Initial Environmental Examination

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IND: Agartala City Urban Development Project – Revival and Restoration of Ujjayanta Palace Complex in Agartala City PART A

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

CURRENCY EQUIVALENTS

(as of 15 July 2020)

Currency unit	–	Indian rupee (₹)
₹1.00	=	$0.0133
$1.00	=	₹75.158

ABBREVIATIONS

ADB	—	Asian Development Bank
AMC	—	Agartala Municipal Corporation
ASCL	—	Agartala Smart City Limited
ASCP	—	Agartala Smart City Plan
CTE	—	Consent to Establishment
CTO	—	Consent to Operate
CPCB	—	Central Pollution Control Board
EIA	—	Environmental Impact Assessment
EMP	—	Environmental Management Plan
EC	—	Environmental Clearance
GAPA	—	Greater Agartala Planning Area
GRC	—	Grievance Redress Committee
GRM	—	Grievance Redress Mechanism
GOI	—	Government of India
H&S	—	Health and safety
IEE	—	Initial Environmental Examination
INR	—	Indian Rupee
MoEFCC	—	Ministry of Environment and Forests and Climate Change
NAAQS	—	National Ambient Air Quality Standards
PIU	—	Project Implementation Unit
PMC	—	Project Management Consultant
PCR	—	Physical Cultural Resources
SEIAA	—	State Environment Impact Assessment Authority
TSPCB	—	Tripura State Pollution Control Board
SPS	—	Safeguard Policy Statement
UDD	—	Urban Development Department

WEIGHTS AND MEASURES

^{o}C	–	Degree Celsius
km	–	kilometer
m	–	meter
nos.	–	numbers
m^2	–	square meters
km^2	–	square kilometer
Kmph	–	kilometer per hour
cum	–	cubic meter

NOTE

In this report, "$" refers to United States dollars.

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APPENDICES

EXECUTIVE SUMMARY

The proposed project is aligned with Government of India's Smart Cities Mission (SCM), launched in 2015 with the aim of making urban areas more livable, citizen-friendly, sustainable and resilient, improving urban equality and living conditions with a focus on creating 100 "smart cities". The project aims to support; (i) urban development: by making the city more livable; (ii) economic development: by promoting the city as an economic and commercial hub in the region; (iii) environmentally sustainable development; and (iv) capacity development of implementing institution. The project is aligned with India CPS 2018–2022, which emphasizes support to national flagship programs including SCM, inclusive urbanization, and development of competitive cities.[1]

The project is aligned with the following impact: Agartala established as an economic-commercial hub in the northeast India with improved quality of life.

Impact and Outcome of the Project. The project will have the following outcome: Livability in Agartala city improved. The project will have three outputs.

- **Output 1**: **Urban roads and drainage upgraded.** This will include (i) construction of 23 km of climate-resilient roads that will decongest the city's central and east zones, along with associated facilities including improved paved surface, geometric traffic junctions transformation, lighting, footpaths, dedicated parking, bollards, signaling, Elderly-Women-Children-Differently abled (EWCD) responsive features, and a utility corridor with shifting of electrical lines; and (ii) construction and rehabilitation of 48 km of new or existing stormwater drains.[1] These activities will improve public health by reducing urban floods and air quality.

- [1] EWCD responsive features are related to adapted sidewalks, pedestrian crossings, street lightning, dedicated parking, bollards, signage, among others.

- **Output 2**: **Tourist places renovated and made more eco-friendly.** This will include (i) rejuvenation of 50,000 square meter (m^2) within the Maharaja Bir Bikram College lake area, through upgrading of eco-park, development of a water recreation area and lakeside public area, creation of a thematic/botanical garden, garden gazebos, enhancement of the lake water quality with artificial wetlands and adequate aeration, and use of waste and effluent management strategies; and (ii) renewal of 100,000 m^2 of open spaces in the Ujjayanta Palace area, through beautification of garden spaces, renewal of existing water fountains, renovation of existing drainage system, development of lake side walkway with resting areas and pergolas, leisure areas, decorative lighting and dedicated parking zone. All facilities will adopt EWCD responsive features and will also increase users' safety through improved lighting zones.
- **Output 3**: **Public awareness on sanitation and hygiene, and capacity of urban local bodies in urban service delivery improved.** The project will provide capacity-building for technical staff of AMC, ASCL, TUDA, and UDD on project

[1] Smart Cities Mission. Strategy. ADB. 2017. *Country Partnership Strategy: India, 2018–2022—Accelerating Inclusive Economic Transformation.* Manila.

management and operation and maintenance of urban infrastructure; own-source revenue generation and financial management; climate and disaster resilient urban planning; and environmental and social safeguards. This output will also provide capacity building for increased knowledge on tourism-related matters, community mobilization, and livelihood enhancement for shop keepers, street vendors and artisans around Ujjayanta Palace. It will also increase knowledge of eligible staff of the Public Health Division of AMC on preventive healthcare. Awareness campaigns will be conducted on road safety; on water conservation, health, sanitation and hygiene; and mitigation of the transmission of communicable diseases such as the coronavirus disease (COVID-19). The project will also accomplish the preparation of at least six climate-resilient components for future investment projects.[1]

- [1] The components include (i) storm water drains, (ii) sewerage, (iii) urban roads, (iv) water supply, (v) open spaces and water bodies, and (vi) housing for economically weaker sections
- [2]

The proposed works at outer area of Ujjayanta Palace project is part of ACUDP, this will uplift the ambience of the area and will increase the tourism potential. Other interventions to improve existing roads will help decongest the city and improve mobility, aesthetics, making roads pedestrians friendly. Drainage project will address problems related to water stagnation and flooding within the city, Sewerage network in old city area making it climate resilient. The project will integrate with the urban planning processes of the city and will also have health benefits to the citizens.

Scope of Work: The scope of work includes:

- Renovation and Restoration of Front Palace Gardens and Façade Illumination
- Revival of North gate and transformation of *Astabal* Structure
- Proposal for Food Court
- Rear garden revival with multi-activity plaza and Amphitheatre
- Proposal for Visitor Parking
- Eastern lake edge development

Construction Details in the proposed project

Sr. No.	Proposal	Site Area (m^2)	Remarks
1	Front Garden	20674	T- Stretch in front of Palace Building including water features, pathways and landscape
2	*Astabal* Area	745	Including 3.5 m wide footpath and the footprint of *Astabal* structure (50.2 mx 2.4 m), Guard hut and toilet block

[2] The subprojects include (i) Storm water drains, (ii) Sewerage, (iii) Urban Roads, (iv) Water Supply, (v) Open spaces and water bodies, and (vi) Housing for Economically weaker sections

Sr. No.	Proposal	Site Area (m^2)	Remarks
3	Food Court	1178	Including one toilet block
4	Rear Garden	3662	Including existing toilet block
5	Parking Area	916	22.4 m wide and 39.5 long plot
6	Eastern Lake Edge	1114	Approximate 4 m wide and 273 m long stretch along eastern lake

Screening and assessment of potential environmental impacts: ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. This states that ADB needs environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries, and private sector loans. Accordingly, this Initial Environmental Examination (IEE) has been conducted to assess the environmental impacts of the infrastructure components proposed under Renovation and Restoration of Ujjayanta Palace in Agartala City Urban Development Project.

Initial Environmental Examination (IEE): This IEE aims to (i) provide critical facts, significant finding, and recommended actions; (ii) present the national, international and local legal and institutional framework within which the environmental assessment has been carried out; (iii) provide information on existing geographic, ecological, social and temporal context including associated facilities within the subproject's area of influence; (iv) assess the subproject's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic, and physical cultural resources in the subproject's area of influence; (v) identify mitigation measures and any residual negative impacts that cannot be mitigated; (vi) describe the process undertaken during project design to engage stakeholders and the planned information disclosure measures and the process for carrying out consultation with affected people and facilitating their participation during project implementation; (vii) describe the subproject's grievance redress mechanism for resolving complaints about environmental performance; (viii) present the set of mitigation measures to be undertaken to avoid, reduce, mitigate, or compensate for adverse environmental impacts; (ix) describe the monitoring measures and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures; and (x) identify who is responsible for carrying out the mitigation and monitoring measures.

The IEE is prepared after detailed design and no major design changes are expected in the subproject during implementation. However, the IEE will be updated/ revised if there are any changes in site/ locations and design of components during preconstruction phase. It will also be updated/ revised based on review of draft IEE and conditions of consents/ approval from other departments. The updated/ revised IEE will be submitted to ADB for review and disclosure. No works will be conducted until ADB has cleared the updated/revised IEE. The revised IEE shall supersede the earlier version of IEE and shall be contractually applicable to the contractor after approval from Agartala Smart City Limited (ASCL) and ADB.

Categorization. Potential negative impacts were identified in relation to pre-construction, construction and operation of the improved infrastructure, but no permanent environmental impacts were identified as being due to either the subproject design or location. Accordingly, Renovation and Restoration of Ujjayanta Palace subproject is classified under environmental Category B as per the SPS as no significant impacts are envisaged. Further mitigation measures have been developed to reduce all negative impacts to acceptable levels. These were discussed

with specialists responsible for the engineering aspects, and as a result some measures have already been included in the designs for the infrastructure.

Description of the Environment: Information on baseline environment was collected from primary survey for air quality, water quality, noise quality and secondary sources of data for the macro environmental parameters like climate, physiography (geology and geomorphology), biological and socioeconomic environment of the project influence area. Agartala is the Capital of Tripura and is an urban settlement and there is no natural habitat at the sites. The project does not involve any type of land acquisition or land use change as it is renovation and restoration of existing Garden. The ownership of the land parcels of Ujjayanta Palace and other proposed project component are under Government of Tripura as per the land records available. There are no mangroves, or estuaries in or near the project location.

Potential Environmental Impacts and Mitigation Measures. In this IEE, negative impacts were identified in relation to location, design, construction and operation of the improved infrastructure. Environmental impacts as being due to the project design or location were not significant as various measures are already included in site planning and detailed design. There are no environmentally or archeologically sensitive areas within Agartala town. The town is mostly surrounded by agricultural areas, and there are no sensitive areas like forests.

Potential impacts during construction are considered significant but temporary and are common impacts of construction in urban areas, and there are well developed methods to mitigate the same. All other construction activities will be confined to the selected sites and the interference with the general public and community around is minimal. In these works, the temporary negative impacts arise mainly from construction dust and noise, hauling of construction material, waste and equipment on local roads (traffic, dust, safety etc.), mining of construction material, occupational health and safety (OHS) aspects. Road construction works will be conducted along already existing public roads in an urban area congested with people, activities and traffic. Therefore, these works may have adverse, but temporary impacts arising mainly from the disturbance of residents, businesses and traffic due to construction work; safety risk to workers, public; access impediment to houses and business, disposal of large quantities of construction waste etc. These are all general impacts of construction in urban areas and there are well developed methods of mitigation that are suggested in the EMP.

Environmental Management Plan. Environmental Management Plan (EMP) deals with the implementation procedure of the guidelines and mitigation measures recommended to avoid, minimize and mitigate foreseen environmental impacts of the project. The implementation of environmental management plan needs suitable organization set up and the success of any environmental management plan depends on the efficiency of the group responsible for implementation of the program. It is proposed to carryout regular environmental monitoring to provide information to the management for periodic review and alteration of the environmental management plan is necessary so as to ensure that environmental protection is optimized at all stages of the project. PIU is responsible for implementing all environmental monitoring and management works during implementation of project to achieve certain level of quality in the project and ensure that all statutory requirements are met during the project implementation. The engineering staff of PIU, supervision consultancy and the contractor who would be responsible for the implementation of the EMP, need to be trained on environmental issues of project. EMP implementation budget for the proposed project is Rs. 31,92,716.

A copy of the approved EMP will always be kept on site during the construction period. The EMP has been made binding on contractor operating on the site and 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. Contractor will establish the baseline environmental conditions prior to commencement of civil works.

Institutional Arrangement: 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 will be responsible for implementing the Project, while the PIU s at project level will support the PMU. The Project Management and Quality Assurance Consultant (PMQAC) and PIUs will support the PMU. The Board of Directors of ASCL will provide policy related directions and project oversight to PMU.

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. SGC will be headed by a safeguards officer (SO) supported by an Environmental Engineer (EE) and a Social and Gender Development Officer.

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. PMQAC 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

Consultation Disclosure and Grievance Redress: The stakeholders were involved in developing the IEE through discussions on-site and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the project. The IEE will be made available at public locations in the city and will be disclosed to a wider audience via the ADB and ASCL websites. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and can participate in its development and implementation. The citizens of the Agartala City will be the major beneficiaries of this subproject. During the construction stage the project will provide employment opportunity and enhance the enterprise development of locals. There will also be skill development due to the project implementation. A project specific grievance redress mechanism is described within the IEE to ensure any public grievances are addressed quickly.

Monitoring and Reporting: The ASCL and Project consultants will be responsible for monitoring. The consultant will submit monthly monitoring reports to ASCL and ASCL will send semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports on its website.

Conclusions: The citizens of the Agartala will be the major beneficiaries. The subproject is primarily designed to improve environmental quality and living conditions of Agartala town by developing Ujjayanta Palace as a major recreational center. The proposed subproject is unlikely to cause significant adverse impacts on either the environment or the human health and safety. The potential impacts that are associated with design, 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, there are no significant impacts and the classification of the subproject as Category "B" is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006).

Recommendations: The following are recommendations applicable to the subproject to ensure no significant impacts:

- Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design.
- Include this IEE in bid and contract documents.
- Conduct safeguards induction to the contractor upon award of contract.
- Strictly supervise EMP implementation
- Ensure contractor appointed qualified EHS officers prior to start of works;
- Documentation and reporting on a regular basis as indicated in the IEE.
- Continuous consultations with stakeholders.
- Contractor to ensure immediate repair of utilities for undisrupted services
- Contractor to ensure safe and secure access to all nearby households and commercial establishments.
  Timely disclosure of information and establishment of grievance redressal mechanism (GRM);
- Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation.
- Involvement of contractors, including subcontractors, in first level GRM;

I. INTRODUCTION

A. Project Background

1. The proposed project is aligned with Government of India's Smart Cities Mission (SCM), launched in 2015 with the aim of making urban areas more livable, citizen-friendly, sustainable and resilient, improving urban equality and living conditions with a focus on creating 100 "smart cities". The project aims to support; (i) urban development: by making the city more livable; (ii) economic development: by promoting the city as an economic and commercial hub in the region; (iii) environmentally sustainable development; and (iv) capacity development of implementing institution. The project is aligned with India CPS 2018–2022, which emphasizes support to national flagship programs including SCM, inclusive urbanization, and development of competitive cities.[3]

B. Impact and Outcome of the Project

2. The project is aligned with the following impact: Quality of life for urban Agartala inhabitants improved.[4] The project will have the following outcome:

3. **Output 1**: Urban roads and drainage upgraded and enhanced. This will include (i) construction of 23 km of climate-resilient roads that will decongest the city's central and east zones, along with associated facilities including improved paved surface, geometric traffic junctions transformation, lighting, footpaths, dedicated parking, bollards, signaling, Elderly-Women-Children-Differently abled (EWCD) responsive features, and a utility corridor with shifting of electrical lines; and (ii) construction and rehabilitation of 48 km of new or existing stormwater drains. These activities will improve public health by reducing urban floods and air quality through reduction of Particulate Matter size less than 10 microns (PM10).

