Stop	Side
1	5+067	Muragacha More	Right
2	5+242	Muragacha More	Left
3	6+142	Natun Raster More	Both
4	6+742	Mohespota More	Both
5	6+842	Nawajpara More	Left
6	9+592	Arpatna More	Both
7	11+442	Bakultala More	Both
8	12+142	Ruiya 56 Bus stand	Both
9	13+717	Wireless More	Right
10	14+042	Wireless More	Left
11	16+142	Babanpur More	Right
12	16+642	Kayrapur bazar	Left
13	33+292	Chadua More	Both

➤ **Proposed Protective Work**

To protect the embankment from road side water bodies, Fisheries (Bheries), ponds and roadside kutcha nullahs, **3155 m** of low height PCC guard wall has been proposed. The top of PCC protective walls are to be provided in a manner that it should be below the level of GSB layers of the embankment. In addition, PCC guard walls are also proposed in the bridge approaches of the RCC Bridge at Chainage 16+634 and to the embankment end in the location of Pedestrian underpass (PUP) to protect embankment for a length of 50 m on both sides. The details are given in **Table 6.12**.



Table 6.12: Chainages of Toe / Guard Wall

Location of Proposed Toe Wall / Guard Wall					
Sl No.	Chainage (Km)		Length (m)	Side	Height (m)
	From	To			
1	5+232	5+257	25	LHS	2
2	5+282	5+312	30	LHS	2.5
3	5+442	5+477	35	LHS	1.5
4	5+542	5+572	30	LHS	2
5	5+662	5+857	195	LHS	2.75
6	9+182	9+212	30	LHS	3.25
7	9+932	9+962	30	RHS	3
8	10+792	10+902	110	RHS	3
9	11+112	11+142	30	LHS	3.5
10	11+492	11+552	60	LHS	2.5
11	11+812	11+842	30	LHS	3.5
12	12+312	12+362	50	LHS	3
13	16+634	(Bridge Approach)	2 x 2 x 30 = 120	LHS+RHS	
14	To protect embankment at the side of CDs at this ends		2 x 2 x 60 x 10 = 2400	All ends	
Total			2520		

## 6.2. Other Project Features :

### 6.2.1. Land Acquisition and Affected Structures :

No land acquisition for implementation of the project will be required as all improvement is being accommodated within the existing land width of 2 x 26.00 m from starting point to 8.00 KMP and thereafter by 2 x 30.00 m upto the end point as per land acquisition plan of Dum Dum – Barrackpore Expressway & Barrackpore – Kalyani Expressway. Beside this, there is 125 m land width from chainage 11+200 to chainage 11+600 of the road.

There are some pucca buildings and boundary walls which are partially encroachment within the ROW. A lump sum cost for the same has been included in this DPR.

### 6.2.2. Environment Aspect

A good no. of trees lying within the project corridor are to be cut, for the widening and improvement of the road to 2 x 2 lane carriageway along with either side service road



instead of present 2 lane roadway. Compensatory plantation in 1:5 ratio with the guidelines of MoEF and Department of Forest, Govt. of West Bengal.

Adjoining ponds, bheries, and water bodies will be protected properly and will be taken care of the fishes and other aquatic animals and in consideration of the use of ponds by local neighborhood.

Considering the environmental conditions, use of fly ash has been proposed for constructions of the embankment in view of less excavation of borrow area earth.

From the point of environment, proposal for Arboriculture and Beautification of the medians, Islands, earthen shoulders has been provided.

To protect the slopes of the embankment in some locations, provision of jute geotextiles has been proposed.

The Bituminous hot mix plant and concrete batching plant will be installed in the free locations where no vicinity of residence, agricultural fields and local fishries.

Labour camps / hutments will be located in such a way that sanitary safeguards are maintained without disturbing nearest residential areas and agricultural fields.

The contractors should be abided by the reasonable steps to minimize dust pollution during the construction works following clause no. 111.1, 111.4, 111.5, 111.6, 111.8.4, 111.9, 111.10, 111.11 and 111.12 of section 10 of MORT&H'S specification the road and bridge works.

### 6.2.3. Utility Service

The utility services viz., shifting electrical poles, transformer, water pipeline, signaling system as present on the road project length shall be shifted as and when directed by the Engineer and shall be followed, by the clause no. 110 of section 100 of MORT&H'S specification of road and bridge works.

It is reported by the WBHDCL that KMDA, prior to handing over the roads, has already paid Rs. 5,65,80,950/- and Rs. 12,16,76,967/- only for shifting of electrical poles, transformer etc for the length of (i) Chainage 0 km to chainage 11.50 km and (ii) Chainage 11.50 km to Chainage 31.50 km respectively in phases to WBSEDCL during the year 2013. It is also learnt, the WBSEDCL is now ready for shifting of the poles, transformer as per direction of the WBHDCL.

As such no cost of shifting of electrical lines, poles, transformer etc in the head of "utility shifting" is required at this stage. As the cost estimate was submitted by the



WBHDCL in the year 2012-2013, escalation on cost of shifting as prepared by the WBSEDCL in the year 2013 has been proposed in this project @ 10% per year i.e. at 30% over the cost of Rs. 17,82,57,917.00 = Rs. 5,34,77,375/- only.

### 6.3. Miscellaneous Items

#### 6.3.1. Traffic Signs

To ensure safe and efficient flow of traffic in the high speed project corridor, traffic must be regulated through a system guidance and control systems. Accordingly traffic signs, of retro-reflective types, as per IRC: 67:2012 will be provided as follows:-

- Auto electric signal post to be provided in all intersections, VUP locations etc.
- Mandatory/Regulating signs (violation of which is legal offence) e.g. stop signs, speed limits near schools, villages etc.
- Warning / Cautionary signs to warn the road users of existence of certain restrictions / hazardous conditions.
- MS grill railings are proposed in Bus Stops / Bus Bays / Intersections etc.
- Informatory signs e.g. BDO office, P.S, markets, intersection, bank, petrol pump, hospitals, distance information boards, directions signs, route number etc.
- Four No. Gantry signs have been considered; two nos. at the beginning and end of the project corridor and two nos. on either side of the Toll Plaza.

#### 6.3.2. Road Marking

Road markings with thermoplastic paint will be proposed for traffic lane markings, edge markings along shoulders and median kerbs, arrows etc. as per IRC 35-2015. The design life is expected to be 3 to 4 years.

#### 6.3.3. Kilometer/Hectometer Stones

Kilometer stones will be provided along the highway on either side as follows:-

- (i) Kilometer stone as per IRC: 8-1980.
- (ii) Hectometer stone as per IRC: 26-1967.

#### 6.3.4. Delineators/Cats Eye.

Road delineators will be provided as visual aids for safety at night at approaches of bridges, along curves, high embankments, culverts etc as per IRC 79-1981.

#### 6.3.5. Illumination

Illumination on over and under the VUPs and high mast poles in all intersections are proposed.



**6.3.6. Crash Barrier**

Metal beam crash barrier has been proposed in all bridge approaches, curves and super elevations.

**6.3.7. Toll Plaza**

A toll Plaza of 10 lane have been proposed on the project road at 19<sup>th</sup> km where land is available and there is also no interference with the existing building structures.

The toll plaza amenities viz., offices, stores, cash office, traffic surveillance room, vault, computer room etc has been proposed to provide at 1<sup>st</sup> floor of toll plaza in view of shortage of space on land width 60.00 m ROW, after providing ten (10) lane toll plaza along with medians for toll booths at road level. The general arrangement of the proposed toll plaza at Ch. 18+975 km is provided in **Figure 6.1 a & Figure 6.1 b**.

**6.3.8. Way side Amenities**

Way side amenities have been provided along the project road at suitable locations where land is available. Other than the bus bays, the amenities include provision for restaurants / motels and toilets (Use & pay), the detail location of which is provided in **Table 6.13**.

**Table 6.13: List of Way side Amenities**

SL. No.	Chainage (Km)	Side	Remarks
1	5+142	Left	Toilet (Use & pay)
2	15+142	Left	Toilet (Use & pay)
3	16+392	Left	Restaurant / Motel (25 m x 15 m) (land on lease basis)
4	16+792	Right	Restaurant / Motel (25 m x 15 m) (land on lease basis)
5	28+352	Left	Toilet (Use & pay)
6	32+242	Right	Toilet (Use & pay)



# **Chapter -7 : Environmental and Social Impact Assessment**



## CHAPTER - 7

## ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

## A. ENVIRONMENTAL IMPACT ASSESSMENT

## 7.1 Introduction

In order to identify the environmental issues related to the activities for Up-gradation of Kalyani Expressway to 4/6 lane configuration from Muragacha (ch. 4+565 km) to Kampa (ch. 35+340 km) including elevated connection with proposed Mogra-Kampa-Barajaguli Road Corridor in the district of North 24 Parganas in West Bengal on Hybrid Annuity Mode an environmental and social assessment were carried out on the basis of secondary data.

There are statutory obligations, which any project proponent has to fulfill before proceeding with any developmental work. At the same time, it is incumbent on the public authorities to ensure that the limited natural resources are optimally utilized without adversely effecting the environment.

Environmental assessment includes the study of the present environmental set-up in and around the project influence area.

**Study Objectives**

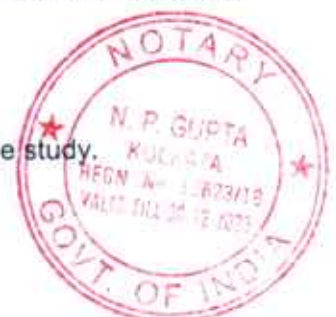
The objectives of environmental assessment are to enable early determination & evaluation of potential impacts on ambient environment due to project related activities during construction & operation phases and thereafter examination of level of the study required in the succeeding period. The Environmental Assessment would also help to design the project in an environmentally sustainable and socially acceptable mode by incorporating environmental regulations and suggestions made by the possible funding institutions.

**Methodology**

Field survey along with interviews of the concerned authority as well as the prospective project impacted people and collection of data were simultaneously undertaken during the study. Relevant information and publications were collected for further reviews. Findings of the study were discussed with the team officials to incorporate environmental dimensions into the project design.

**Guidelines**

State Pollution Control Board and MoEF Guidelines were followed for the study.



## 7.2 Policy, Legal and Administrative Framework

This section reviews the environmental legislation, guidelines and regulations that may have relevance with the proposed project at the national as well as state levels.

### 7.2.1 Institutional Setting

The Ministry of Environment and Forests (MoEF) has overall authority for the administration and implementation of governmental policies, laws and regulations related to the environment, including conservation, environmental assessment, sustainable development and pollution control.

At the state level, the MoEF authority lies in the Department of Environment and Forestry (DoEF) that is known as the Department of Environment in Govt. of West Bengal. The Forest Department is a sub-division within DoEF. The mandates of the department include administration of environmental laws and policy matters, planning and execution of environmental awareness programs, environmental monitoring and studies and participatory environment management.

This Department gives environmental clearance through the West Bengal Pollution Control Board (WBPCB) for any developmental project that may have an impact on the air and water. If a project generates adverse impacts then it requires environmental clearance following the guidelines of the MoEF. WBPCB is a statutory authority entrusted to implement environmental laws and rules within the jurisdiction of the State of West Bengal. The Board, in connection with the Project, is in the position to issue No Objection Certificate (NOC).

### 7.2.2 Environmental Impact Assessment Requirement of the Project

Road and highway projects generally fall under the Environment (Protection) Act, though there is no environmental act or law exclusively governing these projects. In January 1994, the MoEF issued a notification on Environmental Assessments (EA), followed by the following amendments:

- S.O. 356 (E) dated the 4<sup>th</sup> May, 1994
- S.O. 318 (E) dated the 10<sup>th</sup> April, 1997
- S.O. 73 (E) dated the 27<sup>th</sup> January, 2000
- S.O. 1119 (E) dated the 13<sup>th</sup> December, 2000
- S.O. 737 (E) dated the 1<sup>st</sup> August, 2001
- S.O. 1148 (E) dated the 21<sup>st</sup> November, 2001 and
- S.O. 632 (E) dated 13<sup>th</sup> June, 2002



### 7.2.3 Environmental Legislation

The Policies regarding environmental management have been established by GOI through enactment of various legislation such as Water (Prevention and Control Pollution) Act: of 1974, Cess Act of 1977, Air (Prevention and Control of Pollution) Act of 1981, Environmental (Protection) Act of 1986, Forest (Conservation) Act as amended in 1988, Wildlife (Protection) Act of 1972, and the Public Insurance Liability Act, 1991.

To ensure adequate environmental protection in all developmental activities, the Ministry of Environment and Forests (MoEF) has issued the Environmental Impact Assessment (EIA) Notification in 1994, in accordance with the provisions of the Environmental Protection Act. This makes EIAs statutory for 32 activities identified in Schedule I of the notification. All highway/public roads projects with investment of Rs more than 1.0 Billion for new projects and Rs 500 Million for expansion and modernization are required to obtain environmental clearance from MoEF or State Pollution Board / Central Pollution Control Board prior to initiating such projects. However, the highway/road upgradation projects with minor land acquisition are exempted according to the notification of 10th April, 1997 provided they do not pass through ecologically sensitive areas i.e. National Parks, Sanctuaries, Tiger Reserves and Reserve Forests. In the notification of 15th October 1999 it is further clarified that marginal land acquisition is meant to cover a total width of 20 meters on either side of the alignment. Therefore the project proponent needs to undertake EIA in conformity to the Indian laws and regulations. The overall objectives of the EIA of the proposed project are to ensure that the proposal is environmentally sound and sustainable. Elements of recognised environmental consequences are required to be taken into account in planning of the project.

### 7.2.4 Present Environmental Set-Up

Existing environmental setting has been assessed from two perspectives, regional and local. The regional environmental setting is determined by physiography, geological set-up, geohydrological condition, climate of the surrounding area, soil characteristics etc. On the other hand local environmental setting pertains to air quality, water resources and its quality, noise level etc.

#### **Regional Environmental Settings: Physiography**

The project area is in general flat and slopping from North to South. The river Hooghly which is located Westerly runs in North to South direction. The river is the principal



waterway and forms the water boundary of the Barrackpore – Kalyani expressway. The project influence area is a rural / semi - urban area.

### **Geology**

The area is underlain by Quaternary sediments consisting of clay silt and various grades of sand gravel and pebble. No hard rock geological formation is found here. Lithological log indicates the presence of a clay bed at the top of the geological succession with thickness varying from 10-40 m. Alternate clay and sand bed exists further in the downward direction. These layers are being tapped as groundwater sources. The soils in the area are typically deltaic alluvial type and the sediments are generally fine in the upward direction. The area is seismically stable.

### **Climate**

The region is generally warm during the day and cold at night. During summer, day temperature rises up to 42° C (April to June). Rainy season continues from June to October with occasional rainfall during December-January and in March. Mean annual rainfall is around 1600 mm. During winter temperature drops down to 10° C (during January) as recorded by the Meteorological Department. The humidity is moderately high in rainy season, and remains within 90%

### **Soil**

In general the soil is light brown in colour and neutral in reaction. The soil type is mainly alluvial of recent origin, though they show wide variations in drainage and texture with minimum and maximum pH value of 7.0 and 8.0 respectively. The soil of the area found to be sand, silt, clay and mixed loam type amongst which clay and mixed loam types are common.

### **Flora & Fauna**

There are no forests, national parks or sanctuaries found in the project influence area. As there are no forests, terrestrial fauna is limited to few common species of small mammals such as monkey, Jackal, Mongoose, etc. Besides, there are some reptiles and birds.

### **Local Environmental Setting**

#### **Air Quality**

The major sources of air pollution are the vehicles plying on the existing road, small scale industries and domestic fuel burning. No other sources are found. The overall air quality



appears to be superior in terms of threshold values. The air pollutant at major crossings such Muragacha, Barrackpore Wireless More & Kampa More and at few other locations might be slightly on higher side and actual condition need to be ascertained through monitoring.

### **Noise Level**

The project alignment passes mainly through rural / semi-urban areas. Outdoor noise sources are mainly from the honks of the vehicle plying on the existing road. Besides this, there are no other permanent outdoor noise sources. Measurement of noise levels at the major junctions and sensitive areas close to project construction site is essential. During construction ambient noise level will rise due to construction activities.

### **Water Quality**

The area is alluvial plain of Hooghly River and only one canal – Ichapur Canal crosses the road. Main source of water in this area is rainfall. Most of the rainfall finds it way to Hooghly River through the Ichapur canal and various channels and drains of the adjoining municipalities. Some portion gets percolated to form ground water aquiver. Since water quality may be affected during construction, complete assessment of water quality is essential.

## **7.3 Anticipated Environmental Impacts and Mitigation Measures**

### **7.3.1. Environmental Impacts - Construction Phase**

- On Air Quality
- On Noise Levels
- On Water Quality
- On Soil
- On Ecology

Also there would be some impacts on the quality of life due to inconvenience caused to the public as a result of construction activities.

#### **Causes of Impacts on Air Quality are**

- Land clearing
- Construction of pavements
- Handling and transportation of construction and demolition materials



- Wind erosion of open sites and stockpile areas of fly ash proposed to be used in construction

**Noise pollution will be caused by**

- Operation of construction equipment such as earth moving and material handling equipment.

**Cause of Impacts on Water Quality**

- Water quality may deteriorate from runoff and waste generated from construction activities.

**Impact on Soil**

- Contamination of soil is expected due to deposition of construction materials and waste products as well as fuel and lubricant spillage from vehicles.

**Impacts on Ecology**

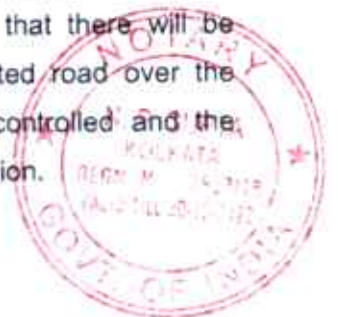
- Unforeseen accidents could result in personal injury and/or damage to private or public property.

**7.3.2 Environmental Impacts - Operation Phase**

During the operation phase the environmental impacts are likely to be mostly positive. However, there could be some adverse impacts due to inadequate operation / maintenance / control. Increase in air pollution is expected during the operation phase since traffic volume is predicted to be high. It is essential that appropriate traffic safety measures are included in the project design

Increase in noise levels is expected due to the increase in number of vehicles passing through a point per unit time. The noise created by the fast moving vehicles will disturb fauna. Construction of the elevated road will result in decrease in noise levels due to smooth running of the vehicles and less congestion at the intersections/junctions.

Chronic pollution of surface runoff will occur from exhaust emission, pavement and petroleum products dripping and corrosion of metal. It is expected that there will be positive impacts during the operation phase of the proposed elevated road over the existing road. Generation of dust from vehicle movement will be controlled and the drainage system will be improved to reduce adverse effects on soil erosion.



Never the less, contamination of soil is expected due to deposition of chemicals from emission of the vehicles as well as fuel and lubricants spillage from the vehicles. Also change in the land use pattern due to development along the roads is expected. Pollution risks will increase from transportation of hazardous products during traffic operation.

The impact of project on the socio-economic environment will be significantly beneficial, as it is likely to stimulate the economic growth of this area. The specific benefits of the project will include reduction in travel time and travel cost.

### 7.3.3 Mitigation Measures

#### 7.3.3.1 Mitigation Measures - Construction Phase

The following measures are recommended for mitigating or minimizing the environmental impacts that are likely to occur during the construction phase of the proposed project.

##### Prevention of Erosion

- Construction will be scheduled so that large areas of soil (particularly along the nullah) are not laid bare during monsoon.
- Ground disturbances will be phased so that these are limited to workable sizes.
- Exposed surface will have to be resurfaced and stabilized as soon as possible.
- Stabilisation of soil at flyover approaches will have to be achieved through plantations.

##### Protection of Trees

During construction proper care would be exercised to avoid additional loss/cutting of trees. New plantation will be developed as far as possible.

##### Prevention of Dust Nuisance

- On exposed construction surfaces during dry/windy periods fugitive dust generation will be suppressed by spraying water etc.
- Workers working in dust-prone areas will be provided with masks and goggles.
- Excavated material and construction materials transported by trucks will be covered and/or wetted to prevent dust nuisance.

##### Noise and Emission from Vehicles and Construction Activities

- All construction vehicles will be properly maintained and will have valid "Pollution Control Certificate".
- Noisy construction activities will be carried out only during normal working hours.



- Where feasible sound barriers will be provided in inhabited areas.

#### **Relocation of Utility Services**

- Utility services such as telephone lines, electric poles and water lines etc. that will be impacted by project construction will be identified.
- Concerned authorities will be informed and their assistance sought to remove, relocate and restore services of all these utilities prior to commencement of construction.
- It will be ensured that these utilities are not damaged due to construction activities.

#### **Prevention of Dust and Noise during Material Handling Operation**

Dust and noise producing activities such as stone crushing, bitumen and cement batching plant etc. will preferably be located downwind and away from habitation settlements wherever practicable.

#### **Prevention of Soil and Surface Water Contamination**

- Alignment susceptible to soil erosion has to be minimized. Only clean fill materials around watercourses, such as quarried rocks containing no fine soil will be used.
- Flow speed (especially near water crossing) is to be controlled.
- Construction activity will have to be planned in a manner to ensure unhindered flow of watercourse at all times.
- Plant and machinery required for concreting etc and construction workers' camps will have to be located away from the watercourse. The water quality will be monitored at regular intervals to detect the change, if any, during the project implementation

#### **Protection of Land Environment**

- Area of ground clearance will have to be minimised, excess cut & fill will have to be avoided.
- Grasses and plants are to be planted in disturbed areas in order to limit the surface erosion effectively.

#### **Road Safety and Traffic Management during Construction**

Contractor in consultation with WBHDCL will have to prepare a traffic management plan for approval of the State Police. The plan will include:

- Measures to be taken to prevent traffic congestion.



- Provision of temporary safe access to school/residence that will be blocked due to construction.
- Measures to be taken for safe passage of traffic including temporary diversions and/or separation of motor vehicle traffic from non-motorised and pedestrian traffic where necessary.
- Measures to be taken to ensure safety of traffic passing through the construction area including signs, marking flags, lights and flagmen as may be required.
- Electronic Traffic Signal Posts on each intersection are proposed.
- High mast electrical post on either side of the each VUP shall be proposed.
- Illumination on VUP and under the VUP Has been provided.

