Initial Environmental Examination

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IND: Agartala City Urban Development Project – Upgradation of Major Roads in Agartala City PART B

Prepared by Project Management Unit, Agartala Smart City Limited, Government of Tripura for the Asian Development Bank.

Sr. No.	Road Name	Sensitive Receptor	Approx. Distance from Centerline of Road (m)
			
26.	Ronaldsay Road	Shani temple 	20
27.	Jail Ashram Road	Lal Bahadur Club 	10
28.	Jail Ashram Road	Panchabati Shiv Mandir	15

Sr. No.	Road Name	Sensitive Receptor	Approx. Distance from Centerline of Road (m)
			
29.	Jail Ashram Road	Sri Ramkrishna Sadhna Kutir 	10
30.	Jail Road	Purbasa Handicraft store 	20

121. **Sensitive receptors**: there are few sensitive receptors like schools, hospitals along the proposed subproject stretches. The details of the same are provided in the Table 24 below along with the approximate distance of the receptors from the centreline of the road.

Table 24: Details of Sensitive receptors

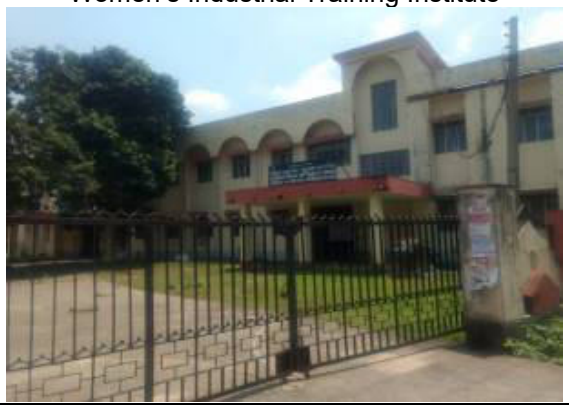
Sr. No.	Road Name	Sensitive receptor	Approx. Distance from Centerline of Road (m)
1.	Hari Ganga Basak Road	State Government Ayurvedic Hospital 	12
2.	VIP Road	Rashtriya Sanskrit Sansthan- Deemed University 	40
3.	VIP Road	Shrikrishna Mission School 	35
4.	VIP Road	Holy Cross School	45

Sr. No.	Road Name	Sensitive receptor	Approx. Distance from Centerline of Road (m)
			
5.	Akhaura Road	B R A M Nursing College 	20
6.	Thakurpalli Road	Rabindra Bhavan- Cultural Center 	15
7.	Thakurpalli Road	Sukanta Academy- Auditorium	27

Sr. No.	Road Name	Sensitive receptor	Approx. Distance from Centerline of Road (m)
			
8.	GB Road	G B Hospital 	50
9.	GB Road	RIPSAT 	30
10.	GB Road	Hospital	15

Sr. No.	Road Name	Sensitive receptor	Approx. Distance from Centerline of Road (m)
			
11.	Barjala Road	Institute of Polytechnic 	15
12.	Barjala Road	Health Care Centre 	30
13.	Barjala Road	Apnaghar Old Age Home	20

Sr. No.	Road Name	Sensitive receptor	Approx. Distance from Centerline of Road (m)
			
14.	Jail Ashram Road	Hospital 	15
15.	Jail Road	Kshudiram Basu English Medium School 	15
16.	B T Road	Bodhjung Boys School	10

Sr. No.	Road Name	Sensitive receptor	Approx. Distance from Centerline of Road (m)
			
17.	ITI Road	Women's Industrial Training Institute 	15

F. Environmental Settings

122. The subproject roads are spread across the entire urban area of the Agartala City. The details of the environmental settings for the selected road stretches are given in Table 25.

Table 25: Environmental Settings of Subprojects

Sr. No.	Road Name	Road Length (Km)	Road Surface	RoW (m)	Drain length (Km)		Footpath length (Km)	Utility trench length (Km)	Nearby land use	Tree Cutting (No.)	Utilities		PCR
					Existing	Proposed					Poles	Transformers	
1.	Hariganga Basak Road	3.48	Bitumen	15.50 to 20.80	0	6.96	6.96	6.96	Commercial	29	282	29	1. Kali Mandir 2. Shani tala 3. Iskon Temple
2.	Akhaura Road	1.33	Bitumen	26.8	1.33	1.33	2.66	1.33	Commercial and Institutional	8	38	8	Nil
3.	Mantribari Road	0.258	Bitumen	16.2	0	0.516	0.516	0.516	Commercial	2	24	4	1. Shani Temple
4	VIP Road	3.18	Bitumen	15.00 to 21.00	0	6.36	6.36	4.76	Mixed	180	107	38	1. Lake Choumunahi Kali Mandir 2. Venuwan Vihar 3. Nirmala Shishu Bhawan
5.	Thakurpalli Road	2.117	Bitumen	12.70 to 15.00	2.624	1.61	4.234	1.61	Mixed	31	152	14	1. Ujjayanta Palace 2. Laxmi Narayan Temple 3. Durga Bari Temple 4. Rabindra Bhawan

Sr. No.	Road Name	Road Length (Km)	Road Surface	RoW (m)	Drain length (Km)		Footpath length (Km)	Utility trench length (Km)	Nearby land use	Tree Cutting (No.)	Utilities		PCR
					Existing	Proposed					Poles	Transformers	
													5. Loknath Ashram 6. Satsang Vihar 7. Shiv Kali Temple
6.	Sakuntala Road	0.5	Bitumen	17.50 to 19.90	0.6	0.4	1.0	0.4	Commercial	0	28	6	1. Bhawan Rabindra
7.	GB Road	4.05	Bitumen	9.00 to 11.70	1.29	6.81	8.1	6.81	Mixed	49	384	31	1. Medicinal Plants Garden 2. Adoption Center 3. Kali Temple
8.	Barjala Road	4.05	Bitumen	12.00 to 16.00	0.508	7.592	8.1	7.592	Mixed	117	346	43	1. Shani Temple 2. Kali Temple 3. Shiv Temple 4. Shakti Temple 5. Apnaghar Old age home
9.	Ronaldsay Road	1.1	Bitumen	17	0	2.2	2.2	2.2	Commercial	11	91	12	1. Puran shani mandir 2. Shani Temple

Sr. No.	Road Name	Road Length (Km)	Road Surface	RoW (m)	Drain length (Km)		Footpath length (Km)	Utility trench length (Km)	Nearby land use	Tree Cutting (No.)	Utilities		PCR
					Existing	Proposed					Poles	Transformers	
10.	Jail Ashram Road	1.547	Bitumen	11	0	3.094	3.094	3.094	Mixed	50	183	18	3. Lal Bahadur Club 4. Panchabati Shiv Mandir 5. Sri Ramkrishna Sadhna Kutir
11.	Jail Road	0.5	Bitumen	10.3	0.5	0.5	1.0	0.5	Mixed	3	19	7	1. Purbasa Handicraft store 2.
12.	BT Road	0.28	Bitumen	13	0.28	0.28	0.56	0.28	Residential	24	29	4	1. Hallelujah Baptist Church
13.	Road Surrounding the proposed IT Hub Site	0.57	Bitumen	11	0.257	0.883	1.14	0.883	Residential	16	44	5	Nil
14.	ITI Road	0.39	Bitumen	11.10 to 12.00	0	0.78	0.78	0.78	Residential	0	53	4	Nil
15.	Lankamura Road	0.21	Bitumen	11.10 t0 15.00	0	0.42	0.42	0.42	Residential	0	20	2	Nil

Sr. No.	Road Name	Road Length (Km)	Road Surface	RoW (m)	Drain length (Km)		Footpath length (Km)	Utility trench length (Km)	Nearby land use	Tree Cutting (No.)	Utilities		PCR
					Existing	Proposed					Poles	Transformers	
		23.562			7.389	39.735	47.124	38.135		520	1800	225	

VI. ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

A. Introduction

123. Potential environmental impacts of the proposed infrastructure components are presented in this section. Mitigation measures to minimize/ mitigate negative impacts, if any, are recommended along with the agency responsible for implementation. Monitoring actions to be conducted during the implementation phase is also recommended to reduce the impact.

124. Screening of potential environmental impacts are categorized into four categories considering subproject phases: location impacts and design impacts (pre-construction phase), construction phase impacts and operations and maintenance phase impacts.

(i) **Location impacts** include impacts associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site.
(ii) **Design impacts** include impacts arising from Investment Program design, including technology used, scale of operation/throughput, waste production, discharge specifications, pollution sources and ancillary services.
(iii) **Construction impacts** include impacts caused by site clearing, earthworks, machinery, vehicles and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.
(iv) **O & M impacts** include impacts arising from the operation and maintenance activities of the infrastructure facility. These include routine management of operational waste streams, and occupational health and safety issues.

125. Screening of environmental impacts has been based on the impact magnitude (negligible/moderate/severe – in the order of increasing degree) and impact duration (temporary/permanent).

126. This section of the IEE reviews possible project-related impacts, in order to identify issues requiring further attention and screen out issues of no relevance. ADB SPS (2009) require that impacts and risks will be analyzed during pre-construction, construction, and operational stages in the context of the project's area of influence.

127. The ADB Rapid Environmental Assessment Checklist for urban development has been used to screen the project for environmental impacts and to determine the scope of the IEE.

128. The IEE study should evaluate impacts due to the location, design, construction and operation of the project. The proposed project would create an impact on the environment in three distinct phases:

(i) Design phase
(ii) During Pre-Construction phase
(iii) During the Construction phase, which may be considered as temporary or short term;
(iv) During the Operation and Maintenance phase, which would have long term effects

B. Design Impact

129. The proposed design for the subproject includes construction of roads, drains, utility ducts and pathways. The subproject road involves construction of utility ducts and trenches for drainage lines, water supply lines, electricity and telecommunication cables and gas pipelines. The IRC: 98-1997, Guidelines on accommodation of utility services on roads in urban areas is followed. Various design features that will improve the existing condition of the roads are as follows:

(i) Storm water drain is provided at the extreme edge of the right of way.
(ii) Water supply lines carrying water at high pressure may cause damage to the road pavement, so they are provided on one side of the road.
(iii) There is safe distance between water supply line and drainage line to avoid any intermixing in case of any leakage or pipe burst.
(iv) Electric cables are kept away from water supply lines to avoid short circuit.
(v) HT cables are kept away from the telecommunication and ICT cables to avoid any possible electrical interference due to induced voltage.
(vi) The cables are away from tree line to avoid possible entrapment of the cable by tree roots.
(vii) Footpaths and zebra crossings are provided cater the needs of elderly and persons with disability.
(viii) The roads are provided with LED streetlights and other fixtures for better lighting and safety of motorists, riders and pedestrians.
(ix) Gas pipeline is located far away from the electricity cables and sources of heat.
(x) Concrete ducts are designed to carry the utilities in groups to minimize the inconvenience of frequent digging of the road at different locations for repairs and maintenance.
(xi) The IS- 1255-1983 (Code of Practice for Installation and Maintenance of Power Cables Up-to and including 33 kV Rating) is followed, based on this the minimum safe distance between power cable to control cables is considered as 0.2m, distance between Power cable and communication cable is kept at 0.3m and the distance between Power Cable and gas/ water main is maintained at more than 0.3m in the design concept.

130. **Visual Improvement**: Roads considered under proposed project are planned to have dedicated footpaths with street furniture, tree belt and landscaping, smart road elements such as smart light poles, WIFI and CCTV poles, smart traffic signals, and parking, etc. Services are designed underground to increase the visual aesthetic in coordination with ICT components being proposed. This will not only enhance the overall visual features of the proposed roads also improve the overall aesthetics of Agartala city and it will be a positive impact to the city and its people.

131. **Safety in Design**: Agartala city faces problems of flash flood. Issues of inundations are reported after heavy rainfall across the city and mainly in the low-lying areas. Mitigation measures provided are follows:

(i) There are storm water pumping stations to pump and dispose the flood water into Katakhal or Haora rivers to address the problem of flash flood.
(ii) Under the Smart City proposal seven existing storm water pumping stations along the subproject roads are enhanced to mitigate the flash flood issues at, 1) IGM Chowmuhani, 2) Orient Chowmuhani, 3) Gangaraj Chowmuhani, and 4) Old Motor stand 5) Dhaleshwar 6) Indranagar 7) Ranjith Nagar.

C. Pre-Construction Phase Impacts

132. **Location Impacts:** It Includes impacts associated with site selection, loss of on-site biophysical properties.

133. **Site Selection of construction work camps, stockpile areas, storage areas and disposal areas**: During the project pre-construction (site clearing) and construction stage, priority is to locate the construction work camps, stockpiles areas, storage areas and disposal areas near the project locations. However, if it is necessary to re-locate elsewhere, sites to be considered will not result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered for setting up camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals near the forest, water bodies, swamps, or in areas which will inconvenience the community. Material stockpiles shall be protected by bunds during the monsoon to arrest the silt laden runoff into drains. The subproject is likely to generate soil from excavations, which needs to be disposed safely. The mitigation measures for handling of soil, excavated earth material and other construction wastes will be as follows:

134. **Mitigation Measures:**

(i) The excavated soil should be removed from construction area at the earliest for beneficial reuse such as land raising/ filling of excavated areas.
(ii) Soil should be covered with tarpaulin sheets during transportation.
(iii) Soil transportation should not be done during peak hours and should be avoid narrow and heavy traffic routes and important religious or tourist sites etc.
(iv) Earthen bund to be provided around the storage areas for excavated soil and other construction material.
(v) Completed earthworks to be sealed and/or re-vegetated at the earliest with the help of landscape expert.

135. **Site Selection for Source of Materials:** The material used for the construction of subproject components are mainly sand, coarse aggregate fine aggregate and gravel for construction works. Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.

136. The natural raw materials like sand, gravel and soil shall be procured/ sourced from the authorized mines listed by Tripura Government as specified in the website http://trpenvis.nic.in/test/natural_resources.html. For material like gravel and bituminous macadam that are not available in the state, the contractor shall ensure that it shall be procured/ sourced from authorized mines listed by the respective state government website. The transportation of raw material from other states may cause trans-boundary pollution leading to air and noise pollution.

137. **Mitigation Measures:**

(i) Contractor should procure these materials only from the quarries permitted/ licensed by Mines and Geology Department, Government of Tripura;
(ii) Contractor should, to the maximum extent possible, procure material from existing authorized quarries;
(iii) The contractor shall try to procure/ source the material from the nearest possible authorized mines.

(iv) It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of Department of Mines & Geology and local revenue administration; and
(v) Contractor should submit the details of sources and copies of approvals, permissions to AMC, and should start procurement only after the respective source is approved by AMC.
(vi) The transportation of raw material should be done in covered vehicles.
(vii) The vehicles used for the transportation of raw material should have valid PUC certificate and should be well maintained to avoid noise pollution.

138. **Tree cutting**: The total number of trees to be cut, falling within the RoW of the proposed project is about 520, road-wise details are given in Table 26. Total numbers of species of trees found in the RoW is 38 (list given in Table 27) with maximum trees of the category of avenue plantation. About 50% of the trees are either raintree or Radha-chura species of trees which are common avenue plantation species. No rare or endangered species of plants are found in the list of trees falling within the RoW. The list of road-wise trees with their species and girth is being surveyed by the Forest Department are given in the Appendix 16.

139. **Mitigation Measures**:

(i) The contractor shall take necessary steps to safeguard the trees and reduce the number of trees to be cut during the time of construction.
(ii) All possible measures should be taken to avoid cutting trees with more than 300 cm girth size (around 20 nos. of trees). This can be done by diverting the utility ducts and drains during the implementation stage.
(iii) Safeguarding these trees will be ensured from the contractor by Nodal Environmental Safeguard Officers of PMU and PMC.

140. **Compensatory plantation**: Details on compensatory plantations were sought from Forest Department vide ASCL letter no. F.4(34)/ASCL/2018/917 dated 19-02-2020 (letter attached in Appendix 15). Forest Department in its Letter no. F.11-13/WFD/Deptt.0prnt/2018-19/11595-597 dated 27-02-2020 (letter attached in Appendix 16) informed that compensatory plantation is done for twice the number of trees to be fell. The estimate for the compensatory plantation is attached in same Appendix 17. The costs of tree cutting, and compensatory plantation are taken in EMP Budget. Based on the discussion with forest department, the common plant species which are planted under the compensatory plantation program in Agartala are given Table 28:

Table 26: Details of trees in the road ROW

Sr. No.	Road Name	Total number of trees
1	Hariganga Basak Road	29
2	Akhaura Road	8
3	Mantribari Road	2
4	VIP Road	180
5	Thakurpalli Road	31
6	Sakuntala Road	0
7	GB Road	49
8	Barjala Road	117
9	Ronaldsay Road	11

Sr. No.	Road Name	Total number of trees
10	Jail Ashram Road	50
11	Jail Road	3
12	BT Road	24
13	Road Surrounding the proposed IT Hub Site	16
14	ITI Road	0
15	Lankamura Road	0
	Total	**520**

Table 27: List of Species in the road RoW

Sr. No.	Species	Scientific Name
1	Raintree	*Samanaia saman*
2	Teak	*Tectona grandis*
3	Mehagony	*Swietenia saman*
4	Debdaru	*Polyalthia longifolia*
5	Bat	*Ficus religiosa*
6	Krishnachura	*Delonix regia*
7	Acacia	*Acacia auriculiformies*
8	Bakul	*Mimusops elengi*
9	Pongamia	*Pongamia ponnata*
10	Rangi	*Chukrasia tabularis*
11	Radhachura	*Peltophorum pterocarpum*
12	Chalta	*Dilenia indica*
13	Eucalyptus	*Eucalyptus globulus*
14	Champa	*Michelia champaca*
15	Kathal	*Artocarpus heterophyllus*
16	Agar	*Aquilaria melacensis*
17	Arjun	*Terminalia arjuna*
18	Sajna	*Moringa oleifera*
19	Kanchan	*Bauhinia purpurea*
20	Naiccha	*Trema orientalis*
21	Aam	*Mangifera indica*
22	Bel	*Aegle marmelous*
23	Jam	*Syzygium cumini*
24	Kurcha	*Holarrhena antidysenterica*
25	Kadam	*Neolamarckia cadamba*
26	Sonal	*Cassia fistula*
27	Khajur	*Phoenix dactylifera*
28	Jarul	*Lagerstroea specioser*
29	Chatim	*Aistonia scholaris*
30	Neem	*Azadurachta indica*

Sr. No.	Species	Scientific Name
31	Barai	*Zizyphus jujuba*
32	Bakul	*Mimusops elengi*
33	Rudrakkha	*Elaeocarpus ganitrus*
34	Tetul	*Tamarindus indica*
35	Xmas Tree	*Araucaria heterophylla*
36	Tula	*Bombax ceiba*
37	Udal	*Sterculia billosa*
38	Palash	*Butea monosperma*

Table 28: List of Species to be planted in Compensatory Plantation

Sr. No.	Tree Species
1	Ashoka
2	Nageswar
3	Tagar
4	Mahagani
5	Babul
6	Poxtail Palm
7	Agar
8	Arjun
9	Jalpari
10	Darchini
11	Aricapalm
12	Tetul
13	Neem
14	Chalta
15	Pungamia
16	Sauli

141. Based on the ecological assessment, 29 species of birds are found along the proposed road stretches (the details are given in Table 20). The cutting of trees disturbs the nesting and breeding of birds due to the destruction in their habitat. The cutting of trees during the nesting and breeding season shall be avoided and contractor shall check for nests before cutting the trees.

142. **Utilities**: Telephone lines, electric poles and wires, water lines within the proposed subproject locations may require to be shifted in few cases. To mitigate the adverse impacts due to relocation of the utilities, the following measures will be followed:

143. **Mitigation Measures:**

(i) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase;
(ii) Conduct detailed site surveys with the construction drawings and discuss with the respective agencies during the construction phase, before ground clearance;

(iii) Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. In case of disruption of water supply, alternative supply, through tankers, shall be provided.

144. **Shifting of transmission line from overhead to underground**: The project involves shifting of HT, LT lines and OFC/ communication lines from above ground to underground. There will be total removal of around 1800 nos. electrical poles and 225 nos. transformers for the proposed smart road project. The benefits of Underground lines are:

(i) Reduced risk of power outages and communication disruption from severe storm.
(ii) Underground lines can absorb emergency loads, lower transmission loss.
(iii) Improved life of transmission and communication lines.
(iv) Improvement in aesthetics of the area.
(v) Reduce the premature death of wildlife (eg-squirrels. Birds, rodents etc.,).

145. There are environmental impacts of the conversion like:

(i) An increase in area of environmental disturbance.
(ii) The complete removal of small trees and bushes along the transmission ROW.
(iii) Generation of removed electrical and telephone poles (approximately 1800 nos.) and around 225 nos. of transformers.
(iv) Increase in occupational health and safety risk to utility operational staff.

146. **To minimize the following mitigation measures will be implemented:**

(i) The alignment is done in such a way to minimize tree cutting, in addition to these, tree will be planted along the median and available spaces in the row.
(ii) The Electrical and Telephone poles will be reused by the Tripura State Electricity Corporation Ltd.,
(iii) The transformer will be reused at other locations and reutilization of streetlamps in other locations.
(iv) Adequate trainings will be provided to the operational staff for occupational health and safety issues.

147. The storage and re-use of electric poles and transformers shall be the responsibility of Tripura State Electricity Corporation Limited (TSECL). A letter dated F.4(28)/TSECL/ Corp.office/ 2018-19/9637-40 dated 29-06-2019 providing No Objection Certificate for storage and reuse of dismantled Electric Poles and transformers recovered during overhead to underground lines conversion work for the subproject roads is received from TSECL, a copy attached as Appendix 4. TSECL officials have confirmed that the transformers used in entire Tripura state are PCB free the details of the consultation are given in Public Consultation chapter.

Figure 27: Images showing the existing transmission line

Table 29: Departments that will be consulted by the Contractor for utility disturbance

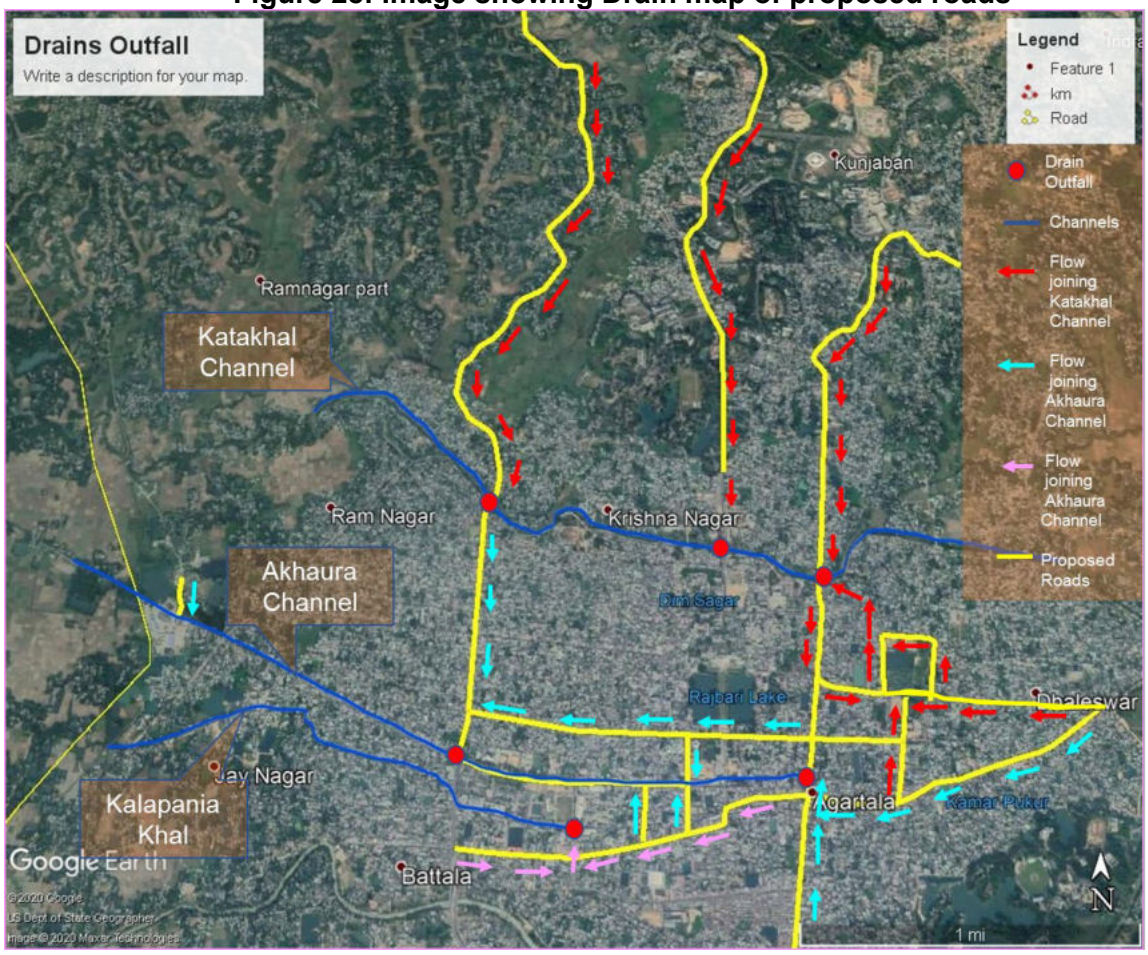
Sr. No.	Department/ Organization	Utility Services
1.	Agartala Municipal Corporation (AMC)	Storm Water Drains, Storm water pumping lines and Traffic Diversion
2.	Tripura State Electricity Corporation Limited	Overhead and Underground Electricity cables, Electric poles and Transformers
3.	Drinking Water and Sanitation Wing of PWD and AMC	Drinking water and Sewer lines below road stretches
4.	Bharat Sanchar Nigam Limited (BSNL), Bharti Airtel, Reliance Jio, Vodafone-Idea	Telecommunication Cables, Junction Boxes, Telephone Posts and Overhead lines etc.,
5.	Agartala Traffic Police	Traffic Diversion, Traffic Signal Posts, Junction boxes and Cable Connections
6.	Tripura State Museum	Works on Thakurpalli Road
7.	Tripura Natural Gas Company Limited	Underground Gas pipelines and allied infrastructures

148. **Flooding**: The Agartala city faces frequent flooding during monsoon leading to inundation of roads. Some of the proposed subproject roads like HGB Road, Mantribari Road, Shakuntala Road and Thakurpalli Roads face flash flood issues. The storm water drains from Barjala Road, VIP Road, GB Road, Jail Road, Jail Ashram Road, IT hub road are connected to Katakhal Channel. Storm water drains from Akhaura Road, Ronaldsay Road and Part of HGB and GB Roads are connected to Akhaura Channel. Storm water drain of part of HGB road from Old motor

stand to Battala junction is connected to Kalapania Khal. The drainage map of proposed roads showing the outfalls are shown in the Figure 28. The catchments of the drains along the proposed roads and its respective outfalls are as per natural gradients. Total quantum of flow from the catchments of roads is about 81.6 cum/ sec, which is very insignificant when compared with the flow in the outfalls points of Katakhal, Akhaura. Further this flow gets distributed at different points and flows into the outfalls without adding to flash floods. The proposed storm drains will act as a medium for efficient conveyance of rain water towards the outfalls that will help in disposal of water.

149. Various mitigation measures are taken to control the flooding issues as enumerated below.

Figure 28: Image showing Drain map of proposed roads



150. **Mitigation Measures:**

(i) 39.735 km of drain are proposed along the designed roads, to reduce the flooding problems of Agartala.

(ii) The drains proposed in the project are designed with proper gradient and flow conditions. The storm water will not lead to any flood like situation in the city and the channels, as the drain catchments as well as the outfalls remains the same before and after development of the proposed project.

(iii) There are storm water pumping stations to pump and discharge flood water into Katakhal or Akhaura Channel rivers to address the problem of flash flood.

(iv) Under the Smart City proposal seven existing storm water pumping stations along the subproject roads are enhanced to mitigate the flash flood issues at, 1) IGM Chowmuhani, 2) Orient Chowmuhani, 3) Gangaraj Chowmuhani, and 4) Old Motor stand 5) Dhaleshwar 6) Indranagar 7) Ranjith Nagar. This will ensure that the proposed project will not enhance the flash flooding issues rather will improve the existing situation.

(v) The proposed drains will be connected to the 3 natural drains, Kalapania khal, Akhaura channel and Katakhal, all these natural channels ultimately lead to _Bay of Bengal through Titas and Meghna river.

151. **Preparation of H&S Plan for Pandemic like COVID- 19**, With the existing EHS guidelines contracture has to prepare a site specific EHS plan including COVID -19 guidelinesbased on following pinciples and it get approved from PMU before staring of construction, the Contractor shall abide by the most stringent procedure available.

(i) Consistently practice social distancing.
(ii) Cover coughs and sneezes.
(iii) Maintain hand hygiene.
(iv) Clean surfaces frequently.

D. Construction Phase Impacts

152. **Screening of non-Significant Impacts**: The construction work is expected not to cause major negative impacts, mainly because:

(i) Most of the activities will be on the built-up areas of Agartala city thus could be constructed without causing impacts to biodiversity;
(ii) All the sites are located on a government-owned land which is not occupied or used for any other purpose;
(iii) Overall construction program will be relatively short and is expected to be completed in 24 months with activities to be conducted by small teams and specified location so most impacts will be localized and short in duration; and
(iv) Most of the predicted impacts associated with the construction process are produced because the process is invasive, such as involving excavation. However, the routine nature of the impacts means that most can be easily mitigated, and the impacts are clearly a result of the construction process rather than the design or location, as impacts will not occur if excavation or other ground disturbance is not involved.

153. As a result, there are several aspects of the environment which are not expected to be affected by the construction process and these can be screened out of the assessment at this stage as required by ADB procedure. These are shown in Table 30. These environmental factors are screened out presently but will be assessed again before starting of the construction activities.

Table 30: Fields in which construction is not expected to have significant impacts

Field	Rationale
Topography, Drainage, and Natural Hazards	Activities are not large enough to affect these features.
Geology, Geomorphology, Mineral Resources, and Soils	Activities are not large enough to affect these features. No mineral resources in the subproject location.
Climate	Activities are not large enough to affect this feature.

Field	Rationale
Geohydrology and Groundwater	Activities will not be large enough to affect these features
Protected Areas	No protected areas nearby the Agartala city and project locations
Flora and Fauna	No rare or endangered species.
Land Use	No change in major land use.
Socio-economic	The project is within the existing ROW, hence social impact will be temporary and minor in nature.
Commerce, Industry, and Agriculture	Activities are not large enough to affect these features
Population	Activities are not large enough to affect this feature.
Health and education facilities	Activities are not large enough to affect this feature.
Historical, Archaeological, Paleontological, or Architectural sites	No scheduled or unscheduled historical, archaeological, paleontological, or architectural sites

154. **Anticipated Impacts and Mitigation Measures**: Although construction of the subproject components involves simple techniques of civil work, excavation and the subproject locations in the built-up areas of Agartala city where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are temporary and for short duration. Physical impacts will be reduced by the method of working and scheduling of work, whereby the project components will be (i) constructed by small teams working at a time; (ii) effective traffic management; (iii) planning for utility shifting (iv) any excavation done near sensitive area like school, religious places and house will be protected as per standard norms.[15]

155. **Air Quality**: Most of the dust (suspended particulate matter) during construction arises from operations such as excavation and filling during site preparation works, loading, unloading and transportation of construction material, drilling use of heavy equipment's and machinery in the earthworks and pavement works. The fugitive dust released during the construction activities cause immediate effect on the construction workers as well as on the nearby households, businesses and people residing in these structures. Increased suspended particulate matter and fugitive gaseous emissions like, oxides of Sulphur (SOx), oxides of nitrogen (NOx), carbon monoxide (CO) etc., will be released from vehicles, batching plants and diesel generator sets etc., also add to the problem. Most of the generated pollutants from the above activities are limited to construction phase and confined to construction site due to surrounding buildings and settlement.

156. **Mitigation Measures**

(i) Dust cannot be avoided completely due to the nature of the activities during site preparation and construction. However, it can be managed by regularly spraying water at the site (particularly during the dry season).
(ii) Stockpiles of raw/ waste material, demolition debris, excavated earth etc., shall be covered with tarpaulin during the entire construction activity.

[15] Occupational Health and Safety of employees working only in factories and mines have been specifically covered in GOI laws. However, the Constitution of India has provisions to ensure that the health and well-being of all employees are protected, and the State has the duty to ensure protection. For this subproject, the mitigation measures were based on the World Bank Environmental, Health, and Safety (EHS) Guidelines.

(iii) Vehicles carrying demolition debris from site shall be covered with tarpaulins while entering and leaving the site will always be covered.
(iv) Consent to Establishment (CTE) and Consent to Operate (CTO) shall be obtained from TSPCB for construction establishments such as hot mix plants, batching plants and stone crushers if set up by the contractor. All project activities are adhered to the contractual obligations under clearances and approvals
(v) Construction labours shall be provided with nose masks and other personnel protective equipment.
(vi) LPG or low Sulphur diesel shall be used in the Diesel Generator sets and DGs are fitted with the chimney stack of required height.

157. **Surface Water**: There are some waterbodies adjacent to the VIP road at a distance within 100 m, and the Ponds of Ujjayanta Palace are adjoining the Thakurpalli Road, along with these Rajbari lake, Jagannath bari lake and Banmalipur dighi along Thakurpalli road, Rani pukur along VIP road near Ginger Hotel and Mukta pukur on Akhaura road. There are a few small streams and nallas crossed by the subproject road. Disturbance to flows; alteration of drainage causing erosion; sewage and oil/grease/lubricant contamination from construction camps may occur.

158. **Mitigation Measures**

(i) Stockpiles shall be at least 5 m from the adjacent pond waters.
(ii) Contractor shall ensure that no construction materials like earth, stone, waste disposed of in a manner that block the flow of water to and from the ponds. Contractor will be required to avoid site cleaning and earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets.
(iii) Provide temporary bunds for stockpiles and materials.
(iv) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas
(v) Place storage areas for fuels and lubricants away from any drainage leading to water bodies
(vi) Dispose any wastes generated by construction activities in designated sites of DC Nagar Lunga Site.
(vii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies.
(viii) Avoid spillage or leakage of raw material and fuel, oil etc., in the water bodies.

159. **Groundwater Quality:** Proposed project activity do not interfere with ground water regime; no ground water usage/ abstraction is proposed, and activities do not affect ground water quality.

160. **Noise & Vibration Impacts**: All the construction works will be conducted during the day time. Increase in noise level may be caused by excavation, transportation of equipment, materials, and people. Noise is a major area of concern, especially where a number of sensitive receptors are located within Impact zone and close to RoW. The impact on ambient noise due to the project is not of significance during both construction as well as the operation stages. Vibration generated from construction activity, for instance from the use of pneumatic drills, will have impact on nearby buildings. Heavy vehicle movement and equipment usage might also damage fragile buildings if vibration is excessive. This impact is negative but short-term, and reversible by mitigation measures.

161. **Mitigation Measures:**

(i) The construction contractor will be required to plan activities in consultation with Environmental and Social Safeguard officer of PMU and PMC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance
(ii) Construction work shall be limited to day light hours (8 AM to 6 PM) for all the works located within the town
(iii) Provide prior information to the local public about the work schedule
(iv) Minimize noise from construction equipment/ pneumatic drills by using silencers, fitting jackhammers with noise-reducing mufflers
(v) The DG sets used for construction activities shall be with acoustic enclosures and shall meet the latest CPCB standards for noise generation.
(vi) Wherever required, personal protective equipment such as ear plugs, earmuffs etc. shall be provided to the persons working in high noise areas
(vii) Personnel Protective Equipment's (PPE) such as Ear plugs, and earmuffs shall be provided to the workers operating or working near noise generating machines
(viii) Equipping construction equipment engines with adequate mufflers, silencers, and engine enclosures would reduce their noise by 5 to 10 dB (A).
(ix) Turning off construction equipment during the prolonged periods of nonuse eliminates noise from construction equipment during those periods.
(x) Regular maintenance of all equipment and training to equipment operators would reduce noise levels and increase efficiency of equipment.
(xi) Locating stationary equipment away from sensitive receptors would decrease noise considerably.
(xii) Noise barriers will be installed near sensitive receptors of HGB Road and Akhaura Road where prevalent noise levels are high to reduce the noise level during operation stage. Noise barrier will be installed at IGM Hospital building facing Akhaura Road (~140m), Government Ayurvedic Hospital, HGB Road (~10m) and Kamini Kumar Sangh School, HGB Road (~120m). The costing of the noise barrier is considered in EMP budget.
(xiii) Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity.

162. **Generation of Spoil and its Disposal**. Some sections of the sub-project roads will cross water bodies, exposing them to risks of pollution caused by: (i) poorly managed construction sediments, and waste materials; and (ii) poor sanitation practices of construction workers. Polluted water bodies will be harmful to aquatic life and people that depend upon such contaminated sources. The impact is thus direct in nature, local to regional in extent, medium in magnitude and short term in duration.

163. **Mitigation measures:**

(i) Not to dispose any construction materials in river/stream which may pollute the river water and aquatic fauna
(ii) Spoil Disposal Management Plan (SDMP) will be prepared and implemented to minimize the potential effects of sediment plumes on aquatic habitats. Sample spoil management plan is attached as Appendix 5.
(iii) Details of the proposed Water Quality Monitoring Program will be included in the environment management plan.

164. **Construction and Demolition Waste**: Construction debris/ waste is generated due to demolition of existing drains and pathways, scarification of existing pavement and excavation at some section of the subproject road, collection of silt from existing drains proposed to be demolished. Improper disposal of scarified bitumen causes decrease in soil fertility and water pollution. Careless disposal of debris can obstruct waterways causing siltation of reservoirs and reduce capacity. Unleaded demolition wastes will cause traffic blockage and dust causing inconvenience and health risks.

165. The excess C&D waste for construction will be processed at C&D waste management site at DC Nagar Lunga, Therefore the existing C&D processing site is an associated facility as per the ADB Safeguard Policy Statement 2009. Compliance with the environmental safeguards will ensure the subproject sustainability. The Environmental Audit Report of Existing C&D waste Management site at DC Nagar Lunga in Agartala is attached as Appendix 6.

166. An application for Request of NOC for dumping/ storing of Construction and Demolition waste and drain silt in DC Nagar Lunga SWM Site for future reuse is submitted to the AMC office, an approval from AMC is received and is attached as Appendix 7. For management and final disposal of all other solid wastes, the mitigation measures that will be applied are:

167. **Mitigation Measures**

(i) It is proposed that more than 35% of the construction and demolition waste generated from the subproject roads will be utilized in construction works and the balance amount will be dumped at the DC Nagar Lunga site owned by AMC, from where the waste could be re-used for future construction activities.
(ii) The silt collected from drains will be disposed on authorized waste management site at DC Nagar Lunga Site.
(iii) Out of the total excavated earth 25% will be reused in construction works and the rest will be stored as the DC Nagar Lunga site for future use
(iv) collection of recyclable solid wastes and supply to scrap vendors
(v) ensure all the camp wastes and construction wastes are placed in the designated waste collection pits away from receiving water.
(vi) establishment of separate bounded areas for the collection and storage of all the toxic material wastes, including batteries, oil filters, mobile, burnt oils, etc. at the construction site
(vii) collection of biodegradable wastes in separate vessels and transfer to municipal waste disposal system.
(viii) application of various waste disposal systems for diverse wastes produced on site as per consultations with environmentalists.

168. **Impact on Accessibility**. Hauling of construction materials and operation of equipment on-site can cause traffic problems. The subproject roads are 2 to 4 lanes roads and during construction stage part diversion will be planned to reduce the accessibility problem to the residents, except for the road stretch between Ker Chowmuhani to TUTCL which is about 500m where due to very narrow width complete closure and diversion will be planned. Potential impact is negative but short term and reversible by mitigation measures.

169. **Mitigation Measures:**

(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;

(ii) Schedule transport and hauling activities during non-peak hours;
(iii) Locate entry and exit points in areas where there is low potential for traffic congestion;
(iv) Keep the site free from all unnecessary obstructions;
(v) Drive vehicles in a considerate manner;
(vi) Coordinate with Govt. Traffic Department for temporary road diversions and with for provision of traffic aids if transportation activities cannot be avoided during peak hours; and Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints. Sample Traffic Management Plan is attached as Appendix 8.

170. **Socio-Economic – Income**. The subproject components will be in existing RoW. Construction works will hinder the access of residents to households and customers to the shops and commercial establishments, places of worship, hospital, schools etc., for a period of 7-15 days' time during the excavation and trenching activities. This will have a negative impact on the income of the shopkeepers and owners of commercial establishments on the subproject roads temporarily. Total number of shops which require access during the construction have been surveyed and presented in the Table 31

171. **Mitigation Measures:**

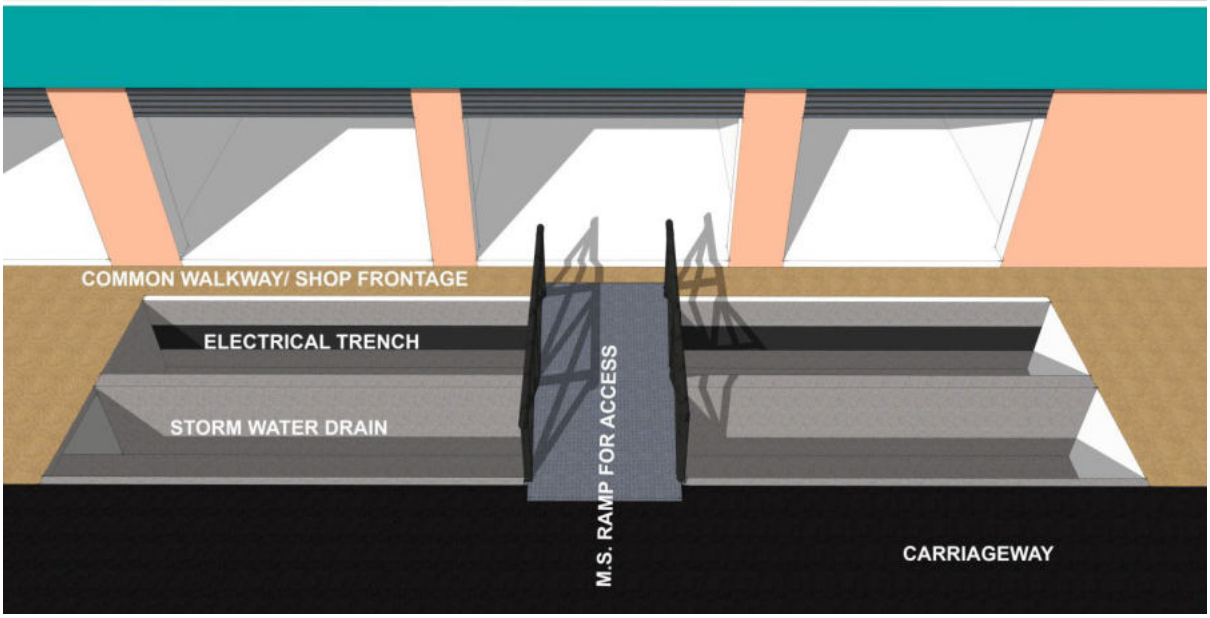
(i) Each of these households and shops shall be provided with safe and secure Mild Steel (MS) ramps with handrails for access, the indicative diagram specific to the proposed project is given in the Figure 29.
(ii) To reduce prolonged disruption of livelihood of commercial establishments, the drain stretches of two roads having high commercial activities are being replaced with precast drains. The stretches are in Sakuntala Road (Sakuntala Road to Jackson gate chowmuhani – 200 m length each on both side) and HGB Road (Post office chowmuhani to old motor stand – 720 m each on both side).
(iii) Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools;
(iv) Consult businesses and institutions regarding operating hours and factoring this in work schedules;
(v) No shops are envisaged to be damaged due to the proposed road works, however, if any damage is anticipated during construction, suitable design changes and diversion arrangements shall be made to avoid the damages and
(vi) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.