4. **Output 2**: Water supply system expanded and improved. This will include in the Chandmari service area (i) construction of one water treatment plant with 8.0 Millions of Litters per Day treatment capacity; (ii) construction of two overhead reservoirs with overall capacity of 1,850KL; (iii) construction of 2 tube wells; (iv) construction and rehabilitation of approximately 42km of water supply network; and (v) establishment of approximately 5,700 new or rehabilitated households connections. Activities under this output will benefit 26,440 people with 135 liters per capita per day of treated water and will improve public health by ensuring 100% of water quality test results in specific distribution system will meet country standards.

5. **Output 3**: Tourist places renovated and made more eco-friendly. This will include (i) rejuvenation of 50,000 m^2 within the Maharaja Bir Bikram College lake area, through upgrading of eco-park, development of a water recreation area and lakeside public area, creation of a thematic/botanical garden, garden gazebos, enhancement of the lake water quality with artificial wetlands and adequate aeration, and use of waste and effluent management strategies; and (ii) renewal of 100,000 m^2 of open spaces in the Ujjayanta Palace area, through beautification of garden spaces, renewal of existing water fountains, renovation of existing drainage system,

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[3] Smart Cities Mission. Strategy. ADB. 2017. *Country Partnership Strategy: India, 2018–2022—Accelerating Inclusive Economic Transformation.* Manila.

[4] Government of India, Ministry of Housing and Urban Affairs. 2015. *Smart City Guidelines*. Delhi

development of lake side walkway with resting areas and pergolas, leisure areas, decorative lighting and dedicated parking zone. All facilities will adopt EWCD responsive features and will also increase users' safety through improved lighting zones.

6. **Output 4**: Capacity of urban local bodies in urban service delivery strengthened. The project will provide capacity-building for the technical staff of Agartala Municipal Corporation, Agartala Smart City Limited, Tripura Urban (Planning and) Development Authority and Urban Development Department, with focus on female staff, on (i) project management and operation and maintenance of urban infrastructure; (ii) own-source revenue generation and financial management; (iii) climate resilient urban planning, gender analysis and mainstreaming, and (iv) gender-responsive budgeting in urban planning. This output will also provide capacity building for increased knowledge on tourism-related matters and livelihood enhancement for shop keepers and street vendors around Ujjayanta Palace. This output will also increase knowledge of eligible staff, with focus on female staff, of (i) the Public Health Division of AMC; and (ii) AMC and DWS on institutional reforms. Awareness campaigns will also be conducted on (i) road safety; and (ii) behavior change activities focusing on water conservation, health, sanitation and hygiene; and awareness on the spread of epidemics or pandemics such as COVID-19. The project will also accomplish the preparation of at least 6 climate-resilient subprojects for future investments projects.[5]

C. Purpose of the Initial Environmental Examination

7. ADB requires the consideration of environmental issues in all aspects of the bank's operations, and the requirements for environmental assessment are described in its Safeguard Policy Statement (SPS), 2009. The proposed projects are categorized as A, B, C or FI to determine the level of environmental assessment required. The proposed subproject causes potential environmental impacts which are less adverse in nature and few of them are reversible and mitigation measures can be designed more readily for the identified impacts. The Rapid environmental assessment using ADB's Rapid Environmental Assessment (REA) Checklist for Ujjayanta Palace project components were conducted and as per the ADB's Guidelines on Environmental Assessment the proposed project (with minimal impacts) is classified as Category 'B' project. Accordingly, this initial environmental examination (IEE) report has been prepared. The Rapid Environmental Assessment Checklist as per ADB is attached as Appendix 1 and Appendix 2 provides initial screening of project activities by "no mitigation measure scenario checklist".

8. **Scope of the IEE:** The IEE is prepared based on detailed design in the detailed project report (DPR), secondary sources of information, field reconnaissance surveys, primary field monitoring (environmental) survey and stakeholder consultation. There are no major design changes expected in the subproject during implementation. However, the IEE will be updated/ revised if there are any changes in site/ locations and design of components during construction phase. The updated/ revised IEE will be submitted to ADB for review and disclosure. No works will be conducted until ADB clears the final IEE.

[5] The subprojects include (i) Storm water drains, (ii) Sewerage, (iii) Urban Roads, (iv) Water Supply, (v) Open spaces and water bodies, and (vi) Housing for Economically weaker sections

9. This IEE will be reviewed during pre-construction stage and project implementation and updated if there is any change in scope of works, change in location of component and change in cost due to addition or subtraction of components which can change the environmental impacts, and revised IEE shall supersede the earlier version of IEE. and shall be contractually applicable to the contractor after approval from ASCL and ADB.

10. The implementation of the subprojects will be governed by Government of India and State of Tripura and other applicable environmental acts, rules, regulations, and standards. Environmental safeguards will be followed in accordance with the ADB SPS 2009. During the design, construction, and operation of the project the borrower/client will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards.

D. Report Structure:

11. This Report contains the following nine sections including the executive summary at the beginning of the report.

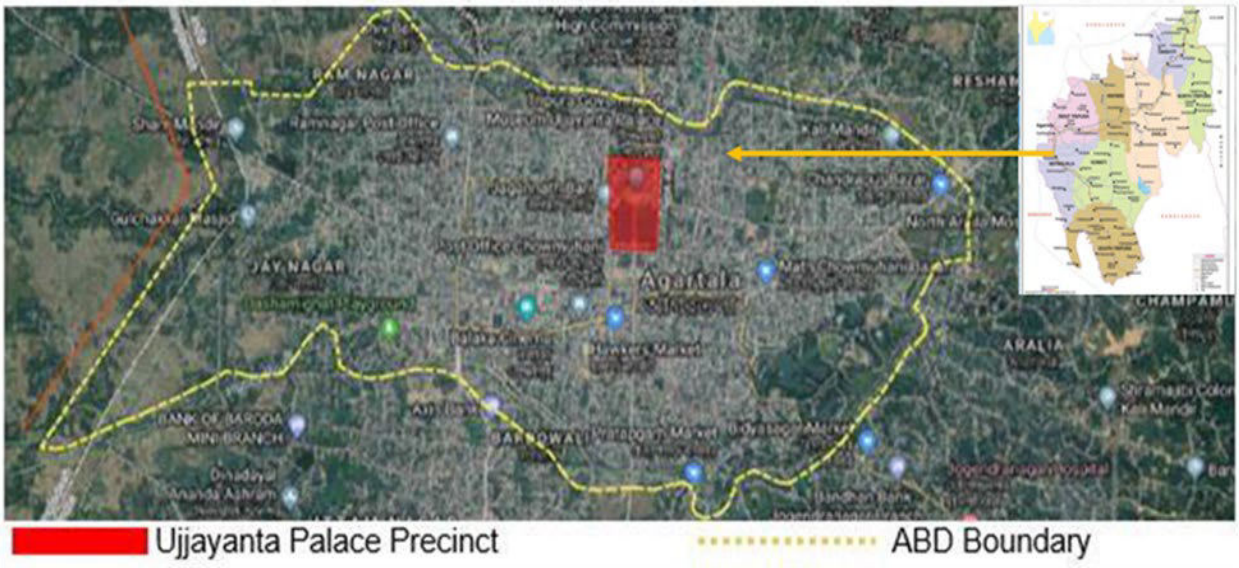
(i) Introduction
(ii) Description of the project
(iii) Policy, legal and administrative framework
(iv) Description of the environment
(v) Anticipated Environmental Impacts & Mitigation Measures
(vi) Public consultation and information disclosure
(vii) Grievance Redress Mechanism
(viii) Environmental management plan
(ix) Conclusion and recommendation

II. DESCRIPTION OF PROJECT COMPONENTS

A. Subproject Location

12. Agartala City is spread over an area of 76.5 square kilometers (km^2), located at 23°50'N Latitude and 91°17''E Longitude. Agartala lies on the bank of the Haora River although the city also extends to the low-lying hills on its northern parts. Agartala is located 2 km from the Bangladesh Border. Agartala city is the most important commercial hub of the state and important trade route to the north-eastern states. The border connectivity with neighboring country Bangladesh makes Agartala an important trading hub for Import and Export. The Palace is located in the Capital city of Tripura. The approach is through Grand entrance at Lakshmi Narayan Bari Road near children's park. Ujjayanta Palace is located at the core of the Agartala city and is accessed by the Thakurpalli Road on the South and VIP road on the North. It has several temples and parks in the vicinity of the complex. Coordinates of the Palace are 23°50'12.67"N and 91°16'57.72"E.9).

Figure 1: Project Area of Agartala City and Location of Ujjayanta Palace.



B. Present Status of Palace

13. The Renovation and Restoration of Ujjayanta Palace subproject has been identified for improvement of the aesthetics of the palace complex and does not involve any type of construction activity within the Ujjayanta Palace.

14. The Ujjayanta palace is the most important tourist destination in Agartala and has the potential to showcase the culture and heritage of the state. The palace precinct (Rajbari) currently lacks a common identity and has been fragmented into discordant zones of disconnected functions. Currently, the tourism activities are confined to sightseeing only, resulting into underutilization of its potential. The sense of the palace complex is not apparent. The encroachment and unthoughtful development in its surroundings affect the aesthetic value of the site. Many heritage structures are in a state of disrepair. These areas have been surveyed and the gaps identified have been mentioned below.

15. **Important historical monument:** As per the Tripura Tourism website, the Ujjayanta Palace Complex in Agartala city in the district of West Tripura is mentioned as a Heritage Site in addition to Neer Mahal Water Palace in Sepaijhala district, Bhubaneswari Temple in Udaipur city in Gomti district and Akhaura Check Post in Agartala city.

16. In the City Development Plan (CDP) for Agartala city initiated by Government of Tripura under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), a scheme of Government of India in 2006 the Ujjayanta Palace Complex has been mentioned as an architectural heritage site.

17. **Legal Heritage status:** The Ujjayanta Palace Complex is not listed as a nationally protected heritage site under Archaeological Survey of India (ASI) and not as a State Protected heritage site under Archaeological Survey of India (ASI), Guwahati Circle.

18. **Adjacent and nearby heritage properties:** There are no adjacent heritage sites to Ujjayanta Palace complex. There are religious sites like Jagannath Bari temple, Laxmi Narayan temple and Durga Bari temple adjacent to the Palace Precinct.

C. Existing condition

1. Ujjayanta Palace Front Garden

19. The garden is located at the front of the palace building and can be accessed by the entry gate in the South. The garden presently is in a state of neglect and is in dire need of proper maintenance. The gaps as identified after the site surveys have been mentioned below. The existing conditions of proposed project components are shown in figures 2 to figure 11 below.

(i) The networks of water retaining structure, fountains, have become non- functional.
(ii) The garden lacks organized plantation, enhanced view of the huge lakes at both sides, variety of elements of interests like pathway, flower, good looking plants, vegetated sculptures, play furniture, maintained lawn etc.

20. Due to uncontrolled growth of vegetation around the lake, the accessibility to its sides and visibility to the lake is highly obstructed.

(i) There are some heritage structures in the garden such as kiosks at corners of lake, ruined houses, boundary wall, gate house complex etc., require restoration.

Figure 2: Existing condition of the front garden

Figure 3: Chhatris, Curved Wall, Statues

2. North Gate

21. It is located on the Northern side of the Palace and serves as an entrance to the Palace precinct. It is in front of a Tri-junction and a 6m wide road further connects the North gate to the rest of the complex. The pathway leading to the Palace from north gate is a black top road and is not maintained. There are antique type light posts which are part of heritage elements in the garden. There are some heritage elements in the garden such as kiosks at corners of lake, ruined houses, boundary wall, gate house complex etc., which may require restoration. Restoration of

existing structures with patchwork is necessary as some of the structures are broken. The gaps as identified after the site surveys have been mentioned below.

(i) Due to vegetation growth, the aesthetics of the gate has been disturbed.
(ii) Surface cracks have developed on the structure due to lack of maintenance.
(iii) Overhead wires and sticking of bills have also contributed to the poor aesthetics of the structure.

Figure 4: Existing condition of the north gate

3. *Astabal* Area

22. The *Astabal* is located at the rear portion of the palace building and can be accessed through the 6 m wide road leading to the palace complex from the North Gate. The total stretch is 130 m long and 5 m wide. The structure is presently in a redundant and poor condition. The gaps as identified after the site surveys have been mentioned below.

(i) Surface cracks have developed on the walls and ceiling and reinforcement has been exposed.
(ii) The aesthetics of the structure has been compromised due to wild vegetation growth, overhead wires and sticking of bills as seen in the pictures below.
(iii) The existing 6 m road lacks in pedestrian facilities and is occasionally encroached by non-designated on street parking.

Figure 5: Cracked ceiling and wild vegetation growth on the existing *Astabal* structure

Figure 6: Existing streetscape in front of the *Astabal* structure

4. Site Proposed for Food Court

23. The site proposed for the food court presently government houses and electricity offices which is to be demolished. The plot dimensions are 60 m x 18 m as per available data. It can be accessed through the 6 m wide road and has a boundary wall on the periphery. The entire stretch of the road as mentioned in the previous sections lacks pedestrian facilities.

Figure 7: Front view of the site proposed for food court

5. Rear Garden

24. It is in the rear portion of the palace building and can be accessed through the 6m wide road. The approximate plot dimensions are 60m x60m as per available data and it has an existing fountain structure and some existing streetlamps. While it has abundant greenery, overgrowth of wild vegetation can also be witnessed. The issues have been discussed below.

(i) The existing fountain is presently dysfunctional and needs repair.
(ii) Overgrowth of wild vegetation on the pathways and lawns.
(iii) The garden lacks shaded seating and furniture to make it usable for public use.
(iv) The pathways are in a dilapidated state.

Figure 8: View of the rear garden showing the existing fountain

6. Site Proposed for Visitor Parking

25. The site proposed for visitor parking acts as a temporary parking space and lacks in designated parking bays.

Figure 9: Existing site for visitor parking

7. Eastern Lake Edge

26. The eastern lake in front of the palace can be accessed by the adjoining road. Approximate width available for development of the promenade is 3.5 m which includes an existing 2 m wide pathway. The current issues have been discussed below.