#### **Health and Safety of Workforce**

- Periodic health check-up of workers will have to be provided.
- Workers engaged in construction activity will have to be provided with proper protective equipment.
- Environmental health and safety considerations are to be enforced at construction sites.
- Camps/compounds will be so located that they do not interfere with the existing alignment.
- Campsites are to have adequate provision of shelter, water supply, excreta and solid waste management, toilet facility and provision of first aid.
- Appropriate control measures are to be taken to prevent insect/vector diseases, especially malaria by measures such as spraying and/or preventing creation of stagnant pools of water.

#### **7.3.3.2 Mitigation Measures - Operation Phase**

Impact on physical and ecological environment and road safety due to increased vehicular traffic in operation phase of the project are the key aspects of operational phase impacts.

#### **Prevention of Air Quality Impact**

- The project implementation will improve the air quality. But increase in traffic may further deteriorate air quality in the subsequent years if long-term mitigation



measures, like avoid of traffic congestion, Planting tall leafy and dense vegetation etc. are not implemented at this stage

#### **Prevention of Noise Level Impact**

- Mitigation measures at the same locations suggested under air quality during operational stage will also contribute to the reduction in noise levels.
- Mitigation of noise at sensitive locations and areas having good habitation will also include the posting of signs prohibiting the use of horns.

#### **Improvement of Road Safety**

- Provision of speed regulating signs at proper locations to control vehicular speed in sensitive and restricted areas, built-up areas and at sharp horizontal and vertical curves.
- Provision of guard rails at approaches to the elevated structures.
- Provision of safety guard rails and physical separation of local traffic in built-up portions.
- Provision of service roads in built up areas.
- Provision of pedestrian under pass at major junctions.
- Improvement of minor junctions.
- Provision of bus bays at most of the bus stoppages.
- Development and enforcement of Emergency Response Plan and Contingency Plan for accidents.
- Provision of suitable lighting arrangements where necessary

#### **Protection of Land Environment**

- Construction should be such as not to cause damage to the environment and the existing regulations should be enforced strictly.
- Trees, shrubs and bushes as appropriate to soil characteristics and climate condition are to be planted to ensure protection of land environment.
- Beautification and arboriculture to be provided on the central median width.

#### **7.4 Environmental Management Plan**

An environmental management plan will have to be prepared along with the necessary institutional arrangements for effective implementation and monitoring activities of the project. It is expected that all stakeholders i.e. the WBHDCL, State Government Forest Department, Irrigation & Waterways Directorate, the Design and Supervision



Consultant, the contractor, NGOs and the general public will play their role in effective implementation of EMP.

Environmental impacts from the project will mostly arise during the construction phase. Items such as soil erosion, air pollution, surface water pollution, noise pollution, preservation of ecological resources, accidents and safety will be controlled by making suitable provisions and assigning the responsibility for implementing mitigation measures to the contractor.

During the operation phase, it is proposed that the WBHDCL will periodically monitor air, water and noise pollution for suitable action as deemed necessary. The post-construction responsibility of the WBHDCL is to ensure proper plantation as per norms.

#### 7.4.1 Planning Consideration

- Provision of good drainage system, where necessary.
- Protection of utility services through proper selection of alignment.
- Protection of soil at the canal/stream site.
- Provision of road signs at suitable locations.
- Protection to active natural streams and water bodies near the project site.

#### 7.4.2 Recommendation for Project Implementation

The proposed project would imply certain favorable socio-economic impacts both long as well as short term such as enhanced economic opportunities, improved livelihood, streamlined transport and communication facilities, reduced pollution due to less congestion by vehicular traffic etc. So it is recommended that the civil works of the project may be implemented keeping the socio-economic and environmental mitigation measures in mind in order to reduce the negative impacts on both the social and physical environments.

#### 7.5 Monitoring Plan

The environmental monitoring plan during construction and operation phases given in Table 7.1

**Table – 7.1 Environmental Monitoring During Construction Phase**

Parameters	Location	Duration	Frequency
Air Quality: SPM, RPM, SO <sub>2</sub> , NO <sub>x</sub> and CO	At two locations	24 hours continuous sampling	Twice in a week
Noise Level L <sub>eq</sub> (day) and L <sub>eq</sub> (night)	At four stations	24 hours continuous	Once in a year Other than monsoon



Parameters	Location	Duration	Frequency
		sampling	
Water Quality : for different physical, chemical and biological parameters	Two surface water samples and two ground water samples	Grab sampling	Once in a year (non-monsoon season)
Soil Quality; Lead (Pb) and Oil & Grease	At two locations	Grab sampling	Once in a year (non-monsoon season)
Plantation & it's maintenance	At selected locations	Throughout the year	Regularly throughout the year

### 7.6 Location of Pond / Ditch protection

Guard wall and Sal bullah have been provided at various locations along the water bodies and ditches adjoining the project road. In general guard walls have been provided for water bodies of greater depth. And Sal Bullah in single & double rows have been provided at ditches of shallow of variable depths. A list of the locations where, guard walls and UC Bullah have been provided is presented below in **Table 7.2.**

**Table 7.2:- Provision of Guard walls & UC Bullah piling along Pond/Ditch**

SL No	Chainage		Length (m)	Side	Height (m)	Type of Land	Type of Work
	From	To					
1	5232	5262	30	Left	2.00	Pond	UC Bullah Single Row
2	5282	5312	30	Left	2.00	Pond	UC Bullah Single Row
3	5382	5402	20	Left	1.50	Pond	UC Bullah Double Row
4	5442	5642	200	Left	2.50	Pond	UC Bullah Double Row
5	5662	5842	180	Left	2.50	Pond	UC Bullah Double Row
6	7142	8142	1000	Left	3.00	Pond	UC Bullah Single Row
7	7142	8142	1000	Right	2.00	Low land	UC Bullah Double Row
8	8642	8742	100	Left	1.50	Pond	Guard Wall
9	8642	8742	100	Right	1.50	Pond	Guard Wall
10	9832	9862	30	Right	3.00	Pond	UC Bullah Double Row
11	9932	9972	40	Right	3.00	Pond	UC Bullah Double Row
12	10792	10902	110	Right	2.50	Pond	UC Bullah Double Row
13	11102	11142	40	Left	3.00	Pond	UC Bullah Single Row



SL No	Chainage		Length (m)	Side	Height (m)	Type of Land	Type of Work
	From	To					
14	11492	11542	50	Left	2.00	Pond	UC Bullah Single Row
15	11542	11692	150	Right	2.00	Ditch	UC Bullah Single Row
16	11812	11842	30	Left	2.00	Pond	UC Bullah Single Row
17	12312	12372	60	Left	2.00	Pond	UC Bullah Single Row
18	12392	12492	100	Right	2.00	Ditch	UC Bullah Single Row
19	18242	18322	80	Left	2.00	Pond	UC Bullah Single Row
20	22542	22592	50	Left	2.00	Pond	UC Bullah Single Row
21	22392	22492	100	Right	2.00	Pond	UC Bullah Single Row
22	23192	23292	100	Right	2.00	Pond	UC Bullah Single Row
23	23992	24092	100	Left	2.00	Pond	UC Bullah Single Row
24	23742	23792	50	Right	2.00	Pond	UC Bullah Single Row
25	24822	24882	60	Right	2.00	Pond	UC Bullah Single Row
26	26012	26092	80	Left	2.00	Pond	UC Bullah Single Row
27	30442	30542	100	Right	2.00	Pond	UC Bullah Single Row
28	31192	31292	100	Right	2.00	Pond	UC Bullah Single Row
29	33072	33132	60	Left	2.00	Pond	UC Bullah Single Row
30	33442	33512	70	Right	2.00	Pond	UC Bullah Single Row
<b>Total</b>			<b>4220</b>				

### 7.7 Trees & Plantations

In the initial stage, when KMDA was the custodian of the road, clearing and grubbing was carried out by the authority from km 15.500 onwards taking into consideration the provision for the service roads on either side. Thereafter, the site was handed over to WBHDCL. Thus, most of the trees and plantations have been cleared during the tenure of KMDA. The number of trees and plantations still available along the corridor of impact of the project facility is detailed chainage wise, and is presented below in **Table 7.3 & Table 7.4**. The trees which need to be cut for the improvement if the junctions is also included.

**Table 7.3:- List of Trees and plantations along the corridor of impact.**

From	To	Palm/Date/Coconut Tree	Bamboo Group	Tree1, Girth <0.6m	Tree2, Girth >0.6m to 1m	Tree3, Girth >1m to 1.5m	Tree4, Girth >1.5m
4+567	5+142	-	-	-	-	-	-
5+142	6+142	1	-	8	8	3	3
6+142	7+142	2	-	2	8	3	1
7+142	8+142	-	-	-	-	-	-
8+142	9+142	-	1	-	1	-	-
9+142	10+142	-	1	-	1	-	-
10+142	11+142	1	-	-	1	3	-
11+142	12+142	2	1	1	5	2	-
12+142	13+142	1	-	4	1	-	-



From	To	Palm/Date/Coconut Tree	Bamboo Group	Tree1, Girth <0.6m	Tree2, Girth >0.6m to 1m	Tree3, Girth >1m to 1.5m	Tree4, Girth >1.5m
13+142	14+142	2	-	5	3	2	5
14+142	15+142	1	-	2	7	4	5
15+142	16+142	1	-	1	2	-	1
16+142	17+142	-	-	7	3	1	1
17+142	18+142	4	2	2	18	5	7
18+142	19+142	3	5	5	5	6	3
19+142	20+142	6	7	6	5	9	8
20+142	21+142	7	-	4	1	2	2
21+142	22+142	2	-	-	-	-	-
22+142	23+142	3	-	2	5	-	1
23+142	24+142	3	-	2	5	2	7
24+142	25+142	5	-	-	4	1	3
25+142	26+142	1	-	-	3	1	2
26+142	27+142	-	-	1	-	-	-
27+142	28+142	12	-	-	1	2	1
28+142	29+142	1	-	-	2	3	2
29+142	30+142	-	-	-	3	1	2
30+142	31+142	12	-	-	2	4	6
31+142	32+142	2	-	-	5	1	5
32+142	33+142	-	-	-	3	2	6
33+142	34+142	2	-	-	1	-	2
34+142	34+342	-	-	-	-	-	-
<b>Total</b>		<b>74</b>	<b>17</b>	<b>52</b>	<b>103</b>	<b>58</b>	<b>73</b>

Table 7.4:- List of Trees and plantations along the Cross Road for junction improvement.

Location	Palm/Date/Coconut Tree	Bamboo Group	Tree1, Girth <0.6m	Tree2, Girth >0.6m to 1m	Tree3, Girth >1m to 1.5m	Tree4, Girth >1.5m
1st Cross Road at Ch. 5+142km	-	-	-	1	5	7
2nd Cross Road at Ch. 13+892km	2	-	-	5	6	14
Naihati More	-	-	-	-	1	3
Panpur More	-	-	-	-	-	3
<b>Total</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>12</b>	<b>27</b>



## B. SOCIAL IMPACT ASSESSMENT

### 7.8 Introduction

The aim of socio-economic study is to obtain information on, extent of actual potential impact on socio-economic development of the project influence area (PIA). The project road has rich potential for transportation of goods and services including production of agriculture, cash crops, livestock, industries, fisheries, dairy and poultry activities as well as developing the tourism in the region. Therefore the improved project road will give an impetus to the growth of healthy transportation services and will act as bypass of the fully urbanized Barrackpore Trunk Road (BT Road – SH 1) and the main artery of North & South Bengal NH 34, which is congested along the stretches of Dum Dum Airport, Birati, Madhyamgram & Barasat.

The socio-economic profile covers the sectoral and higher farm gate price features including agriculture production, land use, occupational pattern, livestock, irrigation, industries, tourism as well as educational and health services etc. existing along the project influence area. The data are based on the relevant published documents available with the Census of India, districts NIC centers and other government departments/ websites which shall also serve as a baseline for social safeguard monitoring and evaluation during post construction of the project. The project road traverses through the district of North 24 parganas and ends near Kampa More at short distance before the township of Kalyani which lies in Nadia district.

### 7.9 North 24 Parganas – The Socio-Economic Profile Of The Project Area

#### 7.10 Area and Location

North 24 Parganas district adjacent to Kolkata lies in southern West Bengal, of eastern India. North 24 Parganas extends in the [tropical zone] from latitude 22°11'6" north to 23°15'2" north and from longitude 88°20' east to 89°5' east. It is bordered by Nadia in the north, by Bangladesh (Khulna Division) in north and east, by South 24 Parganas and Kolkata in the south and on the west is bordered by Kolkata, Howrah and Hooghly. Barasat is the district headquarters of North 24 Parganas. The district is not only most populous in West Bengal but also (following the splitting of the Thane district of Maharashtra in 2014) the most populated district in the whole of India. It is also the tenth-largest district in the State by area.



### 7.11 History of North 24 Parganas

According to Ptolemy's Treatise on geography, written in the 2nd Century A.D., the ancient land of Gangaridi was stretched between the rivers Bhagirathi-Hooghly (lower Ganges) and Padma-Meghna. The modern-day 24 Parganas was the southern and the south-eastern territory of that legendary kingdom.

In the middle of 16th century, Portuguese pirates began to invade and plunder many of the waterways and prosperous human settlements in the lower delta region. People left these places out of the fear of being murdered, raped, or captured to be sold as slaves. The Basirhat sub-division adjacent to Bangladesh Border of North 24 Parganas suffered these torments.

The territory of Greater 24 Parganas were under the Satgaon (ancient Saptagram, now in Hooghly district) administration during the Mughal era and later it was included in Hooghly Chakla (district under post-Mughal Nawabi rule) during the rule of Murshid Quli Khan. In 1757, after the Battle of Plassey, Nawab Mir Jafar conferred the Zamindari of 24 Parganas and Janglimahals (small administrative units) upon the British East India Company. These were Amirpur, Akbarpur, Balia, Birati, Azimabad, Basandhari, Baridhati, Bagjola, Kalikata, Garh, Hatiagarh, Islampur, Dakshin Sagar, Kharijuri, Khaspur, Ikhtiarpur, Magura, Medanmalla, Maida, Manpur, Barasat, Muragachha, Pechakuli, Paikan, Rajarhat, Shahpur, Shahnagar, Satal, New Barrackpore [Aharampur] and Uttar Pargana. Since then, this entire territory is known as 24 Parganas.

In 1983, an administrative reform committee under the chairmanship of Dr. Ashok Mitra suggested to split the district into two and as per the recommendation of the committee on 1<sup>st</sup> March 1986, two districts – North 24 Parganas (24 PGS N) and South 24 Parganas (24 PGS S) were created. The North 24 Parganas which was included to the Presidency Division has been formed with 5 sub-divisions of the Greater 24 Parganas namely Barasat (Headquarters), Barrackpore, Basirhat, Bongaon and Bidhannagar (a township adjacent with Kolkata, also known as Salt Lake).

### 7.12 Physiography

North 24 Parganas district covers an area of 4094 square kilometers. The administrative headquarter is in Barasat. Other main towns are Barrackpore, Bongaon, Basirhat and Bidhannagar.

The district lies within the Ganges-Brahmaputra delta. The river Ganges flows along the entire west border of the district. There are many other rivers, which include the Ichhamati, Jamuna, and Bidyadhari.



A vast area district's south there is Sundarban forest with large no. of islands with populated and also with no population. A most of the north boundary of the district passes side of the Bangladesh.

#### 7.13 Climate

The climate is tropical, like the rest of the Gangetic West Bengal. The hallmark is the Monsoon, which lasts from early June to mid September. The weather remains dry during the winter (mid November to mid February) and humid during summer. Summer temperature in May peaks at 41°C. Winter temperature in January reduces to 10°C. Relative Humidity is between 50% in March & 90% in July. The region receives an average rainfall of around 1579 mm every year.

#### 7.14 Land

Soil Status varies from alluvial to clay loam. Ratio of land High : Medium : Low = 17 : 44 : 39.

#### 7.15 Flora and fauna

In 1984 North 24 Parganas district became home to Sundarbans National Park, which has an area of 1,330 km<sup>2</sup> (513.5 sq mi). It shares the park with South 24 Parganas district. It is also home to the Bibhutibhushan Wildlife Sanctuary, which was established in 1985 and has an area of 0.6 km<sup>2</sup> (0.2 sq mi).

#### 7.16 Land use pattern

The present land use pattern in this district is as under given Table 7.5.

Table 7.5 : Land use pattern

Land use pattern	Area (ha)
Forest Land	4221
Cultivable Area	271845
Net cropped Area	264952
Current fallow land	587
Cultivable wasteland	465
Total vested Land	31791.72
Gross cropped Area	545945

#### 7.17 Agriculture



Potato, jute, rice, sugarcane, rape seed & mustard, wheat, and mesta are the major crops of this district. A detailed break up of agriculture production is provided in **Table 7.6**.

**Table 7.6: Agriculture production**

Crops	Agriculture production (in Thousand tonnes)
Potato	1189.0
Jute	776.9
Rice	641.0
Sugarcane	64.6
Rape seed & Mustard	35.4
Wheat	33.5
Mesta	8.1
<b>Total</b>	<b>2748.5</b>

A large volume of green vegetables, throughout the year, are produced by the farmers which feeds necessity of large need of huge population of the district and at the same time these meet necessity of the markets of north of Kolkata.

### 7.18 Economy

The people of the district are mainly engaged in farming, fishing and other agricultural activities. The average size of agricultural land holdings is 3.2 Bighas. Hindu refugees from Bangladesh form a major part of the industrial workforce. North 24 Parganas is one of the less economically backward districts of West Bengal, but there is chronic poverty in the southern half of the District (the Sundarbans area).

The Information Technology hub of Kolkata is at this district, which is the centre of some of the notable IT/ITES Indian and multinational companies. Around 1.2 lakh people are employed in Sector V and Sector III at Salt Lake IT Sector. The area is administered by Naba Diganta Industrial Township Authority (NDITA).

### 7.19 Cities and Towns Development

Considering necessity of the Kolkata, two new large and well planned cities adjacent to Kolkata has been formed and developed viz. Bidhannagar (Salt



Lake City) and New Town (at Rajarhat) in a vast area of each. Beside this, there are largely populated major cities like Barasat, Barrackpore, Bashirhat and Bongaon. IT Sectors of the state are built up in Salt Lake City (Sector V) and in New town.

Several Govt. offices have already been shifted to the Salt Lake City from the Kolkata.

There are no. of hospitals (incl. Tata Cancer Hospital), schools, colleges, engineering colleges, law colleges, modern shopping malls are developed in these two modern cities.

#### 7.20 Art and Culture

Folk Culture is one of the main traditions of West Bengal. The district of North 24-Parganas is proud of his own folk culture viz Jhumur, Kabigan, Tarjagan, Manashavasan, Rayani, Austakgan, Banabibir Pala, Tusu, Patar Bashi, Bhatiyali etc. This various forms of folk culture have already reached to the people of the whole of West Bengal and as well as all over India. The folk artists of this District have been trying their best to continue their folk forms.

#### 7.21 People

Hindus - 75.23%, Muslims - 24.22%, Christians - 0.23% and Sikhs - 0.12% (Source: Census Report of 2001, Government of India). Hindu refugees from Bangladesh form 42% of the total population.

#### 7.22 Rail transport

The electrified suburban rail network of the Eastern Railway is extensive and stretches far into the north of West Bengal and neighbouring districts of Kolkata, South 24 Parganas, Nadia, Howrah, Hooghly etc.

The Circular Rail encircles the entire city of Kolkata, and is at present being extended to different rail stations of North 24 Parganas. A new metro railway line offshoot has been built to connect the DumDum airport to the southernmost fringes of the city of Kolkata upto New Garia. The present only metro railway line in Kolkata has also been started from Dum Dum in the district and is being extended beyond DumDum upto Noapara in North 24 Parganas.



**7.23 Road transport**

State Transport buses are available from the district to various places. Additionally, many private tour operators also run frequent buses to major cities of North Bengal – Malda, Raiganj, Siliguri, Jalpaiguri & Alipurduar. The district is also connected to the western district towns of Burdwan, Durgapur, Asansol. Besides, for local movement and short distance commuters in the various municipalities and villages local bus, auto rickshaw & Toto service (e –rickshaw) is available.

**7.24 Air transport**

The Netaji Subhash Chandra Bose International Airport (IATA code: CCU) at Dum Dum (previously known as Dum Dum airport) is the only operative airport in West Bengal, and is in North 24 Parganas district, operating both domestic and international flights. It is a gateway to North-East India, Andaman Airport, Bangkok, and Bangladesh. The number of people using the airport has consistently increased over the last few years. The airport has been modernized recently with all newly up-to-date modern amenities and logistics.

**7.25 Tourism**

Bibhuti Bhusan Wild Life Sanctuary, Gandhi Ghat, Jawahar Kunj, Mathura Bil, Taki, Nicco Park, Sanghati Park, Millenium Park, Nolban Boating Complex, Acquatica, Eco Park at New Town and Temple of Dakshineswar are the important tourist places of the district.

**7.26 District at a Glance**

A detailed breakup of the district at a glance is provided in **Table 7.7**.