Table 31: List of shops requiring access during construction

Sr. No.	Road Name	Total Nos. of Shops requiring access
1	Hariganga Basak Road	774
2	Akhaura Road	46
3	Mantribari Road	21
4	VIP Road	78
5	Thakurpalli Road	108
6	Sakuntala Road	67

Sr. No.	Road Name	Total Nos. of Shops requiring access
7	GB Road	428
8	Barjala Road	54
9	Ronaldsay Road	215
10	Jail Ashram Road	114
11	Jail Road	9
12	BT Road	4
13	Road Surrounding the proposed IT Hub Site	6
14	ITI Road	41
15	Lankamura Road	0
	Total	**1965**

Figure 29: MS Ramp for providing access to the commercial establishments and shops



172. **Socio-Economic – Employment**. Manpower will be required during the 24-months construction stage. This can result to generation of contractual employment and increase in local revenue. Thus, potential impact is positive and long-term.

173. **Mitigation Measures:**

(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; and
(ii) Secure construction materials from local market.

174. **Occupational Health and Safety**. Workers need to be mindful of the occupational hazards which can arise from working in height and excavation works. Potential impacts are negative and long-term but reversible by mitigation measures. The construction contractor will be required to Designate a safeguard focal person and undertake safeguards orientation by ASCL/ PIU.

175. **Mitigation measures:**

(i) Comply with all national, state and local labor laws **;**
(ii) Following best practice health and safety guidelines: IFC's General EHS Guidelines,[16] WHO Interim Guidance (and its updates) on Water, Sanitation, Hygiene and Waste management for the COVID19 virus (Appendix 19), and Sector Specific (Water and Sanitation) Guidelines;[17]
(iii) Develop and implement site-specific Health and Safety (H and S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment; (c) H and S Training[18] for all site personnel; (d) documented procedures to be followed for all site activities; and documentation of work-related accidents;
(iv) Strict compliance of H&S plan and requirements of wearing personal protective equipment (PPE) during work hours;
(v) Provide specific guidance for suitable PPE for every on-site work assignment.
(vi) Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
(vii) Provide medical insurance coverage for workers;
(viii) Secure all installations from unauthorized intrusion and accident risks;
(ix) Provide supplies of potable drinking water;
(x) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;
(xi) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
(xii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
(xiii) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
(xiv) Ensure moving equipment is outfitted with audible back-up alarms;
(xv) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards

[16] https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES
[17] https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B-%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES
[18] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence, but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective, and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and

(xvi) Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

105. ASCL Heath and safety plan in response to COVID-19 will be an integral part of the environmental management plan (EMP).

(i) The H&S plan may be updated as and when new guidelines are issued by the governments, and international organizations such as WHO and ADB.

(ii) All the contractors will be advised to prepare site-specific plan compliant with government circulars, guidelines and public health advisories, elaborating the arrangements and measures for implementation of the H&S plan.

(iii) These site-specific plans should be shared with ADB after ACPL approval. In accordance with the government guidelines, the respective agreed measures are in place before start of activity at project sites and congregation of workers at the project site and camps. The implementation of the contractor's approved site-specific plans is properly monitored by the project consultants and the PMU/PIUs.

176. **Maintaining Core Labour Standard**. The Contractor and ASCL are responsible for ensuring that international CLS[19] –as reflected in national labor laws and regulations are adhered to. ASCL is ultimately responsible for monitoring compliance with national labor laws and regulations, provided that these national laws are consistent with CLS. ADB will carry out due diligence – during loan review missions – to ensure that executing and implementing agencies and contractors comply with applicable (national) core labor standards and labor laws. ASCL will ensure that bidding and contract documents include specific provisions requiring contractors to comply with all: (i) applicable labor laws and core labor standards on: (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity or caste; and (c) elimination of forced labor; and (ii) the requirement to disseminate information on sexually transmitted diseases including HIV/ AIDS to employees and local communities surrounding the project sites. These will be monitored as part of the project's safeguards reporting requirements.

177. **Community Health and Safety:** Hazards posed to the public, specifically in high footfall density areas may include traffic accidents and vehicle collision with pedestrians. In most of the cases location of project sites are along the road ways, hence safety risk to community is to be considered with special emphasis to children, women and elderly.

178. **Mitigation Measures:**

(i) Provide barricades in all construction sites, especially near excavations to avoid entry of people specially children.

[19] Core Labor Standards (CLSs) are a set of four internationally recognized basic rights and principles at work: (i) freedom of association and the right to collective bargaining; (ii) elimination of all forms of forced or compulsory labor; (iii) effective abolition of child labor; and (iv) elimination of discrimination in respect of employment and occupation.

(ii) Ensure that the traffic diversion plans are developed considering high footfall of women, children and elderly like schools, temples etc.
(iii) Ensure that no working equipment's should be kept unattended.
(iv) Plan material and waste routes to avoid times of peak-pedestrian activities specially time of school in residential areas.
(v) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure
(vi) Provide road signs and flag persons to warn of dangerous conditions for all the work sites along the roads.

179. **Work Camps**. Operation of work camps can cause temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants. Potential impacts are negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

(i) Consult with ASCL/ PIU before locating project offices, sheds, and construction plants;
(ii) Minimize removal of vegetation and disallow cutting of trees;
(iii) Provide water and sanitation facilities for employees;
(iv) Prohibit employees from poaching wildlife and cutting of trees for firewood;
(v) Train employees in the storage and handling of materials which can potentially cause soil contamination;
(vi) Recover used oil and lubricants and reuse or remove from the site;
(vii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(viii) Remove all wreckage, rubbish, or temporary structures which are no longer required; and
(ix) Request ASCL/ PIU to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

180. Social and Cultural Resources. For this project, excavation will occur at locations known not to have archaeological values, so it could be that there is a low risk of such impacts. Nevertheless, the construction contractor will be required to:

181. **Mitigation Measures:**

(i) Follow the protocol for chance finds (Appendix 11) in any excavation work;
(i) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;
(ii) Stop work immediately to allow further investigation if any finds are suspected;
(iii) Inform local Archaeological Department / Museum office if a find is suspected; take any action they require ensuring its removal or protection in situ.

182. **Sensitive Receptors**: Since the work is being conducted in an urban sensitive area like schools, hospitals and religious center, the excavation of trenches laying activity will create nuisance and health hazard to children and people with ailments. There are various schools along the roads involved in the sub projects, such as Hindi HS school, Rashtriya Sanskrit school, Nirmala Shishu Vihal, Shrikrishna Mission school, Birjala Heigher secondary school etc. Hospitals named as State Government Ayurvedic Hospital, Devlok Hospital, IGM hospital. The measures

suggested under various heads in this section will minimize the impact in general in all areas; however, special attention is necessary at these locations. Following measures shall be implemented in 250 m around the sensitive locations (schools, hospitals, and religious centers)

183. **Mitigation Measures**:

(i) No material should be stocked in this area; material shall be brought to the site as and when required
(ii) Conduct work manually with small group of workers and less noise; minimize use of equipment and vehicles
(iii) No work should be conducted near the religious places during religious congregations
(iv) Material transport to the site should be arranged considering school timings of Hindi HS school, Rashtriya Sanskrit school, Nirmala Shishu Vihal, Shrikrishna Mission school, Birjala Heigher secondary school etc; material should be in place before school starts;
(v) Notify concerned schools, hospitals etc. 2 weeks prior to the work; conduct a 30-minute awareness program on nature of work, likely disturbances and risks and construction work, mitigation measures in place, entry restrictions and dos and don'ts
(vi) Implement all measures suggested elsewhere in this report – dust and noise control, public safety, traffic management, strictly at the sites.
(vii) In case of shifting of any religious or political statue, proper public consultation shall be done with documents and videography.

E. Guidelines for COVID -19

184. Construction sites operating during the Covid-19 pandemic need to ensure they are protecting their WORKFORCE and minimising the risk of spread of infection by strictly following the pre-approved EHS plan including COVID – 19 guidelines. The COVID -19 guidelines must updated strategies and recommendations for employers responding to COVID-19 including:

(i) Conducting daily health checks
(ii) Conducting a hazard assessment of the workplace
(iii) Encouraging employees to wear cloth face coverings in the workplace, if appropriate
(iv) Implementing policies and practices for social distancing in the workplace
(v) Updated cleaning and disinfection guidance
(vi) Updated strategies and recommendations that can be implemented now to respond to COVID-19
(vii) A table outlining the engineering controls, administrative controls, and personal protective equipment (PPE) that employers may use to help prevent the spread of COVID-19 in the workplace
(viii) Persons/Labourers showing COVID-19 symptoms or not providing self-attestation shall be directed to leave the work site and report to the fever clinic/quarantine centre immediately. Labour not to return to the work site until cleared by fever clinic/quarantine centre.

F. Workers Camp

185. Masks (homemade[20] can be thought of) to be provided to all the persons/labourers for use at the camp site as well as at the worksite. Increase cleaning/disinfection visits to at least 2 times a day. Cleaning person(s) to be provided with disposable gloves, gown and face mask for each cycle of cleaning.

G. UPDATES ON COVID-19

186. The Contractor shall be in touch with the Department of Health & Family Welfare and Labour Department to identify any potential worksite exposures relating to COVID-19, including:

(i) Strictly follow the guidelines issues by Ministry of health and OSHA
(ii) Other workers, vendors, inspectors, or visitors to the worksite with close contact to the individual
(iii) Labour Camps / Work areas such as designated workstations or rooms /sheds
(iv) Work tools and equipment
(v) Common areas such as break rooms, tables and sanitary facilities
(vi) PMU to ensure all government staff, Consultant and Contractor personal have Aarogya Setu app, developed and recommended by GOI for tracking COVID-19 patients

H. Training

(i) PMU to ensure all workers get training on above requirements before start of any construction activity
(ii) During construction period frequent visual and verbal reminders to workers can improve compliance with hand hygiene practices and thus reduce rates of infection. Handwashing posters should also be displayed at work site and labour camps.

I. Emergency contact

(i) Provide emergency contact number at work site and labour camp for reporting COVID-19 symptoms.

J. Operation Phase Impacts

187. **Screening out areas of no significant impact**: Because a road up gradation project should operate without the need for major repair and maintenance, there are several environmental sectors which should be unaffected once the system begins to function. These are identified in Table 32 below, with an explanation of the reasoning in each case. These factors are thus screened out of the impact assessment and will not be mentioned further.

[20] Advisory on use of Homemade Protective Cover for Face & Mouth by GOI.

Table 32: O&M Fields

Field	Rationale
Climate	No impact expected
Wildlife, forests, rare species, protected areas	The project is proposed in already established urban areas, no new area is infringed for the project.
Coastal resources	Agartala is not located in a coastal area.
Industries	The road network is for the urban part of the city, hence will not impact industries

188. **Air Quality**: Operation stage impacts will not be as severe as the construction stage impacts and they will be confined generally to a ribbon development close to edge of the pavement. After the completion of road project, smoothened new pavement and widened roads reduces fugitive dust emissions. Reduction in the vehicular emissions is due to more uniform speed and less frequent acceleration and deceleration of vehicles. The levels of SO2, NO2, CO and HC are likely to come down by the operating vehicles of new roads with extensive savings on consumption of fuel. However, there may be localized impact with increase in number of vehicles (traffic) running on the road, adulterated fuel supply and poor maintenance of vehicle, which spreads down depending on wind direction and wind speeds.

189. **Mitigation measures:**

(i) Vertical and median plantation along the road sides and medians respectively should help to control dust and fugitive emissions from reaching the receptors.

190. **Ambient Noise**: The noise will be reduced during operation stage as subproject road will be smoothened and widened as a part of road improvement. However, there will be noise generation due to honking of vehicles.

191. **Mitigation measures**

(i) Traffic management measures such as prohibition on use of horns and speed restrictions at noise sensitive areas like schools, civil courts and major hospitals reduce roadway noise levels.
(ii) Reduction in traffic congestion due to road widening correspondingly decreases traffic noise levels.

192. **Surface water**: Surface water contamination may result from storm water containing oil and grease, metals and other pollutants released by vehicles on the roadway. Storm water may also contain nutrients and herbicides used for management of vegetation in the right-of-way. The accidental spills of oils, fuels and other hazardous chemicals on the roads during operational phase will pollute nearby water courses of the area.

193. **Mitigation measures**

(i) During operation stage, regular cleaning of chocked / blocked or damaged drainage provision are necessary to avoid operational impact.
(ii) Monitoring of water quality to comply with Water (Prevention and Control of Pollution) Act will have better control over the quality maintenance.

194. **Hydrology and Drainage**: Hydrology of the project area is least impacted during operation stage, if all design criterion is taken into consideration during construction.

195. **Mitigation measures**

(i) Regular maintenance of drains by removing the silt and dirt before the start of monsoon will prevent choking of drains.

196. **Terrestrial ecology**: Impacts to terrestrial ecology during project operation are either minimal or positive. Trees will be planted along the road such that it does not affect the visibility and improve micro-climate and sequester greenhouse gases.

197. **Mitigation measures**

(i) All efforts shall be made for survival of planted trees.
(ii) Selection of big tree species having lateral growth should be avoided to ensure vertical clearance on the subproject road to avoid any obstruction to the visibility for the operating vehicles. Small avenue trees shall be preferred over big trees. Fruit bearing avenue trees shall be avoided.
(iii) It is necessary to comply with Hazardous Waste (Handling and Management) Rules, 2016 during road construction projects to protect animals by consuming contaminated water. Accidental chemical spills shall be handled by emergency spill procedure such as stopping the flow; removing ignition source; initiating emergency response; cleanup and safe disposal will be followed.

198. **Occupational Health and Safety**: Incidents during maintenance in utility ducts. Accidental chemical spill or indiscriminate disposal of bituminous materials in the project area may impact the terrestrial ecology and enter surrounding water bodies proving detrimental to local fauna.

199. **Mitigation measures**

(i) Chambers and Openable covers are provided for every 15 m for ease of maintenance.
(ii) Sufficient width is considered for man movement in the duct for free movement.
(iii) Lock out Tag out (LOTO) system for all electrical equipment and the system will be shut down before maintenance to avoid any incidences.
(iv) Commuters and road using community will be educated on the road safety issues to reduce the accidents involving traffic.
(v) Accident Safety and Hazardous Chemical Spill Management Plan shall be prepared by the contractor and submitted to Environmental Engineer, PIU. The plan should also have details of detours in case of emergency.

200. **Community health and safety**. The more significant health and safety issues from road project are pedestrian safety, traffic safety, and emergency preparedness.

201. **Mitigation Measures**

(i) The maintenance of signs, signals, markings, speed limits, warnings of sharp turns shall be maintained. The awareness among the communities on emergency preparedness in addressing emergency situations like vehicular accidents, pedestrian accident, or release of oil and chemical spill.

202. **Anticipated indirect, induced, cumulative impacts**: The project is also assessed for indirect, induced and cumulative impacts. Indirect and induced impacts are identified as impacts of the project caused at the operational stage like, rise in vehicular traffic leading to rise emission levels, the improved road conditions may lead to speeding of vehicles and increase the probability of accidents. The design parameters have considered these aspects and necessary mitigation measures like traffic signals, CCTV camera installations, well lit streets, rumble strips to control speed etc., have been adequately incorporated.

203. Cumulative impacts of proposed road project include the degradation of surface water quality due to land clearance and construction activities induced due to the proposed project, urban population growth near the proposed improved roads, increased forest/ tree cutting due to clearance and consumption of wood and timber products.

204. **Climate change:** It is of strategic importance that proposed development should be designed keeping in mind the future challenges of climate change. The proposed road project has considered the past rainfall data for quantification of runoff and the drain design features have incorporated the same. There are storm water pumping stations to handle flooding of roads in Agartala at few select roads which are vulnerable to flood risk. A detailed adequacy study of the existing infrastructure show that the current pumping capacity and numbers are sufficient to meet the current and forecasted flood risks. Further, augmentation of the storm water pumping stations for handling the flash flood events strengthens the climate resilient design consideration.

205. **Greenhouse gas emissions**: Several steps involved in road construction, contributes to the production and release of greenhouse gas emissions, the activities involved are site clearing and construction activities, raw material sourcing, material storage, preparation of the sub-grade, production of construction materials (i.e. granular sub-base, base course, surfacing), site delivery, construction works and methodology, supervision, maintenance activities, etc.

206. **Mitigation measures:**

(i) The excavated earth generated from site clearance activity will be reused in site for backfilling reducing the sourcing of fresh material.
(ii) The maximum raw materials required for the projects are sourced locally to reduce the emissions from transportation.
(iii) The raw materials are proposed to be stored in decentralized open areas identified along HGB Road, Barjala Road, Jail Road and GB Road to minimize the distance of transport raw material and reducing the greenhouse gases.
(iv) The pavement materials and other construction materials are designed to bear the load which is going to cater on the pavement throughout the design life of 15 years.
(v) The construction drains and utility ducts in the proposed project are designed considering the future requirements so that frequent design changes and demolition are avoided.

207. **Unanticipated impacts:** Some of the cumulative impacts and Unanticipated impacts during the construction phase and operation phase shall be mitigated with suitable mitigation measures which is to be implemented by the PMU and same will be reported and updated in IEE report.

VII. PUBLIC CONSULTATION, PARTICIPATION AND INFORMATION DISCLOSURE

A. Overview

208. The active participation of stakeholders including local community, NGOs/CBOs, and the media in all stages of project preparation and implementation is essential for successful implementation as well as operation of the project. It will ensure that the subprojects are designed, constructed, and operated with utmost consideration to local needs, ensures community acceptance, and will bring maximum benefits to the people. Public consultation and information disclosure are a must as per the ADB SPS 2009.

209. **A three-tier consultation process has been adopted**: focus group discussions, primary household sample surveys and a town-level public consultation workshop. Most of the main stakeholders have already been identified and consulted during preparation of this IEE, and any others that are identified during project implementation will be brought into the process in the future. Primary stakeholders of the subproject are: residents, shopkeepers and businesspeople who live and work alongside the roads in which network improvements will be provided, and government and utility agencies responsible for provision of services, Agartala municipal corporation, Public Health Engineering Department and Tripura State Pollution Control Board. Secondary Stakeholder are: NGOs and CBOs working in the area, community representatives, beneficiary community in general, government agencies, the executing and implementing agencies, Government of India and the ADB.

B. Public Consultation

210. The public consultation and disclosure are continuous process throughout the project implementation, including project planning, design and construction. During IEE preparation stage, public consultations were conducted along the subproject roads and other part of town to access the awareness of general public, the existing condition of the roads and the problems faced by public, safety and security problems at the roads, traffic issues, lack of public utilities, and other suggestions. Local residents, business persons (vendors, hawkers, shopkeepers etc.), Government officials, women residents were consulted during public consultations in November 2018, May 2019 and July 2019. Details of public consultations done are given in Appendix 9.

C. Public Participation During the Preparation of the IEE

211. Public consultation and participation are an integral part of IEE study. The process involves identifying interested and affected people (stakeholders); informing and providing the stakeholders with sufficient background and technical information regarding the proposed development; creating opportunities and mechanisms whereby they can participate and raise their viewpoints (issues, comments and concerns) with regard to the proposed development; giving the stakeholders feedback on process findings and recommendations; and ensuring compliance to process requirements with regards to the environmental and related legislation.

212. Stakeholders are representatives of the society who have direct (primary stakeholders) or indirect (secondary stakeholders) impacts from the project and are involved in one or other way.

1. Primary stakeholders are:

(i) Residents, workers, shopkeepers and business people near the work sites
(ii) Public representatives of the town
(iii) Agartala Municipal Corporation
(iv) Agartala Smart City Limited

2. Secondary Stakeholders are:

(i) PWD department
(ii) UD Department
(iii) Tripura Urban Transport Company Limited
(iv) TSECL (Tripura State electricity Company Limited), Agartala
(v) Traffic Department
(vi) Urban Forest Department
(vii) Tripura State Pollution Control Board, Agartala
(viii) Nongovernmental organization (NGOs) working in the affected communities
(ix) Other community representatives (prominent citizens, religious leaders, elders, women's groups)
(x) The beneficiary community in general
(xi) ADB as the funding agency.

213. The following methodologies are used for carrying out public consultation:

(i) Local communities, Individuals affected to be given priority while conducting public consultation;
(ii) Walk-through informal group consultations along the proposed project area;
(iii) The local communities to be informed through public consultation with briefing on project interventions including its benefits; and
(iv) The environmental concerns and suggestions made by the participants to be listed out, discussed and suggestions to be noted for consideration during implementation.

214. **Stakeholder Meetings:** Most of the stake holders are consulted during the preparation of this IEE and any others that are identified during the project implementation will be brought into the process in the future. Photographs, attendance sheets and Minutes of the recent stakeholder consultation meeting held on 26th November 2018, 10 and 11 July 2019 are attached as Appendix 9.

D. Consultation & Disclosure

215. A public consultation for the subproject was conducted in November 2018, May 2019 and July 2019. Several individuals and groups were met in all the 15 roads as part of public consultation. There were total 150 members consulted including 131 male and 29 females. The objectives were to appraise the stakeholders about the program's environmental impacts and present safeguards to mitigate any potential significant impacts. The major issues raised are related to traffic congestion, stench smell from the open drains, possible dust and noise problems during construction phase. Other comments include construction vehicles creating some disturbances to the local people daily activities, necessity of proper safety arrangements. The issues and comments have been considered and incorporated in the design of the subproject and mitigation measures for the potential environmental impacts raised during the public consultations. People were made aware of the environmental benefits in terms of better air quality by reducing dust emission from the roads, avoidance of odor and health impacts due to open drains after construction of covered drains. Records of public consultations and group meeting are attached as Appendix 9.

216. The people residing along the project activity areas were consulted and discussions were held regarding the project, the various points that were discussed are:

(i) Awareness and extent of the project and development components;
(ii) Benefits of the subproject for the economic and social upliftment of community;
(iii) Labour availability in the subproject locations or requirement of outside labour involvement;
(iv) Local disturbances due to construction works;
(v) Necessity of tree felling etc. at subproject location;
(vi) Water logging and drainage problem if any;
(vii) Traffic Congestion problem;
(viii) Sensitive area nearby the subproject locations.

217. The local people have appreciated the road upgradation proposal of the government and they have ensured that they will cooperate with the EA during project implementation. They want the project to be started immediately. The major issues raised during the public consultations are summarized as follows:

(i) People have informed that the existing Akhaura nallah is uncovered at some places and emanates smells.
(ii) They expressed happiness on closing the entire nallah.
(iii) They wanted work to be completed in time.
(iv) It was informed to the public that the dust emission during road construction will be mitigated by water sprinkling.
(v) It was informed that the noise generating construction activities will be carried out during day time to reduce the impact of noise at night.
(vi) People expressed happiness that proposed road project should improve the existing traffic congestion issues in the subproject roads.
(vii) They informed that efforts should be made by the government to maintain the roads in long term.
(viii) People wished that local people should be employed by the contractor during construction work;
(ix) They insisted that adequate safety measures should be taken during construction work;
(x) Shopkeepers and house owners asked for proper arrangements for access to houses and shops during construction period.
(xi) People expressed their cooperation as the proposed activities are supposed to enhance the living standard of the public.
(xii) The public especially business/ shop owners expressed their concern regarding the traffic management activities during the construction stage which can have impact on their day to day activities.
(xiii) Household residents informed that few days of traffic inconvenience is bearable considering the benefits rendered by the execution of the project.
(xiv) People asked for notice before construction and proper warning signs along the construction area to avoid accidents and inconvenience

218. **Consultation with Forest Department**: PMC team met Mr. G. V. Jenner, IFS, CCF (Protection and NO FCA), CEO CAMPA (Compensatory Afforestation Fund Management and Planning Authority) on 26-07-2019 to understand the requirement of tree cutting permission and associated compensatory plantation for the proposed project. It was informed that the process of tree cutting and compensatory plantation will be initiated only after submission of application for tree cutting by ASCL before the start of construction. After the submission of application, a joint

survey (forest department and ASCL) will be conducted to validate and optimize the number of trees to be cut for the proposed project. Post the survey, tree cutting permission will be provided with a limited validity of 30-45 days. Further, it was also informed by the officer that forest department doesn't possess any land for compensatory plantation/ forestation and they will plant compensatory plantation as avenue plants within or outside the city limits.

219. In February 2020, PMC team met Mr. Shakti Kant Singh, IFS, District Forest Officer, West Tripura District, to know the cost for tree cutting and cost for compensatory plantation. Accordingly, ASCL has sent a letter to District Forest Officer vide No. F.4(34)/ASCL/2018/917 dated 19-02-2020 (letter attached as Appendix 15). Forest Department has sent reply vide letter no. F.11-13/WFD/Deptt.0prnt/2018-19/11595-597 dated 27-02-2020 providing information on tree cutting cost and compensatory plantation cost (letter attached as Appendix 17).

220. **Consultation with TSECL:** A consultation was done with Mr. Vivekanand Roy, AGM Technical TSECL (Tripura State Electrical Corporation Limited) on 25th July 2019. He has informed that PCB containing Transformers are not in use in entire Tripura state (including Agartala). Additionally, he informed that even the inventory of transformers in the SAP system does not show and PCB containing transformers in TSECL system. The PCB oil containing transformers have been banned as per the 'Regulation of Polychlorinated Biphenyls Order, 2016' from MoEFCC.

221. **Consultation with Traffic Department:** Agartala Traffic Addn. SP was involved in the stakeholder meeting held in November 2018, the officer informed that there are dark spots/ accident prone zone near Lichubagan junction area and road shall be provided with speed limit sign board and rumble strips are being provided at all three-roads joining the junction. Same has been incorporated in the design. On diversion of roads during construction state, officer has informed that the traffic diversion plan will be developed based on the situation at site and additional man power will be deployed as per requirement. The sample traffic management plan is attached in this report for reference.

222. **Consultation with Auto-drivers**: The consultation was done with Auto rickshaw drivers in Autostand at Akhaura Road and they were informed that the location of the stand will be disturbed temporarily during the construction stage. The auto-drivers were also informed about the benefits of road upgradation project. The drivers showed their approval for the project as the project will improve the traffic situation in the city and at the same time the improvement in the utilities like covered drains etc., will improve overall quality of life of Agartala residents.

E. Future Consultation and Disclosure

223. The public consultation and disclosure program will remain a continuous process throughout the subproject implementation and shall include the following:

1. Consultation during Construction

224. Prior to start of construction, AMC and PIU with the assistance of PMC will conduct information dissemination sessions at major intersections and solicit the help of the local community leaders/prominent citizens to encourage the participation of the people to discuss various environmental issues. At each ward/neighborhood level, focus group meetings will be conducted to discuss and plan construction work with local communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in project monitoring and evaluation.

225. A constant communication will be established with the affected communities to redress the environmental issues likely to surface during construction and operational phases and also regarding the grievance redress mechanism. AMC/PIU with the help of PMC will organize public meetings and will appraise the communities about the progress on the implementation of EMP. Meeting will also be organized at the potential hotspots/sensitive locations before and during the construction.

226. Public meetings with affected communities (if any) to discuss and plan work programs and allow issues to be raised and addressed once construction has started.

227. Smaller-scale meetings to discuss and plan construction work with local communities to reduce disturbance and other impacts and provide a mechanism through which stakeholders can participate in subproject monitoring and evaluation.

228. During construction, increased traffic, excess generation of dust and noise due to construction activities may cause some inconveniences to the local population. Mitigation measures are already considered in the IEE to keep this at a minimum. Community consultations have already been carried out. During construction, multiple consultations at various levels will be carried out ensuring clear communication to the affected persons about the likely transient impact during construction and continued impact, if any, during the operation stage.

2. Information Disclosure

229. Executive summary of the IEE will be translated in the local language and made available at the offices of AMC, PMU and PIU. Copies of summary will be provided to participants of city level workshop to be organized in Agartala). Hard copies of the IEE will be accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. Electronic version of the IEE in English and Executive Summary in Bengali will be placed in the official website of the AMC after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

230. Public information campaigns (via newspaper, TV and radio) to explain the project to the wider town population and prepare them for disruption they may experience once the construction programme is underway; Formal disclosure of completed project reports by making copies available at convenient locations in the town, informing the public of their availability, and providing a mechanism through which comments can be made.

231. Local communities will be continuously consulted regarding location of construction camps, access and hauling routes and other likely disturbances during construction. The road closure together with the proposed detours will be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.

232. Project related information shall be disclosed through public consultation and making relevant documents available in public locations. PMU and PIUs shall provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected person and other stakeholders. For illiterate people, other suitable communication methods will be used.

233. The following documents shall be made available at the offices of project agencies - PMU, PIU and ULB offices for public reference and shall also be uploaded on respective websites.

(i) Summary of project and draft IEE (in Bengali and English)
(ii) Draft IEE Report (in English)
(iii) Final IEE Report (in English)
(iv) Updated/amended IEE (in English)
(v) Corrective action plan prepared during project implementation (English)
(vi) Semi-annual Environmental Monitoring Reports (English)

234. A concise summary of project and draft IEE report (in Bengali), providing all necessary details of proposals, implementation arrangements, subproject locations, likely issues and mitigation and monitoring measures and grievance redress mechanism, shall be made available to the stakeholders at consultation meetings. This should also provide contact information of project agency. This summary shall also be displayed at the notice boards of PMU, PIU and other public places. During project implementation, relevant information about any major changes to project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders. The following documents will be submitted to ADB for disclosure on ADB website. PMU will send written endorsement to ADB for disclosing these documents: Documents will also be available on the website of Agartala Smart City website.

(i) Final IEE;
(ii) A new or updated IEE and corrective action plan prepared during project implementation, if any; and
(iii) Environmental monitoring reports

VIII. GRIEVANCE REDRESS MECHANISM

A. Common Grievance Redress Mechanism (GRM)

235. A common grievance redress mechanism (GRM) will be put in place to receive, evaluate, and facilitate the resolution of social, environmental or any other project related grievances. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. The GRM described below has been developed in consultation with stakeholders. Public awareness campaign will be conducted to ensure that awareness on the project and its grievance redress procedures is generated. The campaign will ensure that the poor, vulnerable and others are made aware of.

236. The GRM provides an accessible, inclusive, gender-sensitive and culturally appropriate platform for receiving and facilitating resolution of affected persons' grievances related to the project. The multi-tier GRM for the project is outlined below, each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required. ULB-wide public awareness campaigns will ensure that awareness on grievance redress procedures is generated through the campaign. The Environmental and Social Safeguard Officer of PMU will have the overall responsibility for timely grievance redress on environmental and social safeguards issues.

237. **Who can complain:** A complaint may be registered by stakeholders who may be, "directly, indirectly, materially, and adversely" affected by the project. Any other representative can register

a complaint on behalf of the affected person/s or any stakeholder by, provided that he or she identifies the affected person/s and includes evidence of the authority to act on their behalf.

238. **What the Grievance/Complain should contain:** Any concerns pertaining to safeguard compliance - environment, involuntary resettlement, and indigenous people, design related issues, compensation, service delivery or any other issues or concerns related to the project. The complaint must contain name, date, address/contact details of the complainant, location of the problem area, along with the problem. Sample grievance registration form is attached in Appendix12.

239. **Where & How to file a Complaint:** The contractor's site office will be the primary point for receiving and lodging any complaint. Apart from that, Grievances/ suggestions from affected persons can be dropped into suggestion boxes or conveyed through phone or e-mails. Affected Persons or any complainant will also be able to register grievances on social, environmental or other related issues, personally to the Central Complaint Cell located at ASCL office. Sample grievance redressal form is attached in Appendix 10. The Grievance Officer and designated official will be able to correctly interpret/record verbal grievances of non-literate persons and those received over telephone. The concerned Executive Engineers/ Asst. Engineer/ contractor's site engineer, Environment Health & Safety (HSE) Officer of Contractor will monitor these books and if possible take necessary actions to redress minor complaints with intimation to the complainant as well as to the Central Compliant Cell established at PIU level. The time period to resolve any grievances at different level of GRC has been discussed below.

240. PMU will maintain a Central Complaint Cell at ASCL office located in Agartala Municipal Corporation headed by a designated Grievance Officer/Administrative/ Executive Officer under CEO, ASCL. The Complaint Cell will also serve as Public Information Centre, where, apart from grievance registration, information on the Project, subprojects, social and environmental safeguards, etc. can be provided.

241. **Documentation:** Documentation of the complaints is important and must contain name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved. PMU with the support of PIU will have the overall responsibility for timely grievance redress, and for registration of grievances, related disclosure, and communication with the aggrieved party. All the documents made available to the public at the community level (at ward offices) and will include information on the contact number, address and contact person for registering grievances, and will be disseminated throughout the project area by the PIU.

242. **Grievance/Problem Redress through Participatory Process:** Efforts must be made by the PIU with the support of safeguard officers to resolve problems and conflicts amicably through participatory process with the community and the ULBs. In case of grievances that are immediate and urgent in the perception of the complainant, the Contractor and supervision personnel from the PIU will provide the most easily accessible or first level of contact for the quick resolution of grievances. Contact phone numbers and names of the concerned staff and contractors will be posted at all construction sites at visible locations.

243. **Grievance Redressal Committee:** In pursuance of Asian Development Bank (ADB) Guideline, an independent Grievance Redressal Committee (GRC) has to be established under Agartala Smart City Limited (ASCL) to address the grievance of persons affected due to

implementation of sub- projects under ADB assisted projects. The composition of the GRC is provided in Table 33 below:

Table 33: Composition of Grievance Redressal cell

Level 1: Site level GRC	Level 2: Central GRC	Level 3: Apex GRC
• Social Safeguard Officer, EHS Officer of Contractor • Contractor's site engineer • Site Engineer, ASCL	• CEO, ASCL • Administrative Officer /Grievance Office/ Executive Officer, ASCL • E&S Nodal Officer • Public Relationship Officer • Executive Engineer • Asst. Engineer • Team Leader, PMC • E&S Officer, PMC	• The Board of Directors/ Executive committee • Director, UDD • Municipal Commissioner, AMC • Chief Engineer (UDD) • Superintending Engineer, AMC • Joint Director, UDD

244. **Process and Timeframe:**

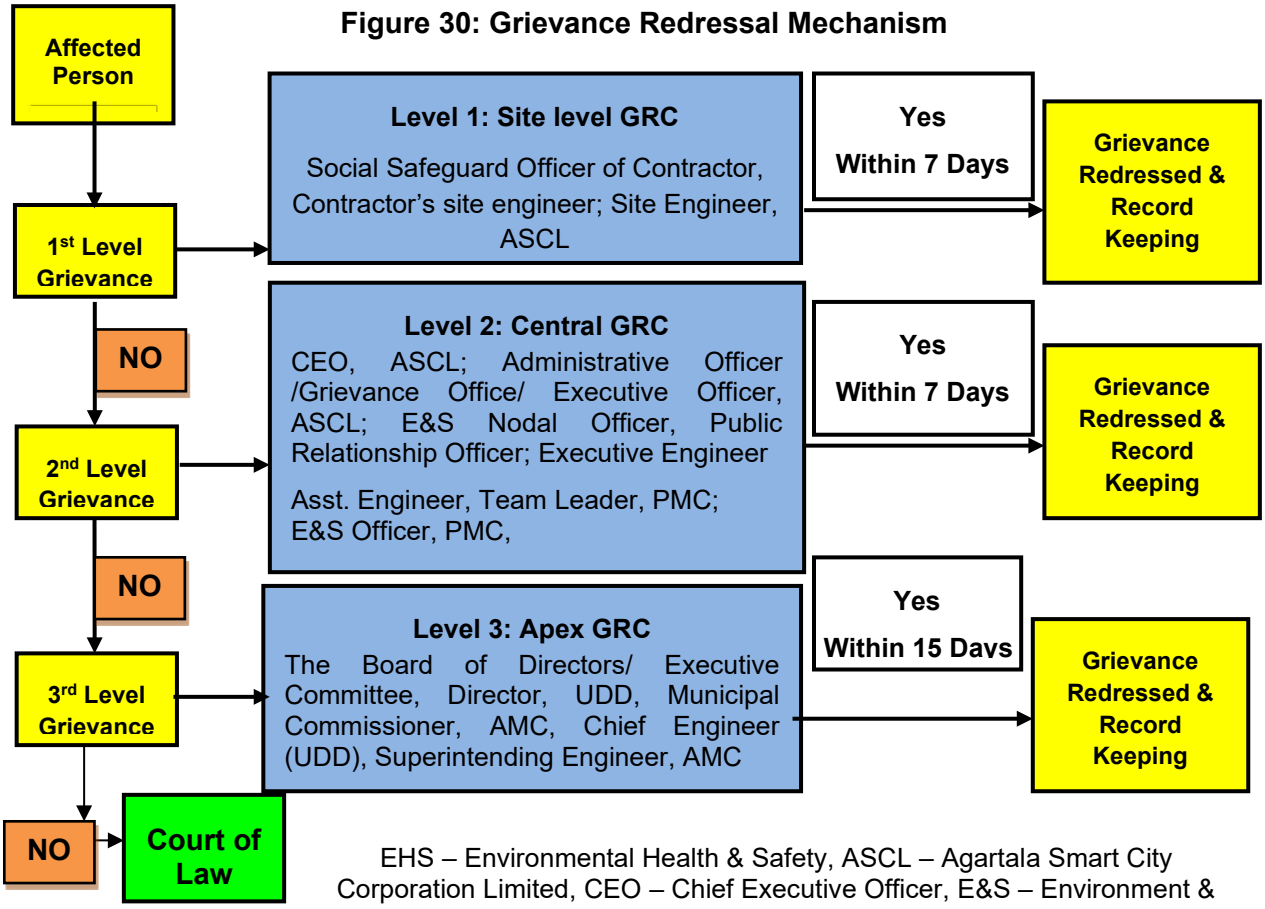
(i) **1st level grievance**: In case of grievances that are immediate and urgent in the perception of the complainant, concerned officer of PIU will direct the contractor to and ensure that it is resolved. If the grievance is not under the contractor scope, but under the project, PMC (field office) will resolve this issue. All the grievances should be resolved within 7 days of receipt of a complaint/ grievance.

(ii) **2nd level grievance**: All grievances that cannot be redressed at first level within 7 days will be brought to the notice of E&S nodal officer of ASCL to place the issue to CEO ASCL. The Grievance Officer may consult/seek the assistance of the Environment & Social officer and Public Engagement Officer of the PMU and E&S Officer of PMC to resolve the complicated issues. The Central GRC will review the grievance and act appropriately to resolve it within 7 days of receipt at this level.

(iii) **3rd level grievance:** All the grievances that are not addressed at 2nd level by PIU within in 15 days of receipt will be brought to the notice of the Apex Grievance Redressal Committee (GRC). The Apex GRC will meet twice a month and determine the merit of each grievances brought to the committee. The GRC will resolve the grievance within 1 month of receiving the complaint. The Social Safeguard Officer will communicate all decisions taken by the GRC to the complainant by the

245. The process of the grievance redressal mechanism (GRM) is given in Figure below.

Figure 30: Grievance Redressal Mechanism



EHS – Environmental Health & Safety, ASCL – Agartala Smart City Corporation Limited, CEO – Chief Executive Officer, E&S – Environment & Social, UDD – Urban Development Department

246. In case of any inter-departmental or inter-jurisdictional coordination required for resolution of specific grievances, the PIU will refer the matter directly to the CEO ASCL for state-level or inter-departmental coordination and resolution. The project GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

247. Periodic community meetings with affected communities to understand their concerns and help them through the process of grievance redress (including translation from local dialect/language, recording and registering grievances of non-literate affected persons and explaining the process of grievance redress) will be conducted if required. The above Grievance Redress Process will be discussed with the different stakeholders during stakeholder consultation meetings. These meetings will be held with affected persons and community members (beneficiaries) and the concerned Municipal Ward Councilors where civil works are proposed. The process and timelines for grievance redress and contact details of the persons responsible for grievance redress will be shared in the stakeholder meetings. Action taken in respect of all complaints will be communicated to the complainant by letter, over phone or e-mail or WhatsApp as the case may be.

248. **Consultation Arrangements for GRM** - This will include group meetings and discussions with affected persons, to be announced in advance and conducted at the time of day agreed on with affected persons and conducted to address general/common grievances; and if required with the Environment/Social Specialist of PMU/ PMC for one-to-one consultations. Non-literate affected persons/ vulnerable affected persons will be assisted to understand the grievance redress process, At the site office the Social Safeguard Officer of contractor and at PIU level, the Grievance officer or any other official appointed at receiving section will assist the Non-literate APs to register complaints and with follow-up actions at different stages in the process.