(i) Irresponsible disposal of solid waste in the edges of lake.
(ii) The existing railing is in a dilapidated condition and needs refurbishment.
(iii) The existing street furniture is not adequate in numbers and is not in a proper condition.
(iv) The footpath is also been used by the local patty vendors.

Figure 10: Existing condition of the eastern lake edge showing the dilapidated footpath and vendor


D. Proposed Subproject Components :

27. The project aims at preserving the very identity of the heritage complex by introducing a cohesive urban vocabulary to tie the discrete areas and create a unique identity for the precinct.

(i) Renovation and Restoration of Front Palace Gardens and Facade Illumination
(ii) Revival of North gate and transformation of *Astabal* Structure
(iii) Proposal for Food Court
(iv) Rear garden revival with multi-activity plaza and Amphitheatre
(v) Proposal for Proposal for Visitors Parking
(vi) Eastern Lake Edge Development

28. The construction works involved in the proposed Ujjayanta Palace project are given in the following Table 1. The structures are designed as per IS1893 part 1 considering Seismic Zone V (Very severe) and coefficient of Z=0.36. Steel structures are designed considering IS 875 Part 3 for wind load.

Table 1: Details of Construction work in Renovation and Restoration of Ujjayanta Palace Complex Project

Sr. No.	Proposal	Site Area (m^2)	Remarks
1	Front Garden	20674	T- Stretch in front of Palace Building including water features, pathways and landscape
2	*Astabal* Area	745	Including 3.5m wide footpath and the footprint of *Astabal* structure (50.2mx 2.4m), Guard hut and toilet block
3	Food Court	1178	Including one toilet block
4	Rear Garden	3662	Including existing toilet block
5	Parking Area	916	22.4m wide and 39.5 long plot
6	Eastern Lake Edge	1114	Approximate 4m wide and 273m long stretch along eastern lake

E. Design Considerations

29. In order to integrate the heritage elements of the site and to develop it into a major tourist attraction, the following strategic interventions have been employed to address the major issues on the site. A “heritage impact assessment” study was also conducted, and findings of reports are incorporated in final design to mitigate all negative impacts, the report is attached as Appendix 13.

30. **Restoration of the existing heritage structures:** The existing built structures have a huge heritage value but at present are in a dilapidated state. Hence, they are proposed to be restored and strengthened with strategic interventions in order to regain their lost glamour. Therefore, clearances of the wild vegetation, removal of existing plastering, strengthening of the reinforcements, re-plastering, waterproofing and repainting are to be done to the identified structures. Such structures include the North Gate and the *Astabal* Structure.

31. **Adaptive Reuse:** The *Astaba*l area has presently lost its functionality and hence it is proposed to be intervened with some adaptive reuse in order to integrate it with the rest of the functional palace precinct. The structure is therefore proposed to be developed into a shopping arcade showcasing the indigenous arts and crafts of Tripura. However, the development of the access roads and footpaths along with public amenities are also included in the scope, as this will contribute to the creation of a lively ambience of Tripura marketplace.

32. **Redevelopment of Existing Gardens:** The existing gardens of the Palace i.e. the front garden and the rear garden are proposed to be developed with suitable landscaping and water scaping interventions in order to develop them into a pleasant and comfortable leisure place for the regular visitors and tourists. This includes revival of the Mughal gardens in the front and proposing of Amphitheater and Multi-activity Plaza for regular public gatherings and social activities. The existing fountains in the front and rear garden are non-functional at present therefore these have also been proposed to be refurbished.

33. **Revival of Lakes and Fountains:** The twin lakes of the Palace Complex have presently lost their glamour and are non-functional at present. The eastern edge of the lake is proposed to be developed with a beautifully landscaped pathway, decorated and illuminated with railings and lamp posts matching those of the Palace complex in order to showcase the heritage of the precinct.

34. **Creation of spaces for social interaction:** For any public area to be gainfully utilized by the people, it is necessary to provide comfortable spaces for public interaction. Owing to the huge footfall of the precinct's commercial section, a food court has been proposed nearby as a space for resting and social interactions. The space is designed as a vibrant and usable space by providing landscape elements like thematic outdoor furniture, pathways, water body and proper illumination to ensure safety. The food court aims at promoting the local and regional cuisines of the state to add to the essence of Tripura culture and heritage.

35. In the rear garden as well, a Multi-activity Plaza and an Amphitheatre has also been proposed as a space for social interactions and public gatherings and activities. This is expected to promote tourism to the site as well as help in community building through the proposed activities and functions.

36. **Provision of Public Infrastructures:** The Palace Precinct is proposed to be developed with all sort of amenities and infrastructures required for the visitors. Therefore, the commercial section is equipped with nearby public toilets and Water ATMs. Also, the vehicular access road from the North Gate is proposed with footpaths, equipped with seating, dustbins for garbage disposals, signages for the ease of the pedestrians as well as appropriate lighting to ensure safety within the campus. All these are added with a vehicular parking area for the visitors on the eastern side of the palace precinct.

37. **Utilities and Amenities:** E-Toilets are proposed which are equipped with toilets for differently abled people as well. Water ATMs shall be provided for the drinking purpose at strategic locations.

38. **Measures to maintain sanitation and cleanliness"** the entire premises of the Ujjayanta Palace are at present subject to garbage disposal and unmaintained plantation growths due to lack of environmental awareness by the locals, creating a visual eyesore. Therefore, the park and the pond waters need to be cleared of all garbage disposals. Also, installation of garbage bins is proposed on the site at strategic locations added with putting up of signage boards to provide awareness on issues of sanity, cleanliness and hygienic environment to the visitors. The unruly plantations and weeds are to be removed as well and proper landscaping to be done as per the final architectural designs. Also, proper supervision and maintenance of the same is to be done from time to time in order to avoid future nuisance on the site.

39. **Measures to maintain Safety:** The Ujjayanta Palace is situated at the heart of the city and therefore can be considered as a crowded zone. Therefore, to ensure safety, the entire precinct is strictly proposed to be guarded with low height boundary walls and railings with enough visual accessibility. Also, the entire premise is proposed to be illuminated properly during the evening hours to ensure safety and security of the visitors.

40. **Barrier free Environment:** The Ujjayanta Palace campus is almost at one level and hence the activities planned on the site are almost at the same level. Therefore, there is no such drastic elevation changes and hence can be considered barrier free and navigable for the differently abled visitors.

1. Crime prevention through Environmental Design (CPED)

Table 2: Application of CPED guidelines

CPED Guidelines (Crime Prevention through Environmental Design)	Proposal in Ujjayanta Palace
Natural Access Control	The entire site is to be well-lit accompanied with adjacent landscape and waterscape lighting.
Management and Maintenance	Regular maintenance of walkway side adjacent landscaping is to be done to prevent them from blocking the sight line.
Legitimate Activity Support	Landscaping and amenities are planned to provide comfort for all needs of the visitors all the year round.
Territorial Reinforcements	Provision of proper signage and maps to provide a sense of comfort to the visitors in the campus. Speed-limit of vehicular movement to be maintained within the campus.

F. Design Details

41. After conducting a detailed study of the site and its surroundings, followed by a situation analysis report and a subsequent feasibility report, the following design elements and interventions have been arrived at.

42. **Renovation and Restoration of Front Palace Gardens and Facade Illumination:** The Ujjayanta Palace building is set on a large Mughal Style Garden during a twin waterfront. The intervention aims at restoring its ancient garden characteristics, making the garden and water-

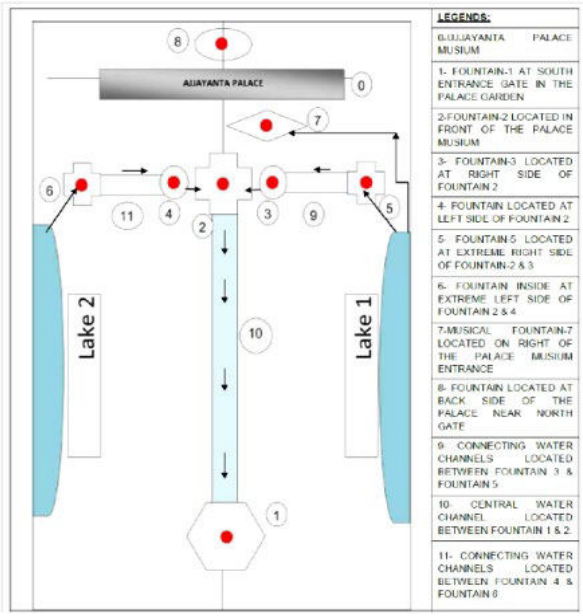
fronts suitable for a pleasant and comfortable leisure place for the regular visitors and tourists. The proposed work includes:

(i) Installation of sculpture fountain on right and left end of the water channel.
(ii) Along the central channel low height fountains to be installed.
(iii) Along the channels small bubblers for aeration shall be installed.
(iv) Suitable lighting for fountain, water channel and palace façade.
(v) Necessary civil works like breaking, repairing, relaying of water channel, incorporating the plumbing and drainage requirement.
(vi) Water proofing of entire water features
(vii) Painting of water channel and fountain
(viii) Hardscape – Necessary repair of existing black top road
(ix) New pathway along water bodies, with pergola and seating at intervals
(x) Themed plantation & Horticulture work including replantation of existing trees (if required) to improve the garden
(xi) Modification of drains and covering of open drains.
(xii) Painting of existing heritage railing
(xiii) Restoration of existing heritage structures with patchwork, plastering, painting, reinstating broken shapes, decorative lighting.
(xiv) Construction of new railing along the water bodies to retain and enhance the heritage character of the area.

Figure 11: Graphical View of proposed components

Proposed view of Front Garden

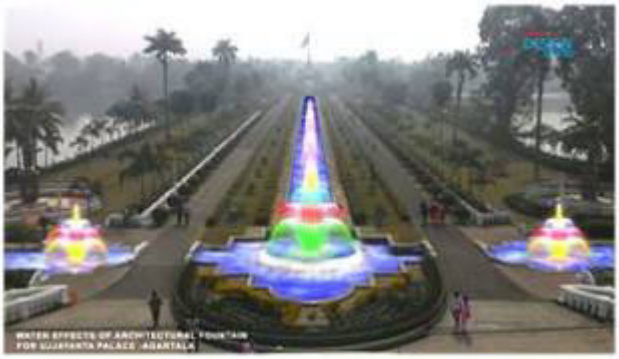
Proposed Railings



Schematic diagram of fountains

Figure 12: Existing and proposed condition of Central Water Channel

Existing condition



Proposed View

Existing condition

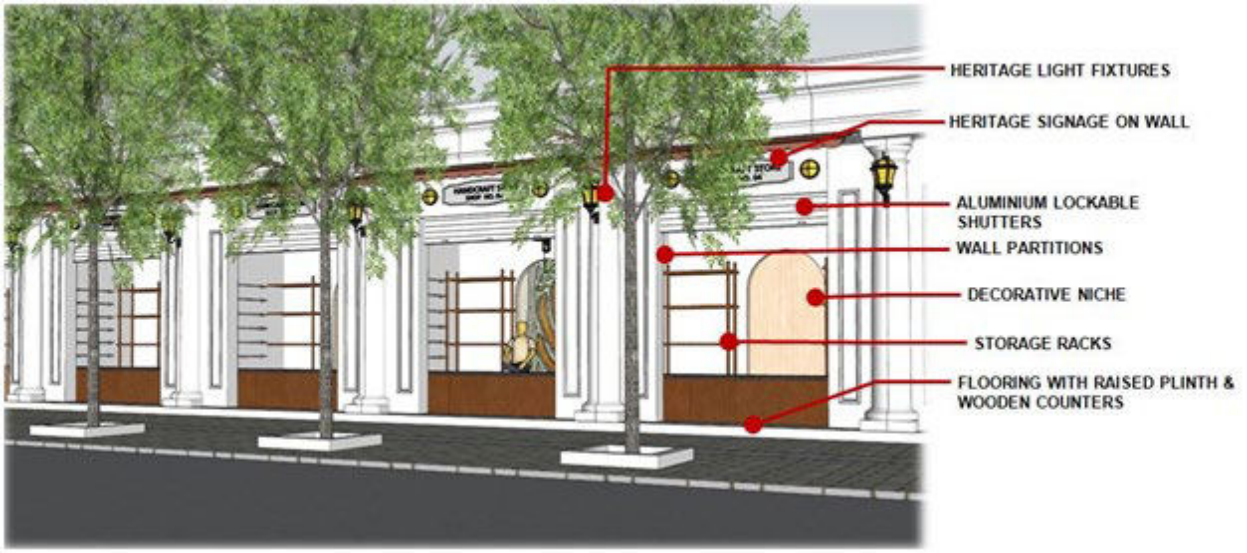
Proposed View

43. **Revival of North gate and transformation of *Astabal* Structure:** Being the architectural masterpieces of neoclassical style, these structures have huge historical and cultural association with the city. The proposed work includes:

(i) Removal of vegetative growth in careful manner from the surface of the heritage structures.
(ii) Restoration of the heritage structures and structural strengthening to it.
(iii) Painting and illumination of the North gate.
(iv) Adaptive reuse of *Astabal*, a heritage structure and converting it into Shopping arcade as per design drawing.
(v) Provision of heritage lamp posts and signages for the aesthetical improvement of the structure.
(vi) Construction of toilets and provision of drinking water facility as per drawing.
(vii) Development of pathway with street furniture's like garbage bins and benches.
(viii) Provision of tree grating around the existing tress and proposal of new trees along the *Astabal* structure for retaining the avenue of trees.

Figure 13: Proposed view of road after retrofitting and upliftment

Figure 14: Proposed view of shopping arcade



44. **Proposal for Food Court:** The food court has been proposed adjacent to the *Astabal* area, demolishing a redundant structure. The proposal aims at promoting the local, regional and international cuisines. The food court features two large food stalls (8m. x 8m.) and organic pattern of seating for a capacity of 110 seats. The entire plot covers an area of 60 m X 18 m Proposal includes: -

(i) Demolition of existing structure on the site.
(ii) General upgradation of the area.
(iii) Construction of a low heighted boundary wall around the site.
(iv) Construction of two food kiosks as per drawing.
(v) Construction of toilets and provision of drinking water facility as per drawing.
(vi) Landscape elements like thematic outdoor furniture (2-seater and 4-seater)
(vii) Pergola, feature wall, fountains, pathways and landscape lighting as per drawing.
(viii) Themed plantation & Horticulture work including replantation of existing trees (if required) to improve the area.