**Table 7.7: District at a glance**

Sl. No.	Particulars	Statistics
<b>1.</b>	<b>Geographical Features</b>	
(i)	Latitude	23 <sup>0</sup> 15'2" & 22 <sup>0</sup> 11'6"North
(ii)	Longitude	89 <sup>0</sup> 5' & 88 <sup>0</sup> 20' East
(iii)	Geographical area	4094 Sq. Km (4.61 % of the State)
<b>2.</b>	<b>Administrative Units</b>	
(i)	Sub Divisions	05
(ii)	Blocks	22
(iii)	Panchayat Samities	22



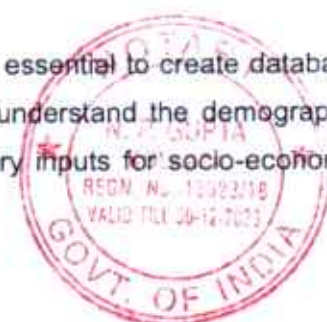
Sl. No.	Particulars	Statistics
(iv)	Gram Panchayats	200
(v)	Mouzas	1606
(vi)	Municipalities	27
(vii)	Non-Municipal Towns	33
(viii)	Outgrowths	11
(ix)	Cantonment Board	01
(x)	Police Stations	35
(xi)	Inhabited villages	1599
<b>3.</b>	<b>Population</b>	
(i)	Male	5119389
(ii)	Female	4890392
(iii)	Urban Population	5732162
<b>4.</b>	<b>Agriculture</b>	
(i)	Gross cropped Area	545945 Hector
(ii)	Forest cover	4221
(iii)	Total vested Land	31791.72
(iv)	Cultivable wasteland	465
<b>5.</b>	<b>Livestock</b>	
(i)	Poultry Bird	3000000
(ii)	Cattle	1100000
<b>6.</b>	<b>Roads</b>	
(i)	National Highway [34 & 35]	101.79
(ii)	Under PWD including 2 SH	1240
(iii)	Under Zilla Parishad	430
(iv)	Panchayat Roads	3500



Sl. No.	Particulars	Statistics
<b>7.</b>	<b>Communication</b>	
(i)	Post Office	481
(ii)	Post & Telegraph	37
<b>8.</b>	<b>Public Health</b>	
(i)	District Hospital	10
(ii)	Beds in District Hospital	2500
(iii)	Sub Divisional Hospital	14
(iv)	Beds in Sub Divisional Hospital	1870
(v)	State General Hospital	18
(vi)	Beds in State General Hospital	1870
(vii)	ESI Hospital	1
(viii)	Beds in ESI Hospital	200
(ix)	Rural Hospital	7
(x)	Beds in Rural Hospital	228
(xi)	Block Primary Health Centre	15
<b>9.</b>	<b>Education</b>	
(i)	Primary Schools	3594
(ii)	Middle Schools	974
(iii)	High Schools	204560
(iv)	Higher Secondary Schools	153
(v)	Degree Colleges	237
(vi)	Technical Schools & Colleges	16
(vii)	Universities	2

### 7.27 DEMOGRAPHIC PROFILE OF THE PROJECT AREA

A demographic profile of the project influence area (PIA) is essential to create database and develop indicators for monitoring and evaluation. To understand the demographic context of the proposed project and for providing necessary inputs for socio-economic



analysis of the project, relevant baseline data on population, social groups, literacy and workforce were collected from various available primary and secondary sources as delineated in the subsequent paragraphs:

### 7.28 Total population

The total population of project impacted district is nearly 10.01 million. The population of the project influence district is presented in the following **Table 7.8**.

**Table 7.8 : Total population**

Project influence district	Population	Percentage
North 24 Parganas	10009781	10.97
West Bengal (State as a whole)	91276115	100

\*Source: Census of India, 2011.

### 7.29 Population density

Population density of project influence district varies considerably as per the census data of 2011, which clearly indicates that the density of population in the project influence area has increased during 2001-2011. This is evident from the following **Table 7.9**.

**Table 7.9 : Population density**

Project influence district	Persons per Sq.km	
	2001	2011
North 24 Parganas	2182	2445
West Bengal (State as a whole)	903	1028

\*Source: Census of India, 2011.

### 7.30 Sex ratio

The breakup of the Sex Ratio is presented in the following **Table 7.10**.

**Table 7.10: Sex ratio**

Project influence district	Overall Sex Ratio	Sex Ratio of child population in the age group of 0-6 yrs
North 24 Parganas	955	956
West Bengal (State as a whole)	950	956

\*Source: Census of India, 2011.



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**7.31 Literacy Rate**

Literacy rate of the project influence district is significantly higher than the literacy rate of the other districts of West Bengal. North 24 Parganas has the literacy rate (84.06%). It is evident from the following **Table 7.11**.

**Table 7.11: Literacy rate**

Project influence district	Literacy Rate (Percentage)
North 24 Parganas	84.06
West Bengal (State as a whole)	76.26

\*Source: Census of India, 2011.

**7.32 Male/ Female demographic profile of project influence district**

The population composition of any district is important to anticipate the extent of project impact. Keeping in view the importance of this, male / female population of district is presented in the following **Table 7.12**.

**Table 7.12: Male/Female Population of Project Influence Districts**

Project influence district	Male	Female	Total Population
North 24 Parganas	5119389	4890392	10009781
West Bengal (State as a whole)	46809027	44467088	91276115

\*Source: Census of India, 2011.

**7.33 Male / Female Literacy in Project Influence Districts**

Literacy is one of the important indicators of social development. The literacy is higher among males relatively to females in the district. It is evident from the following **Table 7.13**.

**Table 7.13: Male/ Female Literacy**

Project influence district	Literates (%)			
	2011		2001	
	Male	Female	Male	Female
North 24 Parganas	87.61	80.34	83.92	71.72
West Bengal (State as a whole)	81.69	70.54	77.02	59.61

\*Source: Census of India, 2011.



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**Chapter -8 : Project Cost Estimate and  
Rate Analysis**



**PROJECT COST ESTIMATE AND RATE ANALYSIS****8.1 General**

The methodologies being adopted for the cost estimating for widening the road from existing 2 lanes with paved Shoulders to 2 x 2 lanes are:

- a) Analysis of unit rates of various items of construction.
- b) Estimation of quantities for
  - i) Road components 2x 2 lane carriageways, along with Paved Shoulder, Service roads, medians including drainages, protective works, traffic safety, cross-drainage structures, bridge etc. and other ancillaries as per IRC/IS specifications.
  - ii) Cost of one toll plaza.
  - iii) Proposed 2 (two) no. of Major VUPs at starting point and at the crossing with Barrackpore – Barasat Road.
  - iv) Proposed 5 no. of VUPs, 7 no. of LVUPs and 5 no. of PUPs.
  - v) Passenger Shelter of Buss Stands
  - vi) Maintenance.
  - vii) Miscellaneous cost
- c) Consideration of allowances for contingencies and Supervision Consultancy Charges.
- d) Cost of utility shifting (Electrical, Water Pipelines, Lock gate)
- e) Illumination on roads, Major VUPs, VUPs, LVUPs & PUPs, Toll Plaza including signaling.
- f) Cost of affected structures.
- g) Environmental Mitigation charges.

**8.2 Analysis of Rates**

The rates of individual items have been assessed on the basis of Standard Data Book of MORT&H in force considering rate of materials as per Schedule of Rates, 2014 of NH wing and Schedule of Rates (2015-16) Public Works (Roads) Directorate, Government of West Bengal and as collected from the market rates where not available from the SOR.

Apart from the above, PWD (W.B) SOR (2015-16) for Building Works Materials & labour and Sanitary & Plumbing are also considered for the few selected items which are not available in SOR, NH Wing and P.W. (Roads) Directorate.



The Overhead charge for each item has been considered on the cost of materials, machinery and labour as per the following rates: (As per MoRT&H Standard Data Book)

- (i.) 8% for all items of road works.
- (ii.) 20% for all items for bridge works.

The contractor's profit has been considered on all items at a uniform rate of 10%. The profit has been considered applicable on material, machinery, labour cost and overhead charges, as per the data book.

As per norms of PWD, lastly labour welfare cess @ 1% has been added in analysis of rates for all items of works.

### 8.3 Cost of various components of Roads & Bridges

The costs of various components are based on estimates of quantities of individual items of works and yardstick for rate as applicable for the works. The main components of the total cost are of:

- a) Road proper (2x2 lane carriageway) along with paved shoulders including medians, drainage, protective works, traffic safety etc.
- b) Service roads including cost of side drainage.
- c) CDs (widening, replacement and new construction) on both carriageways, service roads (including repairs and rehabilitation of existing CDs).
- d) One toll plaza (10 lane) with offices at 1<sup>st</sup> floor and 2 Weigh Bridges.
- e) Proposed 2 Major VUPs at Muragacha & Wireless More.
- f) VUPs in 5 locations, LVUPs in 7 locations and Pedestrian underpass (PUP) in 10 locations including intersections & schools.
- g) Passenger Shelter at bus Stands.
- h) Maintenance.
- i) Miscellaneous works.
- j) Centages on contingency and supervision consultancy.
- k) Utility shifting (Electrical, Water Pipes, Lock gate)
- l) Illumination of Road Intersections, Major VUPs, VUPs, LVUPs, PUPs, Toll Plaza including signaling
- m) Cost of affected structures.
- n) Environmental Mitigation charges.

### 8.4 Cost Estimate

The Estimated Cost of the projects stands at **Rs. 940.42 Crores (Rupees Nine Hundred Forty Crore Forty Two Lakh only)**

The Abstract of the Estimated Cost of the Project is provided in **Table 8.1**



Table 8.1 : Abstract of Cost

Item Description	Amount (in Rupees)
<b>A : ROAD WORKS (2 X 2 LANE CARRIAGEWAY WITH PAVED SHOULDER)</b>	
BILL NO. 1: SITE CLEARANCE AND DISMANTLING	8,02,73,321.00
BILL NO. 2: EARTHWORK	60,54,65,483.00
BILL NO. 3: SUB-BASE & BASE COURSES	1,35,97,46,065.00
BILL NO. 4: BITUMINOUS COURSES	1,20,21,94,182.00
BILL NO. 5: DRAINAGE WORKS	42,03,75,822.00
BILL NO. 6: PROTECTIVE WORKS	14,37,01,163.00
BILL NO. 7: TRAFFIC SIGNS MARKINGS AND OTHER APPURTENANCES	23,14,33,403.00
<b>SUB - TOTAL FOR ROAD WORKS</b>	<b>4,04,31,89,439.00</b>
<b>B : SERVICE ROADS WORKS</b>	
BILL NO. 8: SERVICE ROAD WORKS	1,54,93,42,233.00
<b>C : BRIDGES &amp; CULVERT</b>	
BILL NO. 9: CROSS DRAINAGES	1,14,55,09,871.00
BILL NO. 10: VEHICULAR UNDERPASS (VUP) 48.00m WITH ALL APPROACH RAMP	4,00,08,48,896.00
BILL NO. 11: REPAIR AND REHABILITATION OF EXISTING CDS	39,32,261.00
BILL NO. 12: VEHICULAR UNDERPASS (VUP) (24.0 m span) 3 Nos.	14,68,18,550.00
BILL NO. 13: VEHICULAR UNDERPASS (VUP) (16.0 m span) 2 Nos.	8,48,79,911.00
BILL NO. 14: PEDESTRIAN UNDER PASS (PUP 12.0 m Span) 6 nos.	14,26,10,086.83
BILL NO. 15: PEDESTRIAN UNDER PASS (PUP 10.5 m Span) 6 nos.	12,43,91,773.75
<b>D : TOLL PLAZA WORKS</b>	
BILL NO. 16: TOLL PLAZA (2 x 5 LANES)	12,67,89,628.00
<b>E : PASSENGER SHELTER AT BUS STAND</b>	
BILL NO. 17: PASSENGER SHELTER AT BUS STAND	1,22,75,265.50
<b>F : MAINTENANCE WORKS</b>	
BILL NO. 18: MAINTENANCE OF ROAD	62,89,800.00
<b>G : MISCELLANEOUS WORKS</b>	
BILL NO. 19: MISCELLANEOUS WORKS	63,00,600.00
BILL NO. 20: TOLL PLAZA (OVERHEAD OFFICES etc. & AMENITIES)	2,92,56,050.00
<b>COST OF CONSTRUCTION (INCLUDING CESS) : "P"</b>	<b>11,49,31,88,420.08</b>
<b>COST OF CONSTRUCTION (EXCLUDING CESS) : "Q"</b>	<b>11,49,31,88,419.07</b>
BILL NO. 21: ELECTRICAL & ILLUMINATION WORK	26,68,99,150.26
<b>Total cost of civil works</b>	<b>11,76,00,87,569.33</b>
Cost of utility shifting	0.00
Cost of land acquisition	0.00
Cost of affected structures	0.00
<b>Total cost of other works</b>	<b>0.00</b>
<b>Total Cost</b>	<b>11,76,00,87,569.33</b>
<b>Say</b>	<b>11,76,00,87,569.00</b>

Team Leder  
Mackintosh Burn Limited



## Chapter -9 : Economic Analysis



## ECONOMIC ANALYSIS

## 9.1 Introduction

The economic evaluation has been carried out within the framework of societal cost benefit analysis. The essential objective of public expenditure is to maximize the returns on investment in economic terms. This objective is accomplished by determining the appropriate improvement proposal that leads to the minimum total transport costs in the case of road upgradation projects.

The economic analysis has been based on incremental costs and incremental benefits, i.e. comparing the total transport cost "with the project" and "without the project" which is the base case or the do minimum case. All costs and benefits considered in the study have been valued in monetary terms and expressed in economic prices for avoiding distortion in the input prices of labour, materials and equipment due to market imperfection.

The comparison has been worked out section-wise on a yearly basis for the entire analysis period. The concept behind the approach is that if the project is implemented, the benefits will be the decreased transport (VOC & time cost) cost when compared to the costs of the alternative forgone, i.e. the base case or without project situation. The results have been expressed in terms of Economic Internal Rate of Return (EIRR) and Net Present Value (NPV).

The Economic Analysis has been carried out using HDM IV. The HDM Model has also been used for analyzing pavement options by generating economic cost streams and computing the EIRR and NPV for economic evaluation of the whole project for two different options from engineering point of view. The details of the project are presented in **Table 9.1**.

Table 9.1: Basic Input

Section Name	Length (km)	Avg. width (m)
Kalyani Barrackpore Expressway Section (Km 4+565 – Km 34+000)	30	2x7
<b>Total</b>	<b>30</b>	



## 9.2 HDM Model Input Data

The following values have been considered as input data for the HDM Model.

### *Analysis period*

The period of construction starts from 2017. In accordance with TOR, 33 years have been taken as analysis period for EIRR estimation. Analysis period is inclusive of construction period as well as benefit period. A discount rate of 12% has been considered.

### *Project Costs*

The project costs include costs of road works and bridges/structures, toll plaza, land acquisition and environment costs and costs towards utility shifting etc, (including physical contingencies and engineering supervision and administrative charges)

### *Conversion Factor*

A conversion factor of 0.85 has been used for converting financial costs to economic costs.

### 9.2.1 Road and Pavement Characteristics

Road and pavement characteristics have been used as model input. These include road length, carriageway width, width of paved shoulders, existing pavement composition, sub-grade CBR, roughness of the existing road (IRI), structural number and cracking, raveling and other pavement distress parameters.

### 9.2.2 Cost Inputs for HDM

Construction cost for economic analysis includes Land Acquisition and Resettlement & Rehabilitation cost but excludes toll plaza cost. The capital costs (civil costs) of the project road have been converted into economic cost by using 0.85 as standard conversion factor. Distribution of cost for the project is given in **Table 9.2**.

**Table 9.2: Construction Cost Estimate of Project Road (Rs in Million)**

Civil Cost with Contingency, Supervision Charges	Environmental Monitoring and Mitigation Cost, Utility Shifting Cost etc.	Total Financial Cost	Total Economic Cost	Per km Economic Cost
9051.28	352.91	9404.20	8046.50	277.47



The construction period is 36 months and the phasing of Capital Expenses is

First Year (2017)	:	30%
Second Year (2018)	:	40%
Third Year (2019)	:	30%

### 9.2.3 Routine and Periodic Maintenance Costs

Routine maintenance costs comprise primarily maintenance of the pavement, collection of litter, traffic management (policing), accident repairs and all ancillary works including beautification.

The periodic maintenance strategies include functional overlays, and rehabilitation.

Both routine and periodic maintenance costs have been converted into economic costs by applying the standard conversion factor of 0.85.

Item	Financial Cost (Rs)	Economic Cost (Rs)
<b>Do-Minimum Scenario (Base Case)</b>		
Routine Maintenance (Miscellaneous-drainage, Patching and Crack Sealing)	Rs 100000 / Km	Rs 85000 / Km
Periodic Maintenance: Single layer surface dressing	Rs. 375/square meter	Rs. 318/square meter
<b>Do-Something Scenario</b>		
<b>For existing roads (SL,IL,2L)</b>		
Routine Maintenance (Miscellaneous-drainage, Patching and Crack Sealing)	Rs 100000 / Km	Rs 85000/ Km
Periodic Maintenance: Single layer surface dressing	Rs. 375/square meter	Rs. 318/square meter

### 9.2.4 Traffic Volume and Composition

The daily traffic on the project road has been taken on the basis of the Section I and Section II. The vehicles have been regrouped under the following heads.

- Bus
- Minibus
- Car
- LCV
- Two Axle Truck
- 3-Axle Rigid
- Multi Axle Truck

The effects of non-motorized traffic have also been included in the model.



The following number of axles (Table 9.3) has been used against each category of vehicles.

**Table 9.3: Category of Vehicles and number of Axles**

Vehicle	No. of axles
Car	2
Bus	2
Light Trucks	2
Medium Trucks	2
3-Axle Rigid	3
Multi Axle Truck	≥3

### 9.2.5 Economic Prices

The economic prices of vehicles, tyres, fuel, maintenance labour and crew cost has been shown Table 9.4 to Table 9.7. The opportunity cost of labour has not been considered. The following economic prices of fuel, lubricant, tyre, maintenance cost, passenger time cost, crew cost, cargo time costs etc. have been estimated by the consultant.

**Table 9.4: Vehicle Prices (Rs)**  
(Price as on March 2016)

Vehicle Category	Economic Price of Vehicle	Price of Chasis					Price of Body			Market Price of the Vehicle
		Economic Price of Chasis	Excise Duty	CESS	Sales Tax	Ex-showroom Price	Economic Price of Body	Taxes on Body	Market Price of Body	
Car	154041	154041	25448	193	22460	202142	-	-	-	202142
Taxi	270908	270908	44756	339	39500	355503	-	-	-	355503
Jeep	343024	343024	56670	429	50015	450138	-	-	-	450138
LCV	415827	415827	68697	520	60630	545674	-	-	-	545674
Mini Bus	828890	442624	73124	553	64538	580839	386266	63733	450000	1030839
Standard Bus	1010501	495480	81856	619	72244	650200	515021	84978	600000	1250200
2 Axle Truck	861821	561392	92745	702	81855	736694	300429	49570	350000	1086694
Heavy Commercial Vehicle	1026483	683135	112858	854	99606	896453	343348	56652	400000	1296453
Semi Articulated	1007661	1007661	166472	1260	146924	1322317	-	-	-	1322317
Articulated	1540210	1540210	254452	1925	224573	2021161	-	-	-	2021161



**Table 9.5: Tyre Prices**  
(Price as on March 2016)

Vehicle Type	No. of Tyres	Per Tyre (Rs)	
		Market Price	Economic Price
Car	4	2460	2091
Trekker (diesel)	4	4260	3621
LCV	4	9600	8160
Mini Bus	4	10800	9180
Bus	6	11400	9690
Truck (2 - Axle)	6	12600	10710
MAV Rigid (3- Axle)	10	12600	10710
MAV (Semi - Articulated)	14	12600	10710
MAV (Articulated)	20	12600	10710

**Table 9.6: Crew Cost**  
(Price as on March 2016)

Vehicle Type	Crew cost
	(Rs /hr)
Bus	176.5
LCV	70.6
HCV	105.6
MAV	126.2

**Table 9.7: Fuel Prices (Tax Removal Approach)**  
(Price as on June 2016)

Fuel	Petrol (Rs.)	Diesel (Rs.)
Base Price	27.91	28.24
Market Price	67.79	56.89

### 9.2.6 Value of Cargo Time and Passenger time

HDM generates average speeds of vehicles in "without" and "with" project conditions. Based on this, the time savings by vehicle type are calculated.

The value of time (VOT) of an average car passenger is taken as Rs.41.93 per hour and for an average bus passenger as Rs.27.68 per hour. The VOT per vehicle has been derived using average occupancy rates as obtained from surveys.

The VOT for goods in transit were worked out using the inventory method applying market interest rate on the value of a basket of goods in a truck load, taking into



consideration both normal and perishable/high value goods and presented in **Table 9.8.**

**Table 9.8: Value of Cargo Time**

Vehicle Category	Value of Cargo Time (Rs./ hr)
2-Axle Truck	25.8
LCV	11.2
Multi Axle Truck	65.0
3-Axle Truck	65.0

### 9.30 Economic Internal Rate of Return (EIRR) and Net Present Value (NPV)

The HDM-4 model has been used for economic analysis and the following results are found. The EIRR @ 12% discount rate is determined using the model. The result of the analysis is presented in **Table 9.9.**

**Table 9.9: Results of Economic Analysis (Base case), EIRR (%)**

Summary Indicator	Value
EIRR (%)	22.2
NPV@12% (Rs. million)	7765.71

The economic internal rate of return considered desirable for transport infrastructure projects in India is 12 percent. The project is found viable according to economic analysis.

### 9.40 Sensitivity Analysis

Sensitivity analysis of the project with respect to the combinations of increases in cost and decreases in benefit has been performed for both the strategies. The results have been presented in **Table 12.10.**

**Table 12.10: Results of Sensitivity Analysis - EIRR (%)**

Sensitivity Cases		
	EIRR (%)	NPV@12% (Rs. Million)
Base Case	22.2	7765.71
Cost Increase by 15%	19.5	6471.39
Benefit Decrease by 15%	17.7	4254.57
Cost Increase by 15% & Benefit Decrease by 15%	15.5	2960.24



The project road clears all the sensitivity cases.