249. **Record keeping.** Records of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed actions and measures, the date these were affected, and final outcome will be kept by PIU. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PIU office, ULB office and on the web, as well as reported in the semi-annual social and environmental monitoring reports to be submitted to ADB.

250. **Information dissemination methods of the GRM:** Grievances received, and responses provided will be documented and reported back to the affected persons. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the Central Complaint Cell at ASCL and web. The phone number where grievances are to be recorded will be prominently displayed at the construction sites.

251. **Periodic review and documentation of lessons learned**. The PMU, and PIUs, supported by the PMC specialist will periodically review the functioning of the GRM and record information on the effectiveness of the mechanism, especially on the PIU's ability to prevent and address grievances.

252. **Costs:** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the PMU.

253. **ADB Accountability Mechanism**: If the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB India Resident Mission (INRM). Before submitting a complaint to the Accountability Mechanism, it is recommended that affected people make a good faith effort to resolve their problems by working with the concerned ADB operations department (in this case, the resident mission). Only after doing that, and if they are still dissatisfied, they could approach the Accountability Mechanism. The ADB Accountability Mechanism information will be included in the project-relevant information to be distributed to the affected communities, as part of the project GRM.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

254. An Environmental Management Plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable level and monitoring the same. This is presented in the following tables, which show the potential environmental impacts, designed mitigation measures and responsible agencies for implementation and monitoring.

255. The purpose of the environmental management plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i) providing a

proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the project; and (iv) ensuring that safety recommendations are complied with.

256. A copy of the EMP must always be kept on work sites. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

257. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

258. In case of any change in design the contractor will be required to submit to PIU, for review and approval, an updated site environmental plan (SEP) including (i) designed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEP; and (iv) budget for SEP implementation. No works can commence prior to approval of SEP.

Table 34 : Design Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
Location impacts of proposed components	Nearby community may be affected due to increased pollution during construction and operation	(i)The material storage and workers camp sites should be selected so that nearby community may have no or minimum impact due to proposed works	Consultants	Project costs
Design of components	Design as per national and international norms	The design standards adopted for the study have been evolved based on a study of the existing standards and practices in the country keeping in view the standards recommended by IRC and MoUD. The IRC: 98-1997, Guidelines on accommodation of utility services on roads in urban areas is followed	PMU/ PIU	Project costs
Requirement of tree cutting	Tree cutting may result loss of aesthetics and	(i) The road alignment should be selected so that minimum tree cutting is required	PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
	increase in air pollution	(ii) project documents should include the minimum tree cutting provisions (iii) Obtain prior permission for tree cutting, if required during finalized detailed design (iv) Provision for Compensatory plantations should be as forest department suggestion		
All work sites	Physical cultural resources and chance finds	(i) Ensure that worksites are not located in archeologically sensitive areas; liaise and reconfirm with local Archeological Department during detailed design phase; (ii) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work; (iii) Stop work immediately to allow further investigation if any finds are suspected; (iv) Inform local Archeological Department / Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ.	PMC/ PIU	Project costs

259. Site Specific Environmental Management Plan is prepared for the Upgradation of Major Roads to ensure compliance with the ADB's environmental safeguard requirements and all applicable laws, regulations and standards for environmental protection in India. The EMP ensures that the proposed project activities are undertaken in a responsible, non-detrimental manner with the objectives of:

(i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site;
(ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project;
(iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the project; and
(iv) ensuring that safety recommendations are complied with.

260. These site specific EMPs will be included in the tender and contract documents. The provisions set out in the EMPs will be implemented by the Contractor and monitored by the

Engineer under supervision of PIU Environmental Specialist. Monitoring shall be implemented through the monitoring site visits of environmental specialists of all Project levels. The site visits shall be carried out in accordance with the formal monitoring schedule: Contractor- daily, Engineer -weekly and PIU - monthly. The costs foreseen for the implementation of all the measures prescribed in the EMP are included in the Bill of Quantities.

261. **Environmental Risk Assessment**: The environmental aspects and impacts are identified with the aim to control/ prevent pollution to the environmental and to ensure ADB environmental safeguard requirements and all other legal requirements are being complied with. The assessment shall consider normal, abnormal and foreseeable emergency situations and consider where applicable, the aspects associated with the various project.

262. **Risk Assessment methodology**: The methodology adopted for assessment of environmental impacts and aspects during the preconstruction, construction and operation stage of the proposed Upgradation of Major Roads project is presented below:

Table 35: Risk Assessment Methodology

Likelihood		
Likelihood	**Definition**	**Score**
Certain	Will occur more than once a week	5
Likely	Likely to occur more than once or twice during the construction phase	3
Unlikely	May occur once or twice during the construction phase	2
Rare	Unlikely to occur during the construction phase	1
Consequence		
Consequence	**Definition**	**Score**
Catastrophic	unprecedented damage or impacts involving the natural environment or surrounding communities	5
Major	major damage to natural environment or surrounding communities	3
Moderate	limited adverse impacts on natural environment or surrounding communities	2
Minor	no or minimal adverse environmental or social impacts	1

Figure 31: Risk Matrix

Likelihood and value	**Consequence and value**			
	Catastrophic (5)	**Major (3)**	**Moderate (2)**	**Minor (1)**
Certain (5)	**High**		**Medium**	**Low**
Likely (3)	**High**	**Medium**		
Unlikely (2)	**Medium**		**Low**	
Rare (1)	**Low**		**Low**	

263. **EMP Boundary**: This EMP is applicable for the upgradation of road stretches having a total length of 23.562 Km. This is also applicable to the construction workers camp that will be established by the contractor during the construction stage after necessary site assessment. The EMP boundary for construction works is considered 100 m from the center of the road.

264. **Sensitive Receptors**: Sensitive receptors like schools, water bodies and hospitals within the 100 m of road stretches are given in Table 36, 39 and 40.

265. **Categorization**: Roads are categorised based on development of the surrounding areas, utilization and occupancy. The roads in the proposed project have been categorised as commercial, residential and mixed. Site specific EMPs have been developed for these roads.

(i) Commercial (7.588 Km)
(ii) Residential/ Institutional (1.97 Km)
(iii) Mixed (both residential and commercial) (14.004 Km)
(iv) Site Specific EMPs are also developed for Waterbodies along roads, Labour Camp and Open Spaces along the roads in Table 42, 43 and 45.

266. **Commercial:** Entire HGB Road, Mantibari Road, Ronaldsay Road, Sakuntala Road and parts of Thakurpalli Road, Akhaura Roads, GB Road and Jail Road are major commercial hubs of Agartala city, these road stretches are filled with commercial establishments like cloth stores, hardware shops, grocery shops, bakeries, electrical and electronics shops, fruit, flower and vegetable vendors, eateries and restaurants catering all the needs of entire Agartala. Some of the major shopping centres are City Centre, Big Bazar, fashion outlets of Mantribari road, shopping complex of Akhaura Road. The pictures of roads are shown in Figure 32.

Table 36: Commercial Roads Details

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
1	Commercial	a. HGB Road	Entire length (Google earth images shown in figure 33 & 34)	3.48	a. Buri's Pukur b. Melarmath Pukur c. Govt. Ayurvedic Hospital d. Agartala Nursing Home e. Amiya Sagar f. Santi para pond g. Kumar Pukur h. Kamini Kumar Singh Memorial School	 Buri's Pukur  Melarmath Pukur

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
						 Govt. Ayurvedic Hospital  Amiya Sagar Pukur

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
						 Santipara Pond  Kumar Pukur

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
						 Kamini Kumar Singha Memorial School
		b. Mantribari Road	Entire length (Google earth images shown in Figure 35)	0.28	a. Agartala Nursing Home	 Agartala Nursing Home

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
		c. Akhaura Road	Jackson gate to IGM Chowmuhani (Google earth images shown in figure 36)	0.63	a. Amiya Sagar Pukur b. IGM Hospital	 Amiya Sagar Pukur  IGM Hospital
		d. Thakurpalli Road	Kadamtali Circle to Palace Right boundary (Google	0.547	--	

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
			earth images shown in figure 37)			
		e. GB Chakkar to Ramthakur Club Road	Old Motorstand to Ramthakur Club (Google earth images shown in figure 38)	0.8	--	
		f. Jail Road	Purbasa to Math Chowmuhani (Google earth images shown in figure 39)	0.29	--	
		g. Ronaldsaty Road	Fire Brigade Chowmuhani to Durga Chowmuhani (Google earth images shown in figure 40)	1.1	--	
		h. Sakuntala Road	Surya Chowmuhani to Rabindra Bhavan (Google earth images shown in figure 41)	0.5	--	

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
Total Commercial Road Length (km)				**7.588**		

Figure 32: Commercial Roads (a) Hariganga Basak Road, (b) Mantribari Road (c) Akhaura Road (d) Ronaldsay Road

(a) (b)

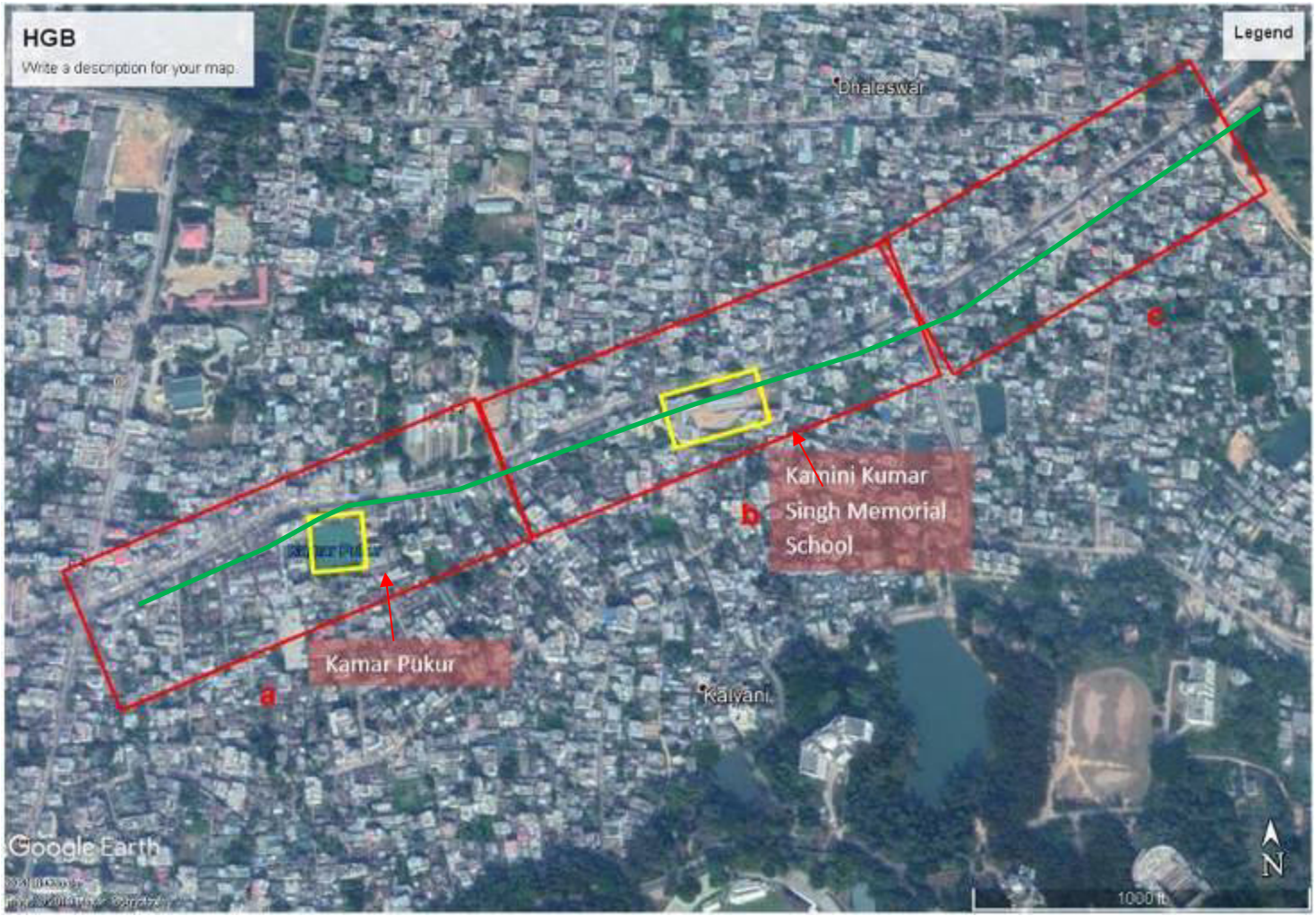
(c) (d)

267. In the road stretches red color boxes indicates boundary of road considered for EMP, yellow color boxes indicates sensitive receptors and green lines indicates road.

Figure 33: HGB Road Commercial stretches along with sensitive receptors on Google Earth Image-I

a. Battala to Paradise Chowmuhani (Commercial)
b. Paradise Chowmuhani to Kaman Chowmuhani (Commercial)
c. Kaman Chowmuhani to Old Motor Stand Chowmuhani (Commercial)
d. Motor Stand Chowmuhani to Math Chowmuhani (Commercial)

Figure 34: HGB Road Commercial stretches along with sensitive receptors on Google Earth image-II

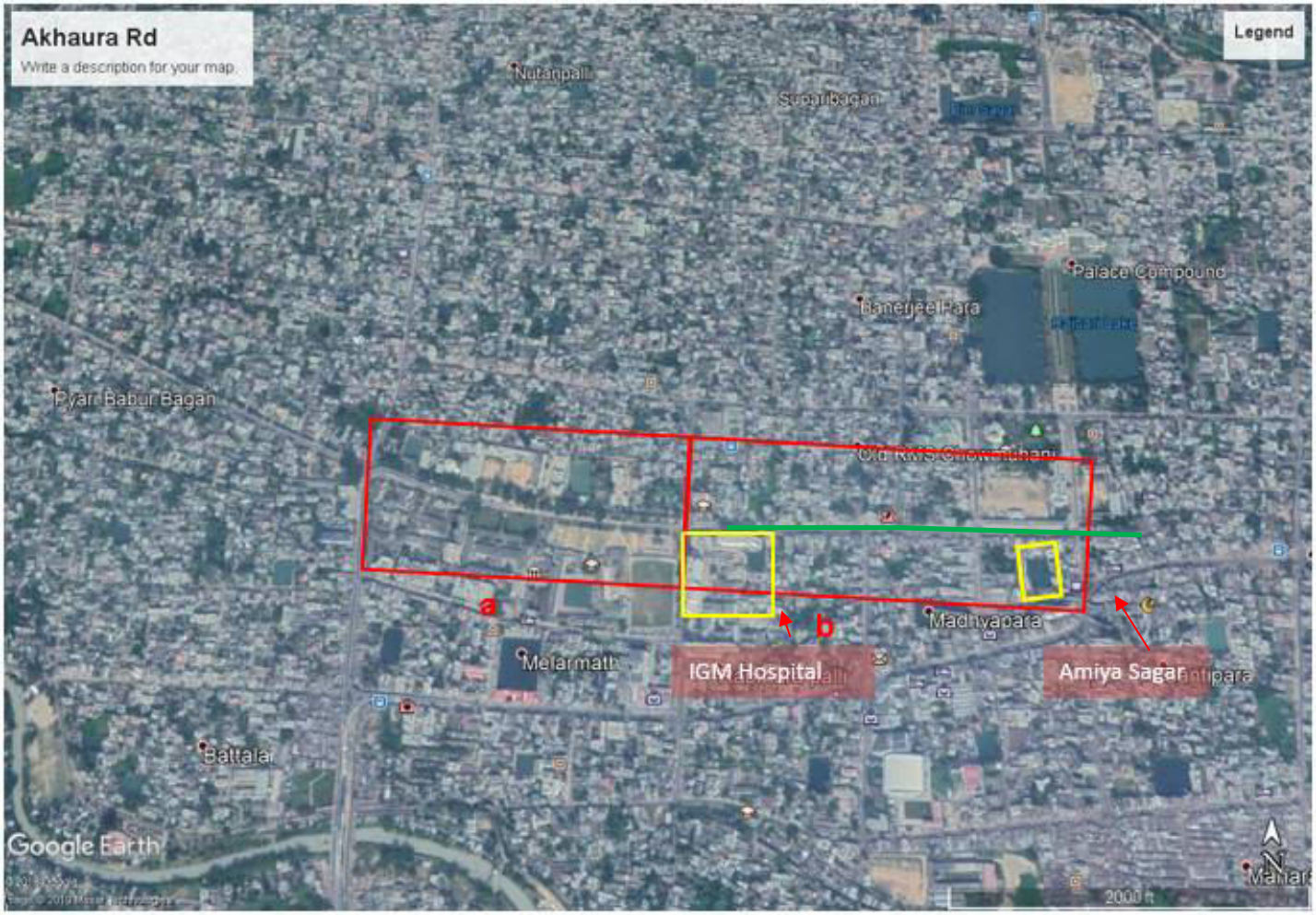


a. Math Chowmuhani to Joyguru Manorama (Commercial)
b. Joyguru Manorama to Kalyani Bus Stop Circle (Commercial)
c. Kalyani Bus Stop Circle to Ashram Chowmuhani (Commercial)

Figure 35: Mantribari Road Commercial stretches along with sensitive receptors on Google Earth image

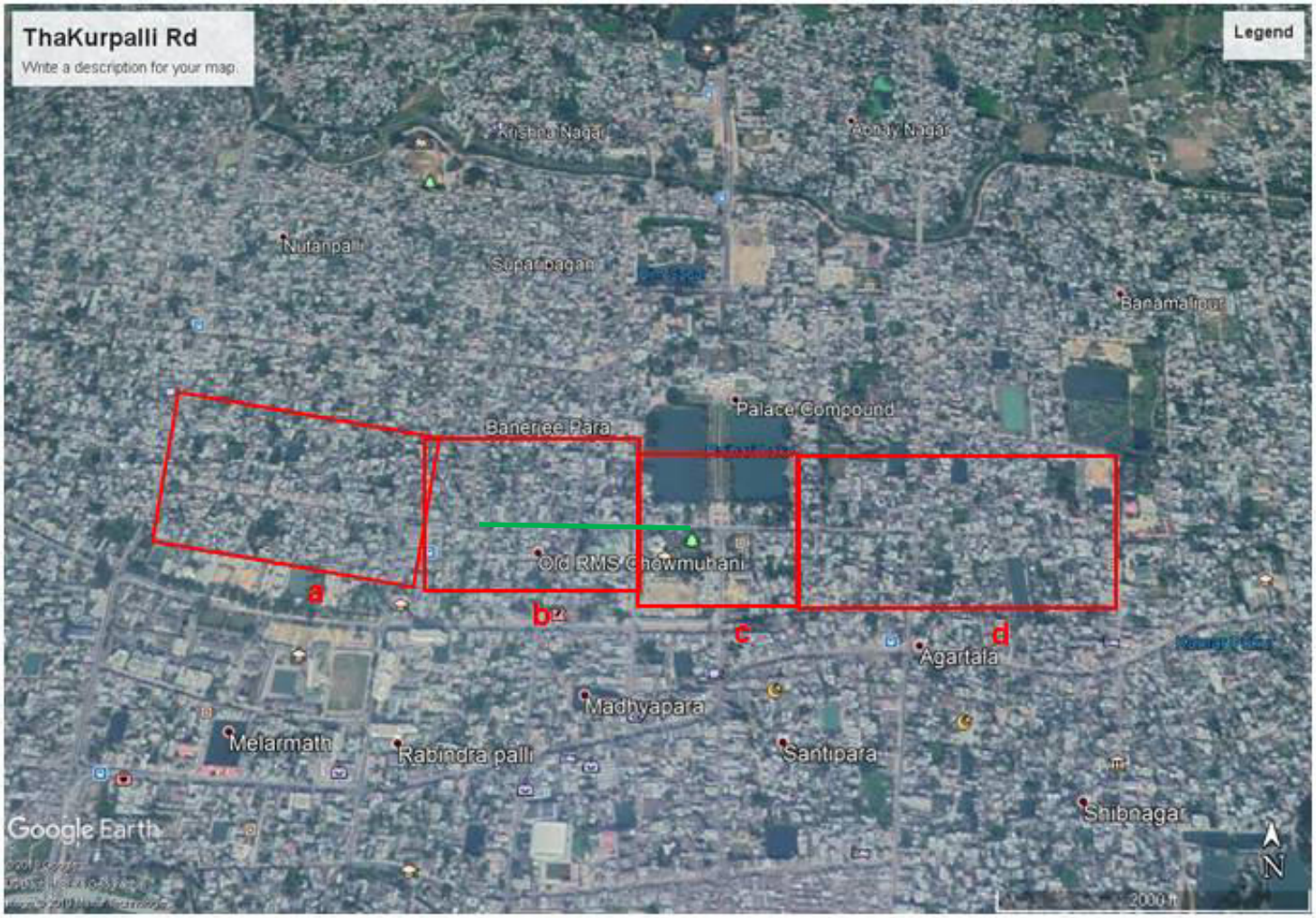
a. From Post Office Chowmuhani to RMC Chowmuhani (Commercial)

Figure 36: Akhaura Road Commercial stretch (Jackson gate to IGM Chowmuhani) along with sensitive receptors on Google Earth image



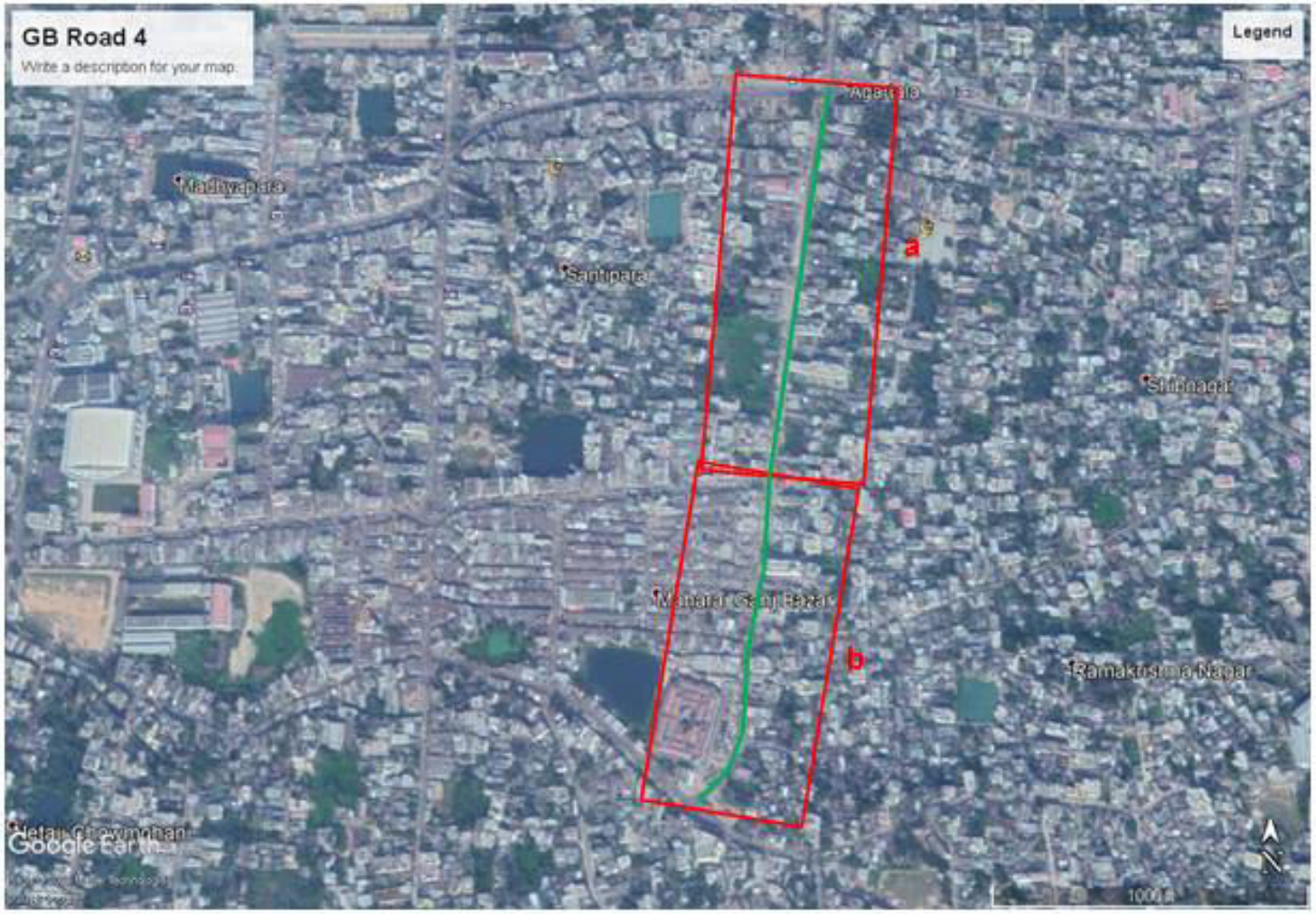
b. IGM Chowmuhani to Jacksongate Junction (Commercial)

Figure 37: Thakurpalli Road Commercial stretch (Kadamtali Chowmuhani to Ujjayanta Palace right end) along with sensitive receptors on Google Earth image



b. Kadamtali Chowmuhani to Ujjayanta Palace right end (Commercial)

Figure 38: GB Chakkar Road Commercial stretch (Old Motorstand Circle to Ramthakur Club) on Google Earth image

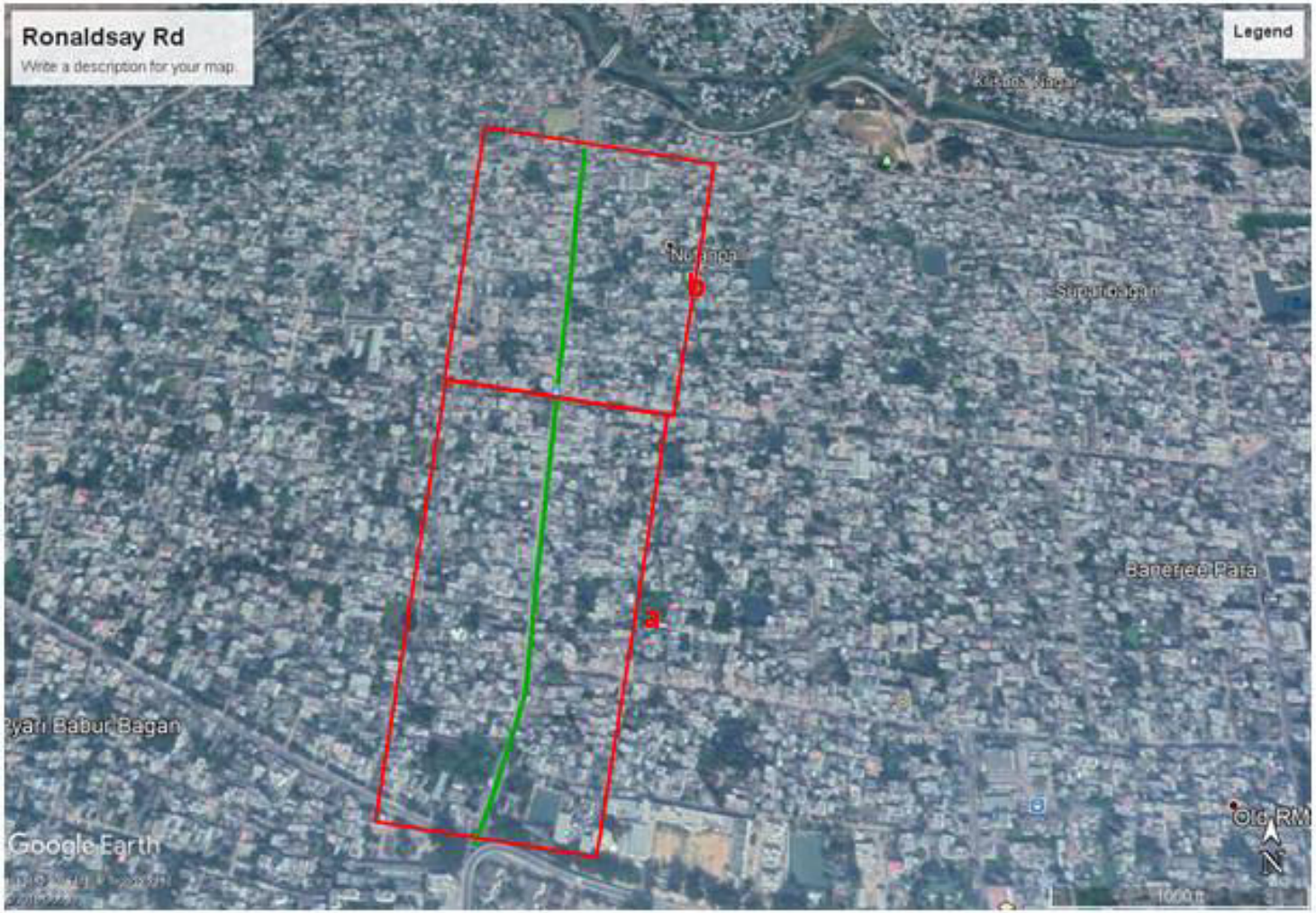


a. Old Motorstand junction to MBB Club (Commercial)
b. MBB Club to Ramthakur Club (Commercial)

Figure 39: Jail Road Commercial stretch (Purbasa to Math Chowmuhani) on Google Earth image

b. Purbasa to Math Chowmuhani (Commercial)

Figure 40: Ronaldsay Road Commercial stretch (Fire Brigade Chowmuhani to Durga Chowmuhani) on Google Earth image



a. Fire Brigade Chowmuhani to Shankar Chowmuhani (Commercial)
b. Shankar Chowmuhani to Durga Chowmuhani (Commercial)

Figure 41: Sakuntala Road Commercial stretch (Surya Chowmuhani to Rabindra Bhavan) on Google Earth image

a. Surya Chowmuhani to Rabindra Bhavan (Commercial)

268. In table below the pre-construction stage EMPs are given which is applicable to all categories viz., Commercial, Residential/ Institutional and Mixed Roads.

Table 37: Pre-Construction Stage EMP

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Responsible for Supervision
Environmental monitoring of baseline conditions of air, noise, water and soil	To establish base line environmental conditions	Environmental monitoring through NABL accredited laboratory	Construction contractor	Report for NABL laboratory	PMC and PMU
Legal compliance	Environmental legal noncompliance may attract legal actions Failure to obtain necessary consents Permits, NOCs etc. can result to design revisions and /or stoppage of works	(i)Obtain all consents, clearances (CTE/CTO from TSPCB), permits NOCs etc. before start of construction works Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (ii)Following consents are required- Tree cutting-local authority Storage, handling and transport of hazardous materials- TSPCB Sand mining, quarries, borrow areas- Department of mines and Geology Traffic diversion/road cutting- local authority, traffic police (iii)Acknowledge in writing and provide report on compliance all	PIU/Consultants in coordination of ULB	Incorporate conditions of NOCs in final design and communicate to contractors.	PMC and PMU

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Responsible for Supervision
		obtained consents, permits, clearance, NOCs etc. (intake works) (iv)Include in detailed design drawings and documents all conditions and provisions; if necessary			
Utilities	Telephone lines, electric poles and wires, water lines within proposed project area	(i) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and (ii) Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. (iii) Require contractors to prepare spoils management plan and traffic management plan	Construction Contractor, PIU and Agartala ULB	(i) List of affected utilities and operators; (ii) Bid document to include requirement for a contingency plan for service interruptions (example provision of water if disruption is more than 24 hours), spoil management plan (Appendix 5), and traffic management plan (Appendix 8)	No cost required. Mitigation measures are part of TOR of PMU, PIU and Consultant
Social and Cultural Resources	Ground disturbance can uncover and damage archaeological and historical remains	Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized, and measures are taken to ensure they are protected and conserved.	Construction Contractor, PIU and Agartala ULB	Chance Finds Protocol (Appendix 11)	No cost required. Mitigation measures are part of TOR of PIU and Consultant

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Responsible for Supervision
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	(i) Prioritize areas within or nearest possible vacant space in the project location; (ii) If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems; (iii) Do not consider residential areas; (iv) Take extreme care in selecting sites to avoid direct disposal to water body which will inconvenience the community. (v) For excess spoil disposal, ensure (a) site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, written consent from landowners (not lessees) will be obtained; (b) debris disposal site shall be at least 200 m away from surface water bodies; (c) no residential areas shall be located within 50 m downwind side of the site; and (d)	Contractor to finalize locations in consultation and approval of PIU	(i) List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas. (ii) Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	PMC and PMU

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Responsible for Supervision
		site is minimum 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies.			
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	(i) Prioritize sites already permitted by the Department of Mines and Geology (ii) If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval of PMU and (iii) If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU.	Construction contractor	(i) List of approved quarry sites and sources of materials; (ii) Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	PMC and PMU

Table 38: Common-Construction Stage EMP applicable for all roads

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					construction Stage			
Occupational Health and Safety	Occupational hazards which can arise during work	3	3	09	• Comply with all national, state and local labor laws ; • Following best practice health and safety guidelines: ADB's Interim Advisory Note on COVID – 19, IFC's General EHS Guidelines,[21] WHO Interim Guidance (and its updates) on Water, Sanitation, Hygiene and Waste management for the COVID19 virus (Appendix 18 and 19), and Sector Specific Guidelines;[22] • Develop and implement site-specific Health and Safety (H&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment; (c) H&S Training[23] for all site personnel; (d)	All construction sites, labour camp and storage site	Contraction contractor and PIU	PMC and PMU

[21] https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES

[22] https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B-%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES

[23] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence, but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective, and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					documented procedures to be followed for all site activities; and documentation of work-related accidents; • Strict compliance of H&S plan and requirements of wearing personal protective equipment (PPE) during work hours; • Provide specific guidance for suitable PPE for every on-site work assignment. • Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; • Provide medical insurance coverage for workers; • Secure all installations from unauthorized intrusion and accident risks; • Provide supplies of potable drinking water; • Provide clean eating areas where workers are not exposed to hazardous or noxious substances; • Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;			

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					• Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Ensure moving equipment is outfitted with audible back-up alarms; • Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and • Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.			
Community Health	Traffic accidents and	3	3	09	• Provide barricades in all construction sites, especially near	All construction sites, labour	Contraction contractor and PIU	PMC and PMU

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
and Safety.	vehicle collision with pedestrians during material and waste transportation				excavations to avoid entry of people specially children. • Ensure that the traffic diversion plans are developed considering high footfall of women, children and elderly like schools, temples etc. • Ensure that no working equipment's should be kept unattended. • Plan material and waste routes to avoid times of peak-pedestrian activities specially time of school in residential areas. • Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure • Provide road signs and flag persons to warn of dangerous conditions for all the work sites along the roads. •	camp and storage site		
Demolition of existing Brick drains drain covers. Clearing of drain silt,	Air pollution due to dust emission during dismantling	5	2	10	• Regular Water spraying on surfaces and demolition stockpile. • Vehicles carrying demolition debris from site shall be covered with tarpaulins while entering and leaving the site will always be covered.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
dismantling of electrical and telephone cables, clearing of trees								
	Noise & vibration generation	5	2	10	• Restrict the demolition work only during day time between 8 am to 6 pm. • Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity.	All along the road stretches	Construction Contractor	PIU
	Soil and water contamination	3	3	9	• Around 50,000 cum of demolition debris in the form of broken brick works, plaster, RCC etc., will be generated. The Contractor shall suitably dispose of the unutilized debris at the centralized facility of DC Nagar Lunga site of AMC after necessary permission. • There will be generation of around 14000 cum of silt during the drains dismantling, the silt will be disposed of suitably in DC Nagar Lunga site of AMC after approvals. • The contractor shall designate a full-time environment, health and safety (EHS) staff. The EHS staff shall supervise, monitor and report on day-to-day compliance to requirements related to workers	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					health and safety as specified in applicable laws, rules and regulations and EMP. • The ESH staff shall possess a recognized degree or advanced diploma in industrial/ construction safety. • The ESH staff shall have practical experience in industrial/construction projects for a period of not less than 5 year. • Submission of updated EMP/ site-specific environmental management plan (SEMP); including work methodology and spoil management plan • Timely submission of periodical monitoring reports including documentary evidence on EMP implementation such as photographs.. • Debris generated due to dismantling of the existing road and drains shall be suitably reused in the proposed construction zone. • Entire excavated earth generated shall be reused at site for backfilling.			
	Hinderance to access of surrounding occupants	3	2	6	• The debris and waste shall not be disposed on the site which hinder the movement of customers and occupants of commercial establishments and in walkways or access to the properties.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	and property owners							
	Cutting of trees	5	2	10	• 520 trees are identified to be cut after receiving clearance from the Forest Dept. as per the notification No. F1.7(44)/FPR/FP/2001/Part-II/19.630-720 dated 20/10/2010 and after the receipt of ASCL's written permission in this regard. • Cutting shall not start until the Implementation of the project on the location of cutting is confirmed. • No additional trees other than identified shall be cut.	All along the road stretches	Construction Contractor	PIU
	Disruption of Community Utilities and Common Property Resources	2	2	4	• Community utilities and properties i.e., hand pumps, water supply lines, sewer lines, telephone cables, buildings and health centers shall not be relocated before construction of subproject road starts.	All along the road stretches	Construction Contractor	PIU
	Blockage of Drainage and flooding	2	3	9	• Contractor shall ensure that no demolition debris and materials like earth, stone, or appendage disposed of in a manner that block the flow of water of any water course and cross drainage channels. • Contractor shall take all necessary measures to prevent any blockage to the water flow. Contractor shall	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					follow the instructions of ASCL and PIU on easy flow of water.			
Removal / Relocation of Transformers in 15 roads	Soil and water contamination by leakage	3	5	15	• There will be removal of around 225 transformers in all the 15 road stretches. • The relocation of transformer should be done in the presence of TSECL officials. • The removed transformed should be immediately transported to the storage site of TSECL until further installation/ reuse. • All precautionary measures shall be taken to avoid leakage of oil.	All along the road stretches	Construction Contractor	PIU
Labour Camp Set up	Water and land Pollution due to discharge of sewage	3	3	6	• Contractor shall set up toilets with septic tank and soak pit at labour camp.	Labour Camp area	Construction Contractor	PIU
	Air Pollution due to burning of solid waste	2	2	4	• Contractor shall provide bins for storage of solid waste and hand over the collected solid waste to AMC collection vehicles for processing. • The burning of waste or any other materials shall be strictly prohibited and informed to workers on this.	Labour Camp area	Construction Contractor	PIU
	Loss of trees for fuel wood	2	2	4	Fuel provision shall be made available in camp like LPG so that no tree cutting is involved for fuel wood.	Labour Camp area	Construction Contractor	PIU
	Ill-health and	3	3	9	• Contractor shall arrange potable drinking water for workers in camp.	Labour Camp area	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	unhygienic conditions				Shall provide adequate number of separate toilets for male and female workers.			
Consumption of construction materials	Disruption in land topography, vegetation, soil erosion, water logging and water pollution	3	3	9	• Contractor should obtain material from existing mines approved/ licensed by Mines and Geology Department/ Revenue Department. • Verify suitability of all material sources and obtain approval of implementing agency. • Submit a monthly statement of construction material procured indicating material type, source and quantity. • For new quarry if Environmental Clearance is applicable to be obtained. • Adequate safety precautions shall be ensured during transportation of quarry material from quarries to the construction site. Vehicles transporting the material shall be covered to prevent spillage.	Mines listed by Tripura Government as specified in the website: http://trpenvis.nic.in/test/natural_resources.html	Construction Contractor	PIU
	Dust generation and air pollution due to transportation of materials	3	2	6	• The vehicles speed shall be adhered to specified limits of 15 Kmph in site to avoid dust generation. • The vehicles transporting materials and entering site shall have PUC certificates and shall be in good condition.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	Noise generation due to transportation	3	2	6	• The vehicles shall be maintained properly to reduce the noise. • silencers shall be provided for high noise generating vehicles.	All along the road stretches	Construction Contractor	PIU
Vehicle movement and diversion of traffic	Disturbance in traffic flow due to the road construction Activity	3	2	6	• Road specific Traffic management plan should be prepared in consultation with the traffic police/ department during construction. • The plan should be such that there will be minimum affect to the commercial operations of shops and estblishments without hindering the their business and incoming customers. • Owners / occupants of commercial establishments should be consulted before development of traffic plan. • Sample traffic management plan attached with the IEE shall be used as guideline/ reference.	All along the road stretches	Construction Contractor	PIU

Site Specific EMP Measures for Commercial Roads:

269. The impacts of the proposed Road upgradation project and mitigations measures suggested specific to commercial roads are given in the table below.