Figure 15: Aerial view of proposed food court

45. **Rear garden revival with multi-activity plaza and Amphitheatre:** The rear garden of the Ujjayanta Palace already has some excellent features and elements in it but due to lack of maintenance is now in a non-functional state. Hence, the proposal aims at restoring its lost valor by retaining a few features and proposing a few. The proposed work includes: -

(i) Demolition of existing pathways.
(ii) Painting of the existing boundary wall.
(iii) Restoration of the existing fountain.
(iv) General plantation & Horticulture work including replantation of existing trees (if required) to improve the area.
(v) Themed plantation for butterfly garden and fragrance garden.
(vi) Creation of Multi-activity plaza as per drawing.
(vii) Construction of Amphitheatre and green room as per drawing.
(viii) Provision of landscape elements like shaded seating, connecting pathways, pergola and landscape lighting.

46. **Proposal for Visitors Parking:** The visitors' parking has been proposed strategically at a central location nearby the shopping arcade as well as to the rear garden. It covers an area of 24

m x 40 m and is proposed to accommodate 12 four-wheelers and 40 two-wheelers. The figure 17 shows the proposed layout of the parking lot.

(i) Construction of boundary wall and gates.
(ii) Upgradation of the access pathway
(iii) Parking layout- hardscape and softscape as per drawing.

47. **Eastern Lake Edge Development:** In order to enhance the aesthetics and usability of the existing lake edge, redevelopment of the stretch has been proposed. The scope includes:

(i) Redevelopment of existing pathways.
(ii) Shrub plantation along the edges.
(iii) Provision of dustbins and benches.
(iv) Replacement of railings and lamp posts to retain and enhance the heritage character of the area.
(v) Installation of Advertisement panels as per specifications.

Figure 16: Layout showing different zones in the rear garden

Figure 17: Proposed layout of visitors parking

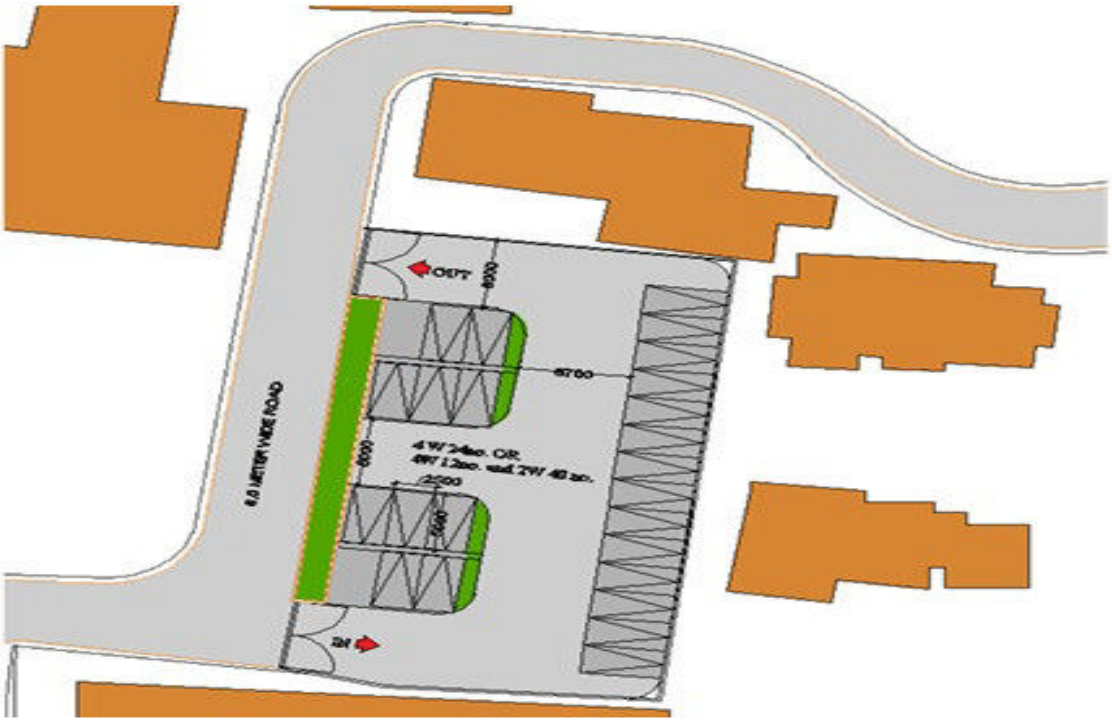


Figure 18: Proposed condition of the existing lake edge

48. **Other Miscellaneous scope of works**

(i) Construction of steps and ramps for universal access to the palace complex.

(ii) Installation of information board and signages at strategic location.
(iii) Irrigation system to cover all the softscape areas
(iv) Modification of drainage network for entire site with suitable drain cover

49. **Construction Material:** Material required for construction will be explored from the project area. Existing sites which are operated with relevant licenses and approvals will be used especially for extraction of metal and sand. Offshore sand could also be used for construction subjected to confirmation of quality. If new material extraction sites will be opened for this project, necessary licenses and approvals will be obtained from relevant agencies. Based on the engineering estimates prepared for the project, approximate quantities of material required for the district is given in Table 3. 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. Of these raw materials, gravel is brought/ imported from mines in Assam state mainly from Harangajao mines which is at around 334 km from Agartala, Bituminous macadam is brought is from Haldia in West Bengal state and partially from Assam state. Haldia is situated at 1670 km from Agartala the sourcing and transportation of raw material will result is impact on air quality due to emissions from vehicles as well as mining activity.

Table 3: Construction Material Requirement

Sr. No.	Materials	Unit	Total
1	PCC (1:3:6)	Cum	326
2	Brickwork (1:4)	Cum	658
3	RCC (M25)	Cum	748
4	Reinforcement Steel	MT	79.1
5	Structural Steel	MT	18.71
6	Bituminous concrete	Cum	85
7	Brick Aggregate	Cum	798
8	Granite	Cum	4.34
9	Red Stone	Cum	275

50. **Construction Waste Quantity:** There will be waste generation from demolition of existing structures as well as from the construction material. The quantities of waste generation are given in Table 4.

Table 4: Construction & demolition waste quantities

Sr. No.	Materials	Unit	Quantity
1	Demolition	Cum	300
2	Excavated Earthwork	Cum	1925
3	Steel	MT	13.2
4	Scarified Bitumen	Cum	255
5	Drain silt	Cum	48

G. ANALYSIS of ALTERNATIVES

51. **No Project Alternative**: The 'No project scenario' is analyzed with respect to the development of Agartala City as a requirement of reliable quality infrastructure for sustained growth of economy and consequent well-being of its citizens. Providing a better infrastructure will enhance the aesthetics and increase the number of visitors to the place. If the subproject is not

implemented, it is very likely that the existing garden will deteriorate further. In the absence of the proposed subproject, the AMC will also find it difficult to generate revenue. Therefore, 'project with alternatives' scenario, with its minor adverse impacts is more acceptable than 'No project scenario' which would mean an aggravation of the existing problems. Hence the implementation of the subproject will be a definite advantage to Agartala in order to achieve better infrastructure and better standard of living for its people.

52. **With Project Alternative:** Alternatives in terms of location (alignment) option is not available as the project is about improving the existing garden. With the project, the existing garden will be improved to more interactive place for citizens and will improve the numbers of visitors to the place. Therefore, this is a timely required project to facilitate the socioeconomic development of the densely populated city of Agartala and ultimately for the development of the country.

H. Implementation Schedule

53. After the completion of detailed designs, bids were invited in March 2020 for the subproject to be implemented under the item rate modality. Bids will be awarded in April 2020. Successful bidder then will carry out detailed designs and construction is likely to take about 11 months. After completion of construction and commissioning, scheme will be operated by operation contractor for 5 years, and after which the O&M will be carried out by ULB/ Tourism department.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

54. ADB SPS requires that during the design, construction and operation of the project necessary compliance to all applicable laws and international conventions / treaties along with pollution prevention and control technologies and practices consistent with international good practice, are ensured.

55. **Screening and Categorization**: ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Projects are assigned to one of the following four categories:

(i) **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.

(ii) **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.

(iii) **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.

(iv) **Category FI**. A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI.

56. The environmental impacts of the subproject have been identified and assessed as part of the planning and design process. An environmental assessment using ADB's Rapid Environmental Assessment Checklist for Urban development (Appendix-1) was conducted, and results of the assessment show that the subproject is unlikely to cause significant adverse impacts. Thus, this IEE has been prepared in accordance with ADB SPS's requirements for environment category B projects.

57. **Environmental Management Plan:** An EMP, which addresses the potential impacts and risks identified by the environmental assessment, shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

58. **Environmental Audit of Existing Facilities**. ADB SPS requires an environmental audit, if a subproject involves facilities and/or business activities that already exist or are under construction, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues.

59. 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 in Agartala is attached as Appendix 14.

60. **Public Disclosure:** The IEE will be put in an accessible place (e.g., Agartala Municipal Corporation Office, ASCL office, local government offices, libraries, community centers, etc.), and a summary translated into local language for the project affected people and other stakeholders. The following safeguard documents will be put up in ADB's website so that the affected people, other stakeholders, and the public can provide meaningful inputs into the project design and implementation:

(i) Final or updated IEE upon receipt; and
(ii) Environmental monitoring reports submitted by the Project Implementation Unit (PIU) during project implementation upon receipt.

61. **Consultation and Participation.** ADB SPS require borrower to conduct meaningful consultation[6] with affected people and other concerned stakeholders, including civil society, and

[6] Per ADB SPS, 2009, meaningful consultation means a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;1 (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and

facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

62. **Grievance Redress Mechanism**. ADB SPS require borrowers to establish a mechanism to receive and facilitate resolution of affected people's concerns, complaints, and grievances about the subproject's performance. The grievance mechanism shall be scaled to the risks and adverse impacts of the subproject.

63. **Monitoring and Reporting**. Borrower shall monitor, measure and document the implementation progress of the EMP. If necessary, the borrower shall identify the necessary corrective actions, and reflect them in a corrective action plan. Borrower shall prepare and submit to ADB semi-annual environmental monitoring reports that describe progress with implementation of the EMP and compliance issues and corrective actions, if any. For subprojects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis until ADB issues a project completion report.

64. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during subproject implementation, ADB SPS requires the borrower to update the environmental assessment and EMP or prepare a new environmental assessment and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts.

65. **Occupational Health and Safety.** ADB SPS requires the borrower[7] to ensure that workers[8] are provided with a safe and healthy working environment, considering risks inherent to the sector and specific classes of hazards in the subproject work areas, including physical, chemical, biological, and radiological hazards. Borrower shall take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work, including: (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) providing appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place.

66. **Community Health and Safety**. ADB SPS requires the borrower to identify and assess risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the subproject, and shall establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.

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other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

[7] In case where responsibility is delegated to subproject contractors during construction phase, borrower shall ensure that the responsibilities on occupational health and safety are included in the contract documents.

[8] Including nonemployee workers engaged by the borrower/client through contractors or other intermediaries to work on project sites or perform work directly related to the project's core functions.

67. **Physical Cultural Resources**. Borrower is responsible for siting and designing the subproject to avoid significant damage to physical cultural resources. ADB SPS requires that such resources likely to be affected by the subproject are identified, and qualified and experienced experts assess the subproject's potential impacts on these resources using field-based surveys as an integral part of the environmental assessment process. When the designed location of a subproject component is in areas where physical cultural resources are expected to be found as determined during the environmental assessment process, chance finds procedures shall be included in the EMP.

68. **ADB SPS International Best Practice Requirements.** ADB SPS requires that, during the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices that are consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. (IFC's General EHS Guidelines[9] and Sector Specific Guidelines[10]). These standards contain performance levels and measures that are normally acceptable and applicable to projects. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS. The IEEs shall also reflect meaningful consultation and disclosure process with a provision for grievance redress mechanism.

B. National and State Laws

69. The implementation of the subprojects will be governed by Government of India and State of Tripura and other applicable environmental acts, rules, regulations, and standards. These regulations impose restrictions on the activities to minimize or mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subprojects are consistent with the legal framework, whether applicable international, national, state or municipal or local. Key standards include those related to drinking water quality, air quality, and protected areas. Compliance is required in all stages of the subprojects including design, construction, and operation and maintenance.

70. **Environmental assessment.** The GOI EIA Notification of 2006 (replacing the EIA Notification of 1994), sets out the requirement for Environmental Assessment in India. This states that Environmental Clearance (EC) is required for specified activities/ projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts.

[9]https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES
[10]https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B-%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES

71. **Category A** projects requires EC from the central Ministry of Environment, Forests and Climate Change (MoEFCC). The proponent is required to provide preliminary details of the project in the prescribed manner with all requisite details, after which an Expert Appraisal Committee (EAC) of the MoEFCC prepares comprehensive Terms of Reference (ToR) for the EIA study. On completion of the study and review of the report by the EAC, MoEFCC considers the recommendation of the EAC and provides the EC if appropriate.

72. **Category B** projects require environmental clearance from the State Environment Impact Assessment Authority (SEIAA). The State level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study) and prepares TOR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the SEIAA issues the EC based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A if it is in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries.

73. None of the components of Renovation and Restoration of Ujjayanta Palace Complex subproject in Agartala falls under the ambit of the EIA Notification 2006, and, therefore EIA Study or EC is not required for the subproject.

74. **Applicable environmental regulations**. Besides EIA Notification 2006, there are various other acts, rules, policies and regulations currently in force in India that deal with environmental issues that could apply to infrastructure development. The specific regulatory compliance requirements of the subproject are shown in the below Table 5.