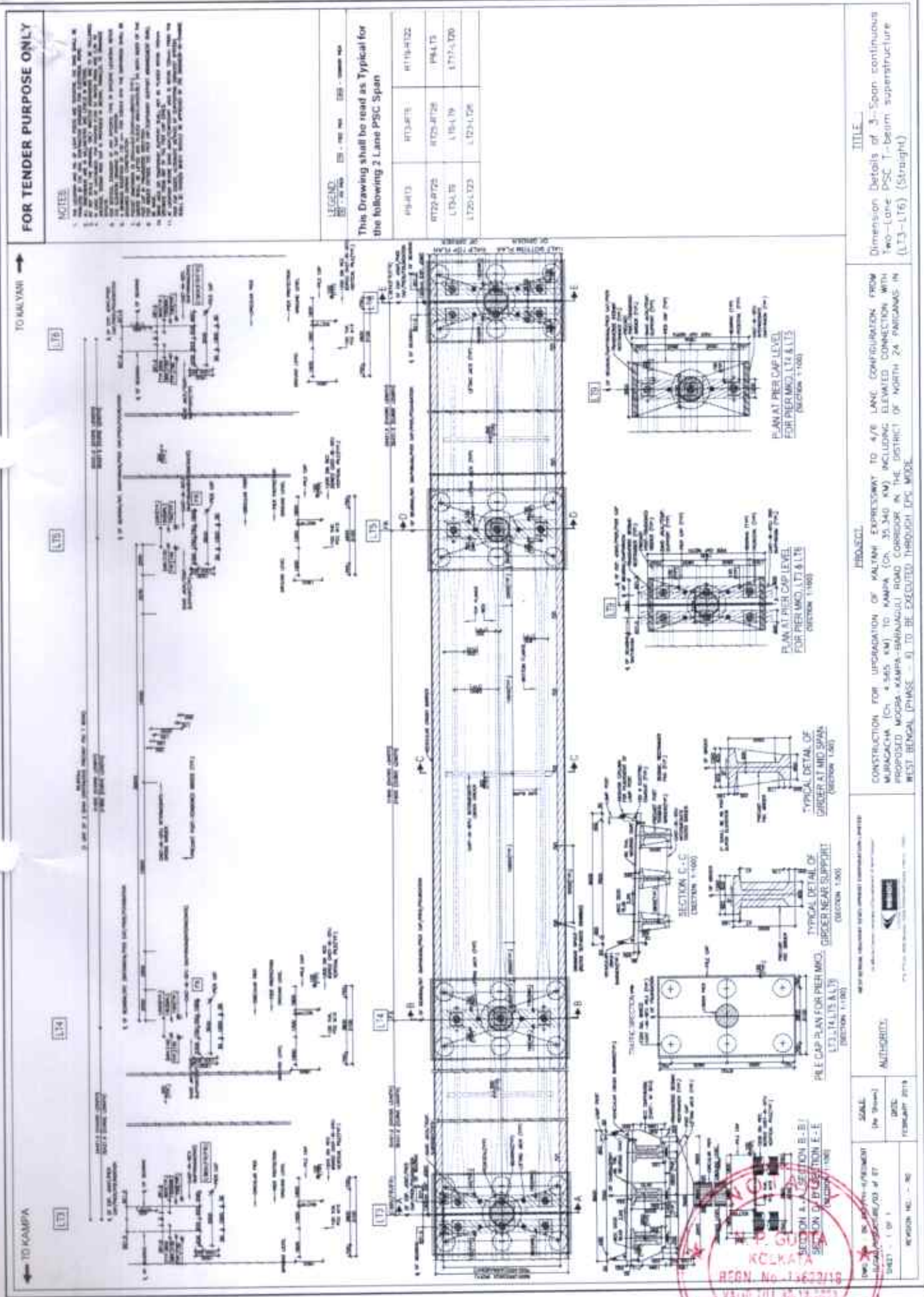
**9.41 Conclusion**

From the economic analysis it is observed that the project road is viable for the proposed improvement program. The project road also clears all the tests of the sensitivity analysis with IRR is higher than the cut off rate of 12% and positive NPV.

**9.42 Recommendation**

From the point of view of the economic justification the project is recommended for implementation.





**FOR TENDER PURPOSE ONLY**

**NOTES:**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CONCERNED AUTHORITIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CONCERNED AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CONCERNED AUTHORITIES.
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9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CONCERNED AUTHORITIES.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CONCERNED AUTHORITIES.

**LEGEND:**

Span - Pier Nos. (Span - Pier Nos.)

This Drawing shall be read as Typical for the following 2 Lane PSC Span

49-413	RT3-RT5	RT16-RT22
RT22-RT25	RT25-RT28	PR4-15
L13A-15	L15A-19	L17A-17D
L120A-123	L123A-126	

**TITLE:**

Dimension Details of 3-Span continuous two-lane PSC T-beam superstructure (L13-L16) (Straight)

**PROJECT:**

CONSTRUCTION FOR UPGRADATION OF KALYANI EXPRESSWAY TO 4/8 LANE CONFIGURATION FROM MURAGACHA (Ch. 4.565 KM) TO KAMPA (Ch. 35.340 KM) INCLUDING ELEVATED CONNECTION WITH PROPOSED MOGRA-KAMPA-BANANAJULI ROAD CORRIDOR IN THE DISTRICT OF NORTH 24 PARAGANAS IN WEST BENGAL (PHASE - II) TO BE EXECUTED THROUGH EPC MODE.

**AUTHORITY:**

SCALE: (As Shown)

DATE: FEBRUARY 2019

REVISION NO.: - 02

DESIGNER: (Signature)

CHECKER: (Signature)

APPROVER: (Signature)

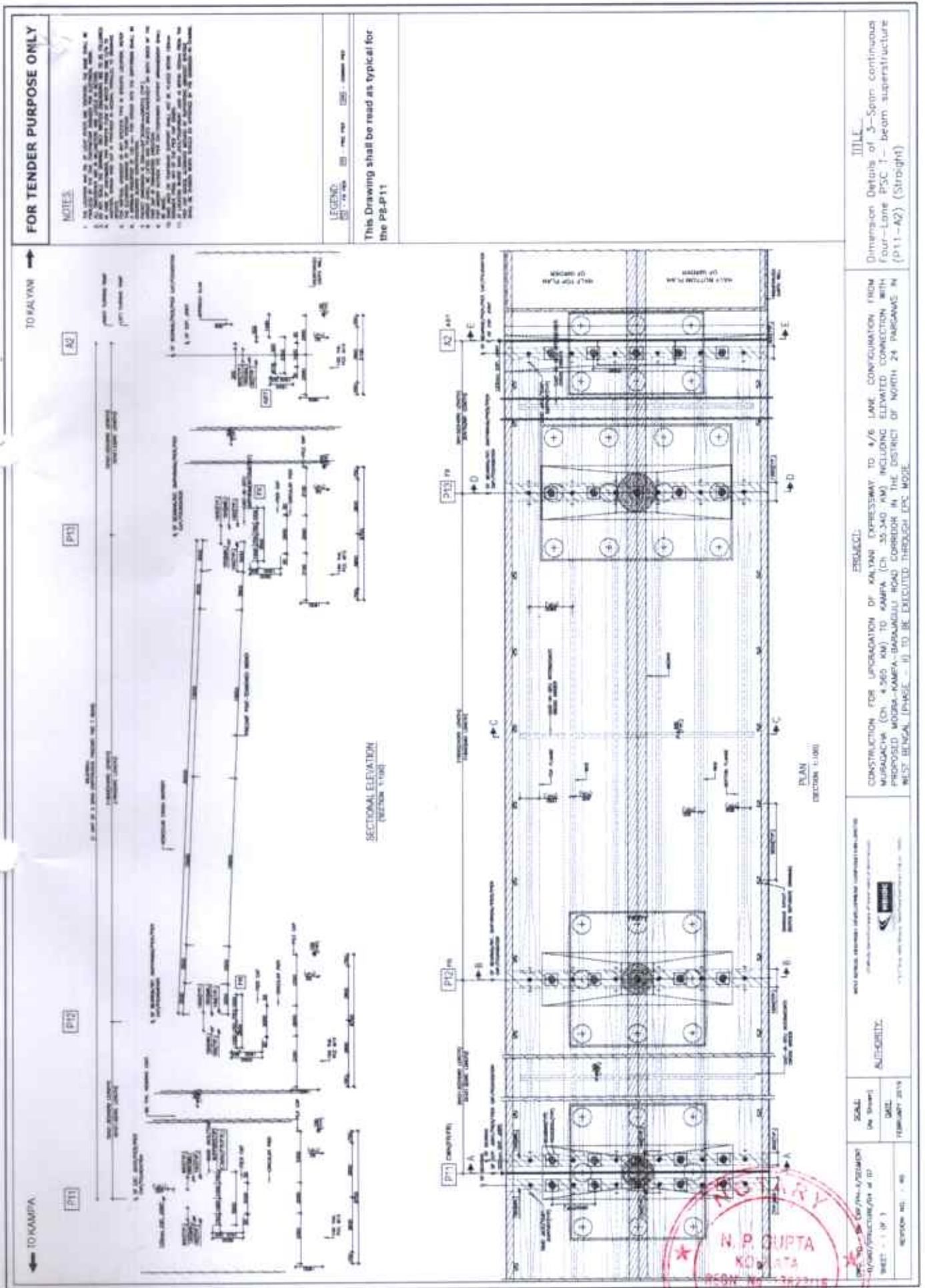
PROJECT ENGINEER: (Signature)

DATE: 20/02/2019

REVISION NO.: - 02

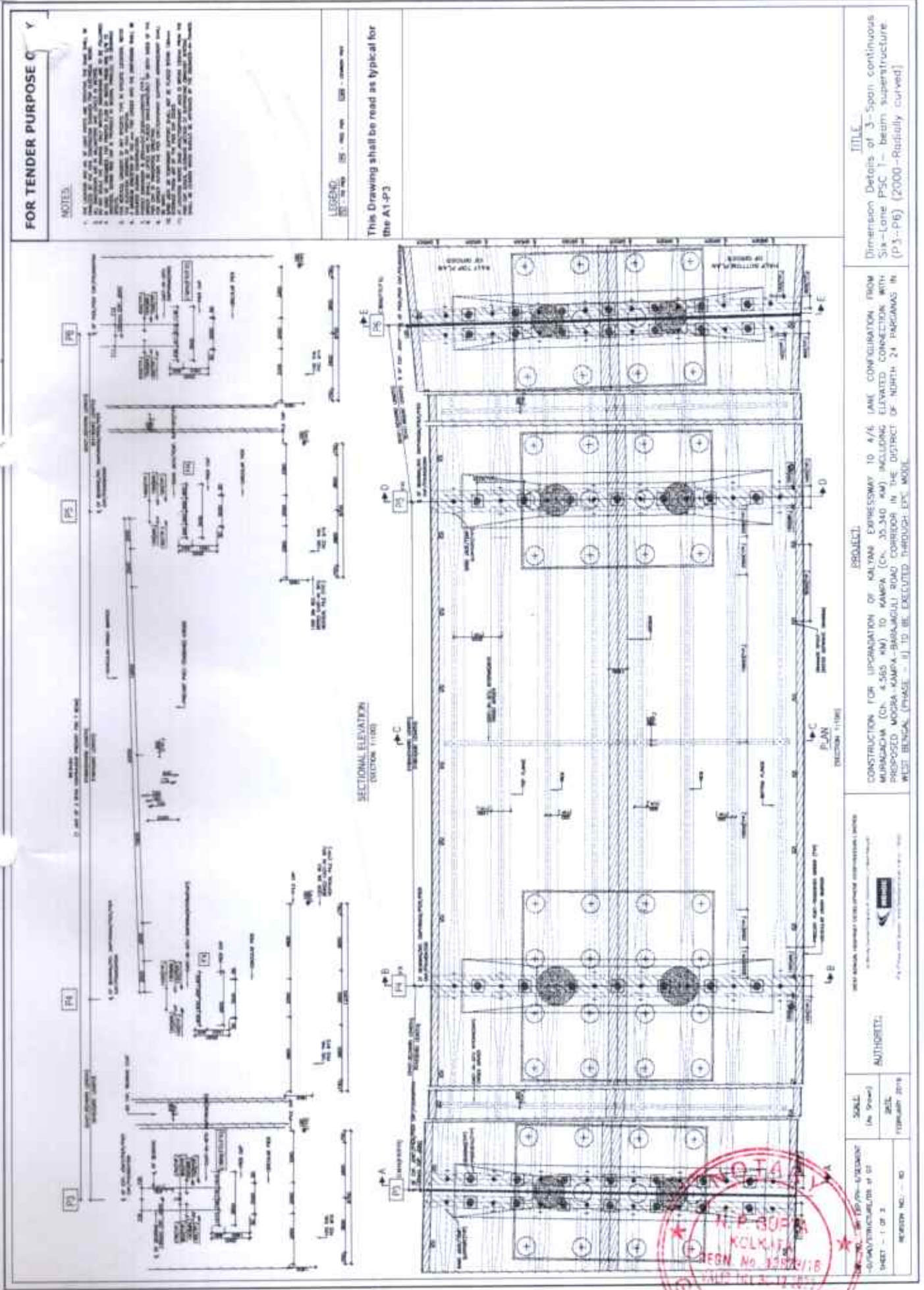


Annexure - 4



**TITLE:**  
Dimension Details of 3-Span continuous Four-lane PSC beam superstructure (P11-A2) (Straight)

Annexure - 4



This Drawing shall be read as typical for the A1-P3

TITLE: Dimension Details of 3-Span continuous Six-Lane PSC T-beam superstructure (P3-P6) (2000-Radiially curved)

PROJECT: CONSTRUCTION FOR UPGRADATION OF KALYAN EXPRESSWAY TO 4/6 LANE CONFIGURATION FROM MURAGACHA (CN. 4.565 KM) TO KAMPA (CN. 30.340 KM) INCLUDING ELEVATED CONNECTION WITH PROPOSED MOGRA-KAMPA-BARAKULLI ROAD CORRIDOR IN THE DISTRICT OF NORTH 24 PARGANAS IN WEST BENGAL (PHASE - II) TO BE EXECUTED THROUGH EPC MODE.

WEST BENGAL HIGHWAY DEVELOPMENT CORPORATION LIMITED  
 10, BALLY ROAD, CALCUTTA - 700019  
 TEL: 2222 2222 FAX: 2222 2222  
 E-MAIL: [wbhdc@wbhdc.co.in](mailto:wbhdc@wbhdc.co.in)

AUTHORITY:  
 SCALE: (As Given)  
 DATE: FEBRUARY 2016

NO. OF SHEETS - 03  
 SHEET - 1 OF 3  
 DESIGN NO. - 10



GOVT. OF INDIA

The  
Kolkata Gazette



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FRIDAY, JULY 30, 2021

| SAKA 1943

PART I.—Orders and Notifications by the Governor of West Bengal, the High Court, Government Treasury, etc.

**GOVERNMENT OF WEST BENGAL**  
**DEPARTMENT OF INDUSTRY, COMMERCE & ENTERPRISES**  
**Mines Branch**  
NOTIFICATION

No. 284-ICE/O/MIN/GEN-MIS/02/2021.—30th July, 2021.—Whereas, the Government of West Bengal has been considering the importance of framing a Sand Mining Policy for the State of West Bengal to improve the effectiveness of monitoring of mining and transportation of sand and to ensure the extraction is carried out in scientific, environmentally sustainable and socially responsible manner ;

Whereas, to prevent damage to the riverine ecology and to protect black marketing and hoarding of sand, the Government of West Bengal through its Cabinet Meeting held on 22nd July, 2021 has decided to bring a new Sand Mining Policy, 2021 for the State of West Bengal ;

Now, therefore, the Governor in the interest of the public service, is pleased to hereby publish the Sand Mining Policy, 2021 for the State of West Bengal as given in the Schedule hereto annexed for information of all persons in good faith.

**The Schedule**

**The West Bengal Sand Mining Policy, 2021**

**1. Introduction**

- 1.1. Articles 39(B) of the Indian Constitution (Directive Principles of State Policy) states that the natural resources of the community have to be distributed so as to sub-serve the common good of the community. Natural resources are legally owned by the State. The State should ensure equitable, sustainable and affordable distribution of natural resources.
- 1.2. Sand, a natural resource, is a minor mineral as defined under S 3(e) of the Mines and Minerals (Development and Regulation) Act, 1957 (" MMDR Act"). Under the MMDR Act, the legal and administrative control over minor minerals vests with the State Government, which has the powers to make rules to govern minor minerals.



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- 1.3. Currently haphazard sand mining has led to severe environmental degradation. The current system is prone to profit-maximization and concern for the environment and the ecology gets relegated.
- 1.4. This policy aims to address the issues of indiscriminate mining of sand, black-marketing, artificial supply shortage through hoarding and to ensure compliance with environmental regulations and affordable pricing for the end consumers.
- 1.5. The State Government through this policy intends to govern the excavation, transportation, storage, sale and consumption of sand. The State Government intends to appoint the West Bengal Mineral Development and Trading Corporation Ltd. ("WBMDTCL") (a fully owned undertaking of the Government of West Bengal) as the designated agency, in order to effectively achieve the above mentioned objectives.

## 2. Sources of sand in West Bengal

2.1. There are two primary sources of sand in the State of West Bengal :

- (i) Riverine System
- (ii) Dams and Reservoirs

## 3. Existing Framework of Sand Mining in West Bengal

- 3.1. Currently, the State of West Bengal follows a system wherein mining Ghats are e-auctioned by the State Government to private players.
- 3.2. Mining lease is granted by the State to the Winning private bidder. The lease period for each sand Ghat is usually 5 (five) years. The winning private bidders are authorized to extract sand as per the mining plan against payment of one time-bid money, royalty and cess proportionate to the quantity of sand extracted.

## 4. Need for Revised Framework :

4.1. There is a need for a revised framework as the current model has the following disadvantages:

- (i) **Severe Damage to the Environment :** The current market-based model promotes profit-maximization. There is prevalent unethical and unscientific mining of sand, causing severe damage to riverine ecology. This in turn leads to groundwater depletion and flooding.
- (ii) **Loss of Revenue of State :** The State Government revenue collection is at present less than the amount realized by the States having smaller or comparable sand reserves.
- (iii) **Multiple Players :** The current market based model encourages participation by multiple players approximately 100-150 lease holders per district. The players due to their smaller size do not make investment in better equipment, scientific and eco-friendly extraction etc.
- (iv) **Black Marketing and Price Fluctuations :** Due to the high demand for sand, there is hoarding and black marketing of sand. This leads to an abnormal increase in the price of sand for the consumers. There are also seasonal shortages.



5. **Objectives of the Policy :**

5.1. The main objectives of this new policy are as follows :

- (i) To ensure that sand mining is done in a scientific, environmentally sustainable and socially responsible manner, so as to prevent damage to the riverine ecology and to prevent groundwater depletion and flooding.
- (ii) To ensure that there is no obstruction to the river flow, water transport and restoring the riparian rights and in-stream habitats.
- (iii) To prevent ground water pollution by prohibiting sand mining on fissures where it works as filter prior to ground water recharge.
- (iv) To increase the revenue earned by the State Government from the sand mining process, not only through realization of Royalty, Cess but ensuring payment of all applicable taxes including GST.
- (v) To make efficient use of technology and Information Technology Enabled Services (ITES) for efficient regulation and monitoring of sand mining in the State and enforcement of compliances connected therewith.
- (vi) To improve the effectiveness and efficiency of monitoring of mining and transportation of sand and to ensure availability of adequate quantity of sand in sustainable manner and to prevent hoarding and black marketing, thereby ensuring that sand is available to the end consumers at an affordable price.

6. **Proposed New Framework :**

- (i) This new policy will be implemented by appointing the WBMDTCL as the designated agency in achieving the above-mentioned objectives. The policy is to be implemented through following steps which are only indicative in nature and may make changes in the implementation procedure as deemed fit to achieve the objectives. The State Government or WBMDTCL may decide to implement different steps concurrently or in a phase wise manner.
- (ii) **WBMDTCL to focus on buliding capacity :** WBMDTCL shall focus on bringing about organizational changes so as to ensure compliance with this policy, strict regard to environmental regualtions and affordable pricing for the end consumers of sand. To man the wings, the personnel will be either recruited directly or through deputation from other departments.

**WBMDTCL shall have 3 (three) wings:**

- (a) **Excavation Wing:** The excavation wing shall be responsible for contracting out the excavation of sand and the transport of sand from the sand mines to the stockyards.
- (b) **Storage and Sales Wing :** The storage and sales wing shall be responsible for managing storage of sand in the stockyard and for ensuring that the sand is sold in a transparent process to the end consumers.



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- (c) **Enforcement Wing** : The enforcement wing officials shall have the power to file a complaint in case of pilferage, illegal mining, illegal transportation, misuse of sand, violation of environmental regulations and other such illegal and irregular activities. A 24x7 control room to be established at State/District level.
- (iii) **Transfer of existing mining leases** : In existing leases, the lease shall not renewed and shall automatically be resumed and vested with the State Government, upon expiry of such leases. The State Government shall then lease the sand mines to WBMDTCL or any agency recommended by it.
- (iv) **Excavation of sand by WBMDTCL** : Once sand mining lease has been granted to WBMDTCL/any agency, it shall ensure sand mining either by appointing a Mine Developer and Operator (MDO) or through any other model through transparent bidding process. WBMDTCL may itself or through its nominated agents contract out the excavation and transportation of sand from the mines to the stockyards/deposits.
- (v) **Development of a Centralized Portal and Introduction of Centralized-Challan System for Transportation of Sand** : The State Government shall issue e-challans to the vehicles transporting sand through a portal developed by WBMDTCL having inter-alia following features :
- (a) **E-challan shall have built in security feature like** Unique Barcode, Unique Quick Response (QR) code, Invisible Ink Mark, Void Pantograph and Watermark etc.
- (b) **Requirement at mine lease site would be built in like**
- Small size plot [Up to 5 (five) hectare] : Android based smart phone.
  - Large size plots [More than 5 (five) hectare] : CCTV camera, personal computer (PC), internet connection, power back up.
  - Access control of mine lease site.
  - Arrangement for weight or approximation of weight of mined out mineral on basis of volume of the trailer of vehicle used.
- (c) **Content of e-challan** :
- E-Challan will capture all essential features like unique number, Date and time of issue, Validity period, Name, address and contact details of the lease holder, lease details, Purchaser details, Vehicle number etc.
- (d) **Scanning of e-challan and uploading on server** :
- **Website** : Scanning of receipt on mining site can be done through barcode scanner and computer using the software.
  - **Android Application** : Scanning on mining site can be done using Android Application in a smart phone. It will require internet availability on SIM card.
  - **SMS** : E-challan shall be uploaded on server even by sending SMS through mobile. Once the e-challan gets uploaded, a unique invoice code gets generated with its validity period.
- (e) **Proposed working of the e-challan system** : The Lessees would be given login id to automatically generate e-challan after entering the relevant details and depositing applicable royalty/cess online.



- (vi) **Collection of Royalty and Cess through WBMDTCL :** The collection of royalty and Cess for the State Government would be done through a software generated centralised e-challan system developed by WBMDTCL.
- (vii) **Environmental Audit :** It shall be conducted by an independent reputed third party entity/consultant to be selected by a bid process. In case of any adverse findings, the State Government may take appropriate actions against the defaulting lease-holder in accordance with applicable laws and the lease deed executed between the State Government and the lease-holder may be terminated after following due procedure.
- (viii) **Monitoring Activities :**
- (a) **Monitoring Excavation Process :** The lease boundary shall be demarcated by WBMDTCL / District Authorities with geo-coordinates or geo- fenced to ensure that sand excavation is being conducted only within the permitted area. Excavation of sand from river beds shall be monitored by WBMDTCL / District Authorities on a regular basis to keep track of excavated quantity.
- (b) **Monitoring Transportation of Sand through GPS Monitoring :** It shall be endeavoured that transportation of sand is monitored in a proper manner starting from the Ghats till its end point. The route of vehicle from source to destination can be tracked through the system using check points , RFID tags and GPS tracking. The vehicles may follow a particular colour code. Vehicles may also be fitted with GPS and the e-challan shall be geo-tagged to the stock of sand in the vehicle.
- (c) **Monitoring the Availability of Sand & Establishing Storage Points / Depots by WBMDTCL :** WBMDTCL shall assess the demand for sand in the State of West Bengal and shall accordingly take measures for ensuring that the stockyards / sand depots have a stock of sand for a period of not more than 3 (three) months at any given point of time .Storage locations may be developed by WBMDTCL either directly or through private parties to store excavated sand at suitable locations like in periphery of urban centres so that consumers can lift sand from these points.
- (d) **Monitoring Sale of Sand :** The centralized online portal developed by WBMDTCL will give consumers facility to view available stocks in different depots and purchase sand online.