Table 39: Site Specific EMP for Commercial Roads

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction Stage								
Excavation of soil	Dust Generation from stockpiles	5	3	15	• Water sprinkling on surface of stockpiles.	All along the road stretches	Construction Contractor	PIU
	Runoff from stockpiles contaminating water	2	3	6	• Stockpiles shall be at least 5 m away from the 1. Buri's pukur, 2. Melarmath pukur, 3. Amiyasagar, 4. Shanti sagar pond 5. Kumar pukur situated along the HGB Road.	All along the road stretches	Construction Contractor	PIU
	Noise & vibration generation	5	2	10	• Restrict the excavation work only during day time between 8 am to 6 pm. • DG sets and other noise generating equipment shall be provided with acoustic enclosures. • Avoiding usage of pneumatic drills or heavy vehicles in the vicinity of fragile buildings to reduce vibration.	All along the road stretches	Construction Contractor	PIU
	Siltation of waterbodies	3	3	9	• Excavated earth shall be stored in designated areas. • Excavated earth stockpile shall be covered so that sediment laden water does not drain into nearby watercourse. • Prioritize re-use of excess soils and debris in the construction works.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	Danger due to deep excavation and chances of accident	3	5	15	• Consult with AMC in identifying deep excavation areas on construction maps. • Provide shoring, hard barricades and sign boards to warn of dangerous conditions.	All along the road stretches	Construction Contractor	PIU
	Hindrance to Accessibility	3	2	6	• The contractor shall provide prior intimation (min 7 days before start of work) to commercial establishments along the road stretches. • The work schedule for the commercial roads shall be planned in consultation with the AMC and commercial establishments' owners. • For construction activities that require temporary closure of establishments, the contractor shall give prior information to the particular establishments and shall have consultation to ensure minimum loss of business. • The Contractor shall provide safe and convenient passage temporarily for vehicles, customers and occupants to and from roadsides commercial establishments. • The Contractor shall also ensure that the existing accesses shall not be dismantled without providing adequate provisions.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	Non-availability of parking space	3	2	6	• The dumping of excavated earth and construction material shall not be haphazard way which can obstruct the parking space create traffic problem. • Construction of drains shall be carried out at one end of road at once so that the parking can be done without much problem to commercial establishments.	All along the road stretches	Construction Contractor	PIU
	Disturbance to utilities	2	2	4	• Utilities like water supply and power supply shall be restored immediately to facilitate day to day business of shops and commercial establishments. • Existing underground utilities shall be relocated and realigned if disturbed. • Replace and reconnect utilities without disrupting the commercial activities in the shops and establishments.	All along the road stretches	Construction Contractor	PIU
	Blockage of Drainage and flooding	2	3	9	• The contractor shall ensure that wastewater/ sewage generated by the commercial establishments like restaurants, eateries, lodges etc., during the construction period should be adequately managed by diverting the flow or collecting and transporting it for necessary treatment and disposal. • Contractor shall ensure that no excavated earth is stored/ stockpiled	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					in a manner that block the flow of water of any water course and cross drainage channels. • Contractor shall take all necessary measures to prevent any blockage to the water flow. Contractor shall follow the instructions of ASCL and PIU on easy flow of water.			
Usage of Construction vehicles and equipment	Dust generation from vehicle movement	5	2	10	• Special care shall be taken near 1. Government Ayurvedic Hospital in HGB Road 2. IGM hospitals on Akhaura Road and 3. Agartala Nursing Home along Matribari Road. The contractor shall not set up concrete mixers and hot mixers in the 100 m periphery of the hospitals which causes respiratory discomfort to the hospital patients. • Provide information to identified sensitive receptors about the work schedule. • Water sprinkling on Kaccha/ mud roads. • Limit of vehicle speed to 15 kmph. • Periodical air quality monitoring shall be done during construction and operation phase.	All along the road stretches	Construction Contractor	PIU
	Emissions from vehicles and equipment	3	2	6	• The vehicles shall be maintained regularly. • Vehicles and machineries working in premises shall have PUC certificate.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	Noise and vibration generation due to operation of vehicles and equipment	5	3	15	• No high noise generating (>85 dB) activities shall be carried out and night time activities shall be strictly prohibited near Hospitals like Government Ayurvedic Hospital, Devlok Hospital, IGM hospital etc. • Maintain maximum sound level of 80 dB when measured at 10 m from the equipment. • The vehicles and equipment shall be maintained properly to reduce the noise. • DG sets and other noise generating equipment shall be provided with acoustic enclosures. • Avoiding usage of pneumatic drills or heavy vehicles in the vicinity of fragile buildings to reduce vibration. • Noise barriers shall be installed at sensitive receptors viz., Government Ayurvedic Hospital and Kamini Kumar Singha School along HGB Road and IGM Hospital building towards Akhaura Road to reduce the noise generation during operation stage.	All along the road stretches	Construction Contractor	PIU
	Soil and Water Pollution due to Spillage / leakage of fuel, oil	2	5	10	• Fuel, oil, lubricants and other chemicals shall be stored on concrete platforms. • DG sets, oil/ fuel consuming equipment shall be placed in concrete platforms.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	and lubricants							
Construction works	Dust Generation and air quality deterioration due to concrete mixers, hot mixers and other construction activities	5	3	15	• Water sprinkling shall be done to control dust emission twice a day in dry areas like stock piles, roads etc., • Stockpiles of raw/ waste material, demolition debris, excavated earth etc., shall be covered with tarpaulin during the entire construction activity. • DG sets if used for construction activity shall meet the required emission standards. • All construction plants like crushers and hot mixers shall be sited sufficiently away from human habitations and occupancies. Such plants shall be located at least 100 m away in the downwind direction. • Periodic Air quality monitoring shall be done at selected locations to check the impact of developmental activity	All along the road stretches	Construction Contractor	PIU
	Siltation of waterbodies and degradation of water quality	3	3	9	• Commercial roads also have around 5 waterbodies within 100 m from the center of the roads (Buri's pukur, Melarmath pukur, Amiyasagar, Shanti sagar pond, Kumar pukkur along HGB road), measures like storing of stockpiles at least 5 m away from waterbodies, covering the stockpiles so that the sediment laden water shall not enter the	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction works					watercourse and storage of fuel, oil, lubricants and other chemicals on concrete platforms to avoid contamination of these waterbodies • Contractor shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment laden water does not drain into water bodies/ ponds along the roads.			
	Impact on water flow of water bodies	2	2	4	• Contractor shall ensure that no construction materials like earth, stone, waste disposed of in a manner that block the flow of water to and from the water bodies/ ponds. • Contractor shall take all necessary measures to prevent any blockage to the water flow. • In addition to the design requirements, the Contractor shall take all required measures as directed by the Environmental Specialist of PIU to prevent temporary or permanent flooding of the site or any adjacent area.	All along the road stretches	Construction Contractor	PIU
	Noise impact on sensitive receptors	5	3	15	• All Construction plants and equipment used in construction shall strictly conform to the MOEFCC/ CPCB noise standards. • At the construction sites within 150 m of the nearest habitation, noisy construction work such as crushing, operation of DG sets, use of high	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction works					noise generation equipment shall be stopped during the night time between 6.00 pm to 6.00 am. • Provide prior information to the identified sensitive receptors about the work schedule. • Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers the sound impact to surrounding sensitive receptor; and use hydraulic or vibro impact hammers in place of diesel hammers for piling work. • Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at 10 m or more from the vehicles & equipment. • Provision of ear-plugs to workers exposed to high noise levels. • Periodic Noise monitoring shall be done at selected locations to check the impact of developmental activity on water body.			
	Impacts on landscape and aesthetics due to construction activity	5	2	10	• Stockpiling of raw material, waste, demolition debris, excavated earth etc. to be done only in the designated areas, care shall be taken in Thakurpalli Road where Ujjayanta Palace is situated. • Avoid disposal of any debris and waste soils in and around the water	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					bodies or near sensitive areas like hospitals, school etc., • Coordinate with PIU for beneficial uses of excess excavated soils or immediately disposed to DC Nagar Lunga site.			
Construction works	Hindrance to traffic movement	5	2	10	• Do not close the road completely, ensure that work is conducted onto edge of the road; allow traffic to move on one line. • In unavoidable circumstances of road closure, provide alternative routes, and ensure that public is informed about such traffic diversions. • At all work sites public information/ caution boards in English and local language (Bengali) shall be provided - information shall inter-alia include: project name, cost and schedule; executing agency and contractor details; nature and schedule of work at that road/ locality; traffic diversion details, if any; entry restriction information; competent official's name and contact for public complaints. • Prepare a Traffic Management Plan.	All Road stretches	Construction Contractor	PIU
	Nuisance/ disturbance to sensitive areas	3	2	6	• No material should be stocked in sensitive area; material shall be brought to the site as and when required.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction works					• Conduct work manually with small group of workers and less noise; minimize use of equipment and vehicles especially near Government Ayurvedic hospital and Agartala nursing home areas. • No work should be conducted near the temples along the road during religious congregations. • Implement all measures suggested elsewhere in this report - dust and noise control, public safety, traffic management, strictly at these sites.			
	Blockage of Drainage and flooding	2	3	9	• Contractor shall ensure that no construction materials like earth, stone, or appendage disposed of in a manner that block the flow of water of any water course and cross drainage channels. • Contractor shall take all necessary measures to prevent any blockage to the water flow. Contractor shall follow the instructions of ASCL and PIU on easy flow of water.	All along the road stretches	Construction Contractor	PIU
Handling of Bitumen for road works	Contamination of soil and water due to accidental spillage or leakage of bitumen	2	3	6	• Care shall be taken that the bitumen shall not be spilled and no leakage shall take place at site. The bitumen will decrease soil fertility and pollute the receiving water body due to phenolic compounds. • Workers at site shall be trained on environmental damages of bitumen on soil and water.	All along the road stretches	Contractor EHS officer and Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	Injuries due to spill of hot bitumen	2	3	6	• Protective footwear, protective goggles, hand gloves and nose masks to be provided compulsorily to the workers employed in asphalt works. • Workers shall be trained before handling of hot bitumen.	All along the road stretches	Contractor EHS officer and Construction Contractor	PIU
Storage, handling and disposal of surplus excavated earth, Demolition Debris, construction wastes, drain silt	Air Pollution due to loading and transportation of wastes	5	2	10	• Before loading the wastes into vehicles, the stockpiles shall be water sprinkled to reduce the dust emission. • Transportation vehicles carrying waste materials shall be covered with tarpaulin to avoid emission of finer particles and dust. • The vehicles carrying wastes shall be checked for their PUC certificate and its fitness.	All Road stretches	Construction Contractor	PIU
	Land contamination and water pollution	3	3	9	• The surplus excavated earth and other construction wastes shall not be dumped on any agricultural land, grass land or water bodies which contaminate the soil and water bodies of Agartala.	Disposal Site	Construction Contractor	PIU
	Degradation of Aesthetics	5	2	10	• The wastes shall not be disposed on road sides of city or anywhere which degrades the aesthetics of the place. • Contractor shall be penalized for disposal of wastes in private/ unauthorized lands or water bodies.	Disposal Site	Construction Contractor	PIU

270. **Residential/ Institutional:** The particular Akhaura road stretch from Fire brigade Chowmuhani to IGM Chowmuhani, entire BT Road, IT Hub Road, Lankamura Road and Part of Jail Road from Purbasa to Jail Ashram Road are residential stretches in the proposed Smart Roads. The details of the stretches are given in the Table 40 and the images are shown in Figure 42.

Figure 42: Residential/ Institutional stretches

(a) **Akhaura Road (Fire brigade Chowmuhani to IGM Chowmuhani)**
(b) **IT Hub Surrounding**
(c) **BT Road**

(a)

(b)

(c)

Table 40: Residential Roads Details

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
1	Residential/ Institutional	a. Akhaura Road	Fire brigade Chowmuhani to IGM Chowmuhani (Google earth images shown in Figure 43)	0.70	a. Umakanta Academy English Medium School b. Mukta Pukur c. Birchandra State Central Library	 Umakanta Academy English Med. School  Birchandra State Central Library

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
		b. IT Hub Surrounding Road	Jail Ashram Road to Jail Backside junction (Google earth images shown in figure 44)	0.57		
		c. BT Road	Jail Ashram Road to Jail Backside junction (Google earth images shown in figure 45)	0.28	a. Jail Pond	 Jail Pond
		d. Lankamura Road	Ankhaura Road to STP (Google earth images shown in figure 46)	0.21	a. Pond near border fence	 Pond near border fence

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 100 m	Photographs of Health and Environmentally Sensitive Receptors
		e. Jail Road	Jail to Purbasa Road (Google earth images shown in figure 47)	0.21	a. Kshudiram Basu English Medium School	 Kshudiram Basu English Medium School
Total Residential Road Length (km)				**1.97**		

Figure 43 Akhaura Road Residential stretch (Fire brigade Chowmuhani to IGM Chowmuhani) along with sensitive receptors on Google Earth image

a. Fire brigade Chowmuhani to IGM Chowmuhani (Residential and Institutional)

Figure 44: IT Hub Road Residential stretch along with sensitive receptors on Google Earth image

a. IT Hub Surrounding Road (Residential)

Figure 45: BT Road Residential stretch along with sensitive receptors on Google Earth image

a. Jail Ashram Road to Jail back side end (Residential)

Figure 46: Lankamura Road Residential stretch along with sensitive receptors on Google Earth image

a. Akhaura Road to STP (Residential)

Figure 47: Jail Road Residential stretch along with sensitive receptors on Google Earth image

a. Jail Tri-junction to Purbasa (Residential/ Institutional)

271. **Mixed (both residential and commercial):** Majority of the road stretches in the proposed project are mixed development road which comprised both residences and commercial establishments on the either side of the roads. Entire VIP road starting from Radhanagar Motor Stand to Agartala Airport, Barjala Road, Jail Ashram Road, ITI Road and stretches of Thakurpalli Road and GB Chakkar to Ramthakur Club are mixed developed roads. The details of the roads are given in the Table 41 and the images are shown in Figure 48.

Figure 48: Mixed Developed stretches

(a) **Thakurpalli Road**
(b) **VIP Road**
(c) **Jail Ashram Road**
(d) **GB Road**

(a)

(b)

(c)

(d)

Table 41: Mixed Use Roads Details

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
1	Mixed Use		Ker Chowmuahni to Kadamtali circle	0.547	--	
		a. Thakurpalli Road (Google earth images shown in figure 49)	Palace right to left boundary	0.32	a. Rajbari pond b. Jagannathbari pond	 Rajbari Pond  Jagannathbari Pond

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
	Mixed Use		Ujjayanta Palace left boundary to Purbasa	0.72	a. Banmalipur Dighi	 Banmalipur Dighi
		b. VIP Road (Google earth images shown in figure 50 and 51)	Radhanagar Motorstand to Centre point near Rajbhavan	0.92	a. Hindi HS School b. Rashtriya Sanskrit School c. Nirmala Shishu Vihar	 Hindi HS School

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
						 Rashtriya Sanskrit School
			Centre point near Rajbhavan to Geetanjali Guesthouse	0.78	--	
			Geetanjali Guesthouse to Secretariat Circle	0.78	a. Sri Krishna Mission School b. Rani Pukur	 Sri Krishna Mission School

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
						 Rani Pukur
			Secretariat Circle to Lichubagan	0.70	--	
		c. GB Road (Google earth images shown in figure 52, 53 and 54)	GB Hospital to BT College Ground end	0.45	a. GB Hospital b. Kumari Tilla	 GB Hospital

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
						 Kumari Tilla
			BT College ground end to Lalit Saha's Shop trijunction	0.52	--	
			Lalit Saha's Shop trijunction to Blood Sun Club	0.55	a. Veterinary Pond	 Veterinary Pond

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
			Blood Sun Club to Abhoynagar Bridge	0.66	a. Abhoynagar Pond b. Unnamed Pond	 Abhoynagar Pond
			Abhoynagar Bridge to Jail Ashram Road junction	0.52	--	
			Ashram Road junction to Old Motorstand junction	0.55	a. Jora Pond b. Unnamed Pond	 Jora Pond

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
		d. Barjala Road (Google earth images shown in figure 55 and 56)	Durga Chowmuhani to Shani Temple Tri-junction	0.9	a. Katakhal Channel b. Health Care Centre	 Katakhal Channel  Health Care Centre

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
			Shani Temple Tri-junction to New Lokenath Varieties	1.25	--	
			New Lokenath Varieties to Ultimate Car Care (Mixed)	0.57	--	
			Ultimate Car Care to Maruti Service Centre (Mixed)	0.78	a. Barjala Higher Secondary School	 Barjala HS School

Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
			Maruti Service Centre to Kalimata Temple (Mixed)	0.55	a. Apnaghar Old-age Home	 Apnaghar Old-age Home
		e. Jail Ashram Road (Google earth images shown in figure 57)	Ashram Choumuhani to Dhaleshwar Postoffice	0.76	-	
			Dhaleshwar Postoffice to lal Bahadur Junction	0.787	a. Bhodhjung Pond b. Kshudiram Basu English Medium School	 Bhodjung Pond

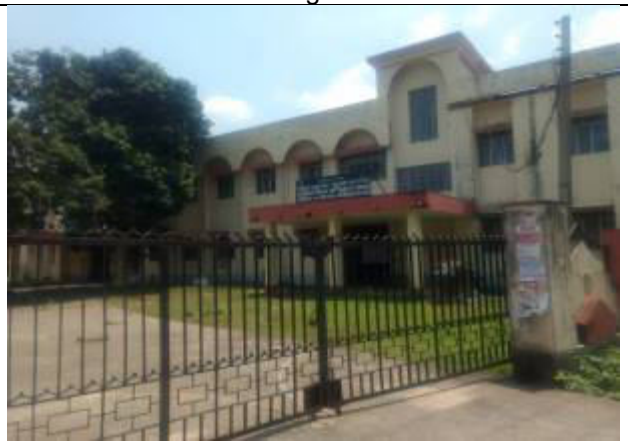
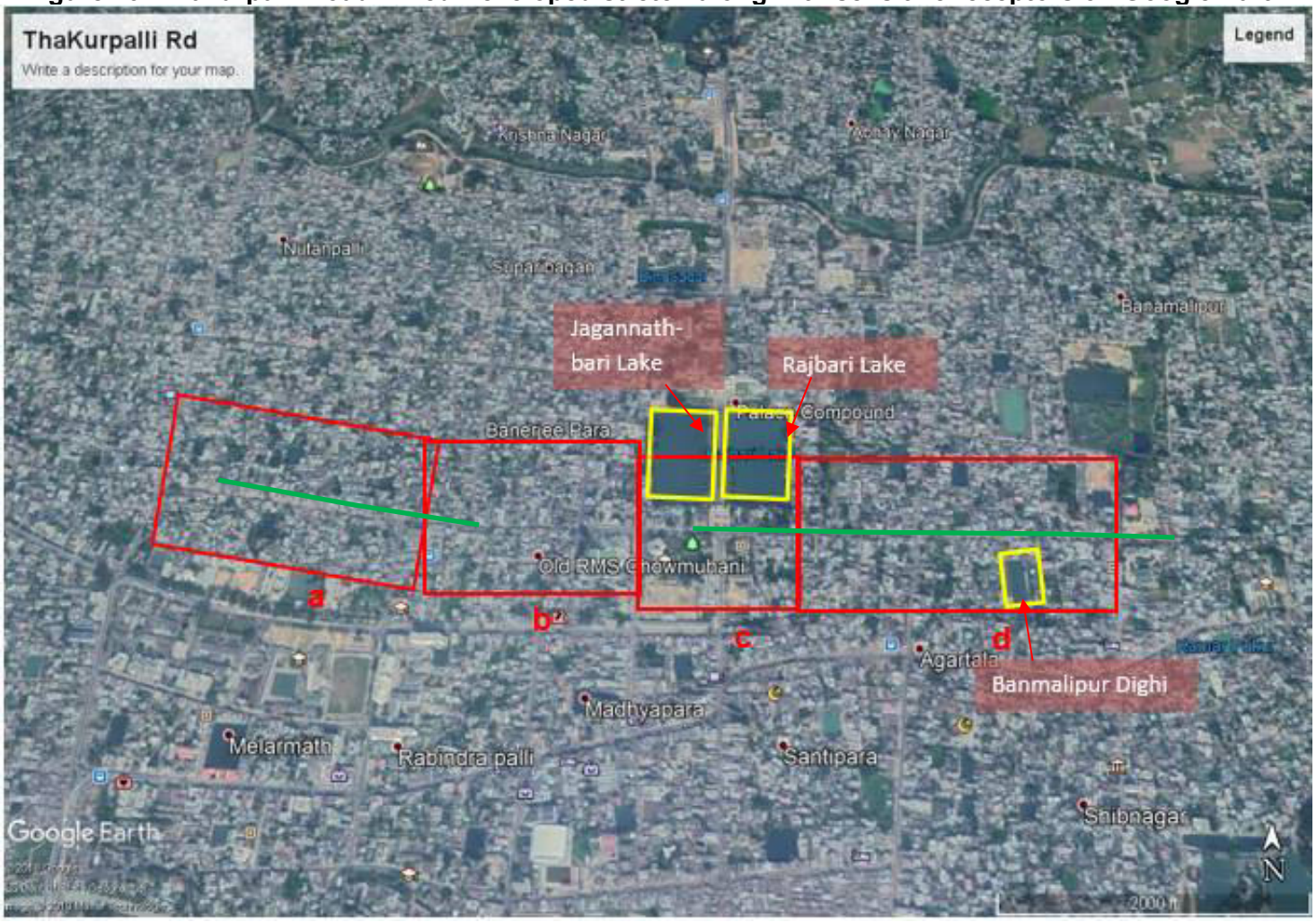
Sr. No.	Road Category	Roads	Road Stretch	Length (Km)	Health and Environmentally Sensitive Receptors within 200 m	Photographs of Health and Environmentally Sensitive Receptors
						 Kshudiram Basu English Medium School
		f. ITI Road (Google earth images shown in figure 58	GB Hospital Circle to IT Bhawan	0.39	Women's ITI College	 Women's ITI College
Total Mixed Road Length (km)				**14.004**		

Figure 49: Thakurpalli Road Mixed Developed stretch along with sensitive receptors on Google Earth image

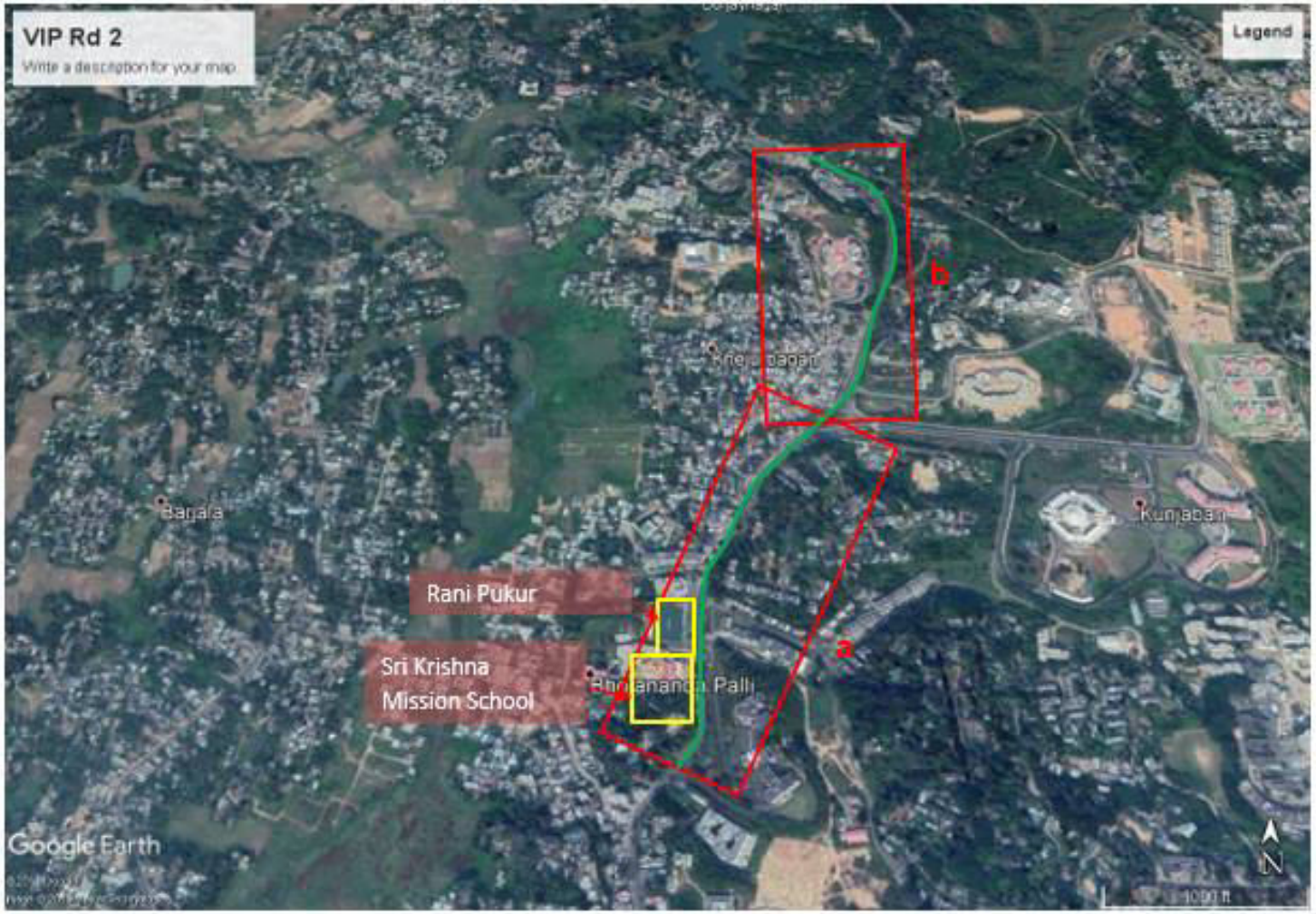


a. Ker Chowmuhani to Kadamtali Chowmuhani (Mixed)
c. Palace right end to left end (Mixed)
d. Ujjayanta Palace left end to Purbasa (Mixed)

Figure 50: VIP Road Mixed Developed stretch along with sensitive receptors on Google Earth image

a. Radhanagar Motorstand to centre point near Rajbhavan (Mixed and Defense)
b. Centre point to Geetanjali Guesthouse entry road (Mixed)

Figure 51: VIP Road Mixed Developed stretch along with sensitive receptors on Google Earth image

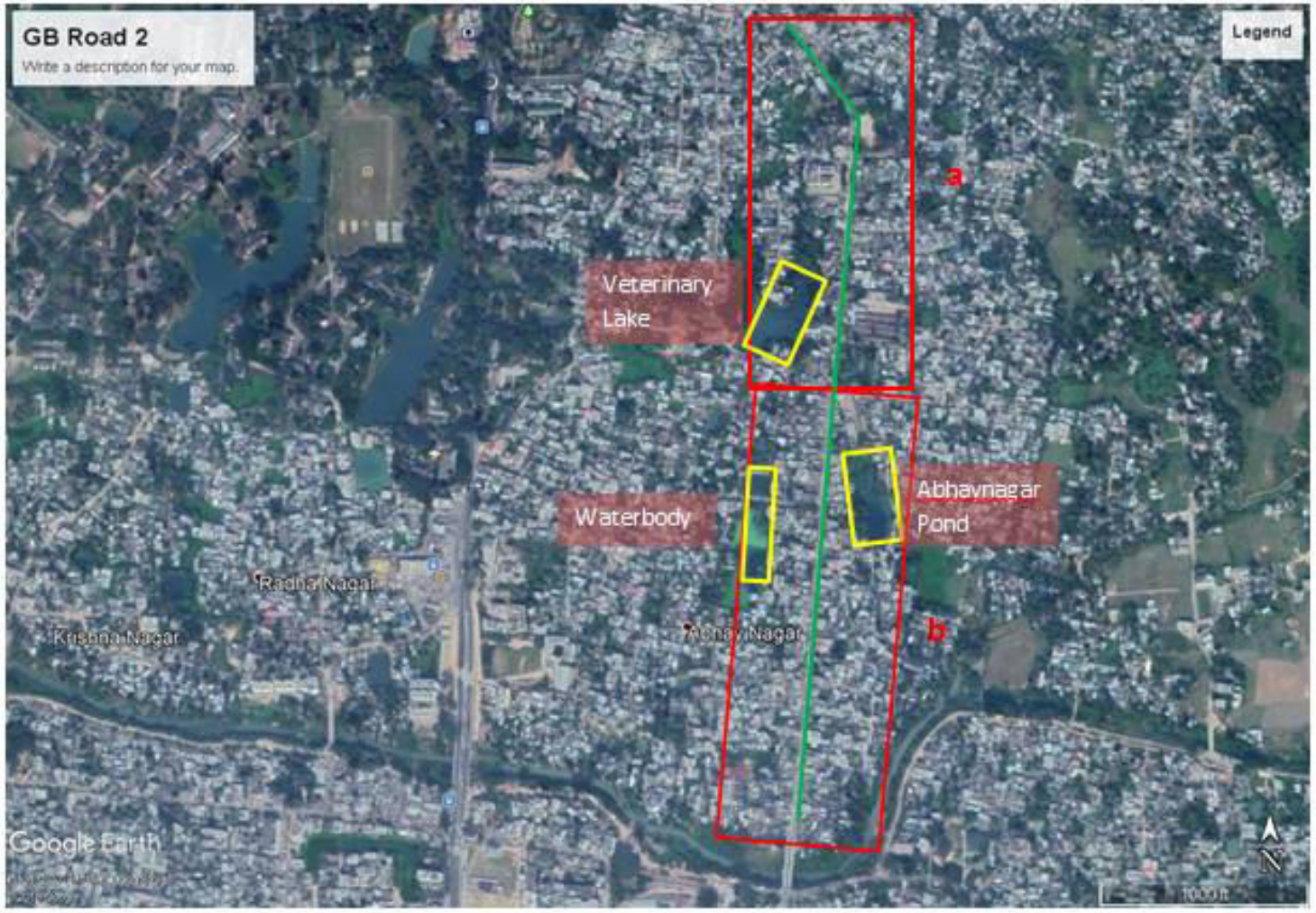


a. Geetanjali Guesthouse entry road to Secretariat circle (Mixed)
b. Secretariat circle to Lichubagan junction (Mixed)

Figure 52: GB Road Mixed Developed stretch (GB Hospital to Lalit Saha Shop) along with sensitive receptors on Google Earth image

a. GB Hospital circle to BT College ground end (Mixed)
b. BT College ground end to Lalit Saha's Shop trijunction (Mixed)

Figure 53: GB Road Mixed Developed stretch (Lalit Saha Shop to Abhoynagar Bridge) along with sensitive receptors on Google Earth image

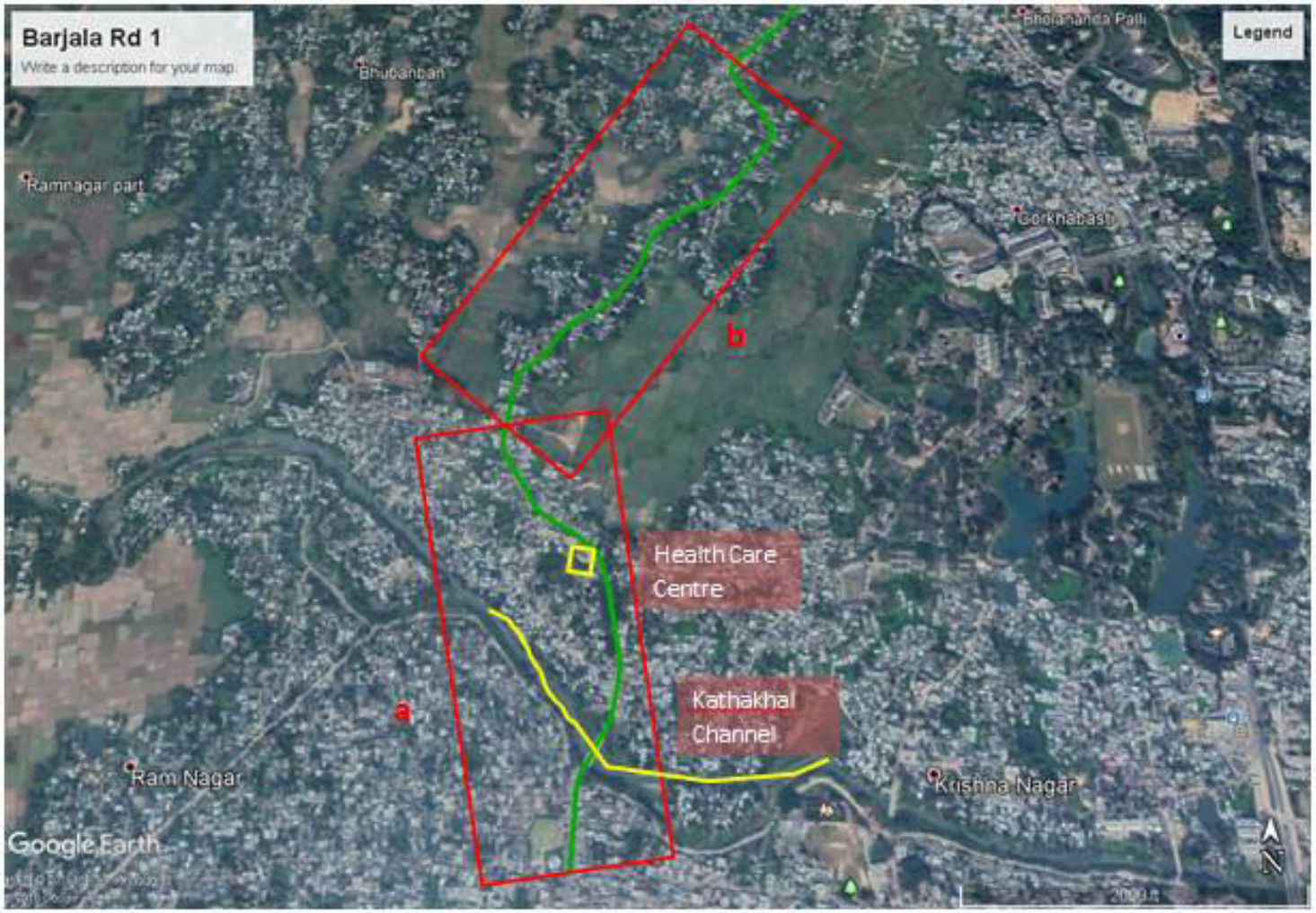


a. Lalit Saha's Shop trijunction to Blood Sun Club (Mixed)
b. Blood Sun Club to Abhoynagar Bridge (Mixed)

Figure 54: GB Road Mixed Developed stretch (Abhoynagar Bridge to Jail Ashram Road Junction) along with sensitive receptors on Google Earth image

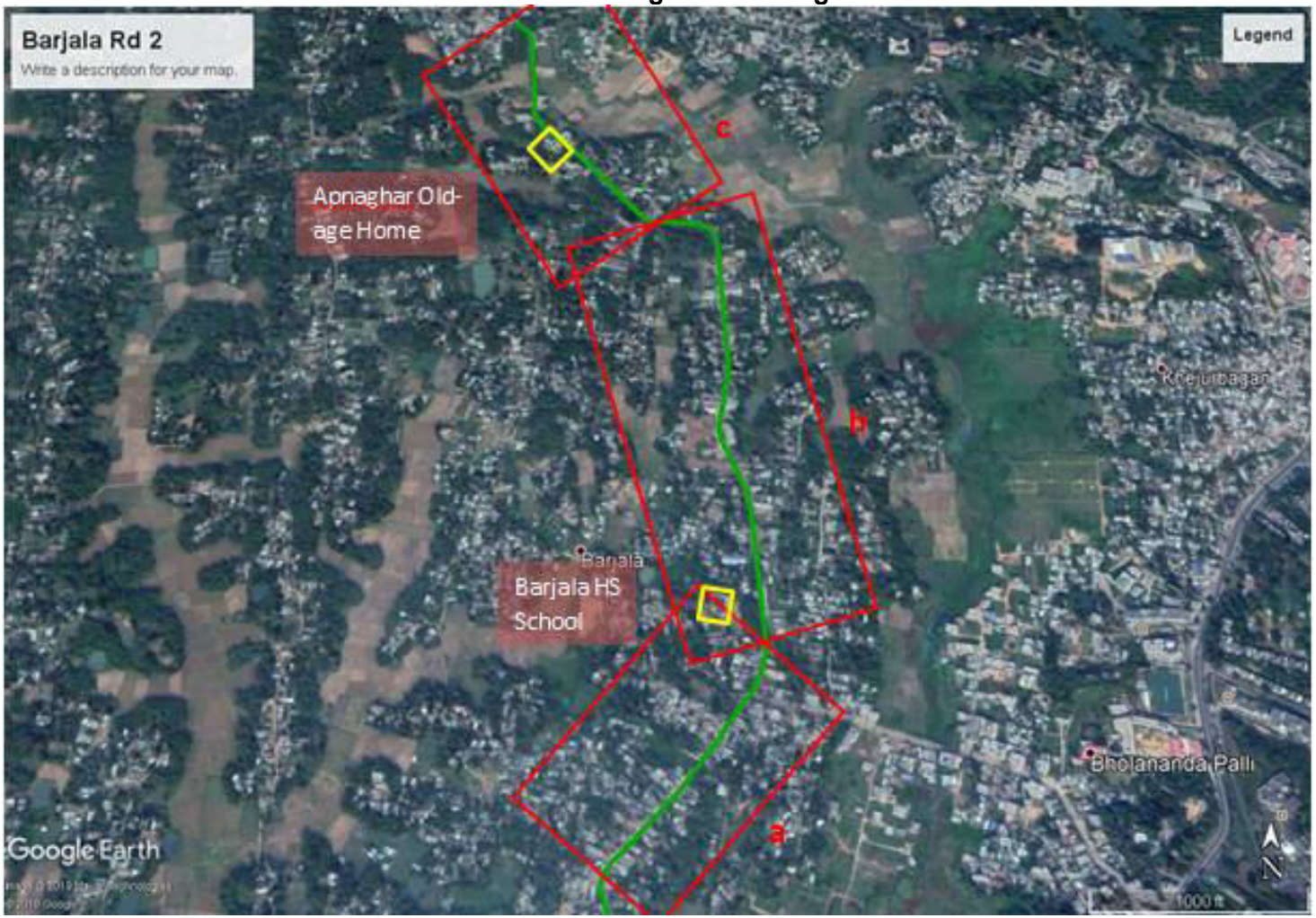
a. Abhoynagar Bridge to Jail Ashram Road junction (Mixed)
b. Ashram Road junction to Old Motorstand junction (Mixed)

Figure 55: Barjala Road Mixed Developed stretch (Durga Chowmuhani to Shani Temple) along with sensitive receptors on Google Earth image



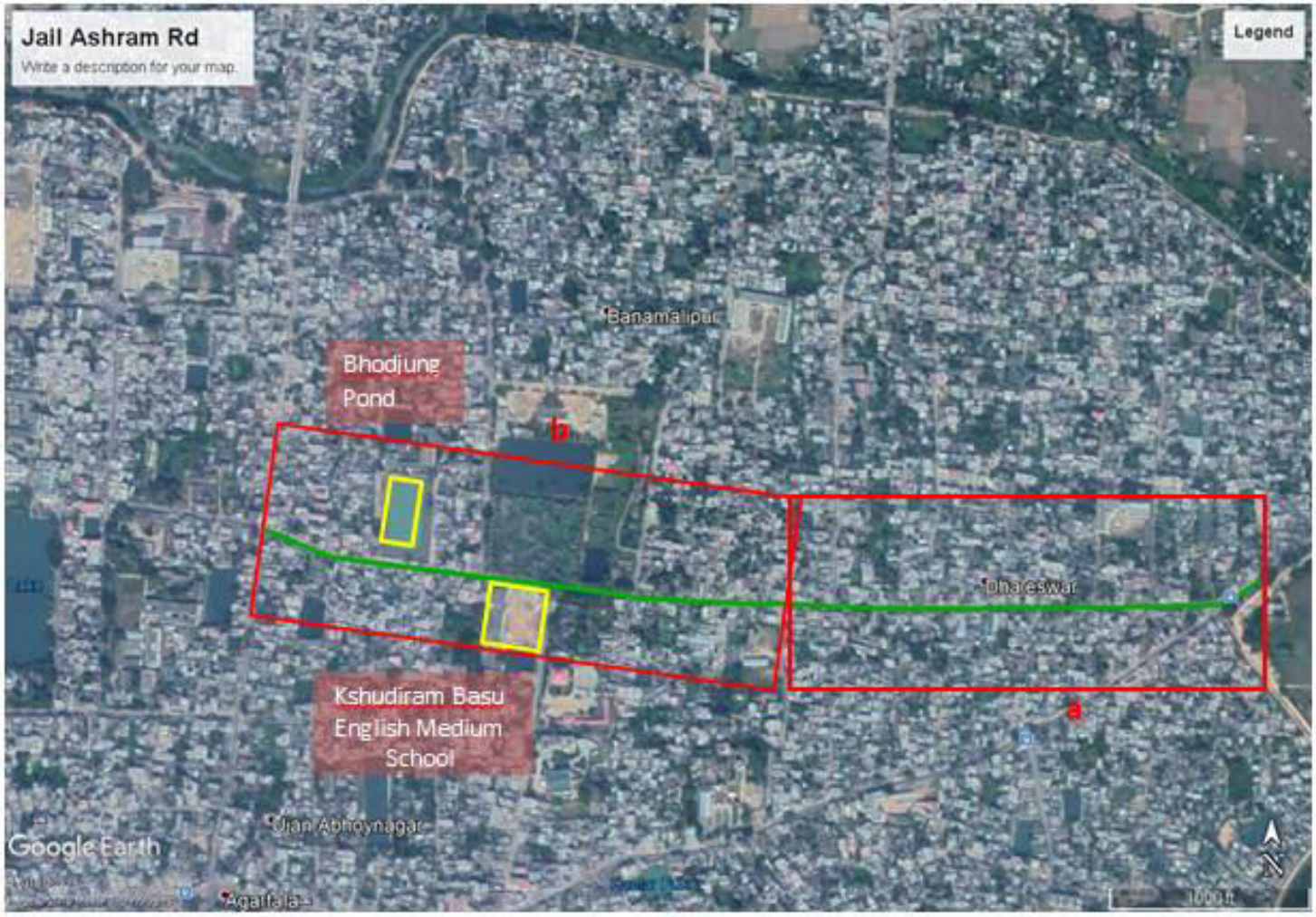
a. Durga Chowmuhani to Shani Temple Tri-junction (Mixed)
b. Shani Temple Tri-junction to New Lokenath Varieties (Mixed)

Figure 56: Barjala Road Mixed Developed stretch (Sahni Temple to Kalimata Temple) along with sensitive receptors on Google Earth image



a. New Lokenath Varieties to Ultimate Car Care (Mixed)
b. Ultimate Car Care to Maruti Service Centre (Mixed)
c. Maruti Service Centre to Kalimata Temple (Mixed)

Figure 57: Jail Ashram Road Mixed Developed stretch (Ashram Chowmuhani to Lalbahadur Junction) along with sensitive receptors on Google Earth image



a. Ashram Chowmuhani to Dhaleshwar Post Office (Mixed)
b. Dhaleshwar Post Office to Lalbahadur Junction (Mixed)

Figure 58: ITI Road Mixed Developed stretch (GB Hospital Circle to IT Bhavan) along with sensitive receptors on Google Earth image

a. GB Hospital circle to IT Bhavan (Mixed)

Site Specific EMP Measures for Residential Roads and Mixed Roads:

272. The residential road and mixed development road have commercial establishments and residences in the stretches. The impacts during construction and mitigation measures suggested to minimize the impacts are given in the following table.