Table 5: Applicable Government of India Environmental Legislations and Specific Requirements for the Project

Law	Description	Requirement	Project Phase
National Environment Policy, 2006.	NEP is a comprehensive guiding document in India for all environmental conservation programs and legislations by central, state and local government. The dominant theme of this policy is to promote betterment of livelihoods without compromising or degrading the environmental resources. The policy also advocates collaboration method of different stakeholders to harness potential resources and strengthen environmental management.	All subprojects under ASCL should adhere to NEP principle of “enhancing and conservation of environmental resources and abatement of pollution”.	All phases of the project
EIA Notification	The EIA Notification of 2006 and 2009 (replacing the EIA Notification of 1994), set out the requirement for environmental assessment in India. This states that Environmental Clearance is required for certain defined activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts. Category A projects requires Environmental Clearance from the National	None of the components of this subproject falls under the ambit of the notification	Not Applicable

Law	Description	Requirement	Project Phase
	Ministry of Environment, Forest and Climate Change (MoEFCC). Category B projects require Environmental Clearance from the State Environmental Impact Assessment Authority (SEIAA).		
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	Control of water pollution is achieved through administering conditions imposed in consent issued under provision of the Water (Prevention and Control of Pollution) Act of 1974. These conditions regulate the quality and quantity of effluent, the location of discharge and the frequency of monitoring of effluents. Any component of the Project having the potential to generate sewage or trade effluent will come under the purview of this Act, its rules and amendments. Such projects must obtain Consent to Establish (CTE) under Section 25 of the Act from Tripura state Pollution Control Board (TSPCB) before starting implementation and Consent to Operate (CTO) before commissioning. The Water Act also requires the occupier of such subprojects to take measures for abating the possible pollution of receiving water bodies.	None of the components in this subproject requires CFE or CFO under this act.	Construction phase
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	The subprojects having potential to emit air pollutants into the atmosphere must obtain CTE under Section 21 of the Air (Prevention and Control of Pollution) Act of 1981 from TSPCB before starting implementation and CTO before commissioning the project. The occupier of the project/facility has the responsibility to adopt necessary air pollution control measures for abating air pollution.	For the project, the following will require CTE and CTO from TSPCB: if, (i) diesel generators; (ii) hot mix plants; and (iii) stone crushers, installed for construction. All relevant forms, prescribed fees and procedures to obtain the CFE and CFO can be found in the TSPCB website (www.tspcb.gov.in). If procuring using third party, contractor to ensure that the plants, from where material is being purchased is having CTE/CTO and copy should be collected from third party and submitted in PIU.	Construction and Operation phase
The Motor Vehicles Act, 1988 (59 Of	The subprojects having potential to emit smoke and vapor carrying air pollutants, and enforcement of other applicable rules as per the motor vehicle act	Pollution under control (PUC) certificate is required for all construction and	Construction and maintenance

Law	Description	Requirement	Project Phase
1988) (14 Oct. 1988)	As per Rule no 115. Emission of smoke, vapor, etc. from motor vehicles and Rule no 116. Test for smoke emission level and carbon monoxide level for motor vehicles of THE CENTRAL MOTOR VEHICLES RULES, 1989	vehicle used for the subproject.	
Environment (Protection) Act, 1986 and CPCB Environmental Standards.	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards notified.	Appendix 3 provides applicable standards for ambient air quality which should be followed during construction phase. Appendix 3 also provides a comparison of national standards and internationally recognized guidelines with respect to ambient air and noise, ADB SPS requires adoption of stringent values for project implementation.	Construction and maintenance
Noise Pollution (Regulation and Control) Rules, 2002 amended up to 2010.	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones.	Appendix 3 provides applicable noise standards. Contractors are required to ensure all noise-producing activities during civil works conform to applicable standards	Construction and maintenance
National Institute of Occupational Safety and Health (NIOSH) Publication No. 98-126	NIOSH has laid down criteria for a recommended standard: occupational noise exposure. The standard is a combination of noise exposure levels and duration that no worker exposure shall equal or exceed.	Internationally recognized environmental standards. Contractors are required to provide hearing-protection equipment and ensure exposures of workers to noise-generating activities are within allowed NIOSH standards.	Construction and maintenance
Municipal Solid Wastes Management Rules, 2016	Rules to manage municipal solid waste generated; provides rules for segregation, storage, collection, processing and disposal.	Solid waste generated at proposed facilities shall be managed and disposed in accordance with the Rules.	Construction and maintenance
Construction and Demolition Waste Management Rules, 2016	Rules to manage construction and to waste resulting from construction, remodeling, repair and demolition of any civil structure. Rules define C and D waste as waste comprising of building materials, debris resulting from construction, re-modeling, repair and demolition of any civil structure.	Construction and demolition waste generated from the project construction shall be managed and disposed as per the rules Request for permission of dumping of the Construction and demolition waste At the DC Nagar Lunga Site and	Construction phase

Law	Description	Requirement	Project Phase
		allowing to use the plant for recycling of construction and demolition waste located at DC Nagar Lunga site for further reuse is made by ASCL to AMC.	
Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016	According to the Rules, hazardous wastes are wastes having constituents specified in Schedule II of the Rules if their concentration is equal to or more than the limit indicated in the said schedule.	If during excavation works, the excavated material is analyzed to be hazardous, they are to be stored and disposed of only in such facilities as may be authorized by the TSPCB for the purpose.	Construction phase
Forest (Conservation) Act, 1980 and Forest Conservation Rules, 2003 as amended	As per Rule 6, every user agency, who wants to use any forest land for non-forest purposes, shall seek approval of the Central Government.	Not applicable as subprojects components are not located in designated forest area	Not Applicable
Wetlands (Conservation and Management) Rules, 2017	The Rules specify activities which are harmful and prohibited in the wetlands such as industrialization, construction, dumping of untreated waste and effluents, and reclamation. The Central Government may permit any of the prohibited activities on the recommendation of Central Wetlands Regulatory Authority.	Not applicable to the Subproject.	Not Applicable
Indian Wildlife (Protection) Act, 1972 amended 1993 and Rules 1995; Wildlife (Protection) Amendment Act, 2002	An Act to provide for the comprehensive protection of wild animals, birds and plants. This would cover matters concerning Appointment of forest authorities, hunting of wild animals, protection of specified plants, conservation of national parks and sanctuaries, trade commerce in relation to plants and animals and prevention of any offences. Wildlife protected areas are notified under this act. - In Tripura State, there are 2 National Parks and 4 Wildlife Sanctuaries	Not applicable as subprojects components are not located in designated protected area.	Not Applicable
Manufacture, Storage, and Import of Hazardous Chemical Rules, 1989	Defines hazardous chemicals Stipulates rules, procedures to manufacture, storage and import of hazardous chemicals Requires permission, authorization from various agencies if the total storage exceeds specified quantity; requires emergency management plan	Requires permission, authorization from various agencies if the total storage exceeds specified quantity; for the hazardous material used for the project like fuel oil for DG sets, Waste fuel oil, grease residues, scarified bitumen, thinners, paints etc.	Construction phase

Law	Description	Requirement	Project Phase
Mines and Minerals (Regulation and Development) Act, 1957 as amended in 1972 Mining of Minerals as per EIA notification 2006 and MoEF circular as per the Supreme Court Order 27.02.2012	Permission of Mining of aggregates and sand As per the circular all mining project (including minor minerals) irrespective of their lease areas of operation would now require environmental clearance.	Only licensed quarry will be used and no new quarries will be developed for minor minerals like stone, soil, river sand etc. However, if new mining of more than 5ha is being explored the contractor may need to take environmental clearance	Construction phase
The Ancient Monument and Archaeological Sites and Remains (Amendment and Validation) Act 2010	The Rules designate areas within a radius of 100 m and 200 m from the “protected property/ monument/ area” as “prohibited area” and “regulated area” respectively. Henceforth, no permission for construction of any public projects or any other nature shall be granted in the prohibited areas of the protected monument and protected area In respect of regulated area, the Competent Authority may grant permission for construction, reconstruction, repair and renovation based on recommendation of the National Monument Authority duly taking note of heritage bye-laws, which shall be prepared in respect of each protected monument and protected area	There are no cultural heritage sites identified on the project corridor as protected monument or Archeological site. In case of chance finds, measures are suggested in Environmental Management Plan (EMP) to take prompt action to ensure its removal or protection in situ.	Construction phase
The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (LARR)	Private land acquisition is guided by the provisions and procedures under this Act. Before the acquisition of any land, the Government is required to consult the concerned Panchayat or Municipal Corporation and carry out a Social Impact Assessment in consultation with them. The Act provides a transparent process for land acquisition for industrialization, development of essential infrastructural facilities and urbanization by giving adequate financial compensation to the affected people.	Land acquisition is not applicable to this project.	Construction phase
The Scheduled Tribes and other Traditional	It grants legal recognition to the rights of traditional forest dwelling communities.	This rule is applicable if land acquisition of forest dwelling ST and other traditional	Not Applicable

Law	Description	Requirement	Project Phase
Forest Dwellers (Recognition of Forest Rights) Act, 2006		forest dwelling communities may be required. This is not applicable for the project.	
The Child Labour (Prohibition and Regulation) Amendment Act, 2016 The Child Labour (Prohibition and Regulation) Act, 1986	No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act's Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule. Child can help his family or family enterprise, which is other than any hazardous occupations or processes set forth in the Schedule, after his school hours or during vacations	No children between the age of 14 to 18 years will be engaged in hazardous working conditions. Silent features of important labor laws are attached in Appendix 4.	Construction and Maintenance phase
The National Green Tribunal (NGT) Act, 2010	NGT provides an effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith. NGT has jurisdiction over matters related to Water Act, 1974; Water Cess Act, 1977; Forest (Conservation) Act, 1980; Air Act, 1981; Environment (Protection) Act, 1986; Public Liability Insurance Act, 1991; and Biodiversity Act, 2002. Consequently, no other court will have jurisdiction over the matters related to environment falling under the above referred Acts. Being a dedicated tribunal for environmental matters with the necessary expertise to handle environmental disputes.	Stakeholders / affected persons may approach NGT to resolve project induced environmental issues	Construction and Maintenance phase
Contract Labour (Regulation and Abolition) Act, 1970	The Act provides for certain welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor.	Applicable to all construction works under ASCL IA to obtain a Certificate of Registration as the principle employer;	Construction and Maintenance phase
Notification by Forest	Guidelines for extraction of trees from non-forest area stipulates that permission for	Necessary permission for non-forest tree cutting shall	Construction phase

Law	Description	Requirement	Project Phase
Department, Government of Tripura,	tree cutting shall be taken from State Forest department	be taken from the Forest Department. Compensatory plantation arrangements will be done in Forest Department in its Letter no. F.11-13/WFD/Deptt.0prnt/2018-19/11595-597 dated 27-02-2020.	
The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.,	• Contractor shall register with Labour Department, if Inter-state migrant workmen are engaged • Adequate and appropriate amenities and facilities to be provided to workers - housing, medical aid, traveling expenses	Construction and Operation phase
Minimum Wages Act, 1948.	The employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employment.	• All construction workers should be paid not less than the prescribed minimum wage.	Construction and Maintenance phase
Workmen Compensation Act, 1923.	The Act provides for compensation in case of injury by accident arising out of and during employment.	• Compensation for workers in case of injury by accident.	Construction and Maintenance phase
Equal Remuneration Act, 1979.	The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.	• Equal wages for work of equal nature to male and female workers.	Construction and Maintenance phase
Regulation of Polychlorinated Biphenyls (PCB) Order, 2016.	The order bans the import of Polychlorinated Biphenyls containing equipment.	• No equipment containing PCB shall be used in the project. • TSECL official has confirmed that all Transformers in Tripura state are PCB free.	Construction phase

C. International Conventions and Treaties

75. In addition to national and state rules and regulations, international conventions such as the International Union for Conservation of Nature and Natural Resources, Convention on Migratory Species of Wild Animals, Convention on International Trade in Endangered Species of

Wild Fauna and Flora, and Ramsar Convention on Wetlands of International Importance are applicable in the selection and screening of subprojects under restricted/sensitive areas. India is a party to these conventions. The international conventions and their requirement to the subproject are given in Table 6.

Table 6 : International Conventions and Their Requirement to the Subproject

International Convention	Description	Requirements
International Union for Conservation of Nature and Natural Resources - 1st July 1975	The International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species (also known as the IUCN Red List or Red Data List), founded in 1963, is a comprehensive inventory of the global conservation status of plant and animal species. The IUCN is an authority on the conservation status of species. A series of Regional Red Lists are produced by countries or organizations, which assess the risk of extinction to species within a political management unit. The IUCN Red List is set upon precise criteria to evaluate the extinction risk of thousands of species and subspecies.	These criteria are relevant to all species and all regions of the world. The aim is to convey the urgency of conservation issues to the public and policy makers, as well as help the international community to try to reduce species extinction. Not relevant to the target area of subproject.
Convention on Migratory Species of Wild Animals – 1st November 1983	The Convention on Migratory Species of Wild Animals (CMS) was adopted in 1979 and entered into force on 1 November 1983. CMS, also known as the Bonn Convention, recognizes that states must be the protectors of migratory species that live within or pass through their national jurisdictions, and aims to conserve terrestrial, marine and avian migratory species throughout their ranges.	CMS Parties strive towards strictly protecting these species, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Not relevant to the target area of subproject.
Convention on International Trade in Endangered Species of Wild Fauna and Flora – March 1973	The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. CITES were first formed, in the 1960s. Annually, international wildlife trade is estimated to be worth billions of dollars and to include hundreds of millions of plant and animal specimens. The trade is diverse, ranging from live animals and plants to a vast array of wildlife products derived from them, including food products, exotic leather goods, wooden musical instruments, timber, tourist curios and medicines. Levels of exploitation of some animal and plant species are high and the trade in them, together with other factors, such as habitat loss, is capable of heavily depleting their populations and even bringing some species close to extinction.	Many wildlife species in trade are not endangered, but the existence of an agreement to ensure the sustainability of the trade is important to safeguard these resources for the future. Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation. Not relevant to the subproject area.

International Convention	Description	Requirements
Ramsar Convention, 3rd February 1971.	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. India is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory countries to include wetland conservation in their national land use plans.	ASCL will help the Government of India comply with this agreement. ASCL will not support subprojects that will locate in wetlands and other protected areas of the country
Montreal Protocol, 6th September 1987	India is a signatory of this convention which aims to reduction in the consumption and production of ozone-depleting substances (ODS), while recognizing differences in a nation's responsibilities. Ozone depleting substances are divided in two groups Chlorofluorocarbons (CFCs) and Hydro Chlorofluorocarbons (HCFCs)	Not applicable in this project as no ODS are involved in construction works.
Basel Convention on Trans-boundary Movement of Hazardous Wastes, 22nd March 1989	India is a signatory of this convention which aims to reduce trans-boundary movement and creation of hazardous wastes.	Contractor shall abide by Basel Convention as well as Hazardous Waste Rules, 2016 for storage, handling, transport and disposal of hazardous waste emerged during construction works.

D. Clearances/ Permissions to be Obtained

76. Clearances/ permissions to be obtained prior to start of construction. Below Table 7 shows the list of clearances/permissions required for project construction. This list indicative and the contractor should ascertain the requirements prior to start of the construction and obtain all necessary clearances/ permission prior to start of construction.