By order of the Governor,

VANDANA YADAV,

Secy. to the Govt. of West Bengal.



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ANNEXURE-62

Item No. 01

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL  
PRINCIPAL BENCH, NEW DELHI**

Original Application No. 200/2014

M.C. Mehta

Applicant(s)

Versus

Union of India & Ors.

Respondent(s)

Date of hearing: 12.12.2019

Date of uploading: 18.12.2019

**CORAM:** HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON  
HON'BLE MR. JUSTICE S.P. WANGDI, JUDICIAL MEMBER  
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

**ORDER**

S. No.	CONTENT	PARA No.
I	The issue: Review of progress of compliance of directions of this Tribunal to prevent and remedy pollution of river Ganga in the light of orders of the Hon'ble Supreme Court dated 29.10.2014 and 24.01.2017 in W.P.(C) 3727/1985	1-4
II	Constitution of Monitoring Committees headed by former Judges in the States of Uttarakhand and Uttar Pradesh vide orders dated 29.11.2018 and 06.08.2018 to oversee execution of Action Plans in the light of stipulated timelines	5
III	Further monitoring, in the light of reports of the Monitoring Committees, vide orders dated 11.03.2019, 14.05.2019 and 29.05.2019; Issue of waste management in 97 'Ganga Towns' and directions for zero discharge of pollutants in Ganga, making concerned officers accountable to be monitored by the Chief Secretaries' of the concerned States	6-9
IV	Monitoring by the Tribunal on last date of hearing i.e. 22.08.2019, fixing strict timelines with consequence of requiring payment of compensation by the defaulting States and NMCG and action against the erring officers	10-12
V	Issue of shifting of Chromium dump in existence since 1976 affecting ground water at Rania, Kanpur Dehat/Rakhi Mandi, UP.	13
VI	Final reports of Justice Tandon Committee for UP and Justice Dhyani Committee for Uttarakhand and progress reports filed by States/NMCG in the light of order dated 22.08.2019 and report of CPCB in terms of order dated 14.05.2019 on the subject of biodiversity parks	14-22
VII	Consideration	23-26
VIII	Future Monitoring Mechanism after submission of final reports by the Committees constituted by the Tribunal earlier	27



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IX	Directions	28
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I. **The issue: Review of progress of compliance of directions of this Tribunal to prevent and remedy pollution of river Ganga in the light of orders of the Hon'ble Supreme Court dated 29.10.2014 and 24.01.2017 in W.P.(C) 3727/1985:**

1. This order may be read in continuation of order dated 22.08.2019 with regard to reviewing the progress of compliance of directions of this Tribunal dated 10.12.2015 and 13.07.2017 on the subject of preventing and remedying the pollution of river Ganga. The matter was earlier being considered by the Hon'ble Supreme Court since the year 1985, before being transferred to this Tribunal, in the year 2014 and 2017<sup>1</sup>.
2. The Tribunal dealt with the pollution caused on account of illegal discharge of untreated sewage and industrial effluents either directly into the River Ganga or its tributaries and connected drains besides issues of dumping of solid waste, bio-medical waste, hazardous waste, plastic waste, muck and other waste, illegal sand mining, illegal encroachment of the floodplains, absence of steps for conservation of ground water, reuse of treated water, restoration of water bodies and maintenance of e-flow.
3. The matter was dealt with by orders dividing the area covered by the River Ganga into different phases and segments. Order dated 10.12.2015 dealt with **Phase-I - Segment-A**: Gaumukh to Haridwar. Order dated 13.07.2017 dealt with **Phase-I - Segment B**: Haridwar to Kanpur. Further order dated 06.08.2018 deals with **Phase-II**: Kanpur to Uttar Pradesh Border, **Phase-III**: UP Border to Jharkhand

<sup>1</sup> M.C. Mehta vs. Union of India & Ors. Writ Petition (Civil) No. 3727/1985 order dated 29.10.2014 (2015) 12 SCC 764 and 24.01.2017



Border (via Bihar), and **Phase-IV**: Jharkhand Border to Bay of Bengal (West Bengal).

4. As already noted, the proceedings have been pending since 1985. Various orders have been passed by the Hon'ble Supreme Court on the subject before transfer of proceedings to this Tribunal and thereafter by this Tribunal. The result of monitoring for 34 years has not been encouraging. Government of India took initiatives by way of Ganga Action Plans I & II and thereafter by way of *Namami Gange*. The progress so far has been far from satisfactory, as noted in earlier orders.

II. **Constitution of Monitoring Committees headed by former Judges in the States of Uttarakhand and Uttar Pradesh vide orders dated 29.11.2018 and 06.08.2018 to oversee execution of Action Plans in the light of stipulated timelines:**

5. While considering the progress of compliance of orders of this Tribunal, vide order dated 19.07.2018 with regard to **Phase-I - Segment-A** and order dated 27.07.2018 with regard to **Phase-I - Segment-B**, the CPCB/SPCBs were required to display the result of water samples at various locations and atleast at one place within 100 kms showing whether water was fit or not fit for consumption or for bathing. A Monitoring Committee was constituted headed by a former Judge of the Uttarakhand High Court for **Phase-I Segment-A** and Allahabad High Court for **Phase-I Segment-B** vide orders dated 29.11.2018 and 06.08.2018 respectively to take stock of the actions taken with clear measurable indicators of progress and success and to oversee the action plans. The actions were required to cover interception and diversion of drains carrying sewage to STPs, laying

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of sewerage network, utilization of treated sewage, compliance of norms by industries in the catchment areas, ground water regulation, flood plain regulation, rain water harvesting systems, good irrigation practices and filing list of industries which have the potential for pollution and creation of bio-diversity parks. Vide order dated 29.11.2018, the Tribunal reviewed the progress in **Segments A and B of Phase-I** on STPs, CETPs and tapping of drains with reference to the laid down timelines and also compliance of MSW Rules, setting up of bio-digesters, sewerage network, improvement in water quality, unregulated ground water extraction, e-flow, public involvement, decentralized waste processing facility close to the source of generation of waste, protection of floodplains and illegal mining. The Tribunal also observed that there was need to prepare a model DPR and standard terms and conditions for tenders to save time and cost. Further directions for public awareness programmes in the light of observations of the Hon'ble Supreme Court were also issued.

III. **Further monitoring, in the light of reports of the Monitoring Committees, vide orders dated 11.03.2019, 14.05.2019 and 29.05.2019. Issue of waste management in 97 'Ganga Towns' and directions for zero discharge of pollutants in Ganga, making concerned officers accountable to be monitored by the Chief Secretaries' of the concerned States:**

6. Again, on 11.03.2019, deficient working of CETPs at Jajmau, Banthar and Unnao was considered and directions were issued to consider closure of non-compliant units to improve the water quality.
7. Vide order dated 14.05.2019, this Tribunal considered the report from Justice U.C. Dhyani with regard to **Segment-A of Phase-I** dated 09.05.2019 *inter-alia* pointing out non-compliance in respect of the



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STPs. The Tribunal directed remedial action including recovery of environmental compensation in view of repeated failures to comply with the directions by the Hon'ble Supreme Court and this Tribunal for the last 34 years. NMCG was to ensure compliance with regard to prevention and removal of encroachments, maintenance of e-flow, afforestation and setting up of bio-diversity parks, ground water regulation, sand mining regulation, stopping any camping on the banks of river Ganga or its tributaries. With regard to **Segment-B of Phase-I**, after noting that the industries were discharging untreated effluents in river Ganga, the Tribunal directed closure of all activities of the members of the dysfunctional CETPs, until the CETPs are compliant. It was further directed that only treated effluents may be discharged into the River Ganga and its tributaries. Further direction was that coercive measures be taken against officers of UPPCB and NMCG colluding in permitting continued operations of polluting activities. Direction was also given for remediation of chromium dumps at Kanpur Dehat, Khanpur and Rakhi Mandi in Uttar Pradesh and ensuring of proper e-flow from the Narora Barrage.

8. With regard to **Phase-II to IV**, NMCG, in co-ordination with State Governments of Uttarakhand, Bihar, Jharkhand, West Bengal and Uttar Pradesh, was to file Action Plans with firm timelines on the subjects of interception and diversion of drains, utilization of treated sewage, compliances by industries in the catchment area, ground water regulation, flood plain regulation, rain water harvesting and good irrigation practices for water conservation in the light of order of this Tribunal dated 13.07.2017. NMCG was to give information about



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status of projects planned and executed between Kanpur to Ganga Sagar. Status of water quality in Uttarakhand, Bihar, Jharkhand, West Bengal and Uttar Pradesh was to be displayed on their respective websites. CPCB was also to indicate such status on its website. Flood plains were to be demarcated, encroachments removed, bio-diversity parks set up, afforestation works undertaken, guidelines for bio-diversity parks prepared by the CPCB and the MoEF&CC, flood plains were to be handed over to the State Forest Departments.

9. Vide order dated 29.05.2019, it was directed that Ganga pollution be monitored directly by the Chief Secretaries in view of such monitoring having already been directed in respect of 351 polluted river stretches in different States by the Chief Secretaries vide order dated 16.01.2019 in O.A. No. 606/2018<sup>2</sup> dealing with solid waste management and orders in O.A. No. 673/2018 dealing with polluted river stretches. No construction zone distance on flood plains was to be measured from the Highest Flood Line (HFL) in the last 25 years and flood plains were to be identified on longitude and latitude. Responsibility for plantations and administrative control of areas beyond HFL were to be handed over to the Forest Departments. UPSPCB was directed to prohibit industrial polluting activities and to revise compensation regime so as to recover the actual cost of restoration. State of UP was to provide funds for remediation of Chromium dumps. E-flow was to be maintained as earlier directed in order dated 29.11.2018. Encroachments were to be removed. Tapping

<sup>2</sup> Compliance of Municipal Solid Waste Management Rules, 2016



of remaining drains and prevention of pollution was to be expeditiously ensured. After noting the status of progress on sewage infrastructure projects in the Ganga Basin, the Chief Secretaries of Bihar, Jharkhand and West Bengal were directed to effectively monitor the progress. Timelines were directed to be reviewed and prepared. NMCG was to undertake progress on reduction of pollution load and improvement of water quality. Further road map, including identification of accountable persons and taking actions for the lapses was to be prepared.

**IV. Monitoring by the Tribunal on last date of hearing i.e. 22.08.2019, fixing strict timelines with consequence of requiring payment of compensation by the defaulting States and NMCG and action against the erring officers:**

10. Status of compliance was further considered vide order dated 22.08.2019 with reference to following specific issues:

- i) Prevention of discharge of untreated industrial waste and sewage in the River Ganga and its tributaries, including tapping of drains and bio-remediation, as applicable;
- ii) Installation of STPs, CETPs, and making existing CETPs functional (including at Jajmau, Banthar and Unnao) and enhance the capacities, so assessed and monitoring of the standards before discharge of water into Ganga River;
- iii) Installation of Continuous Emission Monitoring System (CEMS) at appropriate locations and Online Monitoring System (OMS);
- iv) Usage of treated waste water, of sludge manure and setting up of bio-digesters and septage management;
- v) Preventing dumping of waste and scientific waste management including bio-medical wastes, plastic wastes and decentralizing waste processing, including waste generated from hotels, ashrams, etc.;



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- vi) Floodplains identification and zone demarcation with restrictions against any development/ construction /encroachment;
- vii) Maintenance of E-flow as notified by Ministry of water Resources including releasing water by Hydel projects and barrages; and
- viii) Other directions including displaying water quality data in public domain and at prominent places, development of bio-diversity parks, prohibition of river bed mining, remediation of chromium dumpsites in Uttar Pradesh, collection of compensation from violators and involvement of society including religious, charitable, social and educational institutions for preventing and remedying pollution of River Ganga.

11. The Tribunal considered the progress State-wise as follows:

**"State of Uttarakhand (Phase-I, Segment-A)**

15. *Learned ASG appearing for the State of Uttarakhand has indicated progress on the subjects of STPs, use of treated water, action against polluting industries, compliance of norms by hydropower projects, water quality monitoring, e-flow, plantation in bio-diversity parks, action against violators and erring officers and contractors and bio-remediation of sewage. In short, the information furnished shows that out of 18 projects for setting up of STPs, 9 have been completed and the remaining will be completed upto February 2020. Water quality upto Rishikesh was 'A' class and downstream Rishikesh was 'B' class, which is fit for outdoor bathing as per the 'Designated Best Uses Criteria'<sup>3</sup>. Hydropower projects have to maintain e-flow of 15% of the average lean season flow. Closure order was passed against 32 non-compliant industries. Show cause notice was issued to 166 units from April to July 2019. Four hotels were found discharging sewage out of which two hotels were closed and the remaining two hotels were found to be complying later. Action was also taken for non-compliance of the Bio-Medical Waste Management Rules, 2016. Compensation was collected from the plastic users/violators and for illegal mining. Rafting camps have been removed, Bio-remediation started wherever required. The State Government along with NHAI will consider preparation or revision of Master Plan for Haridwar - Rishikesh designating 'no motor' zones in some areas, 'only electric vehicles' in some areas, widening of roads, green belts and beautification, Information Education Communication (IEC) activities by including religious, charitable, social and educational institutions, plantation in bio-diversity parks*

<sup>3</sup> <https://cpcb.nic.in/water-quality-criteria-2/>



along river Ganga and its tributaries, including on the encroached land (after removing such encroachments).

16. During the interaction, we have considered the remedial measures for expediting execution of the orders of this Tribunal having regard to long delay caused and importance of preventing and remedying the pollution of River Ganga. Since it has been stated that many industries were found operating without consent to operate under the provisions of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981, action in accordance with the provision of law may be undertaken within three months after identifying such units. As already observed by this Tribunal including in the order dated 14.05.2019 that River Ganga being National River with distinct significance for the country, even a drop of pollution therein is a matter of concern. All the authorities have to be stringent and depict zero tolerance to the pollution of River Ganga. Wherever STPs are not operating, immediate bioremediation and/or phyto-remediation may be undertaken if feasible. To avoid procedural delay of tender processes, etc. specifications and norms for undertaking such activities may be specified in consultation with the CPCB as was earlier directed in our order dated 29.11.2018. Performance guarantees may be required to be furnished for ensuring timely performance. It needs to be ensured that setting up of STPs and sewerage network to be completed and carried out so as to avoid any idle capacities being created. Performance guarantees may be taken for preventing such defaults.

17. Wherever the work has not commenced, it is necessary that no untreated sewage is discharged into the River Ganga. Bioremediation and/or phytoremediation or any other remediation measures may start as an interim measure positively from 01.11.2019, failing which the State may be liable to pay compensation of Rs. 5 Lakhs per month per drain to be deposited with the CPCB. This however, is not to be taken as an excuse to delay the installation of STPs. For delay of the work, the Chief Secretary must identify the officers responsible and assign specific responsibilities. Wherever there are violations, adverse entries in the ACRs must be made in respect of such identified officers. For delay in setting up of STPs and sewerage network beyond prescribed timelines, State may be liable to pay Rs. 10 Lakhs per month per STP and its network. It will be open to the State to recover the said amount from the erring officers/contractors.

18. With regard to works under construction, after 01.07.2020, direction for payment of environmental compensation of Rs. 10 lakhs per month to CPCB for discharging untreated sewage in any drain connected to river Ganga or its



tributaries and Rs. 10 lakhs per month to CPCB per incomplete STP and its sewerage network will apply. Further with regard to the sectors where STP and sewerage network works have not yet started, the State has to pay an Environmental Compensation of Rs. 10 lakhs per month after 31.12.2020. The NMCG will also be equally liable for its failure to the extent of 50% of the amount to be paid. Till such compliance, bioremediation or any other appropriate interim measure may start from 01.11.2019.

19. There is need to evolve a tourism policy for permitting hotels, vehicles or other such activities consistent with the carrying capacity to avoid pollution of River Ganga. There is also need for proper planning in all the areas adjacent to the River Ganga to regulate traffic and orderly movement, avoiding vehicular pollution and having 'vehicle free' or only non-polluting vehicles, scientific disposal of solid waste dumps consistent with the orders of this Tribunal dated 17.07.2019 in O.A. No. 519/2019<sup>4</sup>.
20. Learned Amicus pointed out that at Gaumukh, there was pollution of sewers and resultantly bacteriophage activity of River Ganges which gives it inherent ability to kill harmful bacteria is decreasing which is not good in terms of maintaining water quality of the River Ganga. There is need to issue guidelines by the MoEF&CC for setting up of biodiversity parks for handing over flood plains of the rivers in the country to the Forest Department, for the purpose, within four months in terms of Para 21. Guidelines for levying compensation for discharge of untreated sewage/effluents into the river in terms of Para 13 of the order dated 14.05.2019 also needs to be devised.
21. We do not consider it necessary to consider point-wise progress in the present order in view of pre-existing directions on each of the points. The State of Uttarakhand may take action under each head, accordingly.

**State of Uttar Pradesh (Phase -I, Segment- B)**

22. The State of UP is yet to provide the cost of removing the Chromium dumps in terms of Para 5 of the order dated 29.05.2019. It is reported that out of 86 drains to be tapped, only 33 have been wholly or partially tapped, 59 remain to be tapped. For 23 drains, work is yet to commence. It is stated that the land for tapping of two drains was not available. Needless to say that where the land is not available, the State Government can take steps for its acquisition or purchase. **Directions with regard to State of Uttarakhand in paras 16, 17 and 18 will**

<sup>4</sup> News item published in "The Times of India" Authored by Jasjeev Gandhiok & Paras Singh  
Titled "Below mountains of trash lie poison lakes"



**apply to the State of Uttar Pradesh also with regard to the timelines and compensation.**

23. It was stated that though the tanneries were closed for violating the norms of discharge, the dues have not been collected from the members of the CETPs and the industries are clandestinely operating as shown from the data of water samples which contained high Chromium.
24. Chromium dump has been stored since 1976 which is required to be shifted to TSDF. The State of Uttar Pradesh may undertake health survey of the area and ensure shifting of the Chromium dumps within three months failing which it would be liable to pay environmental compensation of Rs. 10 lakhs per month to CPCB besides furnishing performance guarantee of Rs. 1 Crore to CPCB.
25. Let the remedial measures be taken by the SPCB for effective monitoring by installing CCTV cameras or undertaking surveillance in any other manner with the help of local police.
26. As observed in the case of Uttarakhand above, we do not consider it necessary to consider point-wise progress in the present order in view of pre-existing directions on each of the points. The State of Uttar Pradesh may take action under each head, accordingly.

**State of Uttar Pradesh (Phase -II), State of Bihar, Jharkhand and West Bengal**

27. With regard to **Phase-II to IV**, it is pointed out that no specific timelines have been laid down in the order dated 13.07.2017. Needless to say that if no specific timelines have been laid down, the compliance has to be ensured within reasonable time. A period of two years has gone by which can be treated as a reasonable time. Even if further allowance is to be made with regard to works under construction, after 01.07.2020, direction for payment of environmental compensation of Rs. 10 lakhs per month to CPCB for discharging untreated sewage in any drain connected to river Ganga or its tributaries and Rs. 10 lakhs per month to CPCB per incomplete STP and its sewerage network will apply with regard to States of Uttar Pradesh, Jharkhand, Bihar and West Bengal falling in **Phase II to IV**. Further with regard to the sectors where STP and sewerage network works have not yet started, the States of UP, Jharkhand, Bihar and West Bengal have to pay an Environmental Compensation of Rs. 10 lakhs per month after 31.12.2020. The NMCG will also be equally liable for its failure to the extent of 50% of the amount to be paid. Till such compliance, bioremediation or any other appropriate interim measure may start from 01.11.2019. Directions for

compensation for default in this regard will be on the same pattern as in the case of Uttarakhand and Uttar Pradesh as above.

28. As observed above, we do not consider it necessary to consider point-wise progress in the present order in view of pre-existing directions on each of the points. The States of Uttar Pradesh, Bihar, Jharkhand and West Bengal may take action under each head for Phases-II, III and IV accordingly.
29. As noted on an earlier order<sup>5</sup> in a study in respect of 97 Ganga towns, the sanitation status was found to be as follows:

"19 towns had municipal solid waste (MSW) plant within the town; 47 towns had adequate litterbins around the ghat area; 41 towns had anti-littering messages/hoardings placed around the ghat area; 72 towns had old & legacy dumpsites as well as garbage vulnerable points (GVPs) in the vicinity of the ghats; 66 towns had at least one nullah draining into Ganga; 34 towns had sweeping & cleaning arrangements at the ghat area; 33 towns had solid waste floating on at least one of the ghats of the town. Further, the report mentions "The output of the survey offers a comprehensive report on cleanliness to aid the Government take action on the identified gaps. It also helps in understanding the best practices being implemented in various towns and ghats and support in sharing of knowledge among the various stakeholders helping them to inculcate and tailor best actions according to the city's requirement."

The concerned Chief Secretaries may ensure that the above deficiencies are addressed expeditiously.

30. The two Monitoring Committees for **Segment-A Phase-I** and **Segment-B Phase-I** may submit their final reports by 31.10.2019. Thereafter the Chief Secretaries of States of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal Director General, Namami Gange and Secretary, Water Resources, Jal Shakti, Government of India may personally monitor the progress and report compliance to the Tribunal in terms of progress at every quarter in a tabular form as follows:

<sup>5</sup> Order dated 11.03.2019 at para 15.



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Sr. No.	Targets to be achieved as per orders dated 10.12.2015, 13.07.2017 and the 22.08.2019 timelines	Targets achieved and the reasons for delay in compliance	Targets not achieved and the revised timelines proposed*	Action taken or suggested for violation of timelines or non-achieving of targets

\*subject to payment of compensation as mentioned above

31. Let a further quarterly progress report be filed by the Chief Secretaries of Uttarakhand, UP, Bihar, Jharkhand, West Bengal, with an advance copy to Secretary, Water Resources, Jal Shakti, Government of India by 30.11.2019 by e-mail at [judicial-ngt@gov.in](mailto:judicial-ngt@gov.in). The Director General, Namami Gange may file a consolidated report before the next date by e-mail at [judicial-ngt@gov.in](mailto:judicial-ngt@gov.in)."