Table 42: Site Specific EMP for Residential Roads and Mixed Roads

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction Stage								
Excavation of soil	Dust Generation from stockpiles	5	3	15	• Provide information to identified sensitive receptors 1. Umakanta Academy English Medium School, Birchandra State Central Library along Akhaura Road 2. Kshudiram English Medium School on Jail Road, 3. Hindi HS School, Nirmala Shishu Vihar and Sri Krishna Mission School along VIP Road, 4. GB Hospital on BG Road 5. Barjala Higher Secondary School, Apnaghar Old-age Home along Barjala Road 6. Womens ITI College along ITI Road about the work schedule. • Water sprinkling on surface of stockpiles to avoid dust emission.	All along the road stretches	Construction Contractor	PIU
	Runoff from stockpiles contaminating water	2	3	6	• Stockpiles shall be at least 5 m away from the waterbodies viz., 1. Jagannathbari pond, Rjabari pond and Banmalipur dighi along Thakurpalli Road 2. Rani Pukur along VIP Road 3. Jora pond, Abhoynagar pond, Ranir Tila along GB Road	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					4. Bhodjung pond along Jail Ashrma Road. Measures like covering the stockpiles so that the sediment laden water shall not enter the watercourse and contaminate these waterbodies due to excavation activities.			
	Noise & vibration generation	5	2	10	• The excavation activity shall be restricted to day time from 8AM to 6 PM to avoid causing disturbance to residents. • Maintain maximum sound level of 80 dB when measured at 10 m from the equipment. • DG sets and other noise generating equipment shall be provided with acoustic enclosures. • Avoiding usage of pneumatic drills or heavy vehicles in the vicinity of fragile buildings to reduce vibration.	All along the road stretches	Construction Contractor	PIU
	Siltation of waterbodies	3	3	9	• Excavated earth shall be stored in designated areas. • Excavated earth stockpile shall be covered so that sediment laden water does not drain into nearby watercourse. • Prioritize re-use of excess soils and debris in the construction works.	All along the road stretches	Construction Contractor	PIU
	Danger due to deep excavation	3	5	15	• The drains and deep excavation sites shall be barricaded to avoid entry of children and general public.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	and chances of accident (Child Safety and General Public Safety)				• Sign boards to warn of dangerous conditions. • Consult with AMC in identifying deep excavation areas on construction maps.			
	Parking space unavailability	3	2	6	• Construction of drains shall be carried out at one end of road at once so that the parking can be done without much problem to households (except VIP road). • The dumping of excavated earth and construction material shall not be haphazard way which can obstruct the parking space create traffic problem.	All along the road stretches	Construction Contractor	PIU
	Hindrance to Accessibility	3	2	6	• The contractor shall provide prior intimation to the occupants of the commercial establishments and residences on excavation for the project. • The Contractor shall provide safe and convenient passage temporarily for vehicles, customers and occupants to and from roadsides commercial establishments. • The Contractor shall also ensure that the existing accesses shall not be dismantled without providing adequate provisions.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	Disturbance to utilities	2	2	4	• Water supply, Gas supply and power lines shall be restored if disturbed so that the residents should not face the difficulties for day to day activities. • Replace and reconnect utilities without disrupting the commercial activities in the shops and establishments. • Existing underground utilities shall be relocated and realigned if disturbed.	All along the road stretches	Construction Contractor	PIU
	Blockage of Drainage and flooding	2	3	9	• Contractor shall ensure that no excavated earth is stored/ stockpiled in a manner that block the flow of water of any water course and cross drainage channels. • Contractor shall take all necessary measures to prevent any blockage to the water flow. Contractor shall follow the instructions of ASCL and PIU on easy flow of water.	All along the road stretches	Construction Contractor	PIU
Usage of Construction vehicles and equipment	Dust generation from vehicle movement	5	2	10	• Water sprinkling on Kaccha/ mud roads. • Limit of vehicle speed to 20 kmph within site. • Periodical air quality monitoring shall be done during construction and operation phase.	All along the road stretches	Construction Contractor	PIU
	Emissions from vehicles	3	2	6	• The contractor shall not set up concrete mixers and hot mixers in the 100 m periphery of the habitations.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	and equipment				• The vehicles shall be maintained regularly. • Vehicles and machineries working in premises shall have PUC certificate.			
	Noise & vibration generation due to operation of vehicles and equipment	5	3	15	• The vehicles and equipment shall be maintained properly to reduce the noise. • DG sets and other noise generating equipment shall be provided with acoustic enclosures. • Avoiding usage of pneumatic drills or heavy vehicles in the vicinity of fragile buildings to reduce vibration.	All along the road stretches	Construction Contractor	PIU
	Soil and Water Pollution due to Spillage / leakage of fuel, oil and lubricants	2	5	10	• Fuel, oil, lubricants and other chemicals shall be stored on concrete platforms. • DG sets, oil/ fuel consuming equipment shall be placed in concrete platforms.	All along the road stretches	Construction Contractor	PIU
	Dust Generation and air quality deterioration due to concrete mixers, hot mixers and other	5	3	15	• Water sprinkling shall be done to control dust emission twice a day in dry areas like stock piles, roads etc., • Stockpiles of raw/ waste material, demolition debris, excavated earth etc., shall be covered with tarpaulin during the entire construction activity.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction works	construction activities				• DG sets if used for construction activity shall meet the required emission standards. • All construction plants like crushers and hot mixers shall be sited sufficiently away from human habitations and occupancies. Such plants shall be located at least 100 m away in the downwind direction. • Periodic Air quality monitoring shall be done at selected locations to check the impact of developmental activity			
	Siltation of waterbodies and degradation of water quality	3	3	9	• Contractor shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment laden water does not drain into water bodies/ ponds viz., Rajbari lake, Jagannath bari lake and Banmalipur dighi along Thakurpalli road, Rani pukur along VIP road.	All along the road stretches	Construction Contractor	PIU
	Impact on water flow of water bodies	2	2	4	• Contractor shall ensure that no construction materials like earth, stone, waste disposed of in a manner that block the flow of water to and from the water bodies/ ponds. • Contractor shall take all necessary measures to prevent any blockage to the water flow. • In addition to the design requirements, the Contractor shall take all required measures as	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					directed by the Environmental Specialist of PIU to prevent temporary or permanent flooding of the site or any adjacent area.			
Construction works	Noise impact on sensitive receptors	5	3	15	• All Construction plants and equipment used in construction shall strictly conform to the MOEFCC/ CPCB noise standards. • At the construction sites within 150 m of the nearest habitation, noisy construction work such as crushing, operation of DG sets, use of high noise generation equipment shall be stopped during the night time between 6.00 pm to 6.00 am. • Provide prior information to the identified sensitive receptors about the work schedule. • Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers the sound impact to surrounding sensitive receptor; and use hydraulic or vibro impact hammers in place of diesel hammers for piling work. • Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at 10 m or more from the vehicles & equipment. • Provision of ear-plugs to workers exposed to high noise levels.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction works					• Periodic Noise monitoring shall be done at selected locations to check the impact of developmental activity on water body.			
	Impacts on landscape and aesthetics due to construction activity	5	2	10	• Stockpiling of raw material, waste, demolition debris, excavated earth etc. to be done only in the designated areas. • Avoid disposal of any debris and waste soils in and around the water bodies or near sensitive areas like hospitals, school etc., • Coordinate with PIU for beneficial uses of excess excavated soils or immediately disposed to DC Nagar Lunga site.	All along the road stretches	Construction Contractor	PIU
	Hindrance to traffic movement	5	2	10	• Do not close the road completely, ensure that work is conducted onto edge of the road; allow traffic to move on one line. • In unavoidable circumstances of road closure, provide alternative routes, and ensure that public is informed about such traffic diversions. • At all work sites public information/ caution boards in English and local language (Bengali) shall be provided - information shall inter-alia include: project name, cost and schedule; executing agency and contractor details; nature and schedule of work at that road/	All Road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction works					locality; traffic diversion details, if any; entry restriction information; competent official's name and contact for public complaints. • Prepare a Traffic Management Plan.			
	Nuisance/ disturbance to sensitive areas	3	2	6	• No material should be stocked in sensitive area; material shall be brought to the site as and when required. • Conduct work manually with small group of workers and less noise; minimize use of equipment and vehicles especially near Government Ayurvedic hospital and Agartala nursing home areas. • No work should be conducted near the temples along the road during religious congregations. • Implement all measures suggested elsewhere in this report - dust and noise control, public safety, traffic management, strictly at these sites.	All along the road stretches	Construction Contractor	PIU
	Blockage of Drainage and flooding	2	3	9	• Contractor shall ensure that no construction materials like earth, stone, or appendage disposed of in a manner that block the flow of water of any water course and cross drainage channels. • Contractor shall take all necessary measures to prevent any blockage to the water flow. Contractor shall follow the instructions of ASCL and PIU on easy flow of water.	All along the road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Handling of Bitumen for road works	Contamination of soil and water due to accidental spillage or leakage of bitumen	2	3	6	• Care shall be taken that the bitumen shall not be spilled and no leakage shall take place at site. The bitumen will decrease soil fertility and pollute the receiving water body due to phenolic compounds. • Workers at site shall be trained on environmental damages of bitumen on soil and water.	All along the road stretches	Contractor EHS officer and Construction Contractor	PIU
	Injuries due to spill of hot bitumen	2	3	6	• Protective footwear, protective goggles, hand gloves and nose masks to be provided compulsorily to the workers employed in asphalt works. • Workers shall be trained before handling of hot bitumen.	All along the road stretches	Contractor EHS officer and Construction Contractor	PIU
Storage, handling and disposal of surplus excavated earth, Demolition Debris, construction wastes, drain silt	Air Pollution due to loading and transportation of wastes	5	2	10	• Around 95,000 cum of surplus excavated earth, 18,000 cum of demolition debris, 5000 cum of drain silt shall be disposed of in DC Nagar Lunga AMC dump site. • Before loading the wastes into vehicles, the stockpiles shall be water sprinkled to reduce the dust emission. • Transportation vehicles carrying waste materials shall be covered with tarpaulin to avoid emission of finer particles and dust. • The vehicles carrying wastes shall be checked for their PUC certificate and its fitness.	All Road stretches	Construction Contractor	PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	Land contamination and water pollution	3	3	9	• The surplus excavated earth and other construction wastes shall not be dumped on any agricultural land, grass land or water bodies which contaminate the soil and water bodies of Agartala.	Disposal Site	Construction Contractor	PIU
	Degradation of Aesthetics	5	2	10	• The wastes shall not be disposed on road sides of city or anywhere which degrades the aesthetics of the place. • Contractor shall be penalized for disposal of wastes in private/ unauthorized lands or water bodies.	Disposal Site	Construction Contractor	PIU

Table 43: Site Specific EMP for Ponds/ Water bodies

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Excavation of soil	Runoff from stockpiles contaminating water	2	3	6	• Stockpiles shall be at least 5 m away from the waterbodies 1. Buri's pukur, Melarmath pukur, Amiyasagar, Shanti sagar pond, Kumar pukkur along HGB road, 2. Jagannathbari pond, Rjabari pond and Banmalipur dighi along Thakurpalli Road 3. Rani Pukur along VIP Road 4. Jora pond, Abhoynagar pond, Ranir Tila along GB Road 5. Bhodjung pond along Jail Ashram Road • Measures like covering the stockpiles so that the sediment laden water shall not enter the watercourse and contaminate these waterbodies due to excavation activities.	All along the road stretches	Construction Contractor	PIU
	Siltation of waterbodies	3	3	9	• Excavated earth shall be stored in designated areas. • Excavated earth stockpile shall be covered so that sediment laden water does not drain into nearby watercourse. • Prioritize re-use of excess soils and debris in the construction works.	All along the road stretches	Construction Contractor	PIU
Construction Works	Siltation of waterbodies and degradation of water quality	3	3	9	• Contractor shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment laden water does not drain into water bodies/ ponds viz., Rajbari lake, Jagannath bari lake and Banmalipur dighi along Thakurpalli road, Rani pukur along VIP road near Ginger Hotel and Mukta pukur on Akhaura road.	All along the road stretches	Construction Contractor	PIU

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	Impact on water flow of water bodies	2	2	4	• Contractor shall ensure that no construction materials like earth, stone, waste disposed of in a manner that block the flow of water to and from the water bodies/ ponds. • Contractor shall take all necessary measures to prevent any blockage to the water flow. • In addition to the design requirements, the Contractor shall take all required measures as directed by the Environmental Specialist of PIU to prevent temporary or permanent flooding of the site or any adjacent area.	All along the road stretches	Construction Contractor	PIU
Usage of Construction vehicles and equipment	Soil and Water Pollution due to Spillage / leakage of fuel, oil and lubricants	2	5	10	• Fuel, oil, lubricants and other chemicals shall be stored on concrete platforms. • DG sets, oil/ fuel consuming equipment shall be placed in concrete platforms.	All along the road stretches	Construction Contractor	PIU

Table 44: Site Specific EMP for Labour Camp

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Labour Camp Set up	Water and land Pollution due to discharge of sewage	3	3	6	• Contractor shall set up toilets with septic tank and soak pit at labour camp.	Labour Camp area	Construction Contractor	Environmental Specialist of PIU
	Air Pollution due to burning of solid waste	2	2	4	• Contractor shall provide bins for storage of solid waste and hand over the collected solid waste to AMC collection vehicles for processing.	Labour Camp area	Construction Contractor	Environmental Specialist of PIU
	Loss of trees for fuel wood	2	2	4	• Fuel provision shall be made available in camp like LPG so that no tree cutting is involved for fuel wood. • Labourers shall be strictly informed no to cut trees for cooking or other purposes.	Labour Camp area	Construction Contractor	Environmental Specialist of PIU
	Ill-health and unhygienic conditions	3	3	9	• Contractor shall arrange potable drinking water for workers in camp. • Shall provide adequate number of separate toilets for male and female workers.	Labour Camp area	Construction Contractor	Environmental Specialist of PIU

Site Specific EMP for Open Spaces for storage of material and construction equipment

273. There are 5 open spaces encountered during the field visit which can be used for storage of raw material, equipment and machineries. Contractor shall talk to the owners of these open spaces and make arrangements for storage of raw materials and construction equipment. The open spaces are situated in HGB Road, GB Road, Barjala Road and Jail Ashram Road. The details of the same are given in Table 45.

Table 45: Open Spaces for Storage of Material and Equipment

Sr. No.	Road and Coordinates of places	Photographs
1.	HGB Road, Near Battala Bridge Lat: 23°49'43.91" N Long: 91°16'12.19" E	
2.	GB Road, Near Ramthakur Club Lat: 23°49'29.05" N Long: 91°17'07.44" E	
3.	Barjala Road, Behind Saha Decorators Lat: 23°51'02.76" N Long: 91°16'12.59" E	

Sr. No.	Road and Coordinates of places	Photographs
4.	Barjala Road, Near Panchabati Kali Mandir Lat: 23°52'20.22" N Long: 91°16'19.19" E	
5.	Jail Ashram Road, Old Jail Premises Lat: 23°52'20.22" N Long: 91°16'19.19" E	

Table 46: Site Specific EMP for Open Spaces for storage of material and construction equipment

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction Stage								
Storage/ Stockpile area	Dust Generation from stockpiles	5	3	15	• Water sprinkling on surface of stockpiles.	Storage/ Stockpile area	Construction Contractor	PIU
	Runoff from stockpiles contaminating water	2	3	6	• Stockpiles shall be at least 5 m away from the waterbodies. • Entire premises shall be barricaded to prevent outflow of material along with runoff.	Storage/ Stockpile area	Construction Contractor	PIU
	Noise generation from excavation	5	2	10	• Restrict the storage and transportation work only during day time between 8 am to 6 pm.	Storage/ Stockpile area	Construction Contractor	PIU
	Siltation of waterbodies	3	3	9	• Excavated earth shall be stored in designated areas as shown in image. • Excavated earth stockpile shall be covered so that sediment laden water does not drain into nearby watercourse. • Prioritize re-use of excess soils and debris in the construction works.	Storage/ Stockpile area	Construction Contractor	PIU
	Hindrance to Accessibility	3	2	6	• The contractor shall provide prior intimation to the occupants of the surrounding area shops and residents.	Storage/ Stockpile area	Contractor	PIU
	Disturbance to utilities	2	2	4	• In case of any disturbance to the existing utilities due to storage activity, the contractor shall replace and reconnect utilities without	Storage/ Stockpile area		PIU

Activity	Environmental Issue	Likelihood (Score)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					disrupting the commercial activities in the shops and establishments.			
	Blockage of Drainage and flooding	2	3	9	• Contractor shall ensure that no excavated earth is stored/ stockpiled in a manner that block the flow of water of any water course and cross drainage channels. • Contractor shall take all necessary measures to prevent any blockage to the water flow. Contractor shall follow the instructions of ASCL and PIU on easy flow of water.	Storage/ Stockpile area	Construction Contractor	PIU
Storage of Oil, fuel, lubricants and other hazardous materials	Water Pollution due to spillage/ leakage	3	5	15	• Hazardous materials like paints, solvents, fuel and oils shall be stored only when it is necessary • The storage shall be in the designated area and on concrete platforms. • Periodic Water quality monitoring shall be done to check the impact of leakage/ spillage on water body.	Storage/ Stockpile area	Construction Contractor	PIU
Parking and Storage of Construction vehicles and equipment	Soil Contamination due to Spillage / leakage of fuel, oil and lubricants	2	5	10	• Fuel, oil, lubricants and other chemicals shall be stored on concrete platforms. • DG sets, oil/ fuel consuming equipment shall be placed in concrete platforms.	Storage/ Stockpile area	Construction Contractor	PIU

Activity	**Environmental Issue**	**Likelihood** (Score)	**Consequence**	**Risk Score** (consequence x likelihood)	**Mitigation Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
Material and Human Safety	Runoff and Injuries	2	3	6	• The storage site shall be barricaded to prevent runoff of raw materials and entry of unauthorized personnel including children.	Storage/ Stockpile area	Construction Contractor	PIU

274. The Operation and Maintenance EMP along with environmental risk matrix and the proposed mitigation measure during the construction phase and operation phase is given in Table 47 below.

Table 47: Operation and Maintenance EMP for Upgradation of Major Roads

Activity	Environmental Issue	Likelihood ore)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Operation Stage								
Maintenance of drains	Blockage of drains/ flooding	2	2	4	• ASCL/ PIU shall ensure that all drains (side drains, median drain and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding.	All road stretches	O&M Contractor	ASCL/ PIU
Maintenance of damaged roads	Contamination of soil and water due to accidental spillage or leakage of bitumen	2	3	6	• Care shall be taken that the bitumen shall not be spilled and no leakage shall take place at site. The bitumen will decrease soil fertility and pollute the receiving water body due to phenolic compounds. • Workers at site shall be trained on environmental damages of bitumen on soil and water	All along the road stretches	O&M Contractor	ASCL/ PIU
	Injuries due to spill of hot bitumen	2	3	6	• Protective footwear, protective goggles, hand gloves and nose masks to be provided compulsorily to the workers employed in asphalt works. • Workers shall be trained before handling of hot bitumen.	All along the road stretches	O&M Contractor	ASCL/ PIU
Maintenance of Utilities cables	Injuries and electrical shock	1	5	5	• Proper care shall be taken to switch off the main line before taking up utilities maintenance work. • Maintenance workers shall be provided with hand glows, safety	All along the road stretches	O&M Contractor	ASCL/ PIU

Activity	Environmental Issue	Likelihood ore)	Consequence	Risk Score (consequence x likelihood)	Mitigation Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					shoes and other PPEs required for the work. • Lock Out Tag Out system shall be followed for maintenance works.			

B. Institutional Arrangement

275. Agartala Smart City Limited (ASCL) will be the executing agency (EA) and implementing agency (IA) for the Project, responsible for management, coordination and execution of all activities funded under the loan. The PMU[24] will be responsible for implementing the Project, while the PIUs[25] at project level will support the PMU. The social and environmental safeguards specialists (consultants) will be recruited and function as Project Management Consultants who will support PMU / PIUs in safeguard compliance. The Board of Directors of ASCL will provide policy related directions and project oversight to PMU.

276. The PMU will be headed by a Project Director and will be responsible for: 1) approval of detailed project reports; 2) technical sanction on tender/bid evaluation; 3) overall monitoring, supervision & project implementation, and 4) any other matter related to implementation of Social and Environment Safeguard as per ADB SPS requirements from time to time. The Board of Directors of ASCL may assign any other requirements related to ADB assisted project to PMU from time to time. The PMU will have a Safeguard and Gender Cell (SGC) to oversee all safeguards and gender related activities. The SGC at PMU is to be headed by a Safeguard Specialist, who is the Environment and Social Nodal Officer of ASCL, (preferably with bachelor's or master's degree in Environmental Engineering); to be provided with training on ADB SPS 2009. The Safeguard Specialist (E&S Nodal Officer-ASCL) will report directly to the Project Director. The SGC will have a gender expert for the entire project period who will report on the project's gender related results to the Project Director.

277. The PIUs will be headed by Deputy Project Director (DPD) who will have overall responsibility for safeguards management. An Environmental and Social Safeguards Unit (ESSU) will be established for safeguards management which will be staffed with one Assistant Engineer each for environmental and social safeguards. PMC will provide project implementation support to PIUs and will include an Environment Management Specialist and a Social Management Specialist for facilitating safeguards management and reporting. During Implementation, contractor team shall include an Environmental, Health & Safety (EHS) Officer and a Social Safeguard Officer.

278. The institutional roles and responsibilities for environmental safeguards implementation at PMU, PIUs and Contractors level is described below:

C. Safeguards Implementation Arrangement:

1. Project Management Unit:

279. SGC at PMU level will have overall responsibility of implementation of project in compliance with ADB SPS 2009, country legislations, and project-specific policies relating to Grievance Redress Mechanism as agreed between ASCL and ADB. The SGC headed by Nodal Officer (Environmental and Socila) will be supported by environmental specialist of PMC team.

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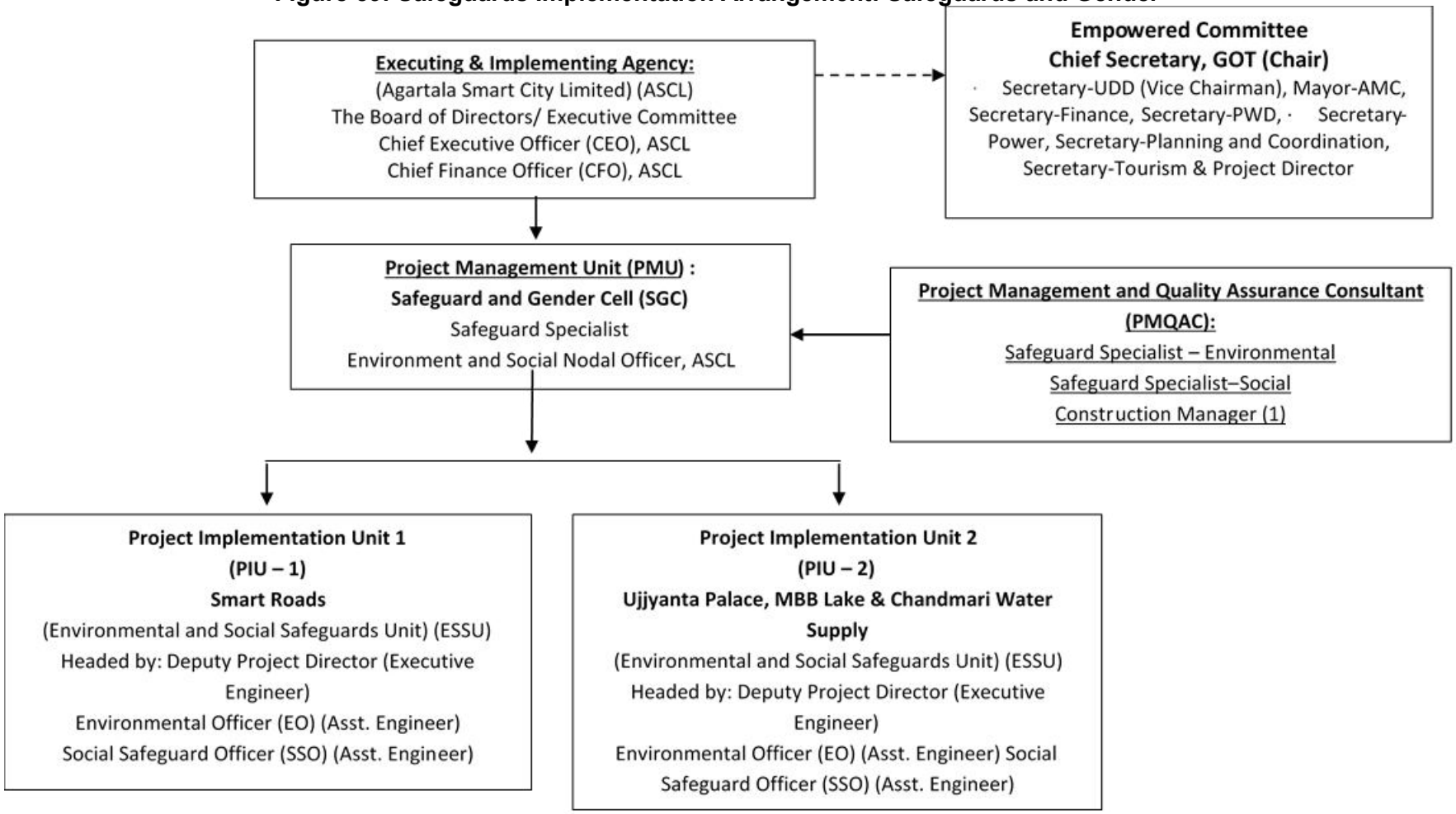
[24] A Project Management Unit (PMU) will be set up comprising of senior management from ASCL.

[25] Two Project Implementation Units (PIUs) will be set up as follows: (i) PIU for Maharajah Bir Bikram (MBB) College Lake Revitalization; Revival and Restoration of Ujjayanta Palace Complex and Chandmari water supply project (ii) PIU for Upgradation of Major Roads in Agartala City.

The Nodal Officer (Environmental and Social) will have overall responsibility in implementation of the environmental safeguard requirements including appropriate monitoring and reporting responsibilities. Key tasks and responsibilities of the Nodal Officer are as follows:

Figure 59: Safeguards Implementation Arrangement: Safeguards and Gender



280. **Nodal Officer (Environmental and Social) at PMU. Environmental Safeguards Responsibilities**

(i)
(ii) Review and finalize subproject environmental category;
(iii) Oversee preparation of IEEs; confirm existing IEEs/EMPs are updated based on detailed designs.
(iv) Ensure that EMPs are included in bidding documents and civil works contracts;
(v) provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by PIUs and contractors;
(vi) Facilitate and ensure compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant;
(vii) Supervise and provide guidance to the PIUs to properly carry out the environmental monitoring as per the IEE/EMP;
(viii) Review, monitor, and evaluate the effectiveness with which the EMPs are implemented, and recommend corrective actions to be taken as necessary;
(ix) Consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB (see the format in Appendix 13);
(x) Ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public; and
(xi) Address any grievances brought about through the grievance redress mechanism in a timely manner.

281. **Project Implementation Units**. PIU will be headed by a Deputy Project Director and supported by PMC. Two PIUs will be established for (i) Roads sub-project and (ii) MBB Lake and Ujjayanta Palace subprojects. An Environmental and Social Safeguards Unit (ESSU) will be established for safeguards management at the PIUs level which will staffed with one Assistant Engineer – Environment (AEE). AEE will oversee the safeguards implementation at PIU level and report to Nodal Officer at PMU. Key tasks and responsibilities of AEE are as below:

282. **Assistant Engineer Environment (AEE) at PIU**

(i) Coordinate public consultation and information disclosure
(ii) Liaise with local offices of regulatory agencies in obtaining clearances /approvals
(iii) Oversee day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations, take necessary action for obtaining rights of way
(iv) Ensure continuous public consultation and awareness
(v) Coordinate grievance redress process and ensure timely actions by all parties
(vi) Review and forward Monthly EMP Monitoring Reports of Contractor to PMU

283. PMC will appoint an environmental specialist for the project. EHS supervisor of Contractor will provide all necessary assistance to environment specialist of PMC in updating IEEs and will supervise day-to-day EMP implementation. Following are the key tasks of environmental specialist of PMC.

(i) Assist in prepare / update REA checklist
(ii) Assist in identification of sites/components in compliance with exclusion criteria and project environmental selection guidelines

(iii) Assist in update / prepare IEE report
(iv) Provide guidance and oversee work of EHS supervisor
(v) Assist in conduct public consultation & information disclosure
(vi) Monitor the implementation of EMP by contractor; report effectiveness and identify the need for corrective actions; work closely with Environmental Specialist
(vii) Assist in review monthly EMP implementation reports submitted by contractors
(viii) Oversee and provide guidance to contractors on environmental monitoring (air, noise, etc.) as per the EMP
(ix) Assist in preparing semi-annual Environmental Monitoring Reports
(x) Assist in grievance redress, and ensure redress
(xi) Provide regular on-site training programs to contractors site staff and supervisors

284. **Environmental Safeguards Tasks of PMC:** PMC will assist SGC PMU to achieve compliance with the environmental management and monitoring requirements in accordance with ADB Safeguard Policy Statement 2009 and government policies and ensuring that the contractors and their sub-contractors design, construct and operate the project facilities in compliance with the same. Detailed tasks of the PMC include, but are not limited to, the following:

(i) Establish a system to monitor environmental safeguards of the Project; including the functioning of the GRM, and prepare indicators for monitoring important parameters of environmental safeguards;
(ii) Support PMU to prepare semi-annual environmental safeguard monitoring reports that will be appraised during project implementation;
(iii) Support the PMU in ensuring that the environmental safeguard activities are carried out in accordance with the agreed plans and frameworks;
(iv) Ensure that the relevant measures specified in the resettlement plans, and gender action plan will be incorporated in bidding documents and approved by ADB prior to issuance of invitation for bidding and monitor their compliance on behalf of PMU; and
(v) Ensure monitoring of social safeguards plans and gender action plan and address unanticipated impacts, if any; and
(vi) Provide training programs to PMU/PIU staff and contractors involved in the project implementation for strengthening their capacity in managing and monitoring social safeguards and gender.

285. PMC will engage services of the following specialists as and when required to address site-specific environmental requirements as below:

(i) **Environment Specialist Consultant.** Responsibilities include the review and refinement of the IEEs and the EMPs and ensure inclusion in the bid documents and during construction, monitor the implementation of the EMPs and support in the reporting and documentation requirements;
(ii) **Heritage Management Specialist.** Provides guidance on the ADB SPS requirement on Physical Cultural Resources in the ASCL project including the conduct of Heritage Impact Assessment, provides support on the statutory clearances to be obtained and the documentation and reporting on the implementation of mitigation measures; and
(iii) **Biodiversity Expert.** Provides guidance on the ADB SPS requirement on Biodiversity Conservation and Critical Habitat Assessment including the conduct preliminary screening (e.g. IBAT assessment reports), on-site verifications and

consultations, recommend specific measures and provide supervisor support during the planning and construction periods;

286. **Civil works contracts and contractors.** EMPs are to be included in bidding and contract documents and verified by the PIUs and PMU. The contractor will be required to designate an Environment, Health and Safety (EHS) supervisor to ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contract. The contractor will be required to submit to PMU, for review and approval, a site environmental management plan (SEMP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEMP; and (iv) budget for SEMP implementation. No works are allowed to commence prior to approval of SEMP.

287. A copy of the EMP/approved SEMP will be kept on site during the construction period at all times. The EMP included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

Table 48 : Institutional Roles and Responsibilities for Environmental Safeguards Implementation

Responsible Agency	**Responsibility**		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
PMU Safeguard Officer [E&S Nodal Officer-ASCL]	(i) Review REA checklists and assign categorization based on ADB SPS 2009 (ii) Review and approve EIA/IEE (iii) Submit EIA/IEE to ADB for approval and disclosure in ADB website (iv) Ensure approved IEEs are disclosed in PMU websites and summary posted in public areas accessible and understandable by local people. (v) Ensure environmental management plans (EMPs) are included in the bid documents and contracts (vi) Organize an orientation workshop for PMU, PIU, ULB and all staff involved in the project implementation on (a) ADB SPS, (b) Government of India national, state, and local environmental laws and regulations, (c) core labor standards, (d) OH&S, (e) EMP implementation especially spoil management, working in congested areas, public relations and ongoing consultations, grievance redress, etc.	(i) Over-all environmental safeguards compliance of the project (iii) Monitor and ensure compliance of EMPs as well as any other environmental provisions and conditions. (vi) Review monthly monitoring report (v) Prepare and submit to ADB semi-annual monitoring reports (vi) If necessary, prepare Corrective Action Plan and ensure implementation of corrective actions to ensure no environmental impacts; (vii) Review and submit Corrective Action Plans to ADB (viii) Organize capacity building programs on environmental safeguards	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	(vii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (viii) Organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation. (ix) Ensure compliance with all government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (x) Assist PMU, PIUs, and contractor to document and develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE. (xi) Assist in the review of the contractors' implementation plans to ensure compliance with the IEE.	(ix) Coordinate with national and state level government agencies (x) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (xi) Coordinate PIUs, consultants and contractors on mitigation measures involving the community and affected persons and ensure that environmental concerns and suggestions are incorporated and implemented	
PIU, Assistant Engineer Environment	(i) Ensure IEE is included in bid documents and contract agreements. Ensure cost of EMP implementation is provided. (ii) Disclose of approved EIAs/IEEs. (v) Obtain all necessary clearances, permits, consents, NOCs, etc. Ensure compliance to the provisions and conditions. (iii) EMP implementation regarding sites for disposal of wastes, camps, storage areas, quarry sites, etc. (ivi) Organize an induction course for the training of contractors, preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures, and on taking immediate action to remedy unexpected adverse	(i) oversee day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations. (ii) take necessary action for obtaining rights of way; (iii) oversee implementation of EMPs, including environmental monitoring by contractors; (iv) take corrective actions when necessary to ensure no environmental impacts; (v) submit monthly environmental monitoring reports to PMU,	(i) Conducting environmental monitoring, as specified in the EMP. (ii) Issuance of clearance for contractor's post-construction activities as specified in the EMP.

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	impacts or ineffective mitigation measures found during the course of implementation.	(vi) conduct continuous public consultation and awareness; (vii) address any grievances brought about through the grievance redress mechanism in a timely manner as per the IEEs; and	
Consultant – PMQAC-Environmental Specialist	(i) Review IEE/EMP submitted by PIU and revise report to submit to PMU (ii) Assist PMU and PIU in obtaining all necessary clearances, permits, consents, NOCs, etc. Ensure provisions and conditions are incorporated in the IEE and detailed design documents. (iii) Update initial environmental assessment for proposed project using REA checklists and submit to PIU (iv) Assist in ensuring IEE is included in bid documents and contract agreements. (v) Assist in determining adequacy of cost for EMP implementation. (vi) Assist in summarizing IEE and translating to language understood by local people. (vii) Assist in addressing any concern related to IEE and EMP. (viii). Conduct specific assessment requirements	(i) Monitor EMP implementation (ii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs. (i) Monitoring of Implementation of EMP at site by contractor (ii) Recommend corrective action measures for non-compliance by contractors (iii) Assist in the review of monitoring reports submitted by contractors (iv) Assist in the preparation of monthly monitoring reports conduct continuous public consultation and awareness;	(i) Assist in the inspection and verification of contractor's post-construction activities.
Consultant – PMQAC-Construction Manager / Deputy Construction Manager	(i) Ensure site-specific EMP and Occupational Health and safety measures are prepared by the contractor prior to mobilization / start of construction. (ii) Assist in addressing any concern related to IEE and EMP. (iii) Conduct specific assessment requirements	(i) Monitor EMP implementation at site by the contractor. (ii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs.	(i) Facilitate and assist environment specialist in the inspection and verification of contractor's post-construction activities.
Contractors (EHS Engineer)	(i) Review the IEE and provide information about changes needed as per revised design and scope of works to E&S Nodal Officer of PMU for final revision of IEE	(i) Implement EMP. (ii) Implement corrective actions if necessary. (iii) Prepare and submit monitoring reports including pictures to PIU	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	(ii)Prepare EHS plan and take approval from PIU and Ensure EMP implementation cost is included in the methodology. (iii) Undergo EMP implementation orientation by E&S Nodal Officer of PMU prior to start of works (iv) Provide EMP implementation orientation to all workers prior to deployment to worksites (v) Seek approval for camp sites and sources of materials. (vi) Ensure copy of IEE is available at worksites. Summary of IEE is translated to language understood by workers and posted at visible places at all times.	(iv) Comply with all applicable legislation, is conversant with the requirements of the EMP; (v) Brief his staff, employees, and laborer about the requirements of the EMP and provide environmental awareness training to staff, employees, and laborers; (vi) Ensure any sub-contractors/ suppliers who are utilized within the context of the contract comply with all requirements of the EMP. The Contractor will be held responsible for non-compliance on their behalf; (vii) Bear the costs of any damages/ compensation resulting from non-adherence to the EMP or written site instructions; (viii) Ensure that PIU are timely informed of any foreseeable activities related to EMP implementation.	

D. Training Needs

288. Executing and implementing agencies need to have a sustained capacity to manage and monitor environmental safeguards. Although specialist consultants support will be available to PMU and PIUs, it is necessary to mainstream safeguards in day-to-day working. Therefore, PMU and PIUs require capacity building measures for (i) a better understanding of the project-related environmental issues; and (ii) to strengthen their role in preparation of IEE, implementation of mitigation measures, and subsequent monitoring. Trainings and awareness workshops are included in the project with the primary focus of enabling the PMU and PIU staff to understand impact assessments and carry out environmental monitoring and implement EMPs. After participating in such activities, the participants will be able to review environmental assessments, conduct monitoring of EMPs, understand government and ADB requirements for environmental assessment, management, and monitoring (short- and long-term), and incorporate environmental features into future project designs, specifications, and tender documents and carry out necessary checks and balances during project implementation.

289. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites.

290. The following Table 49 presents the outline of capacity building program to ensure EMP implementation. The estimated cost is Rs. 3,35,000 (excluding trainings of contractors which will be part of EMP implementation cost during construction) to be covered by the project's capacity building program. The detailed cost and specific modules will be customized for the available skill set after assessing the capabilities of the target participants and the requirements of the project.

Table 49: Outline of Capacity Building Program on EMP Implementation

Description	Target Participants	Estimate (INR) — (Lump sum)	Cost and Source of Funds
1. Introduction and sensitization to environment issues (1 day) • ADB Safeguards Policy Statement and IFC Health and Safety Standards. • Government of India and Tripura applicable safeguard laws, regulations and policies including but not limited to core labor standards, OH&S, etc • Incorporation of EMP into the project design and contracts • Monitoring, reporting and corrective action planning	All staff and consultants involved in the project	Rs.50,000.00	PMU cost
2.EMP implementation (3 days) • Roles and responsibilities • OH&S planning and implementation • Wastes management (water, hazardous, solid, excess construction materials, spoils, etc.) • Working in congested areas, • Public relations • Consultations • Grievance redress • Monitoring and corrective action planning • Reporting and disclosure • Post-construction planning	All staff and consultants involved in the project All contractors prior to award of contract	Rs. 1,00,000.00	PMU cost

Description	Target Participants	Estimate (INR) — (Lump sum)	Cost and Source of Funds
3. Plans and Protocols (3 days) • - Construction site standard operating procedures (SOP) • Site-specific EMP • Traffic management plan • Spoils management plan • Waste management plan • O&M plans • Post-construction plan	All staff and consultants involved in the project All contractors prior to award of contract or during mobilization stage.	Rs. 50,000.00 Rs. 75,000.00	PMU cost Contractors cost as compliance to contract provisions on EMP implementation (refer to EMP tables)
4. Experiences and best practices sharing • Experiences on EMP implementation • Issues and challenges • Best practices followed	All staff and consultants involved in the project. All contractors All NGOs.	Rs.30,000.00	PMU Cost
5. Contractors Orientation to Workers on EMP implementation (OH&S, core labor laws, spoils management, community health, awareness on HIV-AIDS etc)	All workers (including manual laborers) of the contractor prior to dispatch to worksite.	Rs. 30,000.00	Contractors cost as compliance to contract provisions on EMP implementation (refer to EMP tables)

E. Monitoring and Reporting

291. Prior to commencement of the work, the contractor will submit a compliance report to ASCL/ PIU ensuring that all identified pre-construction environmental impact mitigation measures as detailed in the EMP will be undertaken. ASCL with the assistance of the consultant environment specialist will review the report and thereafter ASCL will allow commencement of works. During construction, results from internal monitoring by the contractor will be reflected in their weekly EMP implementation reports to the Construction Supervision Specialist. These weekly reports will be retained in construction supervision office for reference. Construction Supervision Specialist will review and advise contractors for corrective actions if necessary. Sample site inspection checklist is attached in Appendix 12, semi-annual monitoring report (Appendix 13) summarizing compliance and corrective measures taken will be prepared by Construction Supervision Specialist to be reviewed and endorsed by Municipal Corporation to Agartala Smart City Ltd. SEMR will also include monitoring details relating to the implementation of site specific OHS plan and compliance with the COVID19 plan. Based on monthly reports and measurements, PMU will draft, review, and submit to ADB, 6-monthly (twice a year) EMP implementation progress report (Appendix 13). Once concurrence from the ADB is received the report will be disclosed in the Project website. ADB will review project performance against the Agartala Smart City Ltd commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising

of social and environmental safeguards will be integrated into the project performance management system.

292. Monitoring Methods: All environmental monitoring and relevant operational data will be stored in a relational database and linked MIS system. This will enable efficient retrieval and storage and interpretation of the data. Regular data extracts and interpretive reports will be sent to the regulator.

293. Air Quality Monitoring: The ambient concentrations of SPM, SO2, NOx, CO and HC in the ambient air will be monitored at regular intervals. Any abnormal rise will be investigated to identify the causes, and appropriate action will be initiated. Green belt shall be developed for minimizing dust propagation. The ambient air quality data should be transferred and processed in a centralized computer facility equipped with required software. Trend and statistical analysis should be done.