Table 7: Clearances and Permissions Required for Construction Activities

Sr. No.	Construction Activity	Statute under which Clearance is Required	Implementation	Supervision
1.	Tree Cutting/ pruning permission for cutting of Albizia sp. tree at *Astabal* area	Concerned department	PIU	PIU and PMU
2.	Hot mix plants, Crushers and Batching plants	TSPCB	Contractor	PIU/PMU
3.	Storage, handling and transport of hazardous materials	Hazardous Wastes (Management and Handling) Rules. 2016 Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989 from TSPCB	Contractor	PIU/PMU
4.	Sand mining, quarries and borrow areas	Department of Mines and Geology Government of Tripura	Contractor	PIU/PMU

Sr. No.	Construction Activity	Statute under which Clearance is Required	Implementation	Supervision
5.	New quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor	PIU/PMU
6.	Temporary traffic diversion measures	District traffic police	Contractor	PIU/PMU
7.	Clearance for establishing Asphalt plant	TSPCB	Contractor	PIU/PMU
8.	Installation of Generators	CTE and CTO from TSPCB	Contractor	PIU/PMU
9.	Clearance for excavation and transporting soil	Department of Mines and Geology/ Local Bodies	Contractor	PIU/PMU
10.	License for storing Diesel	Commissioner of Explosives and TSPCB	Contractor	PIU/PMU
11.	Labour Camps	District health Officer	Contractor	PIU/PMU
12.	If water must be drawn from river/ reservoir	Concerned Water Authority	Contractor	PIU/PMU

77. PMU will ensure all necessary regulatory clearances and approvals are obtained prior to commencement of works. Respective PIUs, with support of project consultants and DBO contractors, are responsible for obtaining the clearances/permits and ensuring conditions/specifications/provisions are incorporated in the subproject design, costs, and implementation. The PIUs shall report to PMU the status of compliance to clearances/permits as part of the regular progress reporting.

IV. DESCRIPTION OF ENVIRONMENT

78. A Comprehensive understanding of the physical, chemical, and biological environment provides the foundation to a well-executed environmental assessment. The detailed baseline characterization is used as input to model possible project impacts, which allows specialists to provide timely input to project designs to reduce potentially adverse environmental impacts. This in turn produces a more socially and environmentally sustainable project and enhances the efficiency of the project permitting process. The baseline data generation included site visits, primary environmental monitoring, ecological surveys, social surveys and interviews and secondary data review from established sources such as Indian Meteorological Department (IMD), Census of India etc.

A. Physical Resources

1. Location, Area & Connectivity

79. Agartala, the capital of Tripura, is situated along 23° 45’ 23° 55’ N latitude and 91°15’ 91°20’ E longitude, in the flood plains of the Haora River. Historically, the city has been an important border-trading town with trading linkages with Bangladesh. Agartala is the second-largest city in northeast India after Guwahati. The city is governed by the Agartala Municipal Corporation. The city is the seat of the Government of Tripura. It is located on the banks of the Haora River, near the Bangladesh border, about 90 km (55 mi) east of Bangladesh's capital Dhaka.

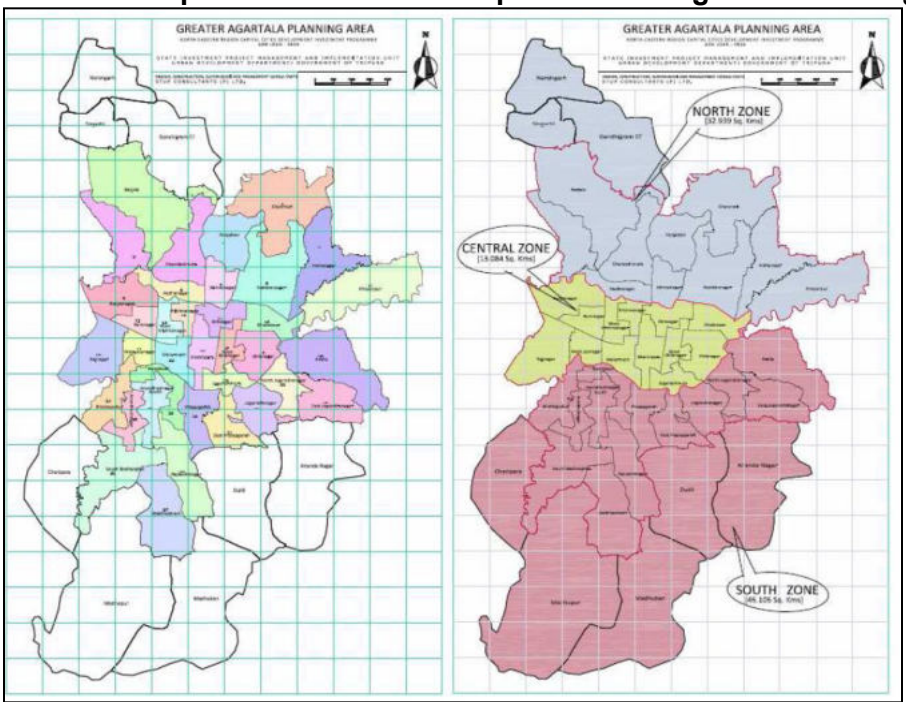
80. **Administrative Boundaries**: Agartala is the capital of Tripura, the third smallest Indian state considered as the gateway to the North-Eastern India. AMC was established in 1871 with an area of only 3 km^2. Presently the extended limit of AMC covers an area of 62 km^2 comprising of 35 wards. The Greater Agartala Planning Area (GAPA) is spread over an area of 92.0 km^2. It comprises AMC and eight other villages with population of more than 4 lakhs. Figure 20 shows the AMC wards and GAPA zonal map. Considering the natural geographical division created by the Haora and Katakhal Rivers, the GAPA has been demarcated to distinguish the three (3) zones: the north zone, central zone and south zone.

(i) **North Zone**: The area is located, north of Katakhal River. This zone comprises mainly the northern extension of the present AMC area (Wards 1 to 8) and peripheral villages, Narsingarh, Singarbil, and Gandhigram CT.

(ii) **Central Zone**: The area bounded by Haora River embankment on the south and Katakhal River on the north. This zone mainly comprises the erstwhile AMC area and the newly extended areas (Wards 9 to16 and Wards 18 to 22).

(iii) **South Zone**: This area is located at the south of Haora River. This zone includes the southern part of the extended AMC (Wards 23 to 35) and the adjoining areas of Ananda nagar, Dukli, Madhupur, Madhuban and Charipara.

Figure 19: Ward Map of AMC and Zone Map of Greater Agartala Planning Area



81. **Road, Rail and Air Connectivity:** The National Highway (NH)-44 connects Agartala with Silchar, Guwahati and other towns of Assam. The city has its own airport and direct flights from many other cities of India for the Agartala Airport. The city also has a very prominent and busy railway station, which connects it with all the major cities of the country. The intercity transportation of Agartala is very well organized too. All the places in the city are easily connected by a well laid network of roads such as VIP road, Pragati Road, Akhuara Road and others. There are buses and other transportations that run in the city all day long. Some important localities in the city include Hrishi Colony, Abhoy Nagar, Ram Nagar, Manipuri Basti, Banamalipur and Shib Nagar

2. Topography, Geology, Mineral resources and Soils

82. **Topography**: -The major part of the City (Central Agartala) has a flat terrain. However, the North and South Zones have a rolling terrain with average altitude varying from a high of 25 to 30 m to a low of 8 m. Greater Agartala is a combination of plain and undulated areas. The central zone is a flat land bounded by the rivers Haora in the south and Katakhal in the north. An important characteristic of the central part of the city is that it is located at a lower level than other areas giving it the appearance of a saucer. Due to its saucer shape, the low-lying areas are vulnerable to inundation during monsoons.

83. **Geology:** -The geology of GAPA is represented by the repetitive succession of sedimentary rock like sandstone, shale and clay from bottom to top, belonging to Surma group, Tipam group and Dupitila group. The valley is dominated by thick sandstones horizons with thin intervening shale/clay horizons. The sedimentary rocks are deformed and folded. The sandstones are highly porous underlain by impermeable shales or clay and are favourable for ground water retention.

84. **Mineral Resource:** - The most important minerals in Tripura are glass sand, lignite, clay, and limestone. The most important of all the minerals that are associated with the state is natural gas and oil. There are good sources of white sand on the bank of the water body called Bijainadi close to the place called old Agartala. Some other reserves are found in the western and eastern parts of Champamura.

85. **Soils:** - The plains of Haora River are alluvial in nature consisting of sand, silt and clay. The soil in Agartala is in general of poor to medium quality. It is characterized by a top soil underlain by a soft to medium/stiff, silty clay/clayey silt layer, which follows a moderately dense to very dense silty sand layer. Bearing capacity of soil is poor and usually is of the range of 4 – 6 tons per m^2 in Central Agartala and most parts of south Agartala.

3. Natural Disasters

86. **Cyclone.**[11] The District is completely prone to cyclonic zone and the probability of damage is very high. The seasonality cyclone occurs in the District during April & May and during October & November in terms of Kalbaisakhi. Sometimes the cyclonic wind the risk the state after pressing Bangladesh. In such events weekly built houses suffer the damage. Cyclone also disrobed power supply, telecommunication, surface communication and if damages agricultural crops and greenery in the District.

87. **Seismicity**: - The District is a part of the most severe seismic zone in the country namely Zone-V of seismic zoning map of India. Several number of moderate to large magnitude earthquake occurred within the District. In 1897 and earthquake took place in the state where the State's only one building that is the king palace which was damaged completely. Several landslide and liquefaction took place in the district.

[11] District Disaster Management Plan 2016-2017.

88. **Floods**: - The District faces flash flood annually during the monsoon season i.e. June to September. The District has now Howrah and Kathakhal rivers are the major rivers draining flood water from Bangladesh. Now a days due to change of climates there are untimely rains un subsequent temporary flooding occur in the low-lying area in District. Particularly Agartala City if facing frequent floods due to blockage of drainage system and free outlet of rain water through Kathakhal and Howrah rivers.

4. Climatic Conditions

89. The climate of Tripura exhibits a strong seasonal rhythm. The state is characterized by a warm and humid tropical climate with five distinct seasons, namely, spring, summer, monsoon, autumn and winter. Spring starts from late mid-February & continues till mid-March. Winter returns if there is rain a fresh in mid-February. Summer season starts from middle of March and reaches its peak in April - May. The monsoon generally breaks in the later part of May or first week of June and lasts till September.

90. Winter sets in from November and is severe in the month of January minimum temperature recorded is 4ºC in January 1995. Humidity is generally high throughout the year. In the summer season the relative humidity is varied from 50 percent to 74 percent whereas in the rainy season it is over 85 percent.

91. Relatively high temperature, occasional thunderstorms and wind velocities characterize the summer season, which extends from March end to mid-May. The average maximum temperature is 34ºC and average minimum temperature is 15ºC. Annual rainfall ranges from 1922 mm to 2855 mm. The rainfall generally increases from Southwest to Northeast

92. On-site monitoring was undertaken for various meteorological variables to generate the site-specific data. Data was collected at site every hour continuously from 20th December 2018 to 7th January 2019.

93. **Methodology**: - Site specific data covering micro-meteorological parameters were recorded on hourly basis during the study period and comprises of parameters like wind speed, wind direction (from 0 to 360 degrees), temperature, relative humidity, atmospheric pressure, rainfall and cloud cover. The monitoring was carried out at two locations:

(i) Pratapgarh (21st-28th December 2018)
(ii) Agartala Motor Stand (29th December 2018 -5th January 2019)

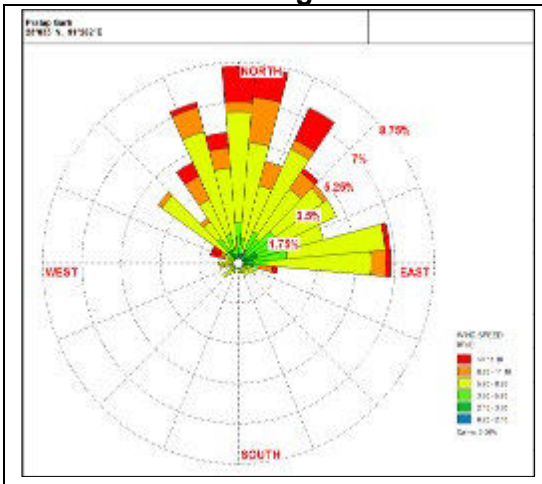
94. **Observations**: The minimum, maximum and average values for all the parameters except wind direction are presented in Table 8 and Figure 21.

Table 8: Summarized Meteorological Data

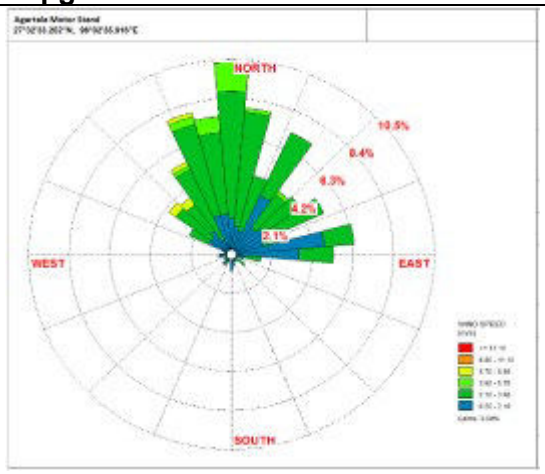
Sr. No.	Parameters	Min. Value	Max. Value	Avg. Value
		Pratapgarh		
1	Wind speed, (kmph)	0.72	18.04	7.18
2	Temperature, °C	11.98	30.89	21.44
3	Humidity (%)	23	79	46.43
		Agartala Motor Stand		
1	Wind speed, (kmph)	1.14	28.01	7.74

Sr. No.	Parameters	Min. Value	Max. Value	Avg. Value
		Pratapgarh		
2	Temperature, °C	11.01	31.5	22.21
3	Humidity (%)	21	78	45.45

Figure 20: Windrose at Pratapgarh and Motor Stand



Windrose at Pratapgarh



Windrose at Agartala Motor stand

95. **Secondary Data** (**Meteorology**): - The climate of Agartala is of tropical monsoon type. The average annual rainfall is around 220 centimeters (cm). The average nos. of rainy days are 100 days. The temperature varies from 4.2°C to 37.6°C on the average. The winter period is from November to February, summer is from March to May and monsoon is from June to September. It has a moderate temperature and highly humid atmosphere. Winds, which are of moderate velocity, are from the south-to-south – east direction for most of the time. Average velocity of wind varies from 4 km to 9 km per hour.

5. Water Quality

96. Selected water quality parameters of water resources within 10-km radius of the study area were studied for assessing the hydrological environment to evaluate and anticipate impact of the proposed project. Understanding the water quality is essential in the preparation of Environmental Impact statement. It also assists to identify critical issues in a view to suggest appropriate mitigation measures for implementation to curb the deterioration of various hydrological sources in the vicinity of the project site.

97. **Surface Water**: surface water sample was examined for physico-chemical, heavy metals and bacteriological parameters in order to assess the water quality. The sample was analyzed as per the procedures specified in 'Standard Methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA).