12. Thus, it was made clear that no untreated sewage was to be discharged into the river and interim remediation measures were to positively start from 01.11.2019 failing which the defaulting States were to pay compensation of Rs. 5 lakhs per month per drain. The Chief Secretaries were to identify the officers responsible for delay and adverse entries were to be recorded in their ACRs. For delay in STPs and sewerage network beyond timeline of 30.06.2019 for ongoing works and 31.12.2020 for works which had not yet started, compensation is payable @ Rs. 10 lakh per month per STP which can be recovered from the erring officers/contractors. NMCG is liable to pay 50% of the amount.

V. **Issue of shifting of Chromium dump in existence since 1976 affecting ground water at Rania, Kanpur Dehat/Rakhi Mandi, UP:**

13. The Tribunal in its order dated 22.08.2019 also fixed the timeline for clearing Chromium dump in the State of UP within three months and in default to pay environmental compensation of Rs. 10 lakh per



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month, besides performance guarantee of Rs. 1 crore. Thereafter, on receipt of a report from Justice Tandon Committee, the Tribunal vide orders dated 27.09.2019 and 15.11.2019 in O.A. No. 985-6/2019 issued directions on the subject. The said matter is now being separately dealt with and is fixed for hearing on 07.02.2020.

**VI. Final reports of Justice Tandon Committee for UP and Justice Dhyani Committee for Uttarakhand and progress reports filed by States/NMCG in the light of order dated 22.08.2019 and report of CPCB in terms of order dated 14.05.2019 on the subject of biodiversity parks:**

14. Accordingly, 'final' reports have been filed by the Monitoring Committees. Quarterly progress reports have been filed by the States of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal and a consolidated report by the NMCG. CPCB has also filed its interim report on the subject of biodiversity parks in terms of order dated 14.05.2019.
15. We first refer to the final report furnished by Justice Dhyani Committee. The report gives the status of construction of STPs, status of operation, management and performance of STPs and status of upgradation of 7 STPs not meeting the prescribed parameters. Town-wise details in respect of priority towns have also been given. The report further gives status of compliance by industries. Compliance status by hotels, ashrams, dharamshalas, compliance status in respect of flood plains, mining on river beds, biomedical waste, municipal solid waste, compliance of directions for recovery of compensation. The summary and recommendations of the report given in chapters 11 and 12 are as follows:



**"Chapter 11**

**SUMMARY OF MONITORING COMMITTEE OBSERVATION**

The years' work of the Committee in verification of compliance to Hon'ble NGT Order on OA No 200/2014 is summarized as under:

- I. *Management of Drains polluting the river and its tributaries: Efforts have been made to intercept and divert the identified drains and work on 111 out of 136 identified drains have been completed. The intercepted waste water couldn't be completely treated as many of the STPs' are as yet under construction. As such an estimated 100 MLD of waste water still remains untreated, including the waste water from the Jagjeetpur and Lakkar Ghat STP that have less capacity as of now. Once the STPs' at Haridwar and Rishikesh are commissioned, near 98% interception, diversion and treatment will be achieved.*

*The alternative methods of waste water treatment must be closely evaluated for their safety and effectiveness. Use of every such methodology must be monitored by at least one Professional Institute and also by CPCB mandatorily. In absence of a standardized protocol, these steps are essential to protect public safety and also public money.*

- II. *Building up of sewage treatment infrastructure: State of Uttrakhand is working upon 18 number of STPs 9 have been completed. The remaining STPs are targeted to complete and commence operation as per the schedule submitted. Committee has the following reservations in respect of the STP infrastructure.*
  - a. *Sixteen smaller STPs' of electrocoagulation seen on the upper reaches of the river are not in operation. The process used to award the contract itself is a serious deviation. The project has been awarded and then the technology and details are submitted for vetting by IIT/Delhi. The Institution has made material changes to the design and added further process and equipment. Looking at the quality and condition of plant it is very clear that the finances proposed do not provide for these changes. Basically the financial bid was for a design that has itself changed substantially. With such a major infraction, can the plant be actually built and operated at the same cost. The situation suggests that it can't and therefore the plants are not getting completed and quality has suffered. The plant output water is compliant since the input waste water is almost clean at this stage.*
  - b. *STP plant is made at higher levels than the development/houses/ commercial establishment. The constructions lower than*



the sewage and closer to the river continue unabated. The sewage lines are not be able to tap sewage from these locations and they are directly discharging into the river. At some places sewage is being pumped against gravity and it requires continuous electricity which is not available. Unless sewage infrastructure and control in habitation activity are completely coordinated the infrastructure will fail to achieve its purpose and river at its inception will continue to get contaminated and at a much faster pace. The areas where the problem is very evident are Badrinath, Joshimath, Devprayag, Rudraprayag- basically the Dhams on upper reaches.

- c. Sludge disposal and its monitoring is the blind spot in the entire system. There is no assessment of sludge generation, testing and scientific disposal so as to ensure that the waste recovered from water is not added back to the environment nullifying the entire effort. It is noted that even the tender document doesn't give it a serious space and therefore actually no one is responsible for sludge. Some effort has now been made to keep records and do the necessary testing of the manure made out of it. A standard protocol is necessary for sludge management as well.
- d. No solution is applied for remote hamlets so far. The problem may not look very severe in numbers but it is polluting the clear stream emanating from the mountains.
- e. Septage management seems to have gained attention. Policy and guidelines have been issued. Continued and sustained efforts are required for the same which includes efficient mechanism for collection/transport, technology inputs for remediation at STPs, remediation where STP is too far and a system of financing and monitoring the activity.
- f. The present system of Project Planning and execution is confusing. DPR is made by an outsourced agency that hands-over the document to Client (NMCG in most cases) and its responsibility ends. The DPR forms basis of tender that is issued by another Agency (UK Pey Jal Nigam) which wasn't actually a part of making the DPR and holds no responsibility for it either. The tender is evaluated by this agency on its own. The bidder is completely responsible for its bid and is required to make its own assessment irrespective of the DPR (if the document is shared). The bidder makes the cost bids basis its own technology and design. Tendering Agency awards work to the lowest bidder. After the work is awarded, the bidder is supposed to get its design vetted by technical institute. Now the design is changed by the Institute for various reasons. The financial costing done by the bidder is changed and the work is still to be executed in the same money. The financing is by NMCG that appoints a third outsourced agency for project monitoring so the critical responsibility shifts to another external party. The project is monitored by State Government as well but responsibility actually rests with an external agency paid for the purpose. Basically, the mother of the project-DPR maker hands over the baton to another one who then passes it to another and so on. No



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one is responsible and all contribute to project cost, delay and confusion.

Much worse is that the Project aim is itself fractured-making STP or a pipeline, or house to house connection; it's not addressing a solution-Treat all waste water in a XYZ town.

- iii. *Industrial Effluent and CETP:* The Industrial establishment in the state fall into two major categories in terms of geographical location- eg. Industrial Clusters such as SIDCUL, Pant Nagar, and standalone industries spread all over the state- eg. Sugar and Distillery in Laksar, India Glycol and Nandi Paper Mills in Kashipur.

The industrial clusters have a possibility of CETP. The three industrial clusters have CETP however the exercise of connecting industries to CETP need deliberate and serious push by UEPPCB and also support by State Government. More needs to be done in this regard. Then there is linked and more serious issue of financing and operating the CETPs'. Committee notices serious gap in viable financing, technical skills of operating agency and effective monitoring of the CETP operations. As a result the systems either fails to meet the desired results or there is a tendency to avoid operating it or both. Department of Industries that creates the infrastructure takes no responsibility for concomitant pollution and has so far not been seriously enlisted as a stakeholder.

The standalone large industries operate under the monitoring of UEPPCB in terms of environment compliances. The organization has neither developed sufficient in house capability nor created a mechanism for effective outsourcing. It is still to start using technology seriously to aid in its working. With the weak champion for the cause of environment, the industries are free to care for environment to the extent that they can or wish to. CPCB has limited intervention and in most cases it cites its dependence on UEPPCB. The situation is not conducive to effective compliance and Committee noticed its impact in every visit. HUL at Haridwar and Venkateshwar Textiles at Kashipur are good corporate citizens and have taken effective measures for water utilization and waste water treatment. In contrast, Sugar Mills and Paper Mills and India Glycol needed monitoring which was inadequate resulting in unchecked environment pollution.

The online monitoring of ETP outlet needs further strengthening in many critical areas including- calibration of the equipment and its temper proofing, real-time data analysis and automatic triggers back to industry, consistency in use of data for prosecution, standardizing best ETP plant and processes, industry-wise, based on performance, crosscheck the data with the catchment drain/water body and more. Aim should be



to ensure fidelity of the data and use it efficiently to secure no pollution by industries. Otherwise monies spent on creating the infrastructure is not sufficiently utilised.

- IV. Flood plain demarcation, protection and utilization plan is still a work in progress. The encroachment close to the river and even the dry river bed in lean season continues unabated. River Chandrabhaga is cited just as an example and the same situation is happening in others as well. There has to be a serious political and administrative will to stop it entirely. Less than that all the plans for protecting river will fall short. The action taken at Maya Kund should become the rule so as to protect the flood plains.
- V. E-FLOW has become a very well-known concept and there is an effort to implement the regime. There are reservations and issues raised by existing Hydel Plants and the same need to be addressed appropriately so that the regime is adhered to.
- VI. Sand Mining on river beds: State Government has made a policy under which licenses are granted. There is awareness about the penalty for illegal mining and it's not as blatant as before. The continued interventions have achieved the purpose of making the sand miners and the officers understand the risks involved and has been able to drill the import of word 'illegal' into all players in this domain. This is a positive development that has helped to minimize illegal sand mining of a commercial and mechanized scale.
- VII. Biomedical Waste Management Regulations have gained wider publicity and there is visible impact on larger hospitals where the colored bins have appeared in the last one year, more so in last six months. The protocol and training for segregation at source are yet to be firmed up and hospitals are experimenting their methods. There is clear effort evident in private hospitals and Government hospitals have still to catch up.
- VIII. The CBWTF design, operation and meeting of desired standards is yet to happen. More attention is required in this segment so that post segregation and collection the biomedical waste is actually safely disposed of. The current competition of 'as cheap as possible' is failing the requirement of 'desired quality'. We have yet to come across a well design and operating facility so far. The management of liquid waste from HCF is yet to start. In fact even the state level agencies lack the knowledge of its requirement including legal provisions. Committee has started the process of creating awareness. Capacity building followed by its implementation and monitoring are the next steps to be taken by State and Central Agencies.
- IX. Basically the stat has still to complete its process of meeting the regulatory requirement on the issue.



- x. *Municipal solid waste management in Ganga Towns is observed as a huge gap and a serious situation. State Government has plans which are on table and need to be brought on ground. The facilities seen do not inspire confidence. Dehradun MSW Plant is the only credible plant in the state. The problem of current waste together with legacy waste is assuming alarming proportions. The Ban on Plastics is not appreciated as effective with plastic seen almost everywhere and in all dumps. The dumping of mixed waste close to the river and the slopes leading to the river hasn't been stopped despite all judicial pronouncements. State Government expresses its limitation in finding a space for its disposal. However, we also see an equal gap in use of technology for its disposal. The seriousness of the problem is compounded by the fact that it is impossible to check its growth with the growing cities, population and commercial development. While space is a constraint for Government, garbage continues to find its own space-it is accumulating at will and everywhere.*
- xI. *Awareness of the issue-saving the rivers and water bodies- is very much evident and overall Committee notes with satisfaction that the issue of water pollution is well highlighted in Schools, Colleges, media and the public as well as private stakeholders. There has been efforts by Government at creating awareness and also a number of private entities. Large Industries have a fair perception that law shall be implemented and it is in their best interest to take necessary steps and be responsible for environment. The same is yet to percolate to smaller and unorganized segment. Yet there is no denying the facts that the old habit of cutting corners calls for concerted and discretion-less application of law. The message that environment safety is precursor to live industry must get drilled longer to make it a habit.*
- xII. *Government system is working on some fronts and needs to co-ordinate its efforts that is widely dispersed over multiple departments making accountability difficult to recognize. The fractured system of DPR and tender coupled with Ll concept are compounding the project execution and further diluting the accountability.*
- xIII. *Maintaining Biodiversity is an important measure and needs more actual support. While Forest Department has been assigned the responsibility, it has to be supported with finances and large scale, impactful projects must be executed in a time bound manner.*

## **Chapter 12**

### **RECOMMENDATIONS OF MONITORING COMMITTEE**

- I. *The Project Planning has to improve so that the DPR, the execution and the final outcome remain one entity's*



responsibility. All elements must fall in place simultaneously to achieve the final result- eg. treat all waste water discharge from say ABC town. Current state of separate DPR for each element at different times fracture the very definition of project and despite the 'lowest cost tender' all monies put together and the failure to achieve results in time prove far more expensive. The Project must include the non-negotiable quality as the start point and poor quality must face stringent measures for the concerned officers mandatorily. One entity must carry the baton till finishing line. 'Simplify' is the only solution.

- II. *Water Footprint Planning must come under one umbrella even in the States. The use and treatment of water has to be planned against its availability, all sources combined. Water is an essential resource that can't be compartmentalized if urban centers have to become sustainable. The upstream of one town is the downstream of another and therefore, the upper town's mis-doings are paid by the lower town and its people.*
- III. *Rivers are sacred in Indian culture and the same has to be shown by actually respecting its purity. It's surprising to see religious institutions- Temples, Ashrams and Dharamshalas polluting the rivers. The same entities must be mobilized to rectify the situations themselves and also propagate the message amongst devotees who throng to rivers for religious reasons. Similar effort has to be made to keep our religious places in good state. The condition of Badrinath, Devprayag, Rudraprayag, Joshimath, and Uttarkashi- in fact all such places speaks poorly of their management. It's difficult to locate the shrines and reach river without walking through dirty congested lanes. The all-weather char dam road will increase this flow and further uncontrolled commercialization of these places. If State Government doesn't plan in advance, whatever we may say about protecting rivers, it is not likely to materialize.*
- IV. *The message of environmental responsibility must be conveyed clearly to the Industries. In fact Industry Department should be the one holding this responsibility. As of now they are promoting industry without any accountability for environment and have no co-ordination with other stakeholders-Central Ground Water Authority, Urban Local Bodies, Water and Waste Water Departments. Environment protection must be non-negotiable for industrial growth and even urban growth. Water recovery, recycle and reuse must be planned simultaneous with planning an Industrial Estate.*
- V. *E-Flow must get maintained. Simultaneously there should be a plan to capture excess water when it becomes available. We are*



a country where flood and draught occur with equal frequency and in the same geographical location.

- VI. State Government in Uttarakhand bears significant responsibility of carrying clean water and delivering the same at its border. This is the river that nurtures the entire Gangetic plain. Therefore, waste water treatment must be of highest quality in the state. Any compromise will cost the other states dearly and there is no financial saving likely at the end. Hon'ble NGT has insisted on the highest parameters for its treatment Plants and there can be no concession or deviation possible. In this light, the meticulous functioning of UK Pey Jal Nigam and UEPPCB is absolutely essential. Both organizations require high caliber professionals, continuous training and use of best technologies to ensure consistent performance. A lot needs to be done on this front.
- VII. The online monitoring infrastructure is still in its infancy. As stated supra it needs to be upgraded and better utilised for the purpose of achieving environment protection.
- VIII. Maintaining the ecological balance in this area is also essential to protect the water sources. Biodiversity is one aspect. Interventions in this regard must be concentrated, impactful and visible. Current strategy of patchy and scattered plantations need a serious re-look. The number of plants seeded is very high but the impact is visible only in Rasiyawad where there is concentrated effort and original flora and fauna have been revived. Similar effort on a large scale and with involvement of local population is urgently required. This is a state known for CHIPKO movement and it will not be a difficult task to have the communities involved in such projects.
- IX. CBWTF are private enterprises and the entrepreneurs would need state support in running the business with good quality output. As of now given limited cooperation of users and very small fee that HCFs are prepared to pay, no entrepreneur is bringing in the right technology and investment in this segment. It's a nascent sector where State Government and Central Agencies need to think through a viability framework. The current ones are facing fines and closures but new ones are not emerging. It is a worrisome situation. Given the performance of government in STP and related segments, one would not wish it to become Government venture. At the same, it's a business that has to be rightly nurtured at this stage.
- X. MSW has been a mounting problem and everyone agrees that it requires an urgent solution. This segment is also gravitating towards the same system of DPR, Tender and no responsibility. Government must have a clear view on do we own that technical competence to make the DPRs and do a



right project of managing 'unsegregated waste'. We have to first make the right 'Problem Statement' - "Manage the unsegregated municipal waste of ABC city in 2 hectares of land with minimum landfill to be accommodated in that land itself for say 15 years". The plan that we have seen so far, begins with segregated waste and ends with land requirement with no indication on how we derived it and what is the final target. If an Agency-nationally or globally, has the proven solution that can be executed, it may be brought in with a system for cost control instead of financial bidding. A credible entity is unlikely to give a financial bid in the current experimental status. A few such plants will provide the actual costs, experienced manpower, test and adaptation of technology and market will see a better and competitive response. As of now small monies are spent and more land is lost under the heap of garbage, not to mention its impact on environment and health of people. It's better to accept crisis and seek all that help that we can get."

16. We may now refer to 'final' Report of the Monitoring Committee for the State of UP dated 23.10.2019 which has been filed on 31.10.2019 for Segment 'B'. The report refers to the progress in terms of waste water treatment, tapping of drains, connecting of tapped drains to STP, compliance by Grossly Polluting Industries (GPIs), reduction in use of water by the industries, leading to reduction in waste water generation and pollution load, biomedical waste management. The Committee has given the status of STPs for which works have been awarded and which are at tender stage. Status of compliance by the existing STPs has also been mentioned. It has been specifically mentioned that STPs at Jajmau were not operational and those not fully operational. Reason for non-compliance by already constructed STPs are structural defects, absence of financial assistance or not receiving the required sewage quantity. The report also mentions illegal order of the Principal Secretary, UP dated 08.08.2019 permitting waste water to be discharged directly into river Ganga which is subject matter of OA 985/2019. Deficiency in working CETP



has also been mentioned. The report also gives the status of major drains. It is stated that the waste extracted from the drains has been heaped on the sides of the drains and not transported to designated place. Demarcation of flood plains has not been completed. E-flow has to be ensured. Green belt plantation direction has yet to be enforced. Mining has to be regulated. Ground water extraction is not being properly regulated. Chromium dump at Rania and Rakhi Mandi needs to be remediated. Primary Effluent Treatment Plants (PETPs) need to be compliant. Solid waste is not being treated. More than 1 lakh MT waste is lying at open in Meerut. 4 lakh MT waste is lying at Kanpur. Such waste is uncovered and lying in open and has a potential of hazard. Recommendations of the Committee are:

**"RECOMMENDATIONS:**

*The Committee may make following recommendation for the purpose of prevention of pollution of River Ganga in light of the various reports and observations.*

**1. STP's, CETP'S and ETP'S**

*CCTV cameras with the provision of live feed through an app on mobile along with storage capacity of 30 days must be installed at all STPs. Access to app may be provided to the public at large so that they may verify at any point of time as to whether the STP is operational or not. OCEAMS must also be installed and linked to a central server for constant monitoring.*

*In the matter of working of STP quantification of the total sludge generated and to whom it is sold or the manner it is disposed of, must be recorded by the STP operator with verifiable data on day to day basis. The record must notice the total sludge generated, quantity of sludge sold/disposed of, along with name of the person with address to whom sold/provided free of cost.*

*In respect of CETP an identical provision for installation of CCTV cameras with live feed through an app on mobile must be made. The sludge generated at the CETP must be analysed, and it must be ascertained as to in what manner*



the same is required to be disposed of. In case the sludge contains heavy metals, it must be directed to be transported to Hazardous Waste Disposal Plant and verifiable records must be maintained on day to day basis by the operator.

So far as the ETP installed by the industries are concerned, provision for installation of CCTV cameras with live feed must be provided which can be monitored through an app on mobile along with storage capacity of 30 days. The sludge generated must be directed to be quantified and recorded on day to day basis. The manner in which the sludge is disposed of/sold with specific details of the purchaser or the person to whom it is provided for disposal must specifically be mentioned.

Quantification of sludge generated at the STP, CETP and the ETP and the manner in which it is disposed of/sold would be a good indicator for assessing the performance of the plant.

The State Government may be asked to constitute a separate State Cadre Service for operation and maintenance of STP's and CETP's consisting of experts having knowledge of operation and maintenance of STPs/CETP's.

## **2. Modular STP's**

In old city areas laying of sewer lines/sewer trunk lines not only requires huge amount of expenditure it also leads to inconvenience to the public at large for months together. Further construction of big STP not only requires large area of land which is in scarcity in big town. It also raises serious issue with regard to discharge of dirty water when the plant becomes nonoperational for maintenance or for other reasons. The Committee would recommend that State may resort to modular STP's to be installed at the tail of the drains which are already carrying sewage to the river/its tributaries.

## **3. Extraction of underground water.**

A study be undertaken industry-wise as to what quantity of underground water is actually required by the industry for its manufacturing purposes. Permission for extraction of underground water be revisited by the Central Ground Water Authority having regard to the aforesaid aspect of the matter, specifically in respect of industries which have become ZLD or partially ZLD. The rates for extraction of underground water in our opinion must be so fixed so as to ensure that larger the amount of water extracted, the higher the rates like in the case of electricity charges.

There must be specific directions for authentication and verification of the flow meters installed in the premises of each industry, on periodical basis.



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The report in that regard must be submitted with the Central Ground Water Authority. Competent department for the purpose must also be identified.

**4. Compliance of conditions mentioned in the order permitting to operate.**

District level officer of the pollution department be specifically made aware of the conditions mentioned in the permission order and they must ensure strict compliance thereof. Periodical reports must be submitted in respect of compliance of the conditions as mentioned in the permission order.

**5. Fresh Joint Inspection of GPI's.-**

In view of the conclusions of the Committee that the joint inspection done in respect of GPI's is not comprehensive and does not take into consideration many issues which are relevant for avoiding pollution a fresh joint inspection of all the GPI's be directed in light of what is observed in the report with the condition that in case a GPI is found to be violating the conditions contained in the permission to extract underground water heavy environmental compensation be imposed on day to day basis.