294. Noise Levels: Ambient noise levels near habitations shall also be monitored once in six months. Audiometric tests should be conducted periodically for the employees working close to the high noise sources.

295. Monitoring of Surface Water: Methods prescribed in “Standard Methods for Examination of water and Wastewater” prepared and published jointly by American Public Health Association (APHA), American Water Works Association (AWWA) and Water Pollution Control Federation (WPCF); Manual on water and wastewater Analysis published by NEERI, Nagpur are recommended.

296. Monitoring Ground Water: The groundwater samples shall be taken from representative locations periodically and analyzed for necessary corrective actions, if any

297. Data Analysis: The monitored data will be analyzed and compared with the baseline and the regulatory standards specified by different government agencies. The standards against which the different environment components will be compared are as per Table 50.

Table 50: Applicable Standards for Different Environmental Components

Sr. No.	Component	Applicable Standards
1.	Ambient Air Quality	National Ambient Air Quality standards, CPCB
2.	Noise Quality	Ambient Air Quality Standards with Respect to Noise, CPCB
3.	Surface water Quality	IS:2296: Class ‘C’ Water, CPCB
4.	Ground water Quality	IS: 10500 Standards, BIS
5.	Soil Quality	--

F. EMP Implementation Cost

298. Most of the mitigation measures require the contractors to adopt good site practice, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. Regardless of this, any costs of mitigation by the construction contractors or consultants are included in the budgets for the civil works and do not need to be estimated separately here. Cost for the capacity building program is included as part of the project. The EMP cost includes the cost for providing water supply, sanitation facilities etc., for the workers. In addition to this, hard barricades need to be provided at the work sites to prevent any entry of the public or animals into the worksite and to prevent any possible accidents.

Table 51: Environmental Monitoring Plan

Sr. No.	Type	Locations	Parameters	Period and Frequency	Institutional Responsibility	
					Implementation	Supervision
Pre-Construction						
1	Ambient Air Quality	10 locations along the main junction across subproject roads. (G B Hospital, ITI College, Kshudiram school jail Road, Higher Sec School at Barjala Road, Old age home at Barjala Road, IGM Hospital, Umakanta School at Akhaura Road, Sri Krishna Mission School, Health Centre GB Road, Health Centre Jail Ashram Raod)	PM10, $PM_{2.5}$, Sulphur dioxide (SO_2), Oxides of nitrogen (NO_2), Carbon monoxide (CO), Hydrocarbon (HC), Volatile Organic Compounds (VOC's)	24-hr (8hr for CO) average samples. once	Contractor through MOEFCC approved agency	PIU
2	Surface Water	8 locations, sampling from (Katakhal River at VIP road crossing, Ponds near Ujjayanta Palace, MBB Lake, Internal Road of IT Hub, Pond near Jail Road, Pond at Jail Ashram Road, Lankamura Road pond, Katakhal Canal)	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals	once	Contractor through MOEFCC approved agency	PIU
3	Ground Water	4 Locations, sampling from existing wells along the subproject road	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals	once	Contractor through MOEFCC approved agency	PIU
4	Noise	8 locations, (Ravindra Bhawan, Ujjayanta Palace, Akhaura Check post, G B Hospital, Barjala School, Old age home at Barjala Road, Kshudiram School, IGM Hospital Road.)	24hrly Day and Night time Leq levels	once	Contractor through MOEFCC approved agency	PIU
Construction Phase						

Sr. No.	Type	Locations	Parameters	Period and Frequency	Institutional Responsibility	
					Implementation	Supervision
1	Ambient Air Quality	10 locations along the main junction across subproject roads. (G B Hospital, ITI College, Kshudiram school jail Road, Higher Sec School at Barjala Road, Old age home at Barjala Road, IGM Hospital, Umakanta School at Akhaura Road, Sri Krishna Mission School, Health Centre GB Road, Health Centre Jail Ashram Raod)	PM10, $PM_{2.5}$, Sulphur dioxide (SO_2), Oxides of nitrogen (NO_2), Carbon monoxide (CO), Hydrocarbon (HC), Volatile Organic Compounds (VOC's)	24-hr (8hr for CO) average samples. once in quarter for 21 months except for monsoon season	Contractor through MOEFCC approved agency	PIU
2	Surface Water	8 locations, sampling from (Katakhal River at VIP road crossing, Ponds near Ujjayanta Palace, MBB Lake, Internal Road of IT Hub, Pond near Jail Road, Pond at Jail Ashram Road, Lankamura Road pond, Katakhal Canal)	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals	once in quarter for 21 months except for monsoon season	Contractor through MOEFCC approved agency	PIU
3	Ground Water	4 Locations, sampling from existing wells along the subproject road	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals	once in quarter for 21 months except for monsoon season	Contractor through MOEFCC approved agency	PIU
4	Noise	8 locations, (Ravindra Bhawan, Ujjayanta Palace, Akhaura Check post, G B Hospital, Barjala School, Old age home at Barjala Road, Kshudiram School, IGM Hospital Road.)	24hrly Day and Night time Leq levels	once in quarter for 21 months except for monsoon season	Contractor through MOEFCC approved agency	PIU
5	Implementationof COVID guidelines	All Construction site, worker camp and contractor's officies	As mentioned in latest government guidelines	Daily and weekly	Contractor through authorized agency to handle COVID- 19	PIU and PMU

Sr. No.	Type	Locations	Parameters	Period and Frequency	Institutional Responsibility	
					Implementation	Supervision
				reporting to pmu		
Operation Phase						
1	Ambient Air Quality	10-To be selected after consultation with SPCB	PM10, PM2.5, Sulphur dioxide (SO_2), Oxides of nitrogen (NO_2) Carbon monoxide (CO) Hydrocarbon (HC) (VOC's)	24-hr (8hr for CO) average samples once in quarter for 21 months except for monsoon season	Contractor through MOEFCC approved agency	PMU
2	Ground Water	8-To be selected after consultation with SPCB	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals	once in quarter for 21 months except for monsoon season	Contractor through MOEFCC approved agency	PMU
3	Surface Water	4-To be selected after consultation with SPCB	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals	once in quarter for 21 months except for monsoon season	Contractor through MOEFCC approved agency	PMU
4	Noise	8- Locations covering the project site and in the surrounding to be identified in consultation with SPCB	24hrly Day and Night time Leq levels	once in quarter for 21 months except for monsoon season	Contractor through MOEFCC approved agency	PMU

Sr. No.	Type	Locations	Parameters	Period and Frequency	Institutional Responsibility	
					Implementation	Supervision
5	Inmplimentatation of covid guidelines	All Construction site, worker camp and contractor's officies	As mentioned in latest government guidelines	Daily and weekly reporting to pmu	Contractor through authorized agency to handle COVID- 19	PMU

Table 52: Estimatied Quantities for implementation of EMP

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
A	**Implementation staff**						
A	EHS Officer with Diploma or degree in civil/ environmental engineering with minimum 5 years of experience in construction safety with knowledge of NEBOSH and OSHA.	Construction	Per month	21	50,000	1,050,000	Civil Works Contract
B	**Monitoring measures-**						
	Pre-Construction Phase						
1	Periodic air quality monitoring during construction stage at construction camp sites, bitumen hot mix plants, crusher plants (if specifically established for Project), at major settlement areas along project road. The parameters to be monitored are SPM, RPM, SO2, NOx and CO, Lead. Each monitoring schedule shall be over a duration of 24 hours (in 8-hour shifts), once	Pre-Construction	Nos.	10	8,000	80,000	Civil Works Contract
2	Surface Water quality monitoring during construction phase at locations given. The sampling shall be carried out once and cover all parameters as per IS10500 including heavy metals.	Pre-Construction	Nos.	8	10,000	80,000	Civil Works Contract
3	Ground Water quality monitoring during construction phase at locations given. The sampling shall be carried out once and cover all parameters as per IS10500 including heavy metals.	Pre-Construction	Nos.	4	10,000	40,000	Civil Works Contract
4	Noise quality monitoring at specified sensitive receptors along Project Road, at construction	Pre-Construction	Nos.	8	2000	16,000	Civil Works Contract

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
	camp sites, crusher plants (if specifically established for Project), and at major settlement areas along project road. - Each monitoring schedule shall be over a duration of 12 hours (6AM to 6PM), once. The monitoring shall be carried out in accordance with CPCB norms.						
Construction Phase							
1	Periodic air quality monitoring during construction stage at construction camp sites, bitumen hot mix plants, crusher plants (if specifically established for Project), at major settlement areas along project road. The parameters to be monitored are SPM, RPM, SO2, NOx and CO, Lead. Each monitoring schedule shall be over a duration of 24 hours (in 8-hour shifts), once in quarter for 21 months except for monsoon season	Construction	Nos.	50	8,000	400,000	Civil Works Contract
2	Surface Water quality monitoring during construction phase at locations given. The sampling shall be carried out once in quarter for 21 months except for monsoon season and cover all parameters as per IS10500 including heavy metals.	Construction	Nos.	40	10,000	400,000	Civil Works Contract
3	Ground Water quality monitoring during construction phase at locations given. The sampling shall be carried out once in quarter for 21 months except for monsoon season and cover all parameters as per IS10500 including heavy metals.	Construction	Nos.	20	10,000	200,000	Civil Works Contract
4	Noise quality monitoring at specified sensitive receptors along Project Road, at construction camp sites, crusher plants (if specifically established for Project), and at major settlement areas along project road. - Each monitoring schedule shall be over a duration of 12 hours (6AM to 6PM), once in quarter for 21 months except for monsoon season. The monitoring	Construction	Nos.	40	2000	80,000	Civil Works Contract

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
	shall be carried out in accordance with CPCB norms.						
	Operation Phase						
1	Periodic air quality monitoring during operation phase at major settlement areas along project road. The parameters to be monitored are SPM, RPM, SO2, NOx and CO, Lead. Each monitoring schedule shall be over a duration of 24 hours (in 8-hour shifts), once in quarter for 21 months except for monsoon season	Operation Phase	Nos.	50	8,000	400,000	PIU
2	Surface Water quality monitoring during operation phase at locations given. The sampling shall be carried out once in quarter for 21 months except for monsoon season and cover all parameters as per IS10500 including heavy metals.	Operation Phase	Nos.	40	10,000	400,000	PIU
3	Ground Water quality monitoring during operation phase at locations given. The sampling shall be carried out once in quarter for 21 months except for monsoon season and cover all parameters as per IS10500 including heavy metals.	Operation Phase	Nos.	20	10,000	200,000	PIU
4	Noise quality monitoring at specified sensitive receptors along Project Road and given locations. Each monitoring schedule shall be over a duration of 12 hours (6AM to 6PM), once in quarter for 21 months except for monsoon season. The monitoring shall be carried out in accordance with CPCB norms.	Operation Phase	Nos.	40	2000	80,000	PIU
	Subtotal (B)					**2,376,000**	
C	**Capacity Building/ Training**						
1	Introduction and sensitization to environment issues	Construction	Lumpsum			50,000	PMU
2	EMP implementation	Construction	Lump sum			100,000	PMU
3	Plans and Protocols	Construction	Lump sum			50,000	PMU

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
			Lump sum			75,000	Civil works contract
4	Experiences and best practices sharing	Construction /Post-Construction	Lump sum			30,000	PMU
5	Contractors Orientation to Workers on EMP implementation (OHS, core labor laws, spoils management, etc.) Activities related to COVID-19 are covered in the bidding documents and BOQ.	Construction	Lumpsum			30,000	Civil works contract
	Subtotal (C)					**335,000**	
D	**Civil Works**						
1	Cost for 520 nos. of Tree cutting as per Forest Dept. Letter no. F.11-13/WFD/Deptt.0prnt/2018-19/11595-597 dated 27-02-2020.	Pre-Construction and Construction	Nos.	520	7000	36,40,000	Civil Works Contract
2	Cost for Compensatory plantation in one-hectare land with 10 years maintenance as per Forest Dept. Letter no. F.11-13/WFD/Deptt.0prnt/2018-19/11595-597 dated 27-02-2020.	Construction	Ha	1	324662	3,24,662	Civil Works Contract
3	Regular water sprinkling (2 tankers engaged in at least 2 times, 3.5 hrs per time = 2 x 3.5 x 2 = 14 hrs) per day at all construction sites for suppression of visible dust levels. Hire charges for water tanker. Note: This item is to be operated after the completion of earthwork to suppress the visible dust levels. Cost of watering during compaction of earthwork is deemed to be already covered under civil works. (Code No. 0130, Building Works PWD SoR 2017 PWD Basic Rate: Page-1)	Construction	hours	6300	310	1,953,000	Civil works contract
4	Construction of shelters for workers.	Construction	lumpsum			3,00,000	Civil works contract
5	Providing Water Supply Facility for the workers	Construction	Lump sum			2,00,000	Civil works contract

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
6	Provision of Portable Toilets for construction workers at workers' camp (Market Rate)	Construction	Nos.	4	40000	1,60,000	Civil works contract
7	Provision of Portable Toilets for construction workers at Construction Site (Market Rate)	Construction	Nos.	4	40000	1,60,000	Civil works contract
8	Providing Personal Protective Equipment to the labours during the construction phase of the project.	Construction	cost/ person	60	1,000	60,000	Civil works contract
9	Waste bins for segregation of waste at Workers' camp (Market Rate)	Construction	Nos.	2	3123	6246	Civil works contract
10	Waste bins for segregation of waste at Construction Site (Market Rate)	Construction	Nos.	4	3123	12,492	Civil works contract
11	First Aid Boxes for the construction site (Market Rate)	Construction	Nos.	4	1964	7856	Civil works contract
12	First Aid Boxes for the Workers Camp (Market Rate)	Construction	Nos.	2	1964	3928	Civil works contract
13	Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x 45 x 5 angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes, 150 mm width with an angle of 450, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55-2001 (Sr. No. as per SDB 8.37 new, SOR 2017 for Roads & Bridge Works, Tripura, PWD (R&B)Page 56 of 240)	Construction	Nos	800	2,493.9	1,995,120	Civil works contract
14	Providing and fixing of retro-reflectorized cautionary, mandatory and informatory sign as per IRC:67 made of high intensity grade shetting vide MoRT&H technical specification Clause 801.3, fixed over aluminum sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M 15 grade cement concrete 450 mm x 450 mm x 600 mm, 600 mm below ground level as per drawings and MoRT&H Technical Specification Clause 801.	Construction	Per unit	60	2,417.6	145,056	Civil works contract

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
	800 mm x 600 mm rectangular Unit = Each Taking output = one traffic sign (Sr. No. 8.4 Ref. to MoRTH Spec. 801, SOR 2017 MoRT&H Analysis, Tripura PWD Page 152 of 388)						
15	Supply and Installation of Noise barriers to reduce noise during operation phase, around 270 m length with 2 m height with support structure installation at IGM Hospital (140 m), Kamini Kumar Singh School (120 m) and Govt. Ayurvedic Hospital (10 m) including of taxes and transportation. (Market Rate)	Construction	Sq. m.	540	9,493.1	5,126,274	Civil works contract
16	Excavation in Roadway cutting in soil by using manual means including loading in truck and carrying of cut earth to embankment site with all lifts and lead upto 1000 meter as per MoRT7H Technical Specification clauses of section 300. Excavation of trenches for noise barrier installation at an interval of 3 m (1 ft x 1 ft x 1ft) (Sr. No. 8.4 Ref. to MoRTH Spec. 300, SOR 2017 MoRT&H Analysis, Tripura PWD Page 24 of 388)	Construction	cum	3	170.3	511	Civil works contract
17	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days as per drawings and MoRT&H technical specification Clauses 2100. PCC for noise barrier in the trenches. (Sr. No. 8.4 Ref. to MoRTH Spec. 2100, SOR 2017 MoRT&H Analysis, Tripura PWD Page 189 of 388)	Construction	cum	3	6,545.9	19,638	Civil works contract
	Subtotal (D)					**1,41,14,782.6**	
	CAPEX					**1,67,75,634.00**	

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
	OPEX					**10,80,000**	
	TOTAL EMP COST (CAPEX+OPEX)					**1,78,55,634.00**	

X. CONCLUSION AND RECOMMENDATIONS

299. The process described in this document has assessed the environmental impacts of all elements under the Subproject. Potential negative impacts were identified in relation to design, pre-construction, construction and operation & maintenance of the proposed infrastructure. Mitigation measures have been developed in generic way to reduce all negative impacts to acceptable levels. The project sites are existing roads hence no land acquisition is required for the project.

300. During the construction phase, impacts mainly arise from the air and noise pollution and from traffic disruption by the construction work. These are common impacts of construction in urban areas, and there are well developed methods for their mitigation. Since the project involves redevelopment of the existing roads, this has potential to create disturbance. To minimize this, the contractor should develop a work method in consultation with ASCL, ULB and Consultants prior to start of work, and should conduct the work strictly in line with the work methods.

301. Handling of traffic is a most significant aspect of the proposed project during the construction phase. A detailed traffic management plan including diversion plans needs to be developed during the execution of the project. There were limited opportunities to provide enhancements, but certain measures were included. For example, it is proposed that the project will employ in the workforce people who live in the vicinity of or in Agartala city to provide them with a short-term economic gain and ensure that people employed in the longer term to maintain and operate the new facilities are residents of nearby communities. The citizens of the Agartala City will be the major beneficiaries of this project. In addition to improved environmental conditions, the subproject will improve the over-all health condition of the town.

302. Mitigation will be assured by a program of environmental monitoring conducted during construction and operation to ensure that all measures are implemented, and to determine whether the environment is protected as intended. This will include observations on- and off- site, document checks and interviews with workers and beneficiaries and any requirements for remedial action will be reported to the ASCL. Finally, stakeholders were involved in developing the IEE through one-on-one discussions and on-site meetings, after which views expressed were incorporated into the IEE and the planning and development of the project. Involvement of NGO's and City level consultation involving all stakeholders could not be held and the same is required to be conducted at various stages of project like pre-construction and construction.

303. The IEE will be made available at public locations in the city and will be disclosed to a wider audience via the ADB website. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.

304. The proposed project of up gradation of road, footpaths and junction in Agartala city is unlikely to cause significant adverse impacts. The potential adverse impacts that are associated with design, preconstruction, construction and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, the classification of the Project as Category "B" is confirmed, and no further special study or detailed EIA needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006).

Appendix 1 : REA Checklist

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST – Smart Roads Subproject

Instructions:
(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/ Project Title:	Agartala City Urban Development Project – Smart Roads
Sector Division:	Urban Development

Scope of Work

Construction Components and construction activities involved in all the 15 roads are given in the section below

1. **VIP Road – 3.18 Km length**

Construction Components:

- Construction of 1.5-1.8m wide pathways of on both the sides of the road.
- Construction of 0.75-1.0 m wide and 1.52 and 1.52m deep SWD on left side of the road.
- Construction of 1.0-3.5 m wide and 1.5 and 2.5m deep SWD on right side of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on left side of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on right side of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 7207 cum
- Earthwork excavation for SWD and Electrical Trench – 47923.2 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 29710 m^2 Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 10641 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 13051.7 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 2826.8 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 11574.02 cum
- Flooring with Paver Tiles on Footpath Area – 12726 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 65527 kg
- Providing Grating on storm water Drain at 15mc/c – 483 nos.
- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 905 m

2. HGB Road – 3.48 Km length

Construction Components:

- Construction of 1.5-1.8m wide pathways of on both the sides of the road.
- Construction of 0.75-2.0 m wide and 1.52 and 2.5m deep SWD on left side of the road.
- Construction of 1.0-2.0 m wide and 1.52 and 2.0m deep SWD on right side of the road.
- Construction of 1.2m wide and 1.67- 2.7m deep electrical cable trenches on left side of the road.
- Construction of 1.2m wide and 1.67- 2.2m deep electrical cable trenches on right side of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 7191 cum
- Earthwork excavation for SWD and Electrical Trench – 58708.9 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 30946 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 18527.4 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 13754.1 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 2894.2 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 14349.32 cum
- Flooring with Paver Tiles on Footpath Area – 13188 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 85975.9 kg
- Providing Grating on storm water Drain at 15mc/c – 464 nos.
- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 870.87 m

3. Thakurpalli Road – 2.117 Km length

Construction Components:

- Construction of 1.8-2.5m wide pathways of on both the sides of the road.
- Construction of 1.0-1.5m wide and 1.0-1.52m deep SWD on left side of the road.
- Construction of 1.8m wide and 1.8m deep SWD on right side of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on left side of the road.
- Construction of 1.2m wide and 2.0m deep electrical cable trenches on right side of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 2510 cum
- Earthwork excavation for SWD and Electrical Trench – 20417.8 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 10761.3 m^2 Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 3420 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 4844 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 957.3 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 5212.23 cum
- Flooring with Paver Tiles on Footpath Area – 4176 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 18705.5 kg

- Providing Grating on storm water Drain at 15mc/c – 155 nos.
- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 290 m

4. Akhaura Road – 1.33 Km length

Construction Components:

- Construction of 2.75-8.55m wide pathways of on both the sides of the road.
- Construction of 1.0-2.0m wide and 1.52-2.0m deep SWD on right side of the road.
- Construction of 1.2m wide and 1.67-2.20m deep electrical cable trenches on right side of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 1597 cum
- Earthwork excavation for SWD and Electrical Trench – 11610.6 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 6628.4 m^2 Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 1189 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 2889.9 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 615 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 2911.03 cum
- Flooring with Paver Tiles on Footpath Area – 2718 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 17543.7 kg
- Providing Grating on storm water Drain at 15mc/c – 101 nos.
- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 189 m

5. Mantribari Road – 0.258 Km length

Construction Components:

- Construction of 1.8m wide pathways of on both the sides of the road.
- Construction of 1.0m wide and 1.52m deep SWD on both sides of the road.
- Construction of 1.2m wide and 1.670m deep electrical cable trenches on both sides of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 544 cum
- Earthwork excavation for SWD and Electrical Trench – 3622.6 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 2166 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 95 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 944.2 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 202.9 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 907.86 cum
- Flooring with Paver Tiles on Footpath Area – 929 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 5995 kg
- Providing Grating on storm water Drain at 15mc/c – 34 nos.

- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 65 m

6. Ronaldsay Road – 1.1 Km length

Construction Components:

- Construction of 1.5m wide pathways of on both the sides of the road.
- Construction of 2.0-2.5m wide and 2.5m deep SWD on left side of the road.
- Construction of 1.5-2.0m wide and 1.5-2.5m deep SWD on right side of the road.
- Construction of 1.2m wide and 2.7m deep electrical cable trenches on left side of the road.
- Construction of 1.2m wide and 1.67-2.7m deep electrical cable trenches on right side of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 1879 cum
- Earthwork excavation for SWD and Electrical Trench – 27557.7 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 12442.4 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 5630.8 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 5831.3 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 1020.6 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 6351.7 cum
- Flooring with Paver Tiles on Footpath Area – 3300 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 25560.4 kg
- Providing Grating on storm water Drain at 15mc/c – 146 nos.
  Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 275 m

7. Ronaldsay Road – 1.1 Km length

Construction Components:

- Construction of 1.5-2.0m wide pathways of on both the sides of the road.
- Construction of 0.75-1.0m wide and 1.52m deep SWD on left side of the road.
- Construction of 0.75-1.2m wide and 1.52m deep SWD on right side of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on both sides of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 8120.8 cum
- Earthwork excavation for SWD and Electrical Trench – 49297.4 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 30681.5 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 9305.8 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 12495.7 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 2566.7 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 12597.62 cum
- Flooring with Paver Tiles on Footpath Area – 12482 m^2

- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 88206.7 kg
- Providing Grating on storm water Drain at 15mc/c – 506 nos.
- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 949 m

8. BT Road – 0.28 Km length

Construction Components:

- Construction of 1.8m wide on left side and 3.0m wide on right side of the road.
- Construction of 1.0m wide and 1.52m deep SWD on left side of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on left side of the road.
- Construction of 1.2m wide and 1.67-2.7m deep electrical cable trenches on right side of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 29.52 cum
- Earthwork excavation for SWD and Electrical Trench – 2093.8 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 1216.7 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 1010.8 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 604.1 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 104.1 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 627.84 cum
- Flooring with Paver Tiles on Footpath Area – 504 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 3253.1 kg
- Providing Grating on storm water Drain at 15mc/c – 18 nos.
  Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 35 m

9. GB Road – 4.05 Km length

Construction Components:

- Construction of 1.5-3.35m wide pathways on left side and 1.5-1.8m on right side of the road.
- Construction of 1.0-1.7m wide and 1.52m deep SWD on both sides of the road.
- Construction of 1.2m wide and 1.67 m deep electrical cable trenches on both sides of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 9985.5 cum
- Earthwork excavation for SWD and Electrical Trench – 69128.5 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 36918.8 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 23585.6 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 15814.7 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 3602.0 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 16492.77 cum

- Flooring with Paver Tiles on Footpath Area – 14034 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 104007 kg
- Providing Grating on storm water Drain at 15mc/c – 596 nos.
  Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 1119 m

10. IT Hub surrounding Road – 0.57 Km length

Construction Components:

- Construction of 2.0m wide pathways on left side and 1.5m on right side of the road.
- Construction of 1.2m wide and 1.52m deep SWD on both sides of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on both sides of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 830.7 cum
- Earthwork excavation for SWD and Electrical Trench – 6322.9 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 3658.6 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 3375.2 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 15731.8 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 328.5 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 1560.26 cum
- Flooring with Paver Tiles on Footpath Area – 1481 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 10259 kg
- Providing Grating on storm water Drain at 15mc/c – 59 nos.
- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 110.4 m

11. ITI Road – 0.39 Km length

Construction Components:

- Construction of 1.8-2m wide pathways of on both the sides of the road.
- Construction of 1.0m wide and 1.52m deep SWD on both sides of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on both sides of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 862.5 cum
- Earthwork excavation for SWD and Electrical Trench – 5243.3 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 3140.8 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 45 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 1359.1 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 273.8 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 1331.66 cum

- Flooring with Paver Tiles on Footpath Area – 1470 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 9062.3 kg
- Providing Grating on storm water Drain at 15mc/c – 52 nos.
  Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 98 m

12. Jail Ashram Road – 1.547 Km length

Construction Components:

- Construction of 1.5m wide pathways of on both the sides of the road.
- Construction of 1.5m wide and 1.52m deep SWD on both sides of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on right side of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 3519.8 cum
- Earthwork excavation for SWD and Electrical Trench – 23663.8 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 12509.3 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 137.8 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 5370.10 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 1235.9 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 5587.60 cum
- Flooring with Paver Tiles on Footpath Area – 4641 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 35947.2 kg
- Providing Grating on storm water Drain at 15mc/c – 206.3 nos.
  Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 386.8 m

13. Jail Road – 0.5 Km length

Construction Components:

- Construction of 2.5m wide pathways on left side and 1.5m on right side of the road.
- Construction of 1.0m wide and 1.52m deep SWD on right side of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on right side of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 392 cum
- Earthwork excavation for SWD and Electrical Trench – 3421.1 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 2051 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 1829.4 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 885 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 1778 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 841.4 cum
- Flooring with Paver Tiles on Footpath Area – 750 m^2

- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 5809.2 kg
- Providing Grating on storm water Drain at 15mc/c – 33 nos.
- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 62.5 m

14. Lankamura Road – 0.21 Km length

Construction Components:

- Construction of 1.8m wide pathways of on both the sides of the road.
- Construction of 0.5m wide and 1.52m deep SWD on left side of the road.
- Construction of 1.5m wide and 1.52m deep SWD on right side of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on both sides of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 285 cum
- Earthwork excavation for SWD and Electrical Trench – 2937.8 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 1786.1 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 1559.8 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 728.4 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 151.9 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 746.08 cum
- Flooring with Paver Tiles on Footpath Area – 756 m^2
- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 4879.71 kg
- Providing Grating on storm water Drain at 15mc/c – 28 nos.
- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 52.5 m

15. Sakuntala Road – 0.5 Km length

Construction Components:

- Construction of 1.5-2.3m wide pathways of on both the sides of the road.
- Construction of 1.5m wide and 1.52m deep SWD on both sides of the road.
- Construction of 1.2m wide and 1.67m deep electrical cable trenches on both sides of the road.

Construction Activities:

- Dismantling of open brick drains of size 1.5mx1.25m – 465 cum
- Earthwork excavation for SWD and Electrical Trench – 3124 cum
- Wooden Shoring (Close timbering un trenches including strutting, shoring and packing cavities) for SWD and Electrical Trenches – 1660.9 m^2
- Breaking of dismantled drain bricks in brick bats of required size for SWD and electrical trench – 1668 m^2
- Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. for SWD & Electrical Trench – 710.4 cum
- Providing and laying cement concrete, 100mm Thick PCC below Raft for SWD & Electrical Trench – 162.7 cum
- Providing and laying Reinforced cement concrete grade M-25 for Storm Water Drain & Electrical Trench – 738.8 cum
- Flooring with Paver Tiles on Footpath Area – 600 m^2

- Electrical tray supporting arrangement: Providing structural steel work in single section fixed with or without connecting plate – 4647.3 kg
- Providing Grating on storm water Drain at 15mc/c – 27 nos.
- Providing and laying non-pressure NP2 class (light duty) RCC pipes for inlet to Storm Drains – 50 m

Comprehensive screening questionnaire for all the 15 roads is given in the section below.

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area			
▪ Densely populated?	**X**		The subproject is within the highly populated area of Agartala City
▪ Heavy with development activities ?	**X**		Large number of projects are planned in and around the sub-project locations like- sewerage network project, junction improvement project, transmission line upgradation projects etc.
▪ Adjacent to or within any environmentally sensitive areas ?			
• Cultural heritage site		**X**	There is no protected monument as per the ASI list of Protected Monument in Tripura. Ujjayanta Palace a tourist situated near to the proposed subproject.
• Protected Area		**X**	There is no Protected area within 10 km of radius. Nearest Wildlife Sanctuary- Sepahijala at 18 km. (Source: Wildlife and protected areas of Tripura Map by Wildlife Institute of India)
• Wetland	**X**		MBB lake/ College Tilla lake is the only wetland identified near to the subproject site. MBB College Tilla lake is identified among the 7 important inland wetlands of Tripura in terms of biodiversity conservation. (Source: National Wetland Atlas of Tripura, prepared by Space Application Center)
• Mangrove		**X**	None
• Estuarine		**X**	None
• Buffer zone of protected area		**X**	None
• Special area for protecting biodiversity		**X**	None
• Bay		**X**	None
B. Potential Environmental Impacts Will the Project cause…			

Screening Questions	Yes	No	Remarks
▪ Encroachment on historical/ cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		**X**	No encroachment and disfiguration will be caused by the project
▪ Encroachment on precious ecology (e.g. sensitive or protected areas) ?		**X**	There are no ecologically sensitive or protected areas along the subproject road.
▪ Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site ?		**X**	No alteration of surface water hydrology. Small khola, nala and small irrigation ditch will maintain its flow and course through appropriate cross-drainage and outlet.
▪ Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	**X**		• Risk is temporary and associated with construction phase. • Worker based camps will be sited away from any surface water body and equipped with septic tanks. • Proper drinking water, sewerage and waste disposal facilities will be ensured at the camps. • Plastic sheeting shall be placed under hazardous material storage area to collect and retain leaks and spills. • Contaminated runoff from storage areas shall be captured in ditches or ponds
▪ Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	**X**		• Risk is temporary and associated with construction phase. • Air pollution due to construction activities is very less as the construction period is limited to approximately 21 months. • Impacts on air quality during construction stage are transitory in nature and can be largely limited by mitigating measures. • Crushing units, hot mix plant and wet mix plants will be located away from the human settlements and sensitive ecosystems. • SPCB consents will be obtained and conditions laid there will be complied for establishing and operating these plants. Grubbing, clearing and wetting of sites will be done for cutting and filling works at construction sites as well as at borrow area.
▪ Noise and vibration due to blasting and other civil works ?	**X**		• Risk is temporary and associated with construction phase. • No blasting sites will be selected nearer to settlements. Blasting timings will be decided by consulting locals. All precautions such as cordoning the area, sirens, manning with flags etc will be taken up before blasting operations. • Noisy equipment such as DG sets will be provided with enclosures and mufflers.

Screening Questions	Yes	No	Remarks
			• People working near excess noise producing equipment and machinery will be provided with ear plugs
▪ Dislocation or involuntary resettlement of people		**X**	No dislocation or involuntary resettlement envisaged
▪ Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?	**X**		Dust could cause respiratory problems. Road construction area shall be maintained damp by periodical spray of water.
▪ Hazardous driving conditions where construction interferes with pre-existing roads?	**X**		• Site specific traffic management plans will be prepared. • Assistance from local police will be taken. Temporary diversions will be provided by maintaining adequate carriage way for diversion traffic. • Barricades, Traffic Safety Signs, Caution boards, markings, flags, lights and flagmen as may be required will be provided to avoid interference to the flow of traffic at preexisting roads.
▪ Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	**X**		• Size of construction camp is small considering the length of road. Majority of workers will be used locally and will not stay in the camps. • Camps shall not be located near settlements; near water supply intakes; or sites that affects locals access to drinking water. • Construction camps will be provided with sanitary latrines and urinals. The sewage system will be operated properly to avoid health hazards, ground water and soil contamination. Compost pits will be constructed for the disposal of the garbage and other biodegradable wastes generated from the camps. • Proper collection, transportation and disposal of the wastes will be ensured. • Construction and labour camps will be sited away from human settlements to avoid possible transmission of communicable diseases from workers to local populations.
▪ Creation of temporary breeding habitats for mosquito vectors of disease?	**X**		• Proper water management to ensure no water impounding at borrow pits, drainage ditch etc.,
▪ Gaseous and odor emissions to the atmosphere from processing operations?	**X**		• As the size of subproject is only 3.48 km (length) and construction period is short quantity of gaseous and odor emissions to the atmosphere are very less. • Hot Mix Plants and Batch Mixing Plants will be sited away from settlements. Chimney height will be raised as per design

Screening Questions	Yes	No	Remarks
▪ Dislocation and compulsory resettlement of people living in right-of-way?		**X**	Not Applicable
▪ Uncontrolled in-migration with opening of roads to forest area and overloading of social infrastructure?		**X**	• Subproject does not open any new roads to forest area. Hence, the question of uncontrolled in–migration and overloading of social infrastructure on the subproject doesn't arise.
▪ Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	**X**		• Traffic management plan implementation. • Should an accidental spill occur, the applicable emergency spill procedure such as stopping the flow; removing ignition source; initiating emergency response; cleanup and safe disposal will be followed.
▪ Increased noise and air pollution resulting from traffic volume?			• After the completion of subproject, there will be a reduction in noise and air pollution due to smooth and uniform flow of traffic. • There will be a gradual increase in air pollution due to increased number of vehicles on the improved roads. • Proposed median plantation should help to control dust, fugitive emissions and noise from reaching the receptors.
▪ Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?			• There is no increased risk of water pollution from small quantities of oil, grease and fuel spills and other materials from vehicles using the road. • The accidental spills of oils, fuels and other hazardous chemicals from the vehicles using the road during operational phase will pollute nearby water courses of the area. • Small quantities of oil and fuel get emulsified in large quantities of runoff and cannot be removed effectively by oil interceptors. • Oil interceptors have been proposed for all the construction camps. • Emergency Services will be engaged for the containment, cleanup and disposal of contamination release into the environment.

Checklist for Preliminary Climate Risk Screening

Country/Project Title: Upgradation of Major Roads
Sector: Urban Development

Screening Questions		Score	Remarks[26]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	0	
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

[26] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Result of Initial Screening (Low, Medium, High): Low Risk

Assessment on the Categorization and Planning Requirement for this subproject

☐ **Category A**. A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.

☒ **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.

☐ **Category C**. A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.

Appendix 2- No Mitigation Checklist

Hariganga Basak (HGB) Road
"No Mitigation Scenario Checklist" (Scoping Checklist)

Part 1 - Questions on Project Characteristics

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies etc.)?				
1.1	Permanent or temporary change in land use, land cover or topography including increases in intensity of land use?	Yes	The proposed project involves upgradation of the HGB Road, which is within the existing RoW. Following works are proposed for the sub project 1. Dismantling above ground utilities like electric, telephone cables. 2. Clearing of drain silts 3. Dismantling Existing Brickwork drains 4. Construction of RCC Drain 5. Repositioning of existing water lines, wherever required. 6. Development of Carriageway/ Road Surface 7. Proposal for Pathways/ walkways 8. Proposal for Underground Utility Corridors Proposal for suitable streetscaping	No, there will not be any changes in land use and land cover, but, there will be changes in topography in terms of level of roads. The proposed project is to improve the road footpath conditions in HGB, the land area will remain the same as there is no land acquisition involved and work will be carried out in existing RoW.
1.2	Clearance of existing land, vegetation and buildings?	Yes	No clearance of land as this is reconstruction of existing road of 3.48 km length within the existing RoW.	No. Clearing of land is not involved in the road project, as the work is being carried out in existing RoW.
			Total 12 trees are required to along the road	Yes. The proposed trees to cut are common species. No threatened or endangered species of plant are sited in the proposed HGB road development area as per the 'Checklist of Rare and Threatened Plants of Tripura' listed in www.indiabiodiversity.org/checklist/show/201.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.3	Creation of new land uses?	No		
1.4	Pre-construction investigations e.g. boreholes, soil testing?	Yes	None. Soil investigation/ testing will be conducted for the road works, but this involves small area.	No, Geotechnical investigations will involve only obtaining a borehole sample for proposed infrastructures. Since undisturbed core would be extracted using a core cutter there would be no impacts on the topography or the geology.
1.5	Construction works?	Yes	Only immediate vicinity of the road will be affected. Road and allied works will potentially impact the immediate environment in terms of air quality due to generation of dusts and vehicle emissions, water pollution due to generation of wastewater from washings and siltation of the water bodies due to solid wastes from demolition and other construction activities. The roads will include utilities Existing Brick walled Storm water drains are proposed to be reconstructed into RCC structures below road surface. Two vent RCC structure is proposed. one vent (Towards the carriageway) shall carry Storm Water and other one (Towards the property line) shall carry Electrical and OFC cables. The vent for Electrical & OFC system will be provided below the footpath and SWD vent shall be provided below the carriageway OFC & Electrical cable is proposed in RCC cable trench system as per IS-1255: 1983. Footpath is provided above the RCC cable trench system.	Yes, because the construction works will take 21 months' time. The construction activities specially the wastes and emissions bring significant adverse impact to the receptors in the area (e.g. institutions and residential/ commercial establishments along the road).
1.6	Demolition works?	Yes	Demolition of existing roads drains will generate wastes	Yes.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
			and air emissions which will impact the air, water and noise quality of the road area. The demolition will generate approx 7191 m3 muck from the road stretch.	The demolition wastes will pose challenge to the passerby and surrounding people also it may result in siltation of water bodies if not removed immediately from the site.
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	There is a possibility of disposal of the solid and liquid wastes to nearby land or water bodies by the construction workers, which could affect the water bodies and soil environment.	Yes. Depending on the size and number of laborers in the construction camps. Pollution of receiving bodies of water around the camps and degradation of aesthetics due to dumping of solid wastes are likely. The construction camps will generate solid and liquid waste, will change the water quality of the receiving water bodies and harm the aesthetics of the area if dumped openly without any processing.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?	Yes	Excavated earth of quantity around 61,000 Cum for all the road works may temporarily affect the land use obstructing the access to by-roads, roadside premises, and houses. Cleaning of drains will generate around 1700 cum spoil.	Yes. The storage of excavated material and other raw material stored will cause problems to people visiting park and passerby. Siltation of the water bodies at the downstream is also a problem during monsoon season.
1.9	Underground works including mining or tunneling?	Yes	No mining or Tunneling is involved in the project. Excavation for utility trenches and drainage system maximum to the depth of 2.5-3m is proposed.	Yes. Excavation for construction of roads and utility trenches lead to generation of muck, which if not disposed from site will contaminate the nearby water body and pose obstruction to the residents and passerby.
1.10	Reclamation works?	No		
1.11	Dredging?	No		
1.12	Coastal structures eg seawalls, piers?	No		
1.13	Offshore structures?	No		
1.14	Production and manufacturing processes?	No		

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.15	Facilities for storage of goods or materials?	Yes	Construction material excavated material etc. will be stored in heaps along the roads, these material heaps could affect aesthetics at the site, and mobility or free movement of pedestrians and vehicles.	Yes. The obstructions brought about by the material heaps could impede the flow of pedestrians and vehicles in the road stretch.
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	Yes	Labour camp for about 25 inhabitants will generates both solid and liquid waste of around 10 Kg/ day and 2.7 KLD respectively. The solid and liquid wastes generated from the labour camps will pose water quality, soil quality and health issues if not processed/ handled properly.	Yes, The solid and liquid waste generated will cause soil contamination, water contamination if not treated and let into the nature.
1.17	Facilities for long term housing of operational workers?	No		
1.18	New road, rail or sea traffic during construction or operation?	No		
1.19	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No		
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in	Yes	The construction will be in phased manner, closure of the road during construction works will be required. Some interior roads may also need temporary closure during construction.	Yes, Road closures during construction phase will cause temporary traffic jams and related issues.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	traffic movements?			
1.21	New or diverted transmission lines or pipelines?	Yes	ICT Line, LT and HT Lines converted from above ground to underground networks and the excavation for underground trenches will generate excavated earth which if not stored and handled properly will pose environmental and safety issues.	Yes, The construction of utility duct and excavation involved will pose environmental, health and safety and aesthetic impacts due to contamination of water bodies, unsafe access to passerby.
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	Slopes and design capacity of drains will be done as per existing rainfall data of the area.	.
1.23	Stream crossings?	Yes	Proposed HGB road will cross 4 drains. Cross drains across the roads are maintained as it is.	No, There is no change in the existing cross drain structures.
1.24	Abstraction or transfers of water from ground or surface waters?	No		
1.25	Changes in water bodies or the land surface affecting drainage or run-off?	Yes	The roadside storm water drains will be demolished and will be converted to underground RCC drains.	Yes. Short term impact only during the construction period. However, the project will improve the drainage system by reduction in operation and maintenance issues.
1.26	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Transportation vehicles for the movement of workers/ personnel, construction equipment, and construction materials will generate dust and noise.	Yes. The dust and noise generated due to transportation of manpower and material will cause discomfort to the occupants of establishments and institutions in the area.
1.27	Long term dismantling or decommissioning or	No	-	-