98. **Sampling locations**: Water sample was collected from Durgabari pond near to the Ujjayanta Palace. The sampling locations are selected to assess the water quality monitoring pre and post project scenarios at possible intake and out fall sites. The sample was taken as grab sample and was analyzed for various parameters to compare with the standards for drinking water as per IS: 10500. The water sampling locations are listed below in Table 9 and results are given in Table 10.

Table 9: Surface Water Monitoring Locations

Sr. No.	Monitoring Location	Date of Sampling	Location Code
1	Durgabari	27th December 2018	SW3

Table 10: Surface Water Monitoring Results

Sr. No.	Parameters	Unit	Standards	SW-3
	Dates			27-12-2018
(I)	Physico-chemical Parameter			
1	Colour	Hazen	5	<1.0
2	pH value	None	6.5-8.5	6.7 at 25 deg c
3	Turbidity	N.T.U.	1	13.7
4	Total Dissolved Solids (as TDS)	mg/l	500	128
5	Anionic Detergents (as MBAS)	mg/l	0.2	<0.02
6	Barium (as Ba)	mg/l	0.7	<0.05
7	Calcium (as Ca)	mg/l	75	27
8	Chloride (as Cl)	mg/l	250	15
9	Copper (as Cu)	mg/l	0.05	<0.02
10	Fluoride (as F)	mg/l	1.0	0.14
11	Iron (as Fe)	mg/l	0.3	1.15
12	Magnesium (as Mg)	mg/l	30	4.9
13	Manganese (as Mn)	mg/l	0.1	0.03
14	Nitrate (as NO3)	mg/l	45	1.43
15	Phenolic Compounds (as C6H5OH)	mg/l	0.001	<0.001
16	Selenium (as Se)	mg/l	0.01	<0.005
17	Sulphate (as SO4)	mg/l	200	<1.0
18	Alkalinity (as CaCO3)	mg/l	200	86
19	Total Hardness (as CaCO3)	mg/l	200	88
20	Cadmium (as Cd)	mg/l	0.003	<0.001
21	Lead (as Pb)	mg/l	0.01	<0.005
22	Mercury (as Hg)	mg/l	0.001	<0.001
23	Polychlorinated biphenyls (as PCB)	mg/l	0.0005	<0.0005
24	Arsenic (as As)	mg/l	0.01	<0.005
25	Total Chromium (as Cr)	mg/l	0.05	<0.01
26	Sodium (as Na)	mg/l	60	7.2
27	Potassium (as K)	mg/l	-	4.7
28	Zinc (as Zn)	mg/l	5	<0.02
29	Hexavalent Chromium (as Cr+6)	mg/l	0.05	<0.01
30	Total Suspended Solid (as TSS)	mg/l	-	20
31	Temperature	Deg C	-	26
32	Conductivity	us/cm	-	203

Sr. No.	Parameters	Unit	Standards	SW-3
	Dates			27-12-2018
33	Biochemical Oxygen Demand (as BOD)	mg/l	-	5.4
34	Chemical Oxygen Demand (COD)	mg/l	-	35
35	Oil and Grease	mg/l	-	<1.4
36	Silica (as SiO2)	mg/l	-	16.2
37	Salinity	mg/l	-	0.12 In respect to KCl equivalent salinity 35
38	Phosphate (as PO4)	mg/l	-	<0.15
39	Phosphorus	mg/l	-	<0.05
40	DO	mg/l	-	5.6
41	Total Nitrogen	mg/l	-	3.4
42	Petroleum Hydrocarbon	mg/l	-	<1.0
(II)	Biological Parameters			
1	Faecal coliform	/100ml	zero	Detected
2	Total coliform	MPN/100ml	zero	170
3	Zooplankton	/1lit	-	Absent
4	Phytoplankton	/1lit	-	Absent

99. **Observations**: The result of Durgabari Pond water quality monitoring shows that most of the parameters are within the limit as prescribed by IS: 10500. Feacal coliform was observed in the water.

100. **Conclusion**: The primary data shows that while most of the parameters are within the limit, iron, manganese and feacal coliforms are observed in the water.

101. **Ground water Quality:** Ground water sample near Krishnanagar, Thakurpally road for physico-chemical, heavy metals and bacteriological parameters in order to assess the effect of industrial and other activities on surface and ground water. The samples were analyzed as per the procedures specified in 'Standard Methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA).

102. **Sampling locations**: Water sample was collected from Krishnanagar, Thakurpally road. The sampling locations are selected to assess the water quality monitoring pre and post project scenarios at possible intake and out fall sites. The sample was taken as grab sample and was analyzed for various parameters to compare with the standards for drinking water as per IS: 10500. The water sampling locations are listed below in Table 11 and the results of the analysis are given in Table 12.

Table 11: Ground Water Monitoring Locations

Sr. No.	Monitoring Location	Date of Sampling	Location Code
1	Near Krishnanagar, Thakurpally road	27th December 2018	GW4

Table 12: Ground Water Monitoring Analysis

Sr. No.	Parameters	Unit	Standards	GW-4
	Date			27-12-2018
(I)	Physical Parameters			
1	Color	Hazen	5	<1.0
2	pH value	None	6.5-8.5	7.05 at 25 deg c
3	Turbidity	N.T.U.	1	130
4	Total Dissolved Solids (as TDS)	mg/l	500	248
(II)	Chemical Parameters			
1	Anionic Detergents (as MBAS)	mg/l	0.2	<0.02
2	Barium (as Ba)	mg/l	0.7	<0.05
3	Calcium (as Ca)	mg/l	75	33
4	Chloride (as Cl)	mg/l	250	48
5	Copper (as Cu)	mg/l	0.05	<0.02
6	Fluoride (as F)	mg/l	1	<0.1
7	Iron (as Fe)	mg/l	0.3	14.7
8	Magnesium (as Mg)	mg/l	30	12
9	Manganese (as Mn)	mg/l	0.1	<0.02
10	Nitrate (as NO3)	mg/l	45	<0.5
11	Phenolic Compounds (as C6H5OH)	mg/l	0.001	<0.001
12	Selenium (as Se)	mg/l	0.01	<0.005
13	Sulphate (as SO4)	mg/l	200	<1.0
14	Total Hardness (as CaCO3)	mg/l	200	133
15	Cadmium (as Cd)	mg/l	0.003	<0.001
16	Lead (as Pb)	mg/l	0.01	<0.005
17	Mercury (as Hg)	mg/l	0.001	<0.001
18	Polychlorinated biphenyls (as PCB)	mg/l	0.0005	<0.0005
19	Arsenic (as As)	mg/l	0.01	<0.005
20	Total Chromium (as Cr)	mg/l	0.05	<0.01
21	Sodium (as Na)	mg/l	60	46
22	Potassium (as K)	mg/l	-	3.1
23	Zinc (as Zn)	mg/l	5	<0.02
24	Hexavalent Chromium (as Cr+6)	mg/l	-	<0.01
25	Total Petroleum Hydrocarbon (as TPH)	mg/l	-	<1.0
26	Total Suspended Solid (as TSS)	mg/l	-	33
27	Temperature	Deg C	-	26
28	Conductivity	us/cm	-	439
29	Dissolved Oxygen	mg/l	-	3.6
30	Biochemical Oxygen Demand (as BOD)	mg/l	-	<2
31	Chemical Oxygen Demand (COD)	mg/l	-	<4
32	Oil and Grease	mg/l	-	<1.4
33	Silica (as SiO2)	mg/l	-	22
34	Salinity*	mg/l	-	0.25

Sr. No.	Parameters	Unit	Standards	GW-4
	Date			27-12-2018
35	Total Alkalinity (as CaCO3)	mg/l	200	130
36	Phosphate	mg/l	-	<0.15
37	Total Nitrogen	mg/l	-	0.7
38	Total Phosphorous	mg/l	-	<0.05
(III)	Biological Parameters			
1	Faecal coliform	/100ml	Zero	Not Detected
2	Total coliform	MPN/100ml	zero	7

*In respect to KCl equivalent salinity 35.

103. **Observations**: the result of water quality monitoring shows that most of the parameters are within the limit as prescribed by is: 10500. Noise quality

104. **Drainage**: - The drainage system of Greater Agartala is dominated by two major rivers (Haora and Katakhal), which drains the core area of the city. These two rivers flow westward into Bangladesh. In terms of catchment area, Haora River is the seventh largest in the Tripura and is the only source of surface water for Greater Agartala. In addition to these two rivers, there are other rivers like Bangeshwar Gang, Debta Gang, Nagichara, Kalapani Charra and its tributaries within Greater Agartala. The Akhaura canal system running along the Akhaura road serves mainly the central area. All rivers are rain-fed and ephemeral in nature and their flow is directly related to rainfall.

6. Air Quality

105. The ambient air quality with respect to the study zone of 10 km radius around the proposed project forms the baseline information. The prime objective of the baseline air quality study was to assess the existing air quality of the area. The study area represents mostly industrial/residential environment. This section describes the selection of sampling locations, methodology adopted for sampling, analytical techniques and frequency of sampling. Ambient air quality monitoring has been carried out during November 2018 to January 2019 representing winter season.

106. **Sampling locations**: - The air quality monitoring was taken place at 4 locations around the Ujjayanta Palace. The details of monitoring locations are given in Table 13. The ambient air quality was monitored during the winter season at all AAQMS.

Table 13: Details of AAQMS

Sr. No.	Monitoring Location	Location Code	Date of Sampling	Latitude	Longitude
1	Rabindra Bhavan	AQ1	24 and 27 Dec 2018	23.834°N	91.2808°E
2	North Gate Tri-Junction	AQ14	30 Dec 2018 and 03 Jan 2019	23.8399°N	91.2831°E
3	Ujjayanta Palace	AQ19	31 Dec 2018 and 04 Jan 2019	23.837°N	91.2828°E
4	Thakurpally Road	AQ20	31 Dec 2018 and 05 Jan 2019	23.834°N	91.2827°E

107. **Parameters of sampling**: - The baseline data of air environment was monitored for parameters mentioned below:

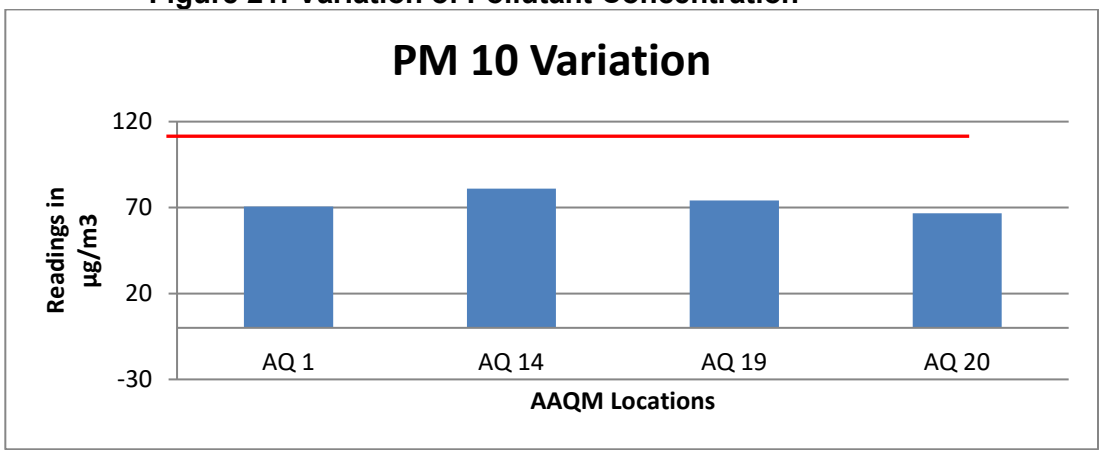
(i) Particulate Matter (PM 2.5);
(ii) Particulate Matter (PM 10);
(iii) Sulphur dioxide (SO2);
(iv) Oxides of Nitrogen (NOx);
(v) Carbon monoxide (CO) and

108. As per Central Pollution Control Board (CPCB) monitoring guidelines Monitoring of Particulate Matter size less than 10 microns (PM10) and Particulate Matter size less than 2.5 microns (PM2.5), Sulphur Dioxide (SO2), Nitrogen Dioxide (NO2) were monitored on 24 hourly basis and for CO were monitored on eight hourly basis.

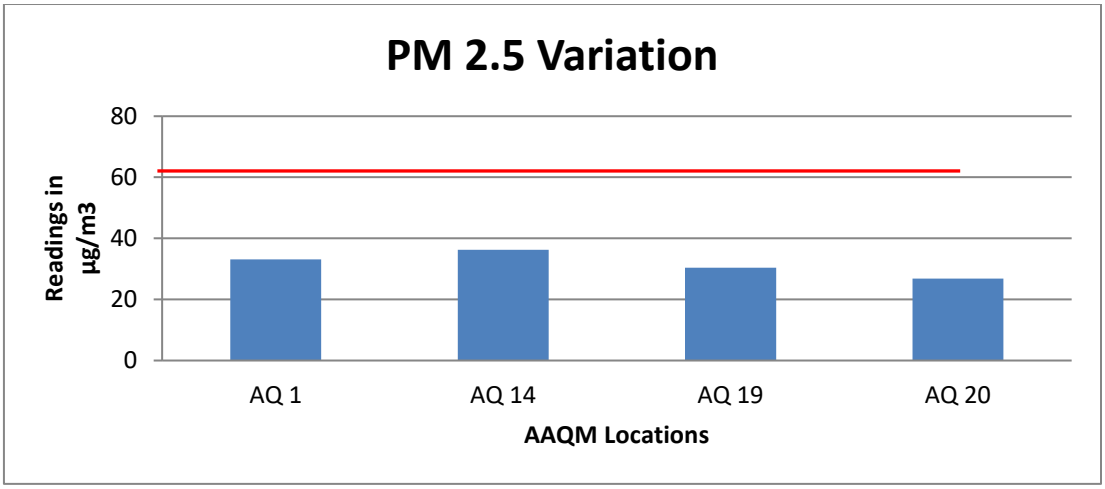
109. Presentation of Primary Data: - The graphs in Figure 21 give the variation of various parameters across all the 4 locations near to the Ujjayanta Palace. The 98 percentile values are denoted in the graphs.