**6. Notification of rates for transportation of spent chrome.-**

Chief Secretary of State of Uttar Pradesh be directed to ensure that rates for transportation of spent chrome from the tanneries to the Hazardous Waste Management Plant at Kanpur are notified within 15 days and recovery from the tanneries is effected in terms of the order of the Hon'ble National Green Tribunal dated 13.07.2017 passed in O..A.No.200/2014.

**7. Finalization of parameters for inlet and outlet of STPs.-**

Under the notification of the Ministry of Environment dated 01.01.2016 each State has to notify the parameters for inlet and outlet of CETPs'. The State of Uttar Pradesh has not been able to do so. The Chief Secretary must be asked to notify the parameters in respect of discharge of CETP and the point from where samples are to be drawn for ascertaining as to whether CETP is compliant or not having regard to the fixed designed parameters.

**8. Monitoring of E-flow**

CWC must be directed to monitor e-flow of River Ganga specifically during lean season at various places specifically between Hardoi to Kanpur regularly. It must be ensured that



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the quantity of water in the normal channel of the river is maintained equivalent to 20% on an average monthly basis during lean months of the River Ganga at Haridwar. CPCB shall continue to monitor the river water quality.

#### **9. Installation of ETP at Hospitals.-**

All hospitals of more than 100 bed capacity must be asked to install their ETP's in a time bound manner failing which action may be recommended and the Chief Medical Officer must be made responsible for ensuring the said compliance.

#### **10. Resorting to Incineration of Waste.-**

CPCB and UP PCB must ensure that where ever permission is granted to dispose of the sludge/industry waste through incineration, then such permission must accompany a detail scheme for disposal of the ash to be generated/collected because of incineration. In case it is not possible to dispose of the ash in the effective and safe manner such permission for incineration must not be granted.

#### **11. Afforestation and Bio-diversity Park**

All the land which become available due to the reduction in the storage capacity of the lagoons at distilleries/sugar factories/other industries in terms of the circular of CPCB, fixing the storage capacity equivalent to 30 days production must be directed to be utilized for thick plantation so as to act as a buffer against foul air of the industry and a source of fresh air to the residents of the localities.

NGT order had asked for framing of guidelines by CPCB and MOEF. The same is yet to be complied. CCA Projects/UP has already framed plans for Biodiversity Parks under guidance of Mr. C R Babu, subject matter expert. All district DFOSs' have have been trained in the concept and 25 projects for establishment of Biodiversity parks have been submitted to State Mission for Clean Ganga on 18 October with a total approx. cost of 323.82 Cr. The same should be perused expeditiously for appropriate approvals.

In pursuance of NGT order, CPCB has also worked upon the plan for bio-diversity and has completed a study on river rejuvenation for Kali East. A draft has been prepared for action for this river.

#### **12. No discharge of untreated dirty water in River Ganga at any point of time.-**

The State must be asked to come up with a comprehensive plan so as to ensure that no sewer or dirty water enter into River Ganga even during the rainy season/ during the period



the STPs are under maintenance/repair or otherwise. The State must resort to phyto-remediation, bio-remediation or any other technology where ever STP's are not in operation. The process used must be well evaluated and also documented as for its safety to the river ecosystem and its effectiveness in pollution abatement. CPCB shall be responsible for constant monitoring of the performance of any such project undertaken in the drains. It shall periodically submit its report to the State Authorities as well while taking appropriate action under law and NGT order. CPCB is entrusted with this important responsibility as custodian of environment, more specifically the Rivers in this case.

**13. Removal of Chromium Dump at Rania, Kanpur Dehat and Rakhi Mandi, Kanpur.-**

Chromium dump lying at Rania, Kanpur Dehat and Rakhi Mandi, Kanpur must be removed with promptness and due diligence. Effective measures in a time bound manner must be taken. Till such removal the dump must be covered so as to ensure that rain water does not come in contact with the chromium dump and leachates from dump is avoided as far as possible. Drinking water facilities for human beings and animals at both the places must be ensured by the State of Uttar Pradesh without fail. There must be a constant monitoring of the steps to be taken by the Government for permanent removal of chromium and responsibility must be fastened for the safe execution of the work upon the Chief Secretary of the State of Uttar Pradesh.

**14. Solid Waste.-**

The State must ensure fast and effective measures for disposal of solid waste both legacy and that generated on day to day basis in big cities like Meerut, Kanpur, Bareilly, Moradabad etc. Safe and hygienic method for disposal of the plastic bags must be a part of the mechanics for disposal of the solid waste. Hon'ble National Green Tribunal must monitor the action plan of the State Government in that regard on regular basis.

**15. Restriction on use of plastic bag.-**

Use of plastic bag for segregation of Bio-medical waste and other waste, both recyclable and food waste etc as well as other Municipal waste must be stopped immediately. State must come out with an alternative for such segregation and transportation of the Bio-medical waste, recyclable waste and other waste.

**LASTLY**



The Committee feels that levy of environmental compensation upon the polluting industries does act as a deterrent. But the same principle of levy of environmental compensation does not act as a deterrent qua the local body, local authority or departments of State of Uttar Pradesh for the simple reason that public money collected by the department/funds provided by the Government are used for payment of such compensation to the Pollution Department. Meaning thereby, that it is the public money which is used for payment of Environmental Compensation. The Hon'ble Tribunal may not only impose/levy environmental compensation in case of pollution norms being violated/ noncompliance of the directions issued by the Hon'ble Tribunal upon local bodies, local authorities and government departments it may also consider to recommend adverse action against the responsible officer, in a time bound manner and further a part of the environmental compensation be directed to be recovered from the salary of the officer concerned. The Committee would recommend that action be taken against the officers at the highest level.

The Committee also requests for appropriate orders on the non-operation of STP infrastructure in Allahabad, namely 29 MLD STP at Salori, 80 MLD STP at Naini, 60 MLD STP at Rajapur. Further, the Committee also submits that Geo-tubes have not been removed from the site nor the sludge entrapped properly managed. The report of UP PCB along with photographs is submitted alongwith.

Committee suggests that the following aspects of Ganga cleaning require continued monitoring.

1. The ground water extraction, water utilization by major industries and ground water replenishment measures need constant monitoring for improvement. CGWA is clearly not proving sufficient to guard the ground water issues which are fairly serious in nature.
2. The accounting for safe disposal of sludge from CETP and STP requires a standard protocol and constant monitoring. As of now it is going unassessed by all the agencies.
3. Kanpur has seen much effort in last two years and continues to require more work to abate the pollution that it causes to River Ganga.
4. Rania Chromium dump is a serious problem whose solution is yet to start. Very close monitoring is called for to ensure that problem is actually solved.
5. Notification of Flood Plains is the starting point in protecting the River ecosystem. It is required to protect the flood plain zones and initiate the process of restoring the biodiversity



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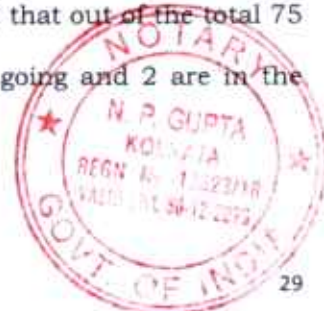
along the river. The same is still pending with State Government.

6. The well- coordinated creation of infrastructure for waste water treatment and its optimal operation and maintenance so as to ensure that no waste water enters river needs consistent watch. It tends to slip up at multiple points in the current multi-agency complex process. Stakeholders haven't envisaged a change in current process and therefore constant watch is the only option to ensure that public funds utilized achieve the purpose of clean river.

7. CPCB shall continue to monitor the waste water infrastructure and the Drains falling into river Ganga and its tributaries. It shall take appropriate action as per NGT order and under the prevailing legal provisions."

17. We may now refer to the consolidated report filed by the NMCG on 11.12.2019. On the most significant of sewerage infrastructure projects, the chart filed is as on 30.07.2019 which has already been quoted in order dated 22.08.2019. During the hearing, the representative of NMCG stated that there is marginal progress but the timeline will be adhered to. On the subject of preventing pollution, installing Continuous Emission Monitoring System (CEMS), use of treated water, sludge, bio digesters and septage management, preventing dumping of waste and management thereof, flood plain identification, maintenance of e-flow and displaying water quality data, development of biodiversity parks, prohibiting river bed mining, recovery of compensation, involvement of civil society, status has not been clearly spelt out though a voluminous chart has been filed.

18. The Executive Director, NMCG, when asked about the latest status with regard to Sewage Infrastructure Projects in Ganga Basin (Downstream of Unano to Gangasagar), stated that out of the total 75 projects, 16 have been completed, 36 are ongoing and 2 are in the



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category "tender to be floated". This amply demonstrates that there is hardly any progress, in terms of achievement of setting up of STPs, after 30.04.2019 which was stated in a tabulated form in our order dated 22.08.2019. The NMCG needs to take action against the erring officers and file a report before the next date.

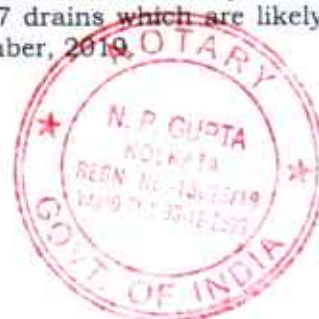
19. Brief summary of the reports received from the States of Uttarakhand, UP, Bihar, Jharkhand and West Bengal are as follows:

#### **UTTARAKHAND**

##### **Setting up of STPs, Interception and Division (I&D) of drains and preventing untreated sewage and effluents in the River Ganga.**

- a. Out of 18 projects sanctioned under Namami Gange Programme, 10 projects have been completed, 5 projects are scheduled to be completed by December 2019, 2 projects to be completed by February 2020 and remaining 01 project relating to Construction of 2 STPs at Joshimath of which 01 STP has also been completed in June, 2019 and work of other STP is stopped which will be completed by June, 2020.
- b. Under 18 projects, 30 STPs are proposed of which 21 STPs are completed, 06 STPs are to be completed by December 2019, 2 STPs will be completed by February 2020 and 01 STPs by June, 2020.
- c. Under these projects, 59 drains are proposed to be intercepted and diverted to these STPs against which 43 drains have been intercepted, 9 drains are proposed to be intercepted by June, 2019, 4 drains by February 2020 and remaining 3 drains by June, 2020.
- d. Bio-remediation on such 07 drains namely 1. Chandershwar drain (Consists of 3 drains merging together at one point-Shamshan Ghat, Dhalwala and Chandershwar), 2. Taulia drain, 3 Junior High School drain, 4. Kothiyalsain drain, 5. Baitarni drain, 6. Pokhari Bend drain and 7. Belni drain has commenced w.e.f. 01.11.2019 in compliance of the directions passed by this Hon'ble Tribunal on 22.08.2019. Thus, all the drains under the ongoing projects shall be intercepted and diverted to STPs for treatment' before 1<sup>st</sup> July 2020; and as an interim measure Bio-remediation facility has also been installed before 01.11.2019 on 07 drains which are likely to be intercepted and diverted after December, 2019.

#### **Information in tabular form**



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Sl. No.	Targets to be achieved as per orders dated 10.12.2015, 13.07.2017 and 22.08.2019 the timelines	Targets achieved and the reasons for delay in compliance	Targets not achieved and the revised timelines proposed	Action taken or suggested for violation of timelines or non-achieving of targets.
1.	As per order dated Gyansu and 40 MID STP Haridwar which were sanctioned before 10.12.2015	As per the directions of Hon'ble NGT the targets were achieved in case of Tapovan, Devprayag and Gyansu. Regarding 40 MID STP at Haridwar, it was approved for 68 MID STP on Hybrid Annuity PPP Model, as such work is now scheduled to be completed by February, 2020 well before the timeline (01.07.2020) set by order dated 22.08.2019 for ongoing works.	Not applicable	Not applicable
2.	As per order dated 22.08.2019 following timelines have been set:- (a). The project- under execution are to be completed by 01.07.2020	Out of 18 projects sanctioned during 2017-2019, so far 10 are completed, OS will be completed by December, 2019, 02 by February, 2020 and remaining 01 by June, 2020. Hence, targets are		Though the projects will be Completed before 01.07.2020, liquidated Damage (LD) has been imposed on contractors who failed to achieve milestone during construction. Detail thereof is given under para 5.16 (6) of. This affidavit.



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(b). The projects where work has not commenced are to be completed by 31.12.2020.	01 project (STP & I&D Srikot) falls under this category. Work has	Not applicable	Not applicable
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**Action Taken by State Government on the Observations of the Monitoring Committee in reference to the Report dated 23.10.2019.**

The State Government has clarified and provided action taken report in response to the report of the Monitoring Committee dated 23.10.2019 which inter alia relates to;

- a. Interception of Pandeywala drains in Haridwar.
- b. Functioning of 3 Mini STPs at Devprayag.
- c. Functioning of STP of 50 KLD at Sangam road NandPrayag.
- d. Functioning of STP of 1.08 MLD, STP at Pokhri, Joshimath town.
- e. Functioning of STP at Badrinath.
- f. Functioning of STP at Tehri Town.
- g. Online Monitoring System for STP of 1 MLD at Rishikesh and other STPs at Haridwar, Tapovar, Swargasharam, Gyansu (Uttarkashi) and Srinagar.
- h. Construction of Electro-Coagulation based technology for 16 small STPs.

**Use of Treated Water**

- a. The treated water of 68 MLD from STP of Jagjeetpur will be use for irrigation by constructing a canal of 10 Km length and 20 Km offsets length having carrying capacity of 90MLD and this will be completed by December 2019.



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- . Treated water from Sarai STP of 32 MLD (18+14) will be used for irrigation.
- a. With regard to STPs at Rishikesh and Munikireti the work is, to be undertaken for construction of a Canal of length of 20045 Km by Irrigation Department to use 5 MLD of treated water. However, **no timelines are given for completion.**
- d. It has been mentioned that treated water will not be possible in hilly region as the discharge from such STPs is very less and not techno economically feasible and hence treated effluent as per described norms is being discharge into the river.
- e. Therefore, **it is important all STPs should meet faecal coliform standards if it is discharged into the river.**

**Use of sludge manure (Ref. 5.4 Page 16)**

- a. The sludge generated from STPs/septic tanks is utilized by the farmers as manure against production of estimated production of 10732 cubic meters sludge, 14924 cubic meters sludge has been distributed to the farmers. (Free of cost)
- b. Sludge generated is found to be saved for application.

**Status of Septage Management (Ref. 5.5 Page 17)**

- a. Protocol for Septage Management has been developed and 9 septage suction transport vehicles have been procured, however, **Timelines are not given Septage Management in other hilly towns where specific Septage Suction Vehicles are needed in these hilly towns.**



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- b. **Direction: In no cases Septage either solid or non slury form should be disposed in any stream leading to the river Ganga or its tributaries.**
- c. **There is no clear cut Action Plan is emerging out with timelines for co-treatment of Septage with existing STPs.**

**Compliance in relation to Industries (Ref. 5.6 Page 18)**

- a. It has been mentioned that out of 7080 industries in operation in the State, 5306 units are having valid consents and 204 applications are under consideration at various levels and remaining 1570 have been issued directions to show cause.

**Functioning of CETPs**

- a. 3 CETPs are reported to be complying with standards.  
All the operational units in Sitarganj are connected with CETP. Out of 531 industries, 20 are not connected in CETP Haridwar and the conveyance system is under construction which will be completed by May, 2020.
- a. In Pantnagar CETP, out of 499 industries, 254 industries are not connected with CETP because of non-availability of conveyance system. Further out of 254 now 61 industries are connected and remaining 193 industries will be connected within one year time.
- b. Observations: can the industries which are not connected to CETP but having stand alone ETP must be complying with the prescribed norms and what is the mode of disposal of their effluent is not clear in the report. Till they are connected to



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CETP, SPCB may take a view on their operations if such units are not found to be complying with the stricter standards.

UKSPCB has to ensure that CETPs should meet with the prescribed norms and the treated water should be utilized instead of discharging effluents in any drain leading direct or indirectly to the river Ganga.

**Rawali Mahdood Drain (Para 5 Page 20)**

- a. The action proposed to be taken for this drain has not been clearly mentioned.

**Installation of STPs and Solid Waste Management in Hotels/Ashrams/Dharamshalas and Roadside Hotels.**

- a. UEPPCB should ensure that as per applicability, hotels/ashrams/dharamshalas should have their own STPs and no untreated water should go into river Ganga or any stream.
- b. The roadside Dhabas, Hotels should not discharge their waste water down the hill/slopes contaminating the fresh water streams.

**Other Issues**

- a. The report has given status on environmental flows, compliance of Solid Waste Management Rules, Disposal of Bio-medical Waste, Zoning of Flood Plains, Regulation of Mining Activities, Plantation of Biodiversity Parks and evolving the Tourism Policy.
- b. With regard to Mining Activities, it is mentioned that River Bed Mining in the State of Uttarakhand is carried out in highly



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regulated unscientific manner as per the provision of State Mining Policy and Uttarakhand Mining Mineral Rules, 2001.

- c. However, it appears large number of illegal mining is taking place which is evidenced as per the statistics given under Para 5 indicating that in the last 5 years 10,167 cases have been reported in posing penalty of 57.71 crore (Para 5 Page 33).

Sl. No.	Financial Year	Illegal Mining/Storage/Transportation cases	Penalty (in Rs. Crore)
1	2015-2016	1324	12.27
2	2016-2017	1424	4.41
3	2017-2018	3231	9.44
4	2018-2019	2649	26.99
5	2019-2020 (Up to October 2019)	1539	4.60
Total		10,167	57.71

**River Water Quality (Para 5.8 Page 22)**

- a. The UEPPCB has provided water quality data of river Ganga at 29 locations (Annexure 11, Page 15854) which has indicating that at 11 locations the water of river Ganga is fit for direct drinking and it is worth appreciating that the sanctity and the glory of the Ganga is observed at such locations such as (>2): River Dhauli Ganga B/C Alaknanda at Vshnuprayag, River Alaknanda B/C River Nandakini at Nandprayag, River ALaknanda A/C Nandakini at Nandprayag, River ALaknand B/C River Pindar at Karanprayag, River Mandakini B/C Alaknanda Rudraprayag, River Alaknanda B/C mandakini Rudraprayag, River Alaaknanda A/C Mandakin Rudraprayag, River Alaknanda A/C Bhagirathi Devprayag, River Alaknanda B/C Bhagirathi Devprayag, River Alaknanda B/C Alaknanda Devprayag, River Mandakin D/S Agustmuni Rudraprayag.



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- b. Since it is achieving the water quality standards of >2 MPN/100 ML Faecal Coliform, however at other locations such as River Alaknanda B/C Dhauli Ganga at Vishnuprayag, River Akaknanda A/C Dhauli Ganga at Vishnuprayag, River Nandakini B/C Alaknanda at Nandprayag, River Pindar B/C Alaknanda at Karanprayag, River ALaknanda A/C Pindar at Karanprayag, River Bhagirathi D/S Uttarkashi, River Ganga U/S Lakshmanjhula Rishikesh, River Ganga U/S Riawala Dehradun, River Suswa at Mathurawala Dehradun, River Song D/S Near Birla Guest House Dehradun, River Ganga D/S Rishikesh, Upper Gnaga Cnal at Laltarao Bridge Haridwar, Upper Ganga Canla at Rishikul Bridge Haridwar, Upper Ganga Cnal D/S Roorkee, Upper Ganga Canal D/S Har Ki Pauri Haridwar, Upper Ganga Canla at Damkoti Haridwar. Where the water quality does not meet the drinking water quality standards of >2 MPN/100ML faecal Coliform. Which requires to be achieved.

#### **Uttar Pradesh**

The Chief Secretary has filed the Quarterly Progress Report dated 11.12.2019. The Report gives a Tabular Statement in respect of expected date of completion of projects and proposes revised timelines for Segment 'B' Phase I and for rest of the State. The report further indicates status of CETPs at Kanpur, utilization of Treated Sewage Water, Bio-remediation of 44-59 drains having sent the proposal/DPR amounting rupees 1796 crores to NMCG, sanitation status in Ganga towns, Solid Waste Management in-situ and safe disposal of chromium dumps at Khanchanpur, Rania and Kanpur Dehat.



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It has been further informed that where CETPs are not working properly, Environment Compensation has been imposed. UPPCB is regularly monitoring the status of compliance of STPs and CETPs and during the quarter of September to November, 20 STPs have been found defaulting on which notices have been issued for imposing Environment Compensation of Rupees 39.04 crores. With regard to CETPs, it is stated that out of 07 CETPs, 02 CETPs have been found defaulting against which EC of rupees 45.60 lakhs has been imposed.

Further, Report on Environmental Flow has been filed along with Report of Irrigation and Water Resource Department. Demarcation of Flood Plain Zone of River Ganga in Segment 'B' has been completed and field verification has been done.

**State of Bihar (Page 15526)**

- a. The report has been filed on 30.11.2019 by SPMG Bihar. The report indicates following towns on the bank of River Ganga

S.No	Name of the River	Name of Towns
------	-------------------	---------------



1	Ganga	1. Patna A. (Phulwarishariff) 2. Maner 3. Danapur 4. Bakhtiyarpur 5. Barh 6. Mokam 7. Munger 8. Sultanganj 9. Bhagalpur 10. Buxar 11. Barahiya	12. Jamalpur 13. Kahalgaon 14. Chhapra 15. Sonapur 16. Hajipur 17. Begusarai 18. Khagaria 19. Naugachhiya 20. Dighwara 21. Teghra 22. Manihari
---	-------	---	--

b. Liquid Waste Management

- A total 26 sewerage infrastructure projects sanctioned at a cost of Rs 5089.82 Crore which are at various stages of implementation in towns namely Patna (11 projects), Begusarai, Munger, Hajipur, Mokama, Sultanganj, Naugachia, Barh, Bhagalpur, Sonapur, Chhapra, Khagaria, Bakhtiyarpur, Maner, Danapur and Phulwarishariff. These projects will facilitate in treatment of 616.5 MLD of sewage through creation/rehabilitation of STPs, sewerage network and allied Interception and diversion works.
- 16 projects (Beur STP, Beur Sewerage Network, Saidpur STP & Adjoining Network, Saidpur Sewerage Network, Karmalichak STP, Karmalichak Sewerage Network, Pahari STP, Pahari Zone-IV A (South), Pahari Zone V, Sultanganj, Mokama, Sonapur, Barh, Naugachhiya, Bakhtiyarpur and Maner) are under implementation
- LOA has been issued for 2 projects (Digha, Kankarbagh) and 10 projects (Munger, Hajipur, Bhagalpur, Begusarai, Chhapra,



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Khagaria, Munger and Fatua, Danapur, Phulwarishariff in one package) are under tendering stages.