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	restoration works?			
1.28	Ongoing activity during decommissioning which could have an impact on the environment?	No	-	-
1.29	Influx of people to an area in either temporarily or permanently?	Yes	The construction phase will increase the personnel movement for a temporary period and operation phase will also result in influx of people due to change in better aesthetics and better traffic facilities.	Yes, The people will be housed in labour camps and this will cause the solid and liquid waste generation from the camps and subsequent contamination of soil and water contaminations and pose health issues
1.30	Introduction of alien species?	No	-	-
1.31	Loss of native species or genetic diversity?	Yes	For the construction of HGB road, 29 trees will be cut, the species exist in those lands are common to the area and therefore no loss of native or genetic diversity is expected.	Yes. Local shrubs and trees are required to remove from the existing area for the construction activities.
1.32	Any other actions?	No	-	-
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?				
2.1	Land especially undeveloped or agricultural land?	No	Construction of road and pathway is within the existing ROW, hence no land resource will be utilized.	No The works are proposed in already developed urban areas and it will not impact any underdeveloped or agriculture land.
2.2	Water?	Yes	During the construction phase, water would be used for construction purposes. During the operations phase, water would be used for watering the road side plantations and ornamental trees.	No, The quantity of water to be used during the construction phase is in small. In Agartala no new water source would be constructed as part of the project. The existing source (municipal water supply and ground water) would be

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				sufficient to supply water for construction.
2.3	Minerals?	Yes	Sand, gravel and soil for subbase of road. This will be sourced from Government approved quarries.	Yes. The huge quantities of sand and aggregates will likely have a significant impact to the aesthetics, topography and ecosystem at the sites or locations where they are sourced or quarried. Transportation of aggregate will also cause air pollution.
2.4	Aggregates?	Yes	The new road surface construction and excavated road repair would be the part of the project. This new construction and repairing of the pavement and concrete works in the project would require aggregates	
2.5	Forests and timber?	No	-	-
2.6	Energy including electricity and fuels?	Yes	None. The required energy, electricity, and fuel during construction activities, vehicle, equipment, and machinery operations are negligible compared to supply.	No. The site is located within urban area where electricity from grid is easily available.
2.7	Any other resources?	No		
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?				
3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, water supplies)?	Yes	During the construction stage, likely leakage of discharge of Fuels like diesel, Petrol, and Oil & Grease will affect human health and environment.	Yes. Any Discharge of these substances will have adverse impacts to environmental quality and human health and may also affect the nearby flora and fauna.
3.2	Will the project result in changes in occurrence of disease or affect disease vectors (e.g.	Yes	The labour camps would generate solid waste as well as sewage. Thus, the camps have potential to spread diseases.	Yes. Airborne, water-borne or vector-borne diseases could spread or transmitted easily from the construction camps to the outside communities.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	insect or water borne diseases)?			
3.3	Will the project affect the welfare of people e.g. by changing living conditions?	Yes	Better traffic circulation, pedestrian movement and streetscapes will improve the living conditions of the residents	Yes, Throughout the operation stage of the project. This is a significant positive impact
3.4	Are there especially vulnerable groups of people who could be affected by the project e.g. hospital patients, the elderly?	Yes	There is a government Ayurvedic Hospital (after Paradise Chowmuhani) on this road. The proposed road works may affect the hospital patients temporarily. There is no orphanage, widow homes, old age homes, shelters for differently abled and other vulnerable institutes in the project area surrounding.	Yes, The probable traffic disruption and emission to air and water contamination may affect the patients coming to the hospital.
3.5	Any other causes?	No		
4. Will the Project produce solid wastes during construction or operation or decommissioning?				
4.1	Spoil, overburden or mine wastes?	Yes	Excavation of drains and roads will produce spoil. The spoil if not readily disposed at safe site, it will occupy the land and may create discomfort to the passer-by.	Yes. The material generated due to excavation will affect the regular walkway and passerby, during the construction period, the material may end up in water body if not stored and disposed properly.
4.2	Municipal waste (household and or commercial wastes)?	Yes	There would be generation of municipal waste from construction camps and during operation phase due to influx of visitors.	Yes. Municipal solid waste generated during the project may cause contamination of land and water bodies if not managed appropriately.
4.3	Hazardous or toxic wastes (including radioactive wastes)?	Yes	Bitumen will be used for the construction of roads, the likely leakage and emissions will cause health and environmental impacts.	Yes, The accidental spills/ leakages of bitumen will cause water and land pollution. Also, the emission from the bitumen during heating will pose health impacts to the workers and passerby.
4.4	Other industrial process wastes?	No		

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
4.5	Surplus product?	No		
4.6	Sewage sludge or other sludge from effluent treatment?	Yes	The 2.7 KLD sewage generated from labour camp may pose environmental and health impacts due to untreated discharge.	Yes, The sewage generated if discharged without treatment will cause ground and surface water pollution.
4.7	Construction or demolition wastes?	Yes	Construction of Roads, pathways and utility trenches will produce construction and demolition waste. The waste if not disposed at designated site, will pose environmental and safety issues by siltation of water bodies and causing uncomfort to passerby.	Yes. Construction and demolition wastes generated or produced during construction phase will change the aesthetics in the project area. Excavated Soil and demolition debris could clog drainages and could cause siltation of drains and pose difficulties to residents and passer-by for access.
4.8	Redundant machinery or equipment?	No		
4.9	Contaminated soils or other material?	No		
4.10	Agricultural wastes?	No		
4.11	Any other solid wastes?	No		
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?				
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources?	Yes	Use of generators, machinery, and heavy vehicles during excavation and construction will generate emissions.	Yes. The impact of these emissions is significant to the health of all human receptors along the road construction sites.
5.2	Emissions from production processes?	No	-	-
5.3	Emissions from materials handling including storage or transport?	Yes	Vehicles used for transport of construction, material and machinery will produce emissions. Dust generation during unloading of materials such as cement, aggregates, etc. There is also a likelihood of re-entrainment of dust particle at the construction	Yes. The impact of these emissions is significant to the health of all human receptors around the construction sites.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
			site due to movement of vehicles	
5.4	Emissions from construction activities including plant and equipment?	Yes	Concrete batching plants, hot-mix plants for bituminous material production during road surfacing will cause emissions.	Yes. The impact of these emissions is significant to the health of all human receptors around the road construction sites.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste?	Yes	Air pollution due to dust generation during construction of roads, excavation and backfilling, handling of excavated and fill material, cement, sand, gravel, aggregates, etc.	Yes. The impact of these emissions is significant to the health of all people residing nearby and passerby.
5.6	Emissions from incineration of waste?	No	-	-
5.7	Emissions from burning of waste in open air (eg slash material, construction debris)?	Yes	The locality of the worker's camp may be affected by the open burning of waste generated from the worker's camp.	Yes. The impact of these emissions is significant to the health of all human receptors living in construction camps and those around the construction camp sites.
5.8	Emissions from any other sources?	No		
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?				
6.1	From operation of equipment eg: engines, ventilation plant, crushers?	Yes	Excavation of trenches by heavy machinery, cutters, etc. and subsequent compaction and road surfacing, use of generators, heavy vehicle movements will generate noise and vibration.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the road construction sites, including the workers.
6.2	From industrial or similar processes?	Yes	Production of concrete and bituminous products will generate noise. Crushers and borrow operations will generate high levels of noise.	Yes. The concrete mixers will cause noise in and around the area and bituminous hot mixes will result in heat radiation which will impact the surrounding population and passerby.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
6.3	From construction or demolition?	Yes	The noise generated from the demolition of ROW for construction of roads and pathways may disturb the people residing at and passerby of core bazaar area.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the construction sites, including the workers.
6.4	From blasting or piling?	No		
6.5	From construction or operational traffic?	Yes	Movement of heavy machinery used for construction work and vehicles transporting construction materials may generate noise that would cause inconvenience to the surrounding communities of road.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the traffic congested sites, including the workers working at these sites.
6.6	From lighting or cooling systems?	No	Night time construction is not envisaged.	No. As per current practices the construction works are allowed only in day time and no lighting for night time working is required.
6.7	From sources of electromagn etic radiation (consider effects on nearby sensitive equipment as well as people)?	No	-	-
6.8	From any other sources?	No	-	-
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters, groundwater, coastal waters or the sea?				
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	Yes	Due to accidental spillage / leakage of fuel and bitumen will pollute the land and water bodies.	Yes. The leakage / spillage of fuel and bitumen will result in land contamination and water pollution.
7.2	From discharge of sewage or other effluents	Yes	The land and water bodies nearby the workers camp may be polluted by the discharge of sewage from camp.	Yes. The impact of discharge of sewage or effluents to land is significant as they could seep into the ground and pollute the groundwater. Likewise,

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	(whether treated or untreated) to water or the land?			the impact of discharge of sewage or effluent to receiving bodies of water in the area is significant as they could pollute the water and subsequently the aquatic species.
7.3	By deposition of pollutants emitted to air, onto the land or into water?	Yes	The land nearby the workers' camp may be polluted by the construction related activities and daily activities of the workers residing there temporarily.	Yes. The discharge of pollutants to air, water or soil will contaminate these natural resources.
7.4	From any other sources?	No		
7.5	Is there a risk of long-term build-up of pollutants in the environment from these sources?	No		
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?				
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?	Yes	Road work involves use of bitumen hot mixes, the accidental fire or explosion of hot mixes and resulting spillages will result in severe impact on human health and as well as environment.	Yes. The explosion and spillage will result in human injury and may pose contamination of land and water and thus it is a significant impact.
8.2	From events beyond the limits of normal environmental protection e.g. failures of pollution control systems?	No	-	-
8.3	From any other causes?	Yes	Accidents can happen due to the carelessness of workers and lapses of safety procedures at the construction sites during the excavation, laying of bitumen	Yes. The impact of accidents is very significant because it can lead to either disability or loss of lives of workers or community people.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
			etc., and these accidents will impact the human health in terms of injury.	
8.4	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslip, etc)?	Yes	The project location is situated in High risk earth quake zone (Zone V) as per the Earthquake map released from National Disaster Management Authority (NDMA), Ministry of Home Affairs (MoH) Government of India. There may be impacts related to earthquake and flooding.	Yes. There would be damages to the structures in case of earthquake and flooding incidences
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?				
9.1	Changes in population size, age, structure, social groups etc.?	Yes	Increased service level of transportation and reliability will create a higher demand for property in the project beneficiary areas.	Yes. There is a chance of in-migration due to this project that will marginally affect the existing community structure and economic conditions etc. This will create a pressure on existing infrastructure.
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g. schools, hospitals, social facilities?	No		
9.3	Through in-migration of new residents or creation of new communities ?	Yes	Such in-migration is possible; however, the numbers would be not much, as the area is already developed commercially and residentially.	No. The number of people migrating will not be much.
9.4	By placing increased demands on local facilities or services eg housing,	Yes	Due to migration, there will be increased demand on local facilities which increases the load on natural resources consumption.	No. The impact on the local facilities will not be significant.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	education, health?			
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	Yes	Requirement of labour for the construction works prioritize the local people hence, providing employment opportunities to the local people.	Yes (Positive impact) The workers (both skilled and unskilled) will gain experience that they can use in the future in other similar kind of works. Improvement of roads will create new business opportunities.
9.6	Any other causes?			
Question - Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?				
10.1	Will the project lead to pressure for consequential development which could have significant impact on the environment e.g. more housing, new roads, new supporting industries or utilities, etc?	Yes	The roads will act as catalyst for development of the surrounding areas and there may be new developments like commercial establishments, malls etc.,	Yes. The anticipated new developments followed by the road projects will result significant environmental impacts due to raw material requirement for the subsequent developments.
10.2	Will the project lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the	Yes	Yes, the project may lead to other developmental projects.	Yes. The project will lead to overall development in the area. Positive Impact

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	environment e.g. supporting infrastructure (roads, power supply, waste or waste water treatment, etc) housing development extractive industries supply industries other?			
10.3	Will the project lead to after-use of the site which could have an impact on the environment ?	No	-	-
10.4	Will the project set a precedent for later developments?	Yes	Improved road infrastructure may create opportunities for other developmental infrastructures.	Yes Quality of life of the Agartala citizens will be improved with all the developmental works. Positive Impact.
10.5	Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?	Yes		

Part 2 - Characteristics of the Project Environment (Environmental Sensitivity)

Question 1 - Are there features of the local environment on or around the Project location which could be affected by the Project? • Areas which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project? • Other areas which are important or sensitive for reasons	No

of their ecology e.g. • Wetlands, • Watercourses or other water bodies, • the coastal zone, • mountains, • forests or woodlands	No
• Areas used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project?	No No
• Inland, coastal, marine or underground waters? • Areas or features of high landscape or scenic value? • Routes or facilities used by the public for access to recreation or other facilities? • Transport routes which are susceptible to congestion or which cause environmental problems? • Areas or features of historic or cultural importance?	Yes, the HGB road is the major connecting route for residents of HGB and nearby areas, the construction activities may hamper the daily movement of these commuters temporarily during construction. Yes, the roads proposed for the development are core city roads and may be susceptible to traffic congestion during the construction phase that may provide discomfort to the passer-by and may disrupt the access to the roadside shops and houses. Yes, a few temples are there along the HGB road. However, the road construction is within the RoW, so no long-term impact is envisaged. The access to these temples will be temporarily affected during the period of construction.
Question 2 - Is the Project in a location where it is likely to be highly visible to many people?	Yes. The project encompasses development of main city roads of Agartala, which includes the main market area due to which it will be highly visible to many people.
Question 3 - Is the Project located in a previously undeveloped area where there will be loss of greenfield land?	No
Question - Are there existing land uses on or around the Project location which could be affected by the Project? For example: • Homes, gardens, other private property, • Industry, • Commerce, • Recreation, • public open space, • community facilities, • agriculture, • forestry, • tourism, • mining or quarrying	Yes The houses, shops and other properties will be affected during the construction period due to disturbance in access to the property, air and noise pollution due to the construction activities etc.
Question 4 - Are there any plans for future land uses on or around the location which could be affected by the Project?	No

Question 5 - Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?	Yes, there is dense population growth along the road proposed for development, these people will be affected during the construction phase of the project. A well-managed traffic Plan will ensure smooth access and operation to these people during construction stage.
Question 6 - Are there any areas on or around the location which are occupied by sensitive land uses which could be affected by the Project? • hospitals, • schools, • places of worship, • community facilities	Yes, there will be temporary disturbance to access to the existing hospitals, schools, places of worship and community facilities along the roads proposed for development. There is Government Ayurvedic Hospital adjacent to the road. The construction activities may impact the hospital patients.
Question 7 - Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project? For example: • groundwater resources, • surface waters, • forestry, • agriculture, • fisheries, • tourism, • minerals.	No
Question 8 - Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	No
Question 9 - Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	Yes, the project area lies under Zone V. The structures in the proposed project are being built by following IS 1893 – Part 1 for Earthquake resistant designs for structures.
Question 10 - Is the Project likely to affect the physical condition of any environmental media? • The atmospheric environment including microclimate and local and larger scale climatic conditions? • Water – e.g. quantities, flows or levels of rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Soils – e.g. quantities, depths, humidity, stability or erodibility of soils? • Geological and ground conditions?	No, the project will not affect any physical condition of the environment; there will be improved road infrastructure after operation of road.
Question 11 - Are releases from the Project likely to have effects on the <u>quality</u> of any environmental media? • Local air quality? • Global air quality including climate change and ozone depletion • Water quality – rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Nutrient status and eutrophication of waters?	Yes, the construction activities may affect local air quality through dust emissions especially during dry season. It also generates noise pollution by the movement of vehicles for transporting materials, and demolition works of RoW for road construction works.

• Acidification of soils or waters? • Soils • Noise? • Temperature, light or electromagnetic radiation including electrical interference? • Productivity of natural or agricultural systems?	
Question 12 - Is the Project likely to affect the availability or scarcity of any resources either locally or globally? • Fossil fuels? • Water? • Minerals and aggregates? • Timber? • Other non-renewable resources? • Infrastructure capacity in the locality - water, sewerage, power generation and transmission, telecommunications, waste disposal roads, rail?	No
Question 13 - Is the Project likely to affect human or community health or welfare? • The quality or toxicity of air, water, foodstuffs and other products consumed by humans? • Morbidity or mortality of individuals, communities or populations by exposure to pollution? • Occurrence or distribution of disease vectors including insects? • Vulnerability of individuals, communities or populations to disease? • Individuals' sense of personal security? • Community cohesion and identity? • Cultural identity and associations? • Minority rights? • Housing conditions? • Employment and quality of employment? • Economic conditions? • Social institutions?	Yes, • This project may offer employment to the local people to involve as a construction worker. This can be viewed as positive impact of the project. • This project may also result in the occurrence or distribution of disease vector due to the temporary settlement of workers as they may not have access to safe water supply and sanitation. • Similarly, this project if properly implemented will have positive effect on the welfare of the local people as they will have better road infrastructure and pedestrian pathways, improved traffic flow which will improve their commuting experience. This will also help in improving the economic conditions of the Agartala.

Part 3: Significance of Impacts

Questions to be Considered
1. Will there be a large change in environmental conditions?
2. Will new features be out-of-scale with the existing environment?
3. Will the effect be unusual in the area or particularly complex?
4. Will the effect extend over a large area?
5. Will there be any potential for trans boundary impact?
6. Will many people be affected?
7. Will many receptors of other types (fauna and flora, businesses, facilities) be affected?
8. Will valuable or scarce features or resources be affected?
9. Is there a risk that environmental standards will be breached?
10. Is there a risk that protected sites, areas, features will be affected?
11. Is there a high probability of the effect occurring?
12. Will the effect continue for a long time?
13. Will the effect be permanent rather than temporary?

14. Will the impact be continuous rather than intermittent?
15. If it is intermittent will it be frequent rather than rare?
16. Will the impact be irreversible?
17. Will it be difficult to avoid, or reduce or repair or compensate for the effect?

VIP Road
"No Mitigation Scenario Checklist" (Scoping Checklist)

Part 1 - Questions on Project Characteristics

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1. Will construction, operation or decommissioning of the Project involves actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc)?				
1.1	Permanent or temporary change in land use, land cover or topography including increases in intensity of land use?	Yes	The proposed project involves upgradation of the VIP Road, which is within the existing RoW. Following works are proposed for the sub project 1. Dismantling above ground utilities like electric, telephone cables 2. Clearing of drain silt. 3. Dismantling existing brick storm water drains. 4. Construction of RCC Drain 5. Repositioning of existing water lines, wherever required. 6. Development of Carriageway/ Road Surface 7. Proposal for Pathways/ walkways 8. Proposal for Underground Utility Corridors 9. Proposal for suitable streetscaping	No, there will not be any changes in land use and land cover, but, there will be changes in topography in terms of level of roads. The proposed project is to improve the road footpath conditions in VIP Road, the land area will remain the same as there is no land acquisition involved and work will carried out in existing RoW.
1.2	Clearance of existing land, vegetation and buildings?	Yes	No clearance of land as this is reconstruction of existing road of 3.18 km length within the same existing RoW.	No. Clearing of land is not involved in the road project, as the work is being carried out in existing RoW.
			Total 147 trees are required to be cut, in the proposed road stretch.	Yes. The proposed trees to cut are common species. No threatened or endangered species of plant are sited in the proposed VIP road development area as per the 'Checklist of Rare and Threatened Plants of Tripura' listed in www.indiabiodiversity.org/checklist/show/201
1.3	Creation of new land uses?	No		

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.4	Pre-construction investigations e.g. boreholes, soil testing?	Yes	None. Soil investigation/ testing will be conducted for the road works, but this involves small area.	No, Geotechnical investigations will involve only obtaining a borehole sample for proposed infrastructures. Since undisturbed core would be extracted using a core cutter there would be no impacts on the topography or the geology.
1.5	Construction works?	Yes	Only immediate vicinity of the road will be affected. Road and allied works will potentially impact the immediate environment in terms of air quality due to generation of dusts and vehicle emissions, water pollution due to generation of wastewater from washings and siltation of the water bodies due to solid wastes from demolition and other construction activities. The roads will include utilities Existing Brick walled Storm water drains are proposed to be reconstructed into RCC structures below road surface. Two vent RCC structure is proposed. one vent (Towards the carriageway) shall carry Storm Water and other one (Towards the property line) shall carry Electrical and OFC cables. The vent for Electrical & OFC system will be provided below the footpath and SWD vent shall be provided below the carriageway OFC & Electrical cable is proposed in RCC cable trench system as per IS-1255: 1983. Footpath is provided above the RCC cable trench system.	Yes, because the construction works will take 21 months' time. The construction activities specially the wastes and emissions bring significant adverse impact to the receptors in the area (e.g. institutions and residential/ commercial establishments along the road).
1.6	Demolition works?	Yes	Demolition of existing roads drains and pathways for construction of new roads. The demolition will generate approx 8500 m3 muck from all the roads.	Yes. The demolition wastes will pose challenge to the passerby and surrounding people also it may result in siltation of water bodies if not removed immediately from the site.
1.7	Temporary sites used for construction works	Yes	Labour camps will be put up temporarily. There is a possibility of disposal of the solid and liquid wastes	Yes. Depending on the size and number of laborers in the

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	or housing of construction workers?		to nearby land or water bodies by the construction workers.	construction camps. Pollution of receiving bodies of water around the camps and degradation of aesthetics due to dumping of solid wastes are likely. The construction camps will generate solid and liquid waste, these will change the water quality of the receiving water bodies and harm the aesthetics of the area if dumped openly without any processing.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?	Yes	Earthwork excavation of quantity around 57,000 Cum for all the road works may temporarily affect the land use obstructing the access to by-roads, roadside premises, and houses. Cleaning of drains will generate around 1800 cum spoil	Yes. The storage of excavated material and other raw material stored will cause problems to people visiting park and passerby. Siltation of the water bodies at the downstream is also a problem during monsoon season.
1.9	Underground works including mining or tunneling?	Yes	No mining or Tunneling is involved in the project. Excavation for utility trenches and drainage system maximum to the depth of 2.5-3m is proposed.	Yes. Excavation for construction of roads and utility trenches lead to generation of muck, which if not disposed from site will contaminate the nearby water body and pose obstruction to the residents and passerby.
1.10	Reclamation works?	No		
1.11	Dredging?	No		
1.12	Coastal structures eg seawalls, piers?	No		
1.13	Offshore structures?	No		
1.14	Production and manufacturing processes?	No		
1.15	Facilities for storage of goods or materials?	Yes	Construction material excavated material etc. will be stored in heaps along the roads, these material heaps could affect aesthetics at the site, and mobility or free movement of pedestrians and vehicles.	Yes. The obstructions brought about by the material heaps could impede the flow of pedestrians and vehicles in the road stretch.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	Yes	Labour camp for about 25 inhabitants will generates both solid and liquid waste of around 10 Kg/ day and 2.7 KLD respectively.	Yes, The solid and liquid waste generated will cause soil contamination, water contamination if not treated and let into the nature.
1.17	Facilities for long term housing of operational workers?	No		
1.18	New road, rail or sea traffic during construction or operation?	No		
1.19	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No		
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	Yes	The construction will be in phased manner, closure of the road during construction works will be required. Some interior roads may also need temporary closure during construction.	Yes, Road closures during construction phase will cause temporary traffic jams and related issues.
1.21	New or diverted transmission lines or pipelines?	Yes	ICT Line, LT and HT Lines converted from above ground to underground networks and the excavation for underground trenches will generate excavated earth which if not stored and handled properly will pose environmental and safety issues.	Yes, The construction of utility duct and excavation involved will pose environmental, health and safety and aesthetic impacts due to contamination of water bodies, unsafe access to passerby.
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	Slopes and design capacity of drains will be done as per existing rainfall data of the area.	.
1.23	Stream crossings?	No	Proposed VIP road will cross 6 drains. Cross drains across the roads are maintained as it is.	, There is no change in the existing cross drain structures.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.24	Abstraction or transfers of water from ground or surface waters?	No		
1.25	Changes in water bodies or the land surface affecting drainage or run-off?	Yes	The roadside storm water drains will be demolished and will be converted to underground RCC drains.	Yes. Short term impact only during the construction period. However, the project will improve the drainage system by reduction in operation and maintenance issues.
1.26	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Transportation vehicles for the movement of workers/ personnel, construction equipment, and construction materials will generate dust and noise.	Yes. The dust and noise generated due to transportation of manpower and material will cause discomfort to the occupants of establishments and institutions in the area.
1.27	Long term dismantling or decommissioning or restoration works?	No	-	-
1.28	Ongoing activity during decommissioning which could have an impact on the environment?	No	-	-
1.29	Influx of people to an area in either temporarily or permanently?	Yes	The construction phase will increase the personnel movement for a temporary period and operation phase will also result in influx of people due to change in better aesthetics and better traffic facilities.	Yes, The people will be housed in labour camps and this will cause the solid and liquid waste generation from the camps and subsequent contamination of soil and water contaminations and pose health issues
1.30	Introduction of alien species?	No	-	-
1.31	Loss of native species or genetic diversity?	Yes	For the construction of VIP road, 180 trees will be cut, the species exist in those lands are common to the area and therefore no loss of native or genetic diversity is expected.	Yes. Local shrubs and trees are required to remove from the existing area for the construction activities.
1.32	Any other actions?	No	-	-

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?				
2.1	Land especially undeveloped or agricultural land?	No	Construction of road and pathway is within the existing RoW, hence no land resource will be utilized.	No The works are proposed in already developed urban areas and it will not impact any underdeveloped or agriculture land.
2.2	Water?	Yes	During the construction phase, water would be used for construction purposes. During the operations phase, water would be used for watering the road side plantations and ornamental trees.	No, The quantity of water to be used during the construction phase is in small. In Agartala no new water source would be constructed as part of the project. The existing source (municipal water supply and ground water) would be sufficient to supply water for construction.
2.3	Minerals?	Yes	Sand, gravel and soil for subbase of road. This will be sourced from Government approved quarries.	Yes. The huge quantities of sand and aggregates will likely have a significant impact to the aesthetics, topography and ecosystem at the sites or locations where they are sourced or quarried. Transportation of aggregate will also cause air pollution.
2.4	Aggregates?	Yes	The new road surface construction and excavated road repair would be the part of the project. This new construction and repairing of the pavement and concrete works in the project would require aggregates	
2.5	Forests and timber?	No	-	-
2.6	Energy including electricity and fuels?	Yes	None. The required energy, electricity, and fuel during construction activities, vehicle, equipment, and machinery operations are negligible compared to supply.	No. The site is located within urban area where electricity from grid is easily available.
2.7	Any other resources?	No		
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?				
3.1	Will the project involve use of substances or materials which are hazardous or	Yes	During the construction stage, likely leakage of discharge of Fuels like diesel, Petrol, and Oil & Grease will affect human health and environment.	Yes. Any Discharge of these substances will have adverse impacts to

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	toxic to human health or the environment (flora, fauna, water supplies)?			environmental quality and human health and may also affect the nearby flora and fauna.
3.2	Will the project result in changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)?	Yes	The labour camps would generate 10 kg per day of solid waste as well as 2.7 KLD of sewage. Thus, the camps have potential to spread diseases.	Yes. Airborne, water-borne or vector-borne diseases could spread or transmitted easily from the construction camps to the outside communities.
3.3	Will the project affect the welfare of people e.g. by changing living conditions?	Yes	Better traffic circulation, pedestrian movement and streetscapes will improve the living conditions of the residents	Yes, Throughout the operation stage of the project. This is a significant positive impact
3.4	Are there especially vulnerable groups of people who could be affected by the project e.g. hospital patients, the elderly?	No	There are no orphanage, widow homes, old age homes, shelters for differently abled and other vulnerable institutes in the project area surrounding.	
3.5	Any other causes?	No		
4. Will the Project produce solid wastes during construction or operation or decommissioning?				
4.1	Spoil, overburden or mine wastes?	Yes	Excavation of drains and roads will produce spoil. The spoil if not readily disposed at safe site, it will occupy the land and may create discomfort to the passer-by.	Yes. The material generated due to excavation will affect the regular walkway and passerby, during the construction period, the material may end up in water body if not stored and disposed properly.
4.2	Municipal waste (household and or commercial wastes)?	Yes	There would be generation of municipal waste from construction camps and during operation phase due to influx of visitors.	Yes. Municipal solid waste generated during the project may cause contamination of land and water bodies if not managed appropriately.
4.3	Hazardous or toxic wastes (including radioactive wastes)?	Yes	Bitumen will be used for the construction of roads, the likely leakage and emissions will cause health and environmental impacts.	Yes, The accidental spills/ leakages of bitumen will cause water and land pollution. Also, the emission from the bitumen

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				during heating will pose health impacts to the workers and passerby.
4.4	Other industrial process wastes?	No		
4.5	Surplus product?	No		
4.6	Sewage sludge or other sludge from effluent treatment?	Yes	The sewage generated from labour camp of around 2.7 KLD may pose environmental and health impacts due to untreated discharge.	Yes, The sewage generated if discharged without treatment will cause ground and surface water pollution.
4.7	Construction or demolition wastes?	Yes	The drain dismantling work will generate around 8500 cum of demolition waste. The waste if not disposed at designated site, will pose environmental and safety issues by siltation of water bodies and causing uncomfort to passerby.	Yes. Construction and demolition wastes generated or produced during construction phase will change the aesthetics in the project area. Excavated Soil and demolition debris could clog drainages and could cause siltation of drains and pose difficulties to residents and passer-by for access.
4.8	Redundant machinery or equipment?	No		
4.9	Contaminated soils or other material?	No		
4.10	Agricultural wastes?	No		
4.11	Any other solid wastes?	No		
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?				
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources?	Yes	Use of generators, machinery, and heavy vehicles during excavation and construction will generate emissions.	Yes. The impact of these emissions is significant to the health of all human receptors along the road construction sites.
5.2	Emissions from production processes?	No	-	-
5.3	Emissions from materials handling including storage or transport?	Yes	Vehicles used for transport of construction, material and machinery will produce emissions. Dust generation during unloading of materials such as cement, aggregates,	Yes. The impact of these emissions is significant to the health of all human receptors around the

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
			etc. There is also a likelihood of re-entrainment of dust particle at the construction site due to movement of vehicles	construction sites.
5.4	Emissions from construction activities including plant and equipment?	Yes	Concrete batching plants, hot-mix plants for bituminous material production during road surfacing will cause emissions.	Yes. The impact of these emissions is significant to the health of all human receptors around the road construction sites.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste?	Yes	Air pollution due to dust generation during construction of roads, excavation and backfilling, handling of excavated and fill material, cement, sand, gravel, aggregates, etc.	Yes. The impact of these emissions is significant to the health of all people residing nearby and passerby.
5.6	Emissions from incineration of waste?	No	-	-
5.7	Emissions from burning of waste in open air (eg slash material, construction debris)?	Yes	The locality of the worker's camp may be affected by the open burning of waste generated from the worker's camp.	Yes. The impact of these emissions is significant to the health of all human receptors living in construction camps and those around the construction camp sites.
5.8	Emissions from any other sources?	No		
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?				
6.1	From operation of equipment eg engines, ventilation plant, crushers?	Yes	Excavation of trenches by heavy machinery, cutters, etc. and subsequent compaction and road surfacing, use of generators, heavy vehicle movements will generate noise and vibration.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the road construction sites, including the workers.
6.2	From industrial or similar processes?	Yes	Production of concrete and bituminous products will generate noise. Crushers and borrow operations will generate high levels of noise.	Yes. The concrete mixers will cause noise in and around the area and bituminous hot mixes will result in heat radiation which will impact the surrounding population and passerby.
6.3	From construction or demolition?	Yes	The noise generated from the demolition of ROW for construction of roads and pathways may disturb the	Yes. The impact of noise and vibration is significant to

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
			people residing at and passerby of core bazaar area.	the health of all human receptors around the construction sites, including the workers.
6.4	From blasting or piling?	No		
6.5	From construction or operational traffic?	Yes	Movement of heavy machinery used for construction work and vehicles transporting construction materials may generate noise that would cause inconvenience to the surrounding communities of road.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the traffic congested sites, including the workers working at these sites.
6.6	From lighting or cooling systems?	No	Night time construction is not envisaged.	No. As per current practices the construction works are allowed only in day time and no lighting for night time working is required.
6.7	From sources of electromagnetic radiation (consider effects on nearby sensitive equipment as well as people)?	No	-	-
6.8	From any other sources?	No	-	-
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters, groundwater, coastal waters or the sea?				
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	Yes	Due to accidental spillage / leakage of fuel and bitumen will pollute the land and water bodies.	Yes. The leakage / spillage of fuel and bitumen will result in land contamination and water pollution.
7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?	Yes	The land and water bodies nearby the workers camp may be polluted by the discharge of sewage from camp.	Yes. The impact of discharge of sewage or effluents to land is significant as they could seep into the ground and pollute the groundwater. Likewise, the impact of discharge of sewage or effluent to receiving bodies of water in the area is significant as they could pollute the water and subsequently the aquatic species.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
7.3	By deposition of pollutants emitted to air, onto the land or into water?	Yes	The land nearby the workers' camp may be polluted by the construction related activities and daily activities of the workers residing there temporarily.	Yes. The discharge of pollutants to air, water or soil will contaminate these natural resources.
7.4	From any other sources?	No		
7.5	Is there a risk of long-term build-up of pollutants in the environment from these sources?	No		
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?				
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?	Yes	Road work involves use of bitumen hot mixes, the accidental fire or explosion of hot mixes and resulting spillages will result in severe impact on human health and as well as environment.	Yes. The explosion and spillage will result in human injury and may pose contamination of land and water and thus it is a significant impact.
8.2	From events beyond the limits of normal environmental protection e.g. failures of pollution control systems?	No	-	-
8.3	From any other causes?	Yes	Accidents can happen due to the carelessness of workers and lapses of safety procedures at the construction sites during the excavation, laying of bitumen etc., and these accidents will impact the human health in terms of injury.	Yes. The impact of accidents is very significant because it can lead to either disability or loss of lives of workers or community people.
8.4	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslip, etc)?	Yes	The project location is situated in High risk earth quake zone (Zone V) as per the Earthquake map released from National Disaster Management Authority (NDMA), Ministry of Home Affairs (MoH) Government of India. There may be impacts related to earthquake and flooding.	Yes. There would be damages to the structures in case of earthquake and flooding incidences
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?				
9.1	Changes in population size, age, structure, social groups etc?	Yes	Increased service level of transportation and reliability will create a higher demand for property in the project beneficiary areas.	Yes. There is a chance of in-migration due to this project that will marginally

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				affect the existing community structure and economic conditions etc. This will create a pressure on existing infrastructure.
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g. schools, hospitals, social facilities?	No		
9.3	Through in-migration of new residents or creation of new communities?	Yes	Such in-migration is possible; however, the numbers would be not much, as the area is already developed commercially and residentially.	No. The number of people migrating will not be much.
9.4	By placing increased demands on local facilities or services eg housing, education, health?	Yes	Due to migration, there will be increased demand on local facilities which increases the load on natural resources consumption.	No. The impact on the local facilities will not be significant.
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	Yes	Requirement of labour for the construction works prioritize the local people hence, providing employment opportunities to the local people.	Yes (Positive impact) The workers (both skilled and unskilled) will gain experience that they can use in the future in other similar kind of works. Improvement of roads will create new business opportunities.
9.6	Any other causes?			
Question - Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?				
10.1	Will the project lead to pressure for consequential development which could have significant impact on the environment e.g. more housing, new roads, new supporting industries or utilities, etc?	Yes	The roads will act as catalyst for development of the surrounding areas and there may be new developments like commercial establishments, malls etc.,	Yes. The anticipated new developments followed by the road projects will result significant environmental impacts due to raw material requirement for the subsequent developments.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
10.2	Will the project lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g. supporting infrastructure (roads, power supply, waste or waste water treatment, etc) housing development extractive industries supply industries other?	Yes	Yes, the project may lead to other developmental projects.	Yes. The project will lead to overall development in the area. Positive Impact
10.3	Will the project lead to after-use of the site which could have an impact on the environment?	No	-	-
10.4	Will the project set a precedent for later developments?	Yes	Improved road infrastructure may create opportunities for other developmental infrastructures.	Yes Quality of life of the Agartala citizens will be improved with all the developmental works. Positive Impact.
10.5	Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?	Yes		

Part 2 - Characteristics of the Project Environment (Environmental Sensitivity)

Question 1 - Are there features of the local environment on or around the Project location which could be affected by the Project? • Areas which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project? • Other areas which are important or sensitive for reasons of their ecology e.g. • Wetlands, • Watercourses or other waterbodies,	No

• the coastal zone, • mountains, • forests or woodlands	No
• Areas used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project?	No
• Inland, coastal, marine or underground waters?	No
• Areas or features of high landscape or scenic value?	
• Routes or facilities used by the public for access to recreation or other facilities?	Yes, the road proposed for the development is connecting to Airport, High Court, Secretariat and other government offices and is susceptible to traffic congestion during the construction phase that may provide discomfort to the passer-by and may disrupt the access to the roadside shops and houses
• Transport routes which are susceptible to congestion or which cause environmental problems?	
• Areas or features of historic or cultural importance?	There are no temples and cultural important places along the VIP road. However, the road construction is within the RoW, so no long-term impact is envisaged. The access to these temples will be temporarily affected during the period of construction.
Question 2 - Is the Project in a location where it is likely to be highly visible to many people?	Yes. The project encompasses development of main road connecting to Airport, High Court and Secretariat due to which it will be highly visible to many people.
Question 3 - Is the Project located in a previously undeveloped area where there will be loss of Greenfield land?	No
Question - Are there existing land uses on or around the Project location which could be affected by the Project? For example: • Homes, gardens, other private property, • Industry, • Commerce, • Recreation, • public open space, • community facilities, • agriculture, • forestry, • tourism, • mining or quarrying	Yes The houses, shops and other properties will be affected during the construction period due to disturbance in access to the property, air and noise pollution due to the construction activities etc.
Question 4 - Are there any plans for future land uses on or around the location which could be affected by the Project?	No
Question 5 - Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?	Yes, there is dense population growth along all the roads proposed for development, these may people will be affected during the construction phase of the project. A well managed traffic Plan will ensure smooth access and operation to these people during construction stage.
Question 6 - Are there any areas on or around the location which are occupied by sensitive land uses which could be affected by the Project? • hospitals,	Yes, there will be temporary disturbance to access to the existing hospitals, schools, places of worship and community facilities along the roads proposed for development.

• schools, • places of worship, • community facilities	A well managed traffic Plan will ensure smooth access and operation to these people during construction stage.
Question 7 - Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project? For example: • groundwater resources, • surface waters, • forestry, • agriculture, • fisheries, • tourism, • minerals.	No
Question 8 - Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	No
Question 9 - Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	Yes, the project area lies under Zone V. The structures in the proposed project are being built by following IS 1893 – Part 1 for Earthquake resistant designs for structures.
Question 10 - Is the Project likely to affect the physical condition of any environmental media? • The atmospheric environment including microclimate and local and larger scale climatic conditions? • Water – e.g. quantities, flows or levels of rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Soils – e.g. quantities, depths, humidity, stability or erodibility of soils? • Geological and ground conditions?	No, the project will not affect any physical condition of the environment; there will be improved road infrastructure after operation of road.
Question 11 - Are releases from the Project likely to have effects on the <u>quality</u> of any environmental media? • Local air quality? • Global air quality including climate change and ozone depletion • Water quality – rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Nutrient status and eutrophication of waters? • Acidification of soils or waters? • Soils • Noise? • Temperature, light or electromagnetic radiation including electrical interference? • Productivity of natural or agricultural systems?	Yes, the construction activities may affect local air quality through dust emissions especially during dry season. It also generates noise pollution by the movement of vehicles for transporting materials, and demolition works of RoW for road construction works.
Question 12 - Is the Project likely to affect the availability or scarcity of any resources either locally or globally? • Fossil fuels? • Water? • Minerals and aggregates?	No

• Timber? • Other non-renewable resources? • Infrastructure capacity in the locality - water, sewerage, power generation and transmission, telecommunications, waste disposal roads, rail?	
Question 13 - Is the Project likely to affect human or community health or welfare? • The quality or toxicity of air, water, foodstuffs and other products consumed by humans? • Morbidity or mortality of individuals, communities or populations by exposure to pollution? • Occurrence or distribution of disease vectors including insects? • Vulnerability of individuals, communities or populations to disease? • Individuals' sense of personal security? • Community cohesion and identity? • Cultural identity and associations? • Minority rights? • Housing conditions? • Employment and quality of employment? • Economic conditions? • Social institutions?	Yes, • This project may offer employment to the local people to involve as a construction worker. This can be viewed as positive impact of the project. • This project may also result in the occurrence or distribution of disease vector due to the temporary settlement of workers as they may not have access to safe water supply and sanitation. • Similarly, this project if properly implemented will have positive effect on the welfare of the local people as they will have better road infrastructure and pedestrian pathways, improved traffic flow which will improve their commuting experience.

Part 3: Significance of Impacts

Questions to be Considered
1. Will there be a large change in environmental conditions?
2. Will new features be out-of-scale with the existing environment?
3. Will the effect be unusual in the area or particularly complex?
4. Will the effect extend over a large area?
5. Will there be any potential for trans boundary impact?
6. Will many people be affected?
7. Will many receptors of other types (fauna and flora, businesses, facilities) be affected?
8. Will valuable or scarce features or resources be affected?
9. Is there a risk that environmental standards will be breached?
10. Is there a risk that protected sites, areas, features will be affected?
11. Is there a high probability of the effect occurring?
12. Will the effect continue for a long time?
13. Will the effect be permanent rather than temporary?
14. Will the impact be continuous rather than intermittent?
15. If it is intermittent will it be frequent rather than rare?
16. Will the impact be irreversible?
17. Will it be difficult to avoid, or reduce or repair or compensate for the effect?

Akhaura Road
"No Mitigation Scenario Checklist" (Scoping Checklist)

Part 1 - Questions on Project Characteristics

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1. Will construction, operation or decommissioning of the Project involves actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc)?				
1.1	Permanent or temporary change in land use, land cover or topography including increases in intensity of land use?	Yes	The proposed project involves upgradation of the Akhaura Road and is within the existing RoW. Following works are proposed for the sub project 1. Dismantling above ground utilities like electric, telephone cables 2. Clearing of drain silts 3. Dismantling existing brick storm water drains 4. Construction of RCC Drain 5. Repositioning of existing water lines, wherever required. 6. Development of Carriageway/ Road Surface 7. Proposal for Pathways/ walkways 8. Proposal for Underground Utility Corridors 9. Provision of Parking facility from Orient Chowmuhani to Jackson gate. For a length of around 200m and width 5.5 m. 10. Proposal for suitable streetscaping	No, there will not be any changes in land use and land cover, but, there will be changes in topography in terms of level of roads. The proposed project is to improve the road footpath conditions in Akhaura Road, the land area will remain the same as there is no land acquisition involved and work will carried out in existing RoW.
1.2	Clearance of existing land, vegetation and buildings?	Yes	No clearance of land as this is reconstruction of existing road of 1.33 km length within the existing RoW.	No, Due to short length of road the duration of impact will be of short time and limited to construction phase only.
			Total 12 trees are required to be cut, 2 along the right side of the road and 10 along the left side of the road	Yes. The proposed trees to cut are common species. No threatened or endangered species of plant are sited in the proposed Akhaura road development area as per the 'Checklist of Rare and Threatened Plants of Tripura' listed in www.indiabiodiversity.org/checklist/show/201
1.3	Creation of new land uses?	No	The proposed work involved only construction of roads and pathways in the existing roads.	No Impacts, As new facilities will be constructed within the existing RoW.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.4	Pre-construction investigations e.g. boreholes, soil testing?	Yes	Soil investigation is involved for the design foundation	No, Geotechnical investigations will involve only obtaining a borehole sample for proposed infrastructures. Since undisturbed core would be extracted using a core cutter there would be no impacts on the topography or the geology.
1.5	Construction works?	Yes	Re-construction of roads, including pathways. The roads will include utilities shifting. Existing Brick walled Storm water drains are proposed to be reconstructed into RCC structures below road surface. Two vent RCC structure is proposed. one vent (Towards the carriageway) shall carry Storm Water and other one (Towards the property line) shall carry Electrical and OFC cables. The vent for Electrical & Optical Fiber Cable (OFC) system will be provided below the footpath and SWD vent shall be provided below the carriageway. OFC & Electrical cable is proposed in RCC cable trench system as per IS: 1255 - 1983. Footpath is provided above the RCC cable trench system.	Yes, because the construction works will take 21 months' time. The construction activities specially the wastes and emissions bring significant adverse impact to the receptors in the area (e.g. institutions and residential/ commercial establishments along the road).
1.6	Demolition works?	Yes	Demolition of existing roads drains and pathways for construction of new roads. The demolition will generate approx 2000 m3 muck from all the roads.	Yes. The demolition wastes will pose challenge to the passerby and surrounding people also it may result in siltation of water bodies if not removed immediately from the site.
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Labour camps will be put up temporarily. There is a possibility of disposal of the solid and liquid wastes to nearby land or water bodies by the construction workers.	Yes. Depending on the size and number of laborers in the construction camps. Pollution of receiving bodies of water around the camps and degradation of aesthetics due to dumping of solid wastes are likely. The construction camps will generate solid and liquid waste, these will change the water quality of the receiving water

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				bodies and harm the aesthetics of the area if dumped openly without any processing.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?	Yes	Earthwork excavation of quantity around 18,000 Cum for all the road works may temporarily affect the land use obstructing the access to by-roads, roadside premises, and houses. Cleaning of drains will generate around 650 cum spoil	Yes. The storage of excavated material and other raw material stored will cause problems to people visiting park and passerby. Siltation of the water bodies at the downstream is also a problem during monsoon season.
1.9	Underground works including mining or tunneling?	Yes	No mining or Tunneling is involved in the project. Excavation for utility trenches and drainage system maximum to the depth of 2.5-3m is proposed.	Yes. Excavation for construction of roads and utility trenches lead to generation of muck, which if not disposed from site will contaminate the nearby water body and pose obstruction to the residents and passerby.
1.10	Reclamation works?	No		
1.11	Dredging?	No		
1.12	Coastal structures eg seawalls, piers?	No		
1.13	Offshore structures?	No		
1.14	Production and manufacturing processes?	No		
1.15	Facilities for storage of goods or materials?	Yes	Construction material excavated material etc. will be stored in heaps along the roads, these material heaps could affect aesthetics at the site, and mobility or free movement of pedestrians and vehicles.	Yes. The obstructions brought about by the material heaps could impede the flow of pedestrians and vehicles in the road stretch.
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	Yes	Labour camp for about 25 inhabitants will generates both solid and liquid waste of around 10 Kg/ day and 2.7 KLD respectively. The solid and liquid wastes generated from the labour camps will pose water quality, soil quality and health issues if not processed/ handled properly.	Yes, The solid and liquid waste generated will cause soil contamination, water contamination if not treated and let into the nature.
1.17	Facilities for long term housing of operational workers?	No		

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.18	New road, rail or sea traffic during construction or operation?	No		
1.19	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No		
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	Yes	The construction will be in phased manner, closure of the road during construction works will be required. Some interior roads may also need temporary closure during construction.	Yes, Road closures during construction phase limited to the length of construction only.
1.21	New or diverted transmission lines or pipelines?	Yes	ICT Line, LT and HT Lines converted from above ground to underground networks and the excavation for underground trenches will generate excavated earth which if not stored and handled properly will pose environmental and safety issues.	Yes, The construction of utility duct and excavation involved will pose environmental, health and safety and aesthetic impacts due to contamination of water bodies, unsafe access to passerby.
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	Slopes and design capacity of drains will be done as per existing rainfall data of the area.	.
1.23	Stream crossings?	Yes	There are 3 drain crossings in the Akhaura Road.	No, There is no change in the existing cross drain structures.
1.24	Abstraction or transfers of water from ground or surface waters?	No		
1.25	Changes in water bodies or the land surface affecting drainage or run-off?	Yes	The roadside storm water drains will be demolished and will be converted to underground RCC drains.	Yes. Short term impact only during the construction period. However, the project will improve the drainage system by reduction in operation and maintenance issues.
1.26	Transport of personnel or	Yes	Transportation vehicles for the movement of workers/ personnel,	Yes.

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	materials for construction, operation or decommissioning?		construction equipment, and construction materials will generate dust and noise.	The dust and noise generated due to transportation of manpower and material will cause discomfort to the occupants of establishments and institutions in the area.
1.27	Long term dismantling or decommissioning or restoration works?	No	-	-
1.28	Ongoing activity during decommissioning which could have an impact on the environment?	No	-	-
1.29	Influx of people to an area in either temporarily or permanently?	Yes	The construction phase will increase the personnel movement for a temporary period and operation phase will also result in influx of people due to change in better aesthetics and better traffic facilities.	Yes, The people will be housed in labour camps and this will cause the solid and liquid waste generation from the camps and subsequent contamination of soil and water contaminations and pose health issues
1.30	Introduction of alien species?	No	-	-
1.31	Loss of native species or genetic diversity?	Yes	For the construction of Akhaura road, 8 trees will be cut, the species exist in those lands are common to the area and therefore no loss of native or genetic diversity is expected.	Yes. Local shrubs and trees are required to remove from the existing area for the construction activities.
1.32	Any other actions?	No	-	-
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?				
2.1	Land especially undeveloped or agricultural land?	No	Construction of road and pathway is within the existing RoW, hence no land resource will be utilized.	No The works are proposed in already developed urban areas and it will not impact any underdeveloped or agriculture land.
2.2	Water?	Yes	During the construction phase, water would be used for construction purposes. During the operations phase, water would be used for watering the road side plantations and ornamental trees.	No, The quantity of water to be used during the construction phase is in small. In Agartala no new water source would be constructed as part of the project. The existing source (municipal water supply and ground water)

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				would be sufficient to supply water for construction.
2.3	Minerals?	Yes	Sand, gravel and soil for subbase of road. This will be sourced from Government approved quarries.	Yes. The huge quantities of sand and aggregates will likely have a significant impact to the aesthetics, topography and ecosystem at the sites or locations where they are sourced or quarried. Transportation of aggregate will also cause air pollution.
2.4	Aggregates?	Yes	The new road surface construction and excavated road repair would be the part of the project. This new construction and repairing of the pavement and concrete works in the project would require aggregates	
2.5	Forests and timber?	No	-	-
2.6	Energy including electricity and fuels?	Yes	None. The required energy, electricity, and fuel during construction activities, vehicle, equipment, and machinery operations are negligible compared to supply.	No. The site is located within urban area where electricity from grid is easily available.
2.7	Any other resources?	No		
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?				
3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, water supplies)?	Yes	During the construction stage, likely leakage of discharge of Fuels like diesel, Petrol, and Oil & Grease will affect human health and environment.	Yes. Any Discharge of these substances will have adverse impacts to environmental quality and human health and may also affect the nearby flora and fauna.
3.2	Will the project result in changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)?	Yes	The labour camps would generate 8 kg per day of solid waste as well as 2.7 KLD of sewage. Thus, the camps have potential to spread diseases.	Yes. Airborne, water-borne or vector-borne diseases could spread or transmitted easily from the construction camps to the outside communities.
3.3	Will the project affect the welfare of people e.g. by changing living conditions?	Yes	Better traffic circulation, pedestrian movement and streetscapes will improve the living conditions of the residents	Yes, Throughout the operation stage of the project. This is a significant positive impact

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
3.4	Are there especially vulnerable groups of people who could be affected by the project e.g. hospital patients, the elderly?	Yes	IGM hospital is adjacent to the proposed Akhaura road. The proposed road works may affect the hospital patients temporarily. There are no orphanage, widow homes, old age homes, shelters for differently abled and other vulnerable institutes in the project area surrounding.	Yes, The probable traffic disruption and emission to air and water contamination may affect the patients coming to the hospital.
3.5	Any other causes?	No		
4. Will the Project produce solid wastes during construction or operation or decommissioning?				
4.1	Spoil, overburden or mine wastes?	Yes	Excavation of drains and roads will produce spoil of around 9800 cum, of this around 3900 cum will be reused at site for backfilling and rest will be disposed at AMC authorized site. The spoil if not readily disposed at safe site, it will occupy the land and may create discomfort to the passer-by.	Yes. The material generated due to excavation will affect the regular walkway and passerby, during the construction period, the material may end up in water body if not stored and disposed properly.
4.2	Municipal waste (household and or commercial wastes)?	Yes	There would be generation of municipal waste from construction camps and during operation phase due to influx of visitors.	Yes. Municipal solid waste generated during the project may cause contamination of land and water bodies if not managed appropriately.
4.3	Hazardous or toxic wastes (including radioactive wastes)?	Yes	Bitumen will be used for the construction of roads, the likely leakage and emissions will cause health and environmental impacts.	Yes, The accidental spills/ leakages of bitumen will cause water and land pollution. Also, the emission from the bitumen during heating will pose health impacts to the workers and passerby.
4.4	Other industrial process wastes?	No		
4.5	Surplus product?	No		
4.6	Sewage sludge or other sludge from effluent treatment?	Yes	The sewage generated from labour camp of around 2.7 KLD may pose environmental and health impacts due to untreated discharge.	Yes, The sewage generated if discharged without treatment will cause ground and surface water pollution.
4.7	Construction or demolition wastes?	Yes	The drain dismantling work will generate around 2000 cum of demolition waste. The waste if not disposed at designated site, will pose environmental and safety issues by siltation of water bodies	Yes. Construction and demolition wastes generated or produced during construction phase will change the aesthetics in the project area. Excavated Soil and

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
			and causing uncomfort to passerby.	demolition debris could clog drainages and could cause siltation of drains and pose difficulties to residents and passer-by for access.
4.8	Redundant machinery or equipment?	No		
4.9	Contaminated soils or other material?	No		
4.10	Agricultural wastes?	No		
4.11	Any other solid wastes?	No		
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?				
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources?	Yes	Use of generators, machinery, and heavy vehicles during excavation and construction will generate emissions.	Yes. The impact of these emissions is significant to the health of all human receptors along the road construction sites.
5.2	Emissions from production processes?	No	-	-
5.3	Emissions from materials handling including storage or transport?	Yes	Vehicles used for transport of construction, material and machinery will produce emissions. Dust generation during unloading of materials such as cement, aggregates, etc. There is also a likelihood of re-entrainment of dust particle at the construction site due to movement of vehicles	Yes. The impact of these emissions is significant to the health of all human receptors around the construction sites.
5.4	Emissions from construction activities including plant and equipment?	Yes	Concrete batching plants, hot-mix plants for bituminous material production during road surfacing will cause emissions.	Yes. The impact of these emissions is significant to the health of all human receptors around the road construction sites.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste?	Yes	Air pollution due to dust generation during construction of roads, excavation and backfilling, handling of excavated and fill material, cement, sand, gravel, aggregates, etc.	Yes. The impact of these emissions is significant to the health of all people residing nearby and passerby.
5.6	Emissions from incineration of waste?	No	-	-
5.7	Emissions from burning of waste in open air (eg slash material,	Yes	The locality of the worker's camp may be affected by the open burning of waste generated from the worker's camp.	Yes. The impact of these emissions is significant to the health of all human receptors living in construction camps and

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	construction debris)?			those around the construction camp sites.
5.8	Emissions from any other sources?	No		
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?				
6.1	From operation of equipment eg engines, ventilation plant, crushers?	Yes	Excavation of trenches by heavy machinery, cutters, etc. and subsequent compaction and road surfacing, use of generators, heavy vehicle movements will generate noise and vibration.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the road construction sites, including the workers.
6.2	From industrial or similar processes?	Yes	Production of concrete and bituminous products will generate noise. Crushers and borrow operations will generate high levels of noise.	Yes. The concrete mixers will cause noise in and around the area and bituminous hot mixes will result in heat radiation which will impact the surrounding population and passerby.
6.3	From construction or demolition?	Yes	The noise generated from the demolition of ROW for construction of roads and pathways may disturb the people residing at and passerby of core bazaar area.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the construction sites, including the workers.
6.4	From blasting or piling?	No		
6.5	From construction or operational traffic?	Yes	Movement of heavy machinery used for construction work and vehicles transporting construction materials may generate noise that would cause inconvenience to the surrounding communities of road.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the traffic congested sites, including the workers working at these sites.
6.6	From lighting or cooling systems?	No	Night time construction is not envisaged.	No. As per current practices the construction works are allowed only in day time and no lighting for night time working is required.
6.7	From sources of electromagnetic radiation (consider effects on nearby sensitive equipment as well as people)?	No	-	-
6.8	From any other sources?	No	-	-

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters, groundwater, coastal waters or the sea?				
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	Yes	Due to accidental spillage / leakage of fuel and bitumen will pollute the land and water bodies.	Yes. The leakage / spillage of fuel and bitumen will result in land contamination and water pollution.
7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?	Yes	The land and water bodies nearby the workers camp may be polluted by the discharge of sewage from camp.	Yes. The impact of discharge of sewage or effluents to land is significant as they could seep into the ground and pollute the groundwater. Likewise, the impact of discharge of sewage or effluent to receiving bodies of water in the area is significant as they could pollute the water and subsequently the aquatic species.
7.3	By deposition of pollutants emitted to air, onto the land or into water?	Yes	The land nearby the workers' camp may be polluted by the construction related activities and daily activities of the workers residing there temporarily.	Yes. The discharge of pollutants to air, water or soil will contaminate these natural resources.
7.4	From any other sources?	No		
7.5	Is there a risk of long-term build-up of pollutants in the environment from these sources?	No		
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?				
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?	Yes	Road work involves use of bitumen hot mixes, the accidental fire or explosion of hot mixes and resulting spillages will result in severe impact on human health and as well as environment.	Yes. The explosion and spillage will result in human injury and may pose contamination of land and water and thus it is a significant impact.
8.2	From events beyond the limits of normal environmental protection e.g. failures of pollution control systems?	No	-	-
8.3	From any other causes?	Yes	Accidents can happen due to the carelessness of workers and lapses of safety procedures at the construction sites during the	Yes. The impact of accidents is very significant because it can lead to either disability or loss of

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
			excavation, laying of bitumen etc., and these accidents will impact the human health in terms of injury.	lives of workers or community people.
8.4	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslip, etc)?	Yes	The project location is situated in High risk earth quake zone (Zone V) as per the Earthquake map released from National Disaster Management Authority (NDMA), Ministry of Home Affairs (MoH) Government of India. There may be impacts related to earthquake and flooding.	Yes. There would be damages to the structures in case of earthquake and flooding incidences
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?				
9.1	Changes in population size, age, structure, social groups etc?	Yes	Increased service level of transportation and reliability will create a higher demand for property in the project beneficiary areas.	Yes. There is a chance of in-migration due to this project that will marginally affect the existing community structure and economic conditions etc. This will create a pressure on existing infrastructure.
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g. schools, hospitals, social facilities?	No		
9.3	Through in-migration of new residents or creation of new communities?	Yes	Such in-migration is possible; however, the numbers would be not much, as the area is already developed commercially and residentially.	No. The number of people migrating will not be much.
9.4	By placing increased demands on local facilities or services eg housing, education, health?	Yes	Due to migration, there will be increased demand on local facilities which increases the load on natural resources consumption.	No. The impact on the local facilities will not be significant.
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	Yes	Requirement of labour for the construction works prioritize the local people hence, providing employment opportunities to the local people.	Yes (Positive impact) The workers (both skilled and unskilled) will gain experience that they can use in the future in other similar kind of works. Improvement of roads will create new business opportunities.
9.6	Any other causes?			

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
Question - Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?				
10.1	Will the project lead to pressure for consequential development which could have significant impact on the environment e.g. more housing, new roads, new supporting industries or utilities, etc?	Yes	The roads will act as catalyst for development of the surrounding areas and there may be new developments like commercial establishments, malls etc.,	Yes. The anticipated new developments followed by the road projects will result significant environmental impacts due to raw material requirement for the subsequent developments.
10.2	Will the project lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g. supporting infrastructure (roads, power supply, waste or waste water treatment, etc) housing development extractive industries supply industries other?	Yes	Yes, the project may lead to other developmental projects.	Yes. The project will lead to overall development in the area. Positive Impact
10.3	Will the project lead to after-use of the site which could have an impact on the environment?	No	-	-
10.4	Will the project set a precedent for later developments?	Yes	Improved road infrastructure may create opportunities for other developmental infrastructures.	Yes Quality of life of the Agartala citizens will be improved with all the developmental works. Positive Impact.
10.5	Will the project have cumulative effects due to proximity to other	Yes		

No.	Questions to be considered in Scoping	Yes/ No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	existing or planned projects with similar effects?			

Part 2 - Characteristics of the Project Environment (Environmental Sensitivity)

Question 1 - Are there features of the local environment on or around the Project location which could be affected by the Project?	
• Areas which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project? • Other areas which are important or sensitive for reasons of their ecology e.g. • Wetlands, • Watercourses or other water bodies, • the coastal zone, • mountains, • forests or woodlands	No
• Areas used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project?	No
• Inland, coastal, marine or underground waters?	No
• Areas or features of high landscape or scenic value?	No
• Routes or facilities used by the public for access to recreation or other facilities?	Yes, the road proposed for the development is passes from main city roads from IGM Chowmuhani to Jackson gate having Passport Sevakendra and Reserve Bank of India (RBI) offices and is susceptible to traffic congestion during the construction phase that may provide discomfort to the passer-by and may disrupt the access to the roadside shops and houses
• Transport routes which are susceptible to congestion or which cause environmental problems?	
• Areas or features of historic or cultural importance?	There are no temples and cultural important places along the Akhaura road. However, the road construction is within the RoW, so no long-term impact is envisaged. The access to these temples will be temporarily affected during the period of construction.
Question 2 - Is the Project in a location where it is likely to be highly visible to many people?	Yes. The project encompasses development of main road connecting IGM Chowmuhani to Jackson gate having Passport Sevakendra and Reserve Bank of India (RBI) offices in the stretch.
Question 3 - Is the Project located in a previously undeveloped area where there will be loss of Greenfield land?	No
Question - Are there existing land uses on or around the Project location which could be affected by the Project? For example:	Yes

• Homes, gardens, other private property, • Industry, • Commerce, • Recreation, • public open space, • community facilities, • agriculture, • forestry, • tourism, • mining or quarrying	The houses, shops and other properties will be affected during the construction period due to disturbance in access to the property, air and noise pollution due to the construction activities etc.
Question 4 - Are there any plans for future land uses on or around the location which could be affected by the Project?	No
Question 5 - Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?	Yes, there is dense population growth along all the roads proposed for development, these may people will be affected during the construction phase of the project. A well-managed traffic Plan will ensure smooth access and operation to these people during construction stage.
Question 6 - Are there any areas on or around the location which are occupied by sensitive land uses which could be affected by the Project? • hospitals, • schools, • places of worship, • community facilities	Yes, there will be temporary disturbance to access to the existing hospitals, offices, commercial establishments and community facilities along the roads proposed for development. A well-managed traffic Plan will ensure smooth access and operation to these people during construction stage.
Question 7 - Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project? For example: • groundwater resources, • surface waters, • forestry, • agriculture, • fisheries, • tourism, • minerals.	No
Question 8 - Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	No
Question 9 - Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	Yes, the project area lies under Zone V. The structures in the proposed project are being built by following IS 1893 – Part 1 for Earthquake resistant designs for structures.
Question 10 - Is the Project likely to affect the physical condition of any environmental media? • The atmospheric environment including microclimate and local and larger scale climatic conditions? • Water – e.g. quantities, flows or levels of rivers, lakes,	No, the project will not affect any physical condition of the environment; there will be

groundwater. Estuaries, coastal waters or the sea? • Soils – e.g. quantities, depths, humidity, stability or erodibility of soils? • Geological and ground conditions?	improved road infrastructure after operation of road.
Question 11 - Are releases from the Project likely to have effects on the <u>quality</u> of any environmental media? • Local air quality? • Global air quality including climate change and ozone depletion • Water quality – rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Nutrient status and eutrophication of waters? • Acidification of soils or waters? • Soils • Noise? • Temperature, light or electromagnetic radiation including electrical interference? • Productivity of natural or agricultural systems?	Yes, the construction activities may affect local air quality through dust emissions especially during dry season. It also generates noise pollution by the movement of vehicles for transporting materials, and demolition works of RoW for road construction works.
Question 12 - Is the Project likely to affect the availability or scarcity of any resources either locally or globally? • Fossil fuels? • Water? • Minerals and aggregates? • Timber? • Other non-renewable resources? • Infrastructure capacity in the locality - water, sewerage, power generation and transmission, telecommunications, waste disposal roads, rail?	No
Question 13 - Is the Project likely to affect human or community health or welfare? • The quality or toxicity of air, water, foodstuffs and other products consumed by humans? • Morbidity or mortality of individuals, communities or populations by exposure to pollution? • Occurrence or distribution of disease vectors including insects? • Vulnerability of individuals, communities or populations to disease? • Individuals' sense of personal security? • Community cohesion and identity? • Cultural identity and associations? • Minority rights? • Housing conditions? • Employment and quality of employment? • Economic conditions? • Social institutions?	Yes, • This project may offer employment to the local people to involve as a construction worker. This can be viewed as positive impact of the project. • This project may also result in the occurrence or distribution of disease vector due to the temporary settlement of workers as they may not have access to safe water supply and sanitation. • Similarly, this project if properly implemented will have positive effect on the welfare of the local people as they will have better road infrastructure and pedestrian pathways, improved traffic flow which will improve their commuting experience.

Part 3: Significance of Impacts

Questions to be Considered
1. Will there be a large change in environmental conditions?
2. Will new features be out-of-scale with the existing environment?
3. Will the effect be unusual in the area or particularly complex?
4. Will the effect extend over a large area?
5. Will there be any potential for trans boundary impact?
6. Will many people be affected?

7. Will many receptors of other types (fauna and flora, businesses, facilities) be affected?
8. Will valuable or scarce features or resources be affected?
9. Is there a risk that environmental standards will be breached?
10. Is there a risk that protected sites, areas, features will be affected?
11. Is there a high probability of the effect occurring?
12. Will the effect continue for a long time?
13. Will the effect be permanent rather than temporary?
14. Will the impact be continuous rather than intermittent?
15. If it is intermittent will it be frequent rather than rare?
16. Will the impact be irreversible?
17. Will it be difficult to avoid, or reduce or repair or compensate for the effect?

Mantribari Road
"No Mitigation Scenario Checklist" (Scoping Checklist)
Part 1 - Questions on Project Characteristics

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.1	Permanent or temporary change in land use, land cover or topography including increases in intensity of land use?	Yes	The proposed project involves up gradation of the Mantribari Road, which is within the existing RoW. Following works are proposed for the sub project 1. Dismantling above ground utilities like electric, telephone cables. 2. Clearing drain silt 3. Dismantling existing brick storm water drains 4. Construction of RCC Drain 5. Repositioning of existing water lines, wherever required. 6. Development of Carriageway/ Road Surface. 7. Proposal for Pathways/ walkways 8. Proposal for Underground Utility Corridors 9. Proposal for suitable streetscaping	No, there will not be any changes in land use and land cover, but, there will be changes in topography in terms of level of roads. The proposed project is to improve the road footpath conditions in Mantribari road, the land area will remain the same as there is no land acquisition involved and work will carried out in existing RoW.
1.2	Clearance of existing land, vegetation and buildings?	Yes	No clearance of land as this is reconstruction of existing road of 0.258 km length within the existing RoW.	No. Clearing of land is not involved in the road project, as the work is being carried out in existing RoW.
			Total 4 trees are required to be cut, 2 along the right side of the road and 2 along the left side of the road	Yes. The proposed trees to cut are common species. No threatened or endangered species of plant are sited in the proposed Mantribari road development area as per the 'Checklist of Rare and Threatened Plants of Tripura' listed in www.indiabiodiversity.org/checklist/show/201 The proposed tree cutting to may change the microclimatic conditions of the area.
1.3	Creation of new land uses?	No		
1.4	Pre-construction investigations	Yes	None. Soil investigation/ testing will be conducted for the road works, but this involves small area.	No, Geotechnical investigations will involve only obtaining a

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	e.g. boreholes, soil testing?			borehole sample for proposed infrastructures. Since undisturbed core would be extracted using a core cutter there would be no impacts on the topography or the geology.
1.5	Construction works?	Yes	Only immediate vicinity of the road will be affected. Road and allied works will potentially impact the immediate environment in terms of air quality due to generation of dusts and vehicle emissions, water pollution due to generation of wastewater from washings and siltation of the water bodies due to solid wastes from demolition and other construction activities. The roads will include utilities Existing Brick walled Storm water drains are proposed to be reconstructed into RCC structures below road surface. Two vent RCC structure is proposed. one vent (Towards the carriageway) shall carry Storm Water and other one (Towards the property line) shall carry Electrical and OFC cables. The vent for Electrical & OFC system will be provided below the footpath and SWD vent shall be provided below the carriageway OFC & Electrical cable is proposed in RCC cable trench system as per IS-1255: 1983. Footpath is provided above the RCC cable trench system.	Yes, because the construction works will take 21 months' time. The construction activities specially the wastes and emissions bring significant adverse impact to the receptors in the area (e.g. institutions and residential/ commercial establishments along the road).
1.6	Demolition works?	Yes	Demolition of existing roads drains will generate wastes and air emissions which will impact the air, water and noise quality of the road area. The demolition will generate approx. 640 m3 muck from all the roads.	Yes. The demolition wastes will pose challenge to the passerby and surrounding people also it may result in siltation of water bodies if not removed immediately from the site.
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	There is a possibility of disposal of the solid and liquid wastes to nearby land or water bodies by the construction workers, which could affect the water bodies and soil environment.	Yes. Depending on the size and number of laborers in the construction camps. Pollution of receiving bodies of water around the camps and degradation of aesthetics due

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				to dumping of solid wastes are likely. The construction camps will generate solid and liquid waste, these will change the water quality of the receiving water bodies and harm the aesthetics of the area if dumped openly without any processing.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?	Yes	Excavated earth of quantity around 3700 Cum for all the road works may temporarily affect the land use obstructing the access to by-roads, roadside premises, and houses. Cleaning of drains will generate around 150 cum spoil.	Yes. The storage of excavated material and other raw material stored will cause problems to people visiting park and passerby. Siltation of the water bodies at the downstream is also a problem during monsoon season.
1.9	Underground works including mining or tunneling?	Yes	No mining or Tunneling is involved in the project. Excavation for utility trenches and drainage system maximum to the depth of 2.5-3m is proposed.	Yes. Excavation for construction of roads and utility trenches lead to generation of muck, which if not disposed from site will contaminate the nearby water body and pose obstruction to the residents and passerby.
1.10	Reclamation works?	No		
1.11	Dredging?	No		
1.12	Coastal structures eg seawalls, piers?	No		
1.13	Offshore structures?	No		
1.14	Production and manufacturing processes?	No		
1.15	Facilities for storage of goods or materials?	Yes	Construction material excavated material etc. will be stored in heaps along the roads, these material heaps could affect aesthetics at the site, and mobility or free movement of pedestrians and vehicles.	Yes. The obstructions brought about by the material heaps could impede the flow of pedestrians and vehicles in the road stretch.
1.16	Facilities for treatment or disposal of solid	Yes	Labour camp for about 25 inhabitants will generates both solid and liquid waste of around 10 Kg/ day and 2.7 KLD respectively.	Yes, The solid and liquid waste generated will cause soil contamination, water

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	wastes or liquid effluents?		The solid and liquid wastes generated from the labour camps will pose water quality, soil quality and health issues if not processed/ handled properly.	contamination if not treated and let into the nature.
1.17	Facilities for long term housing of operational workers?	No		
1.18	New road, rail or sea traffic during construction or operation?	No		
1.19	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No		
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	Yes	The construction will be in phased manner, closure of the road during construction works will be required. Some interior roads may also need temporary closure during construction.	Yes, Road closures during construction phase will cause temporary traffic jams and related issues.
1.21	New or diverted transmission lines or pipelines?	Yes	ICT Line, LT and HT Lines converted from above ground to underground networks and the excavation for underground trenches will generate excavated earth which if not stored and handled properly will pose environmental and safety issues.	Yes, The construction of utility duct and excavation involved will pose environmental, health and safety and aesthetic impacts due to contamination of water bodies, unsafe access to passerby.
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	Slopes and design capacity of drains will be done as per existing rainfall data of the area	
1.23	Stream crossings?	No	There are no drain crossings in the Mantribari Road.	
1.24	Abstraction or transfers of water from ground or surface waters?	No		

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.25	Changes in water bodies or the land surface affecting drainage or run-off?	No	The roadside storm water drains will be demolished and will be converted to underground RCC drains.	Yes, Short term impacts will be there only during the construction period. However, the project will improve the drainage system by reduction in operation and maintenance issues.
1.26	Transport of personnel or materials for construction, operation or decommissioning ?	Yes	Transportation vehicles for the movement of workers/ personnel, construction equipment, and construction materials will generate dust and noise.	Yes. The dust and noise generated due to transportation of manpower and material will cause discomfort to the occupants of establishments and institutions in the area.
1.27	Long term dismantling or decommissioning or restoration works?	No	-	-
1.28	Ongoing activity during decommissioning which could have an impact on the environment?	No	-	-
1.29	Influx of people to an area in either temporarily or permanently?	Yes	The construction phase will increase the personnel movement for a temporary period and operation phase will also result in influx of people due to change in better aesthetics and better traffic facilities.	Yes, The people will be housed in labour camps and this will cause the solid and liquid waste generation from the camps and subsequent contamination of soil and water contaminations and pose health issues
1.30	Introduction of alien species?	No	-	-
1.31	Loss of native species or genetic diversity?	Yes	For the construction of Mantribari road, 2 trees will be cut, the species exist in those lands are common to the area and therefore no loss of native or genetic diversity is expected.	Yes. Local shrubs and trees are required to remove from the existing area for the construction activities.
1.32	Any other actions?	No	-	-
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?				
2.1	Land especially undeveloped or agricultural land?	No	Construction of road and pathway is within the existing RoW, hence no land resource will be utilized.	No The works are proposed in already developed urban areas and it will not impact any

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				underdeveloped or agriculture land.
2.2	Water?	Yes	During the construction phase, water would be used for construction purposes. During the operations phase, water would be used for watering the road side plantations and ornamental trees.	No, The quantity of water to be used during the construction phase is in small. In Agartala no new water source would be constructed as part of the project. The existing source (municipal water supply and ground water) would be sufficient to supply water for construction.
2.3	Minerals?	Yes	Sand, gravel and soil for subbase of road. This will be sourced from Government approved quarries.	Yes. The huge quantities of sand and aggregates will likely have a significant impact to the aesthetics, topography and ecosystem at the sites or locations where they are sourced or quarried. Transportation of aggregate will also cause air pollution.
2.4	Aggregates?	Yes	The new road surface construction and excavated road repair would be the part of the project. This new construction and repairing of the pavement and concrete works in the project would require aggregates	
2.5	Forests and timber?	No	-	-
2.6	Energy including electricity and fuels?	Yes	None. The required energy, electricity, and fuel during construction activities, vehicle, equipment, and machinery operations are negligible compared to supply.	No. The site is located within urban area where electricity from grid is easily available.
2.7	Any other resources?	No		
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?				
3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, water supplies)?	Yes	During the construction stage, likely leakage of discharge of Fuels like diesel, Petrol, and Oil & Grease will affect human health and environment.	Yes. Any Discharge of these substances will have adverse impacts to environmental quality and human health and may also affect the nearby flora and fauna.
3.2	Will the project result in changes in occurrence of disease or affect	Yes	The labour camps would generate 10 kg per day of solid waste as well as 2.7 KLD of sewage. Thus, the camps have potential to spread diseases	Yes. Airborne, water-borne or vector-borne diseases could

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	disease vectors (e.g. insect or water borne diseases)?			spread or transmitted easily from the construction camps to the outside communities.
3.3	Will the project affect the welfare of people e.g. by changing living conditions?	Yes	Better traffic circulation, pedestrian movement and streetscapes will improve the living conditions of the residents	Yes, Throughout the operation stage of the project. This is a significant positive impact
3.4	Are there especially vulnerable groups of people who could be affected by the project e.g. hospital patients, the elderly?	Yes	Agartala Nursing home is adjacent to the proposed Mantribari road. The proposed road works may affect the hospital patients temporarily. There are no orphanage, widow homes, old age homes, shelters for differently abled and other vulnerable institutes in the project area surrounding.	Yes, The probable traffic disruption and emission to air and water contamination may affect the patients coming to the hospital.
3.5	Any other causes?	No		
4. Will the Project produce solid wastes during construction or operation or decommissioning?				
4.1	Spoil, overburden or mine wastes?	Yes	Excavation of drains and roads will produce spoil of around 3700 cum, of this around 900 cum will be reused at site for backfilling and rest will be disposed at AMC authorized site. The spoil if not readily disposed at safe site, it will occupy the land and may create discomfort to the passer-by.	Yes. The material generated due to excavation will affect the regular walkway and passerby, during the construction period, the material may end up in water body if not stored and disposed properly.
4.2	Municipal waste (household and or commercial wastes)?	Yes	There would be generation of municipal waste from construction camps and during operation phase due to influx of visitors.	Yes. Municipal solid waste generated during the project may cause contamination of land and water bodies if not managed appropriately.
4.3	Hazardous or toxic wastes (including radioactive wastes)?	Yes	Bitumen will be used for the construction of roads, the likely leakage and emissions will cause health and environmental impacts.	Yes, The accidental spills/ leakages of bitumen will cause water and land pollution. Also, the emission from the bitumen during heating will pose health impacts to the workers and passerby.
4.4	Other industrial process wastes?	No		
4.5	Surplus product?	No		
4.6	Sewage sludge or other sludge from effluent treatment?	Yes	The sewage generated from labour camp of around 2.7 KLD may pose environmental and health impacts due to untreated discharge.	Yes, The sewage generated if discharged without treatment

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				will cause ground and surface water pollution.
4.7	Construction or demolition wastes?	Yes	The drain dismantling work will generate around 640 cum of demolition waste. Construction of Roads, pathways and utility trenches will produce construction and demolition waste. The waste if not disposed at designated site, will pose environmental and safety issues by siltation of water bodies and causing uncomfort to passerby.	Yes. Construction and demolition wastes generated or produced during construction phase will change the aesthetics in the project area. Excavated Soil and demolition debris could clog drainages and could cause siltation of drains and pose difficulties to residents and passer-by for access.
4.8	Redundant machinery or equipment?	No		
4.9	Contaminated soils or other material?	No		
4.10	Agricultural wastes?	No		
4.11	Any other solid wastes?	No		
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?				
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources?	Yes	Use of generators, machinery, and heavy vehicles during excavation and construction will generate emissions.	Yes. The impact of these emissions is significant to the health of all human receptors along the road construction sites.
5.2	Emissions from production processes?	No	-	-
5.3	Emissions from materials handling including storage or transport?	Yes	Vehicles used for transport of construction, material and machinery will produce emissions. Dust generation during unloading of materials such as cement, aggregates, etc. There is also a likelihood of re-entrainment of dust particle at the construction site due to movement of vehicles	Yes. The impact of these emissions is significant to the health of all human receptors around the construction sites.
5.4	Emissions from construction activities including plant and equipment?	Yes	Concrete batching plants, hot-mix plants for bituminous material production during road surfacing will cause emissions.	Yes. The impact of these emissions is significant to the health of all human receptors around the road construction sites.
5.5	Dust or odours from handling of materials including construction materials,	Yes	Air pollution due to dust generation during construction of roads, excavation and backfilling, handling of excavated and fill material, cement, sand, gravel, aggregates, etc.	Yes. The impact of these emissions is significant to the health of all people residing nearby and passerby.

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	sewage and waste?			
5.6	Emissions from incineration of waste?	No	-	-
5.7	Emissions from burning of waste in open air (eg slash material, construction debris)?	Yes	The locality of the worker's camp may be affected by the open burning of waste generated from the worker's camp.	Yes. The impact of these emissions is significant to the health of all human receptors living in construction camps and those around the construction camp sites.
5.8	Emissions from any other sources?	No		
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?				
6.1	From operation of equipment eg engines, ventilation plant, crushers?	Yes	Excavation of trenches by heavy machinery, cutters, etc. and subsequent compaction and road surfacing, use of generators, heavy vehicle movements will generate noise and vibration.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the road construction sites, including the workers.
6.2	From industrial or similar processes?	Yes	Production of concrete and bituminous products will generate noise. Crushers and borrow operations will generate high levels of noise.	Yes. The concrete mixers will cause noise in and around the area and bituminous hot mixes will result in heat radiation which will impact the surrounding population and passerby.
6.3	From construction or demolition?	Yes	The noise generated from the demolition of ROW for construction of roads and pathways may disturb the people residing at and passerby of core bazaar area.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the construction sites, including the workers.
6.4	From blasting or piling?	No		
6.5	From construction or operational traffic?	Yes	Movement of heavy machinery used for construction work and vehicles transporting construction materials may generate noise that would cause inconvenience to the surrounding communities of road.	Yes. The impact of noise and vibration is significant to the health of all human receptors around the traffic congested sites, including the workers working at these sites.
6.6	From lighting or cooling systems?	No	Night time construction is not envisaged.	No. As per current practices the construction works are allowed only in day time and no lighting

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				for night time working is required.
6.7	From sources of electromagnetic radiation (consider effects on nearby sensitive equipment as well as people)?	No	-	-
6.8	From any other sources?	No	-	-
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters, groundwater, coastal waters or the sea?				
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	Yes	Due to accidental spillage / leakage of fuel and bitumen will pollute the land and water bodies.	Yes. The leakage / spillage of fuel and bitumen will result in land contamination and water pollution.
7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?	Yes	The land and water bodies nearby the workers camp may be polluted by the discharge of sewage from camp.	Yes. The impact of discharge of sewage or effluents to land is significant as they could seep into the ground and pollute the groundwater. Likewise, the impact of discharge of sewage or effluent to receiving bodies of water in the area is significant as they could pollute the water and subsequently the aquatic species.
7.3	By deposition of pollutants emitted to air, onto the land or into water?	Yes	The land nearby the workers' camp may be polluted by the construction related activities and daily activities of the workers residing there temporarily.	Yes. The discharge of pollutants to air, water or soil will contaminate these natural resources.
7.4	From any other sources?	No		
7.5	Is there a risk of long-term build-up of pollutants in the environment from these sources?	No		
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?				
8.1	From explosions, spillages, fires etc from storage, handling, use or production of	Yes	Road work involves use of bitumen hot mixes, the accidental fire or explosion of hot mixes and resulting spillages will result in severe impact on human health and as well as environment.	Yes. The explosion and spillage will result in human injury and may pose contamination of land and water and thus it is a significant impact.

No.	Questions to be considered in Scoping	Yes / No	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	hazardous or toxic substances?			
8.2	From events beyond the limits of normal environmental protection e.g. failures of pollution control systems?	No	-	-
8.3	From any other causes?	Yes	Accidents can happen due to the carelessness of workers and lapses of safety procedures at the construction sites during the excavation, laying of bitumen etc., and these accidents will impact the human health in terms of injury.	Yes. The impact of accidents is very significant because it can lead to either disability or loss of lives of workers or community people.
8.4	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslip, etc)?	Yes	The project location is situated in High risk earth quake zone (Zone V) as per the Earthquake map released from National Disaster Management Authority (NDMA), Ministry of Home Affairs (MoH) Government of India. There may be impacts related to earthquake and flooding.	Yes. There would be damages to the structures in case of earthquake and flooding incidences
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?				
9.1	Changes in population size, age, structure, social groups etc?	Yes	Increased service level of transportation and reliability will create a higher demand for property in the project beneficiary areas.	Yes. There is a chance of in-migration due to this project that will marginally affect the existing community structure and economic conditions etc. This will create a pressure on existing infrastructure.
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g. schools, hospitals, social facilities?	No		
9.3	Through in-migration of new residents or creation of new communities?	Yes	Such in-migration is possible; however, the numbers would be not much, as the area is already developed commercially and residentially. Due to migration, there will be	No. The number of people migrating will not be much.