- In addition, revised estimate of 1 project (Buxar) is under process
- Total 126 Nallas in the Ganga towns in which 124 Nallas has been screened. Rest 2 Nallas screening not required.

**State of Jharkhand (P-15508 to 15512)**

- a. 2 STPs have been constructed by SMLP and 7 MLD capacity and the work is completed.
- b. 1 STP of 3.5 MLD capacity is under construction and will be completed by June, 2020.

**State of West Bengal (Page 15522-15524)**

- a. Report has been filed on 29.11.2019 by Programme Director WBSPMG. The quarterly report relates to details of STPs and target dates. According to the report, there will be overshooting of the dates/prescribed timelines given in the Order of the Tribunal dated 22.8.2019.

**Report of CPCB on Biodiversity Parks**

Though the issue has not been finalized, the proposal is to prepare guidelines giving structural components of biodiversity parks with reference to such parks already developed and functional. The report mentions as follows:

*".....DDA has notified so far 7 Biodiversity Parks (the Yamuna, the Aravalli, the Neela Hauz, the Tilpath Valley, the Northern (Kamla nehru) Ridge, Tughalaqabad and South Delhi Biodiversity Parks, besides the recent order for setting up of Riverfront Biodiversity Parks by DDA. Of these 7 Biodiversity Parks, the Yamuna and Aravalli Biodiversity Parks are fully functional and have become Nature Reserves of Delhi. Both the Biodiversity Parks have become global models for conservation of natural heritage and environmental sustainability. The Yamuna Biodiversity Park model is an appropriate model for replication in the floodplains of the rivers across India."*



Conservation zone will have biological communities and forest communities as follows:

**"Nature Conservation Zone**

The Nature Conservation zone has biological communities interspersed with wetlands and grasslands. There are altogether 25-30 biological communities, some of which are given below:

- (i) *Mitragyna* dominated communities (Figure 1 a)
- (ii) *Terminalia chebula* dominated communities
- (iii) *Adina* dominated community
- (iv) *Acacia catechu* dominated community (Figure 1 b)
- (v) *Holoptelia* dominated community (Figure 2b)
- (vi) Teak dominated community
- (vii) *Terminalia tomentosa* dominated community
- (viii) *Acacia nilotica* dominated community
- (ix) *Dalbergia sisso* dominated community
- (x) *D. lanceolata* dominated community
- (xi) *Albizia* dominated community (Figure 2a)
- (xii) *A. lebbek* dominated community
- (xiii) *Cordia* dominated community
- (xiv) Jamun dominated community (Figure 2c)
- (xv) Amla dominated community
- (xvi) Grasslands communities (that include short, intermediate and tall grasslands) (Figure 2b)
- (xvii) Mixed deciduous forest (Figure 3a)
- (xviii) Wetlands ecosystems (wetlands are fully functional and biologically rich and attract 1000s of migratory birds during winter months) (Figures 4a,b,c&d)

Communities have diversified food web and three trophic levels. These riparian forest communities provide a wide range of ecological services and harbour rich wildlife (Figure 7b, 8a&b).

These diversified riparian ecosystems: (a) buffer ambient temperature, (b) prevent evaporation by keeping the water cool, (c) provide detritus (organic matter) to the biota that live in the river water and purify the water more effectively than RO plants, (d) prevent erosion / gully formation on the flood plains, (e) enhance recharging potential of the flood plains, (f) serve as filter for both point and non point source air pollution, (g) act as shelter belt, (h) reduce the flood water velocity that ensure protection of infrastructure and communities in the downstream, and (i) harbour rich wildlife having three trophic levels.

The wetlands alone store flood water of several million gallons and recharge ground water and even provide lateral flow to the river during lean period, clean waste water if it enters into river system (treatment wetlands) through storm drains. The wetlands also serve as habitat for a wide range of animal species that form



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*a rich trophic life. These wetlands attract 1000s migratory birds during winter months."*

A test case has been proposed to rejuvenate Kali river stretch of 200-300 km from Khatauli to the Aligarh-Diwai Railway Bridge (at Chhatari village) where the Kali river exits from Bulandshahr District.

20. We have heard Shri A.N.S. Nadkarni, learned ASG appearing for the State of Uttarakhand and learned Counsel for the States of Uttar Pradesh, Bihar, Jharkhand and NMCG. None appears for the State of West Bengal.
21. It is seen that except the State of Uttarakhand, no other report has been given in a tabular form as directed in terms of para 30 in the order dated 22.08.2019. With regard to State of Uttarakhand, progress has been indicated on the following subjects:
- i. Setting up of STPs, Interception and Division (I&D) of drains and preventing untreated sewage and effluents in the River Ganga
  - ii. Use of treated water
  - iii. Use of sludge manure
  - iv. Status of septage management
  - v. Compliance in relation to industries
  - vi. Installation of STPs/treatment facilities in Hotels/Ashrams and Dharmshalas.
  - vii. Water quality monitoring of river Ganga and its tributaries.
  - viii. Maintenance of environmental flow in river Ganga.
  - ix. Disposal of Bio-medical waste.
  - x. Compliance of Solid Waste Management (SWM) Rules, 2016
  - xi. Preparation of maps and zoning of flood plains.



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- xii. Mining activity under supervision of the concerned authorities.
- xiii. Action against identified polluters, law violators and officers responsible for failure for vigorous monitoring.

22. It is stated that the work of STPs will be completed within the timeline laid down and bioremediation has been started on seven drains which have not yet been taped. The points raised by the Monitoring Committee have been addressed. Learned ASG, however, stated that more action was required for solid waste management for which CCTV cameras need to be installed, security guards posted and designated areas cordoned off. Legacy waste dump sites which are said to be atleast 12 in major towns need to be bio-remediated. Let such steps be taken expeditiously.

**VII. Consideration:**

23. The States of Uttarakhand, UP, Bihar, Jharkhand and West Bengal need to take further action in terms of orders of this Tribunal for preventing pollution and rejuvenation of Ganga and its tributaries as per timelines already given. The report filed by UPPCB shows that as of now lot of untreated sewage is entering into the River Ganga and its tributaries. Similar is the position in the States of Jharkhand, Bihar and West Bengal. Despite directions of this Tribunal, in-situ Sewage Treatment is not shown to have commenced for any of the drains except in the State of Uttarakhand. There is no information on water quality of river Ganga in the stretch falling in UP, Jharkhand, Bihar and West Bengal and information of regulation of Flood Plain Zone. The reports from the States other than Uttarakhand do not



describe the number of drains and a plan for their interception and diversion to the Sewage Treatment Plants.

As regards solid waste management, including legacy waste sites, this Tribunal has already issued directions in O.A. No. 606/2018 as noted in para 10 of the order dated 22.08.2019 and in O.A. No. 519/2019 as already observed in para 19 in the order dated 22.08.2019 to the effect that tender process can be avoided if other successful models and rates involved therein such as Indore model are to be followed. Directions have also been issued for installing CCTV cameras and undertaking surveillance in para 25 of the said order. Further directions are for ensuring that not even a drop of raw sewage should be discharged in river Ganga and where STPs are not operative, immediate bio-remediation and/or phytoremediation need to be undertaken and to avoid procedural delay of tender process etc., specifications and norms should be adopted in consultation with the CPCB. We may also note that vide order dated 18.10.2019 this Tribunal in O.A. No. 606/2018 directed that rates for all such services and particulars of service providers should be standardized and specified on GeM portal. NMCG is a part of the Committee constituted by this Tribunal. Further, for setting up of STPs standard cost involved is said to be around Rs. 2 crore per MLD as per works allotted by NMCG. Cost of establishing sewerage networks, including setting up of pumping stations is said to be around Rs. 5 crores per MLD. Further direction on the subject may be issued by the NMCG/CPCB pending report of the Committee constituted by this Tribunal. All that this Tribunal can observe is that clearance of legacy



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waste and sewage treatment being high priority areas, the authority should find ways and means to shorten the delays by avoiding DPRs/tender process which can be done if specifications and rates are standardized which may be explored by the concerned authorities.

24. The Tribunal has also directed that atleast interim measures of treatment of sewage by way of bio-remediation and/or phytoremediation or any other measures may start positively from 01.11.2019, failing which the defaulting States may be liable to pay compensation of Rs. 5 lakhs per month per drain and for such violations, adverse entries must be made in the ACRs of the identified officers.

We reiterate the said direction and since 01.11.2019 has already gone, wherever interim treatment of untreated sewage has not started in the manner earlier directed, the compensation be deposited with the CPCB which will be personal responsibility of the Chief Secretaries of the concerned States. The Chief Secretaries of concerned States are put to notice that in case of any default in compliance their salaries may be liable to be stopped and for enforcing the directions, further coercive measures including order of civil imprisonment may be liable to be passed personally against the Chief Secretaries.

25. We may also refer to the order of this Tribunal dated 03.12.2019 in O.A. No. 425/2019, *Vijay Kumar Vs. State of Himachal Pradesh*, to the



effect that Hydropower projects in hill States including Uttarakhand must ensure minimum specified e-flow.

We may also add that replenishment study of mining areas needs to be carried out, if not already done. This may be mentioned in the next report of the States.

26. As already mentioned, with regard to States of Uttar Pradesh, Bihar and Jharkhand, the status report is not in a tabular form as required. It is not clear whether the STPs are functional and meet the norms. Bio-remediation, phytoremediation or any other measures for treatment of sewage have not started where STPs are not functional, except that in respect of 14 drains in Kanpur interception and diversion works are said to have been undertaken/completed. Directions in para 23 above will also apply to the Chief Secretaries of the all concerned States. CPCB may monitor and give its report to this Tribunal.

**VIII. Future Monitoring Mechanism after submission of final reports by the Committees constituted by the Tribunal earlier**

27. As noted earlier in para 5 above, this Tribunal constituted Monitoring Committees headed by former High Court Judges in the States of Uttarakhand and UP. The Committees were meant to monitor the progress till further orders and vide order dated 22.08.2019, the said Committees were to furnish final reports which have since been furnished. There is thus need for further directions for effective monitoring mechanism. While the Chief Secretaries of the States are expected to monitor rejuvenation of Ganga on the pattern of



monitoring of rejuvenation of 351 polluted river stretches, which include Ganga and its tributaries, in terms of orders of this Tribunal in O.A. No. 673/2018 and O.A. No. 606/2018, on suggestion of State of UP, this Tribunal set up a Monitoring Committee for environmental issues in the State of UP vide order dated 21.10.2019 in O.A. No. 670/2018. The said Committee may henceforth monitor steps for prevention and control of pollution of Ganga also in the same manner as other issues are being monitored. In State of Uttarakhand Justice U.C. Dhyani is heading Monitoring Committee for solid waste management and certain other issues. Such Committee may also monitor prevention and control of pollution of Ganga in the State of Uttarakhand. It is not necessary to continue other members in terms of earlier orders in the present matter, unless the State so directs. It is open to the States of Jharkhand, Bihar and West Bengal to evolve or suggest any additional monitoring mechanism on the pattern of State of UP or otherwise. These directions will not affect in any manner working of any Committees or authorities under the provisions of NMCG or otherwise.

**IX. Directions:**

28. We may now sum up our directions as follows:

- i. As already directed vide order dated 22.08.2019, timely completion of all projects relating to sewage treatment be ensured i.e. by 31.06.2020 in respect of ongoing projects and by 31.12.2020 in respect of others failing which compensation has to be paid in terms of the said order, apart from action against the erring officers. Till then, to avoid untreated sewage



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being discharged directly into Ganga, interim remedial measures have to be adopted and for the default after 01.11.2019 compensation has to be deposited in terms of order dated 22.08.2019. CPCB may make necessary calculation within one month from today and raise demands with the Chief Secretaries of the concerned States which may be complied within one month from the date of such demand failing which accountability will be of the Chief Secretaries personally.

ii. NMCG and concerned States - Uttarakhand, UP, Jharkhand, Bihar and West Bengal may take further steps as per directions already issued for

- a) Preventing discharge of industrial effluents in Ganga and its tributaries/drains by ensuring installation of proper functioning of ETPs/CETPs.
- b) Utilization of treated sewage, use of sludge as a manure and septage management.
- c) Demarcation of flood plain zones and preventing encroachments thereof.
- d) Maintenance of e-flow.
- e) Preventing dumping of solid and other waste in and around Ganga.
- f) Clearing old legacy waste dump sites.
- g) Preventing and regulating illegal sand mining.
- h) Steps for conservation of groundwater particularly with reference to critical, semi-critical or over-exploited areas.
- i) Restoration of water bodies.
- j) Monitoring and displaying of water quality.
- k) Taking action against polluters by way of recovering compensation for restoration of the damage to the environment.



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- l) Closing, till compliance, all establishments near river banks being run without necessary STPs and compliance of environmental norms.
  - m) Public awareness and involvement for prevention and control of pollution of Ganga.
  - n) Regulating activities on and around river Ganga including ghats and other establishments.
  - o) Afforestation and setting up of biodiversity parks.
  - p) CPCB and SPCBs may periodically undertake biological assessment of Ganga. NMCG and States concerned may depict biological diversity of Ganga in public domain.
  - q) Any other directions covered by earlier orders of this Tribunal.
- iii. The State of UP may take steps for remediating Chromium dump at Rania and Khanchanpur Village near Kanpur, as directed earlier vide orders dated 22.08.2019 and 15.11.2019.
  - iv. CPCB may take further action to finalise and circulate Guidelines for Biodiversity parks expeditiously which may be complied with by the concerned States and status of compliance included in the reports to be filed before this Tribunal.
  - v. Apart from the Chief Secretaries, the progress may be monitored by the Monitoring Committee constituted in the State of UP vide order dated 21.10.2019 in O.A. No. 670/2018, by Justice U.C. Dhyani in the State of Uttarakhand and in such manner as may be laid down by the Chief Secretaries in the States of Jharkhand, Bihar and West Bengal in the light of discussion in para 27 above.
29. Let further quarterly progress report be filed by 31.03.2020 by e-mail at [judicial-ngt@gov.in](mailto:judicial-ngt@gov.in).



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List for further consideration on 29.04.2020.

A copy of this order be forwarded to the Hon'ble Supreme Court in terms of directions of the Hon'ble Supreme Court vide order dated 29.10.2014, (2015) 12 SCC 764 Para 20.

Adarsh Kumar Goel, CP

S.P. Wangdi, JM

Dr. Nagin Nanda, EM

December 18, 2019  
Original Application No. 200/2014  
DV





~~422~~ - 413 - ANNEXURE - H  
All India Anti Corruption Organisation (Regd.)

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)

Ref No - AIACO/\_\_\_\_\_/20

Date: 16/05/23

To

- 1) The Principal Secretary  
Land and Land Reforms Department,  
325, Sarat Chatterjee Road, Mandirtala,  
Shibpur, Howrah- 711102.
- 2) The Secretary,  
Industry Commerce & Enterprises,  
Shilpa Sadan,  
6th Floor,  
4, Abanindranath Tagore Sarani  
(Camac Street), Kolkata-700 016.
- 3) The Director General Of Police,  
Bhabani Bhawan,  
Alipore.
- 4) Chairman,  
SPM Port Trust (Kolkata),  
Kolkata - 700001.
- 5) The Chairman,  
The West Bengal Mineral Development & Trading Corporation Ltd.  
Karunamoyee,  
Salt Lake,  
Kolkata - 700091.
- 6) The District Magistrate,  
Nadia District,  
Krishna Nagar, PIN - 741101.
- 7) The Superintendent of Police,  
Ranaghat Police District,  
Kalyani, PIN - 741



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**All India Anti Corruption Organisation (Regd.)**

Certified by Central Vigilance Commission

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Paschim Bardhaman, West Bengal, Pin code - 713206, India.

Mobile : +917797545055 | E - mail : [msubrata939@gmail.com](mailto:msubrata939@gmail.com)

Ref No - AIACO/\_\_\_\_/20

Date:- 16/05/23

- 8) The Managing Director,  
West Bengal Highway Development Corporation Ltd.  
Salt Lake,  
Kolkata - 700091.

Ref: Illegal Sand mining in the Ganga River bed at Majherchar, Kacharipara, Kalyani.  
Sub: Notice in c/w the above.

Sir/Madam,

In inviting your kind attention to the fact of illegal sand mining at the captioned location, it is to mention before your auspicious office that several instances of sand mining from the bed of river Ganga at Majherchar, Kacharipara of Kalyani sub-division, Nadia District in violation of the express norms set by the National Green Tribunal, has been noticed by this undersigned who is a social activist and has remained actively involved to restrain any such illegal activity.

It has been duly noted that the local residents of the said area, in connivance with the Proddhan of the Local Panchayet, and in collaboration with a section of corrupt Govt. officials, have been involved in lifting silver sand from the bed of the River Ganga, in contravention of norms established by law including the Sand Mining Policy 2021, declared by the Govt. of West Bengal in August 2021. It is also noteworthy that the said illegal activities are being conducted within 500 metres of the ISWAR GUPTA SETU connecting the districts of Hooghly and Nadia, which is already declared as a weak bridge and construction of new bridge is underway in the vicinity.

As a matter of fact, the illegal activity is under the supervision of several big-shots of the local area who have neither obtained any environmental clearance nor any but the said silver sand is supplied at the work site of WBHDC at Kalyani - Barrackpore Expressway which is being constructed by DR Agarwal Infracon Pvt.Ltd. as a contractor of WBHDC, who is the principal developer of the Kalyani - Barrackpore Expressway.

This undersigned humbly states that the entire sand mining sector is now under the control and supervision of the WBMDTCL, who is the nodal agency of the Govt. of West Bengal as per the Sand Mining Policy of 2021, and in the same policy, it has been specified that the WBMDTCL will be the only authority to conduct auction of sand reserves and will also issue challans for the same to competent parties but in this case, there has neither been any auction to obtain sand from the river bed of Ganga nor any challan for the same has been issued by the WBMDTCL:



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**All India Anti Corruption Organisation (Regd.)**

Certified by Central Vigilance Commission

Branch Office : Qtr No - RIII/81, Bidhannagar Housing Colony, Durgapur,  
Paschim Bardhaman, West Bengal, Pin code - 713206, India.

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Ref No - AIACO/\_\_\_\_\_/20

Date:-16/05/23

Moreover, this pattern of illegal sand mining is dangerously effecting the environment and is an upcoming threat to the entire Ganga basin of west Bengal. This can be ascertained from the SUSTAINABLE SAND MINING MANAGEMENT GUIDELINES, 2016, published by the Ministry of Environment, Forest and Climate Change, Govt. of India. But it is noted by this undersigned with sorrow, that the said guidelines are not followed neither the competent authorities are informed about the matter.

It is pertinent to mention at this juncture that the responsibility of maintaining the depth and navigability of the Ganga River lies with the Shyama Prasad Mukherjee Port Trust (Kolkata), who hold the key to allow or disallow any activity of dredging in the basin of the Ganga River, as they are statutorily entitled to look after the entire riverbed upto Murshidabad District, and this undersigned would like to know whether any such permission has been granted by the SPM Port Trust or not.

In absence of any of the above mentioned aspects, the entire process of lifting riverbed Sand from the Ganga River by the persons mentioned herein above, it is clear that the whole process is going on illegally and unless your esteemed department takes stringent action in this regard, it will continue unabated.

Your esteemed office is therefore requested to take strict action against the offenders within 7 days of receipt of this notice or else this undersigned will have no option but to follow the course of law in this respect.

Expecting your strict and prompt action in this regard,

Thanking you,

Yours Sincerely,  
ALL INDIA ANTI CORRUPTION ORGANISATION

*Subrata Mallick*  
16/05/23  
ADDL DIRECTOR OF CRIME (K)

Dt:

# VAKALATNAMA

Before the National Green Tribunal  
Principal Bench

**DISTRICT : NADIA**

Constitutional Writ Civil Criminal Revisional  
Appellate Jurisdiction

O.A. No. of 2023

**All India Anti Corruption Organization (REGD)**

{ Appellant  
Petitioner

-Versus-

**State of West Bengal & Ors.**

{ Respondent  
Opposite Party

Vakalatnama on behalf of Applicant

Know all men by these presents that by Vakalatnama, I/We appoint the Advocates noted below or any one of them my/our lawful Advocate or Advocates for filing the memorandum of appeal or petition of entering appearance

in the above matter for appearing conducting and arguing the same for depositing or withdrawing any money in connecting therewith for moving the Court in any matter connected therewith, for preparing the paper book in the case and for putting in papers, petitions, etc. On my/our behalf for filing, taking back any documents for withdrawing suits or appeals or petitions with permission to institute fresh suit etc. For signing and filing petitions of compromise in connections with the said matter and for taking copies of paper from the Record and I/We further say that any act. Done by my/our said Advocate or Advocates or by any one of them after accepting this Vakalatnama, shall be considered as my/our own true and lawful act.

And I/We further hereby agree and undertake to pay the said Advocates his or their fees as settled and all others sums that may be necessary to carry out the requisition of the Court and otherwise to enable the said Advocates to conduct the case properly. Failing which the said Advocates after notice to me/us will be at liberty to withdraw from the further conducting the case.

IN WITNESS WHEREOF I/WE sign and execute this Vakalatnama on this the day of June, 2023.

Received this vakalatnama  
from the executant and  
accepted as same by duly  
satisfaction  
Sudhakar Mallick  
Advocate  
14/5/23

Name of Advocate

SAHEB BANERJEE  
ADVOCATE

BAR ASSOCIATION, HIGH COURT  
Room No. -16

Mobile No. - 9844033616

Email: - 1981sahab@gmail.com

W. B. 640/2012

**DISTRICT: NADIA**

**BEFORE THE NATIONAL GREEN TRIBUNAL  
EASTERN ZONE BRANCH,  
KOLKATA**

O.A. No.                      of 2023;

In the matter of :  
An application under Section 14, 18(2)(e)  
of the National Green Tribunal Act, 2010  
and Rule 8 of the National Green Tribunal  
(Practice and Procedure) Rule, 2011;

-And-

In the matter of:  
All India Anti Corruption Organization  
(Regd.), represented by Sri Subrata Mallick  
.....Applicant

-Versus-

The State of West Bengal & Ors.  
..... Respondents

**ORIGINAL APPLICATION**



**MR. SAHEB BANERJEE**

Advocate  
Bar Association Room No.16  
High Court, Calcutta  
(M) 7044033616