Figure 21: Variation of Pollutant Concentration

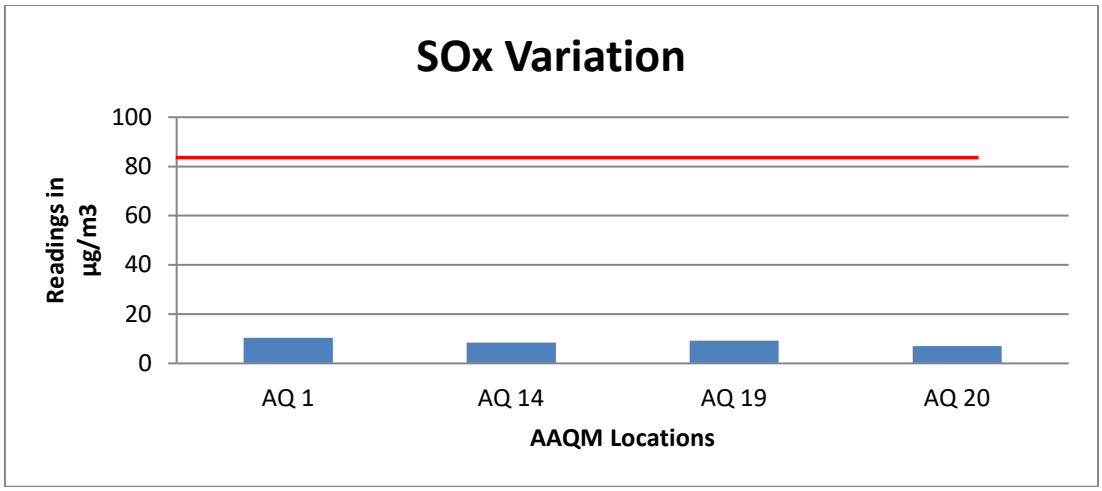
NAAQS for PM10– 100 µg/m3



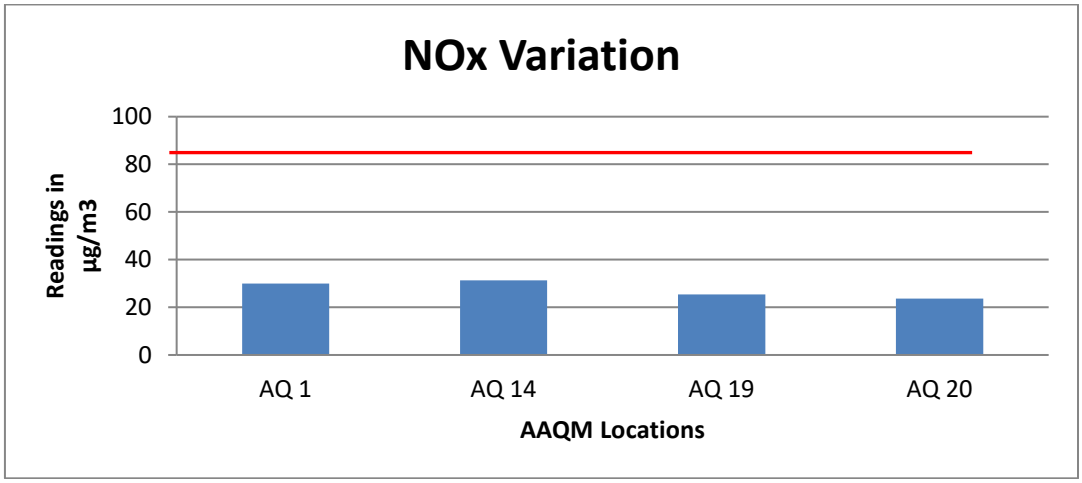
NAAQS for PM2.5– 60 µg/m3



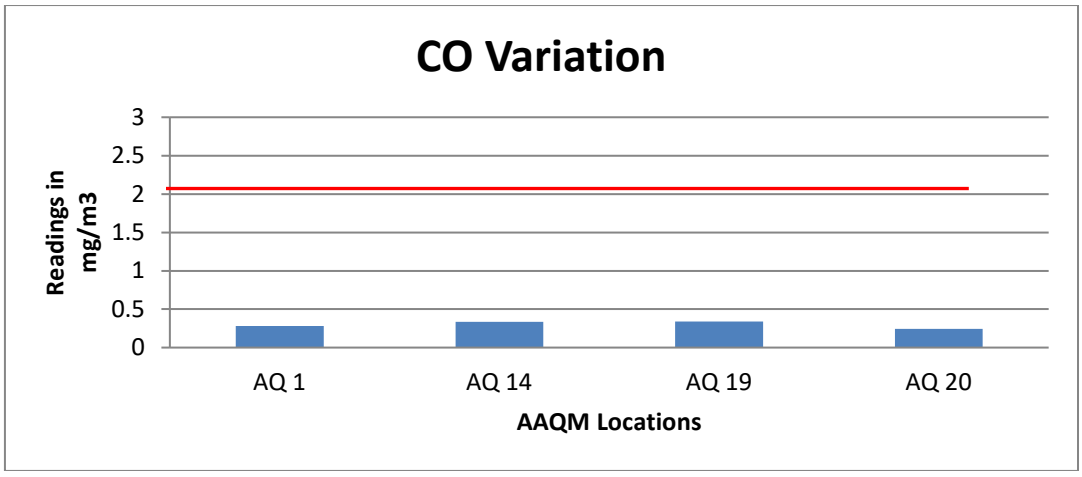
NAAQS for SO2– 80 µg/m3



NAAQS for NO2– 80 µg/m3



NAAQS for CO– 2 mg/m3



110. Observation: All the parameters at all the locations are within the permissible limit (SO2-80 µg/m3, PM10- 100 µg/ m3, PM 2.5 - 60 µg/m3 and CO-2 mg/m3) of the National Ambient Air Quality Standards (NAAQS). The highest concentration was found at station 12, which is also in permissible limits.

B. Noise Quality

111. To understand the noise levels in the Ujjayanta Palace area, 24 hrs continuous noise monitoring was done at two locations near Ujjayanta lake. 24-hour monitoring was done at each station. Data was recorded using a Lutron sound level meter. The sound level meter was used to record the SPL reading placed in flat terrain at 1.2 to 1.5 m above ground level in an open area with minimum obstruction, at least 3 m away from sound reflecting sources like walls, matted or tall grasses, shrubs, or wooded areas.

112. **Sampling locations:** The noise quality monitoring was done at 2 locations near the Ujjayanta Palace. The details of the locations are given in Table 14.

Table 14: Noise Quality Monitoring Locations

Sr. No.	Monitoring Location	Date of Monitoring	Location Code
1	NQ7 (NEAR DURGABARI)	20th December 2018	NQ7
2	NQ8 (NEAR MUSEUM AREA)		NQ8

113. **Observations:** 24-hour monitoring was done at each station. Data was recorded using a Lutron sound level meter. The sound level meter was used to record the SPL reading placed in flat terrain at 1.2 to 1.5 m above ground level in an open area with minimum obstruction, at least 3 m away from sound reflecting sources like walls, matted or tall grasses, shrubs, or wooded areas. The results show that the noise levels are high during both day and nighttime for the locations, this can be attributed to the vehicular traffic movement near the Thakurpally road and around Ujjayanta Palace. The parameters are analyzed for Lday and Lnight. These results are given in Table 15.

Table 15: Noise Quality Monitoring Locations

Time	NQ7	NQ8
Date	**25.12.2018**	**25.12.2018**
Classification	**Mixed Developed**	**Mixed Developed**
L Day	57.7	60.7
Standard	**55**	**55**
L Night	50.1	42.7
Standard	**45**	**45**
L Max	60.9	61.5
L Min	41.9	37.9

114. Following requirements of ADB SPS, 2009, PMU and PIUs shall apply pollution prevention and control technologies for all the applicable environmental parameters and practices consistent with international good practice. When the Government of India regulations differ from these levels and measures, PMU shall achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific subproject circumstances, PMU shall provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

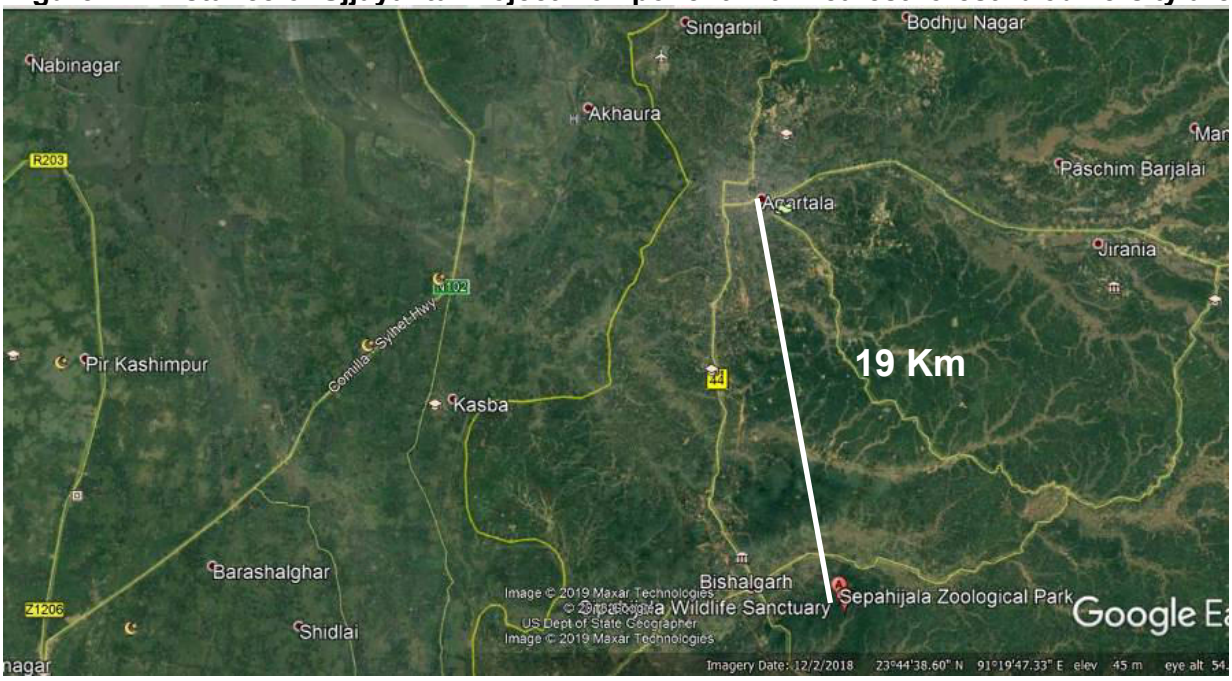
C. Ecological Resources

115. There are no protected areas, wetlands, mangroves, or estuarine in or within the subproject location. The “Shipahijala Wildlife Sanctuary” situated in Bishalgarh Development Block, is

located at 28 km from Agartala city. The sanctuary covers an area of 18.53 sq km and possesses rich diversity of wildlife particularly birds (migratory birds during winter seasons) and primates. The subproject components are not expected to have any effect on the Sanctuary. The statement of forest land as per the Tripura Forest department shows that the Sadar region of Tripura, which consists of Agartala does not have any protected forest or protected reserve forest. (Source: Forest Resource of Tripura, Tripura Forest Department, Govt. of Tripura).

116. **Critical Habitats**: As per Proximity report generated by the Integrated Biodiversity Assessment Tool (IBAT) no Protected Areas and Key Biodiversity Areas are within 10 km of the subproject area. Habitats critical to the survival of IUCN-designated Critically Endangered or Endangered species, migratory species, congregatory species and endemic or restricted range species are critical habitats. Figure 22 below shows the distance from the proposed Ujjayanta Palace project area to the nearest forest/ important biodiversity area.

Figure 22: Distance of Ujjayanta Project Component with nearest forest/ biodiversity area



117. **Critically Endangered/ Endangered Species:** Table 16 below lists the species designated by the IUCN as Critically Endangered or endangered that are potentially found within 50km of the subproject area. The subproject area is an urban area with complete modified habitats with no pristine natural habitat or flora and fauna, but the 50 km surrounding area of the subproject includes many pockets of pristine natural habitats and have ranges of many IUCN designated fauna and flora. The 50 km area includes Natural Habitat like moderate to dense forest, rivers with influence of tidal water from Bay of Bengal. The IBAT results shows following IUCN designated species have their range in 50 km surroundings of project area.

Table 16: IUCN Listed species of the project area

Scientific name	Common name	IUCN Category	Group
Indotestudo elongata	Elongated Tortoise	CR	Reptilia
Aythya baeri	Baer's Pochard	CR	Aves

Scientific name	Common name	IUCN Category	Group
Houbaropsis bengalensis	Bengal Florican	CR	Aves
Gyps bengalensis	White-rumped Vulture	CR	Aves
Ardea insignis	White-bellied Heron	CR	Aves
Emberiza aureola	Yellow-breasted Bunting	CR	Aves
Gyps tenuirostris	Slender-billed Vulture	CR	Aves
Cuon alpinus	Dhole	EN	Mammalia
Elephas maximus	Asian Elephant	EN	Mammalia
Geoclemys hamiltonii	Spotted Pond Turtle	EN	Reptilia
Manis crassicaudata	Indian Pangolin	EN	Mammalia
Trachypithecus phayrei	Phayre's Leaf-monkey	EN	Mammalia
Hoolock hoolock	Western Hoolock Gibbon	EN	Mammalia
Platanista gangetica	South Asian River Dolphin	EN	Mammalia
Amblyceps arunchalensis		EN	Actinopterygii
Perdicula manipurensis	Manipur Bush-quail	EN	Aves
Asarcornis scutulata	White-winged Duck	EN	Aves
Sterna acuticauda	Black-bellied Tern	EN	Aves
Haliaeetus leucoryphus	Pallas's Fish-eagle	EN	Aves
Aquila nipalensis	Steppe Eagle	EN	Aves
Leptoptilos dubius	Greater Adjutant	EN	Aves
Laticilla cinerascens	Swamp Grass-babbler	EN	Aves
Tor putitora		EN	Actinopterygii

Restricted Range Species

Species name	Common name	IUCN Category	Group
Acrocephalus orinus	Large-billed Reed-warbler	DD	Aves

Source: Proximity report generated by the Integrated Biodiversity Assessment Tool (IBAT)

** Status assigned by the International Union for Conservation of Nature and Natural Resources, where - EN – Endangered; DD- Data Deficient and CR – Critically Endangered*

118. **Critical Habitats:** As per Proximity report generated by the Integrated Biodiversity Assessment Tool (IBAT), the nearest Protected Areas and Key Biodiversity Areas are 50 km away from the Ujjayanta Palace. The list of protected area and key biodiversity areas as reported by IBAT proximity checklist are given below in Table 17 and 18. The detailed proximity report generated IBAT for 10 km and 50 km from the project area are given in Appendix 12.

Table 17: Protected Areas

Sr. No	Area name	Distance
1	Gumti	50 km
2	Rema Kalenga	50 km
3	Rudrasagar Lake	50 km
4	Satchari	50 km
5	Sepahijala	50 km
6	Trishna	50 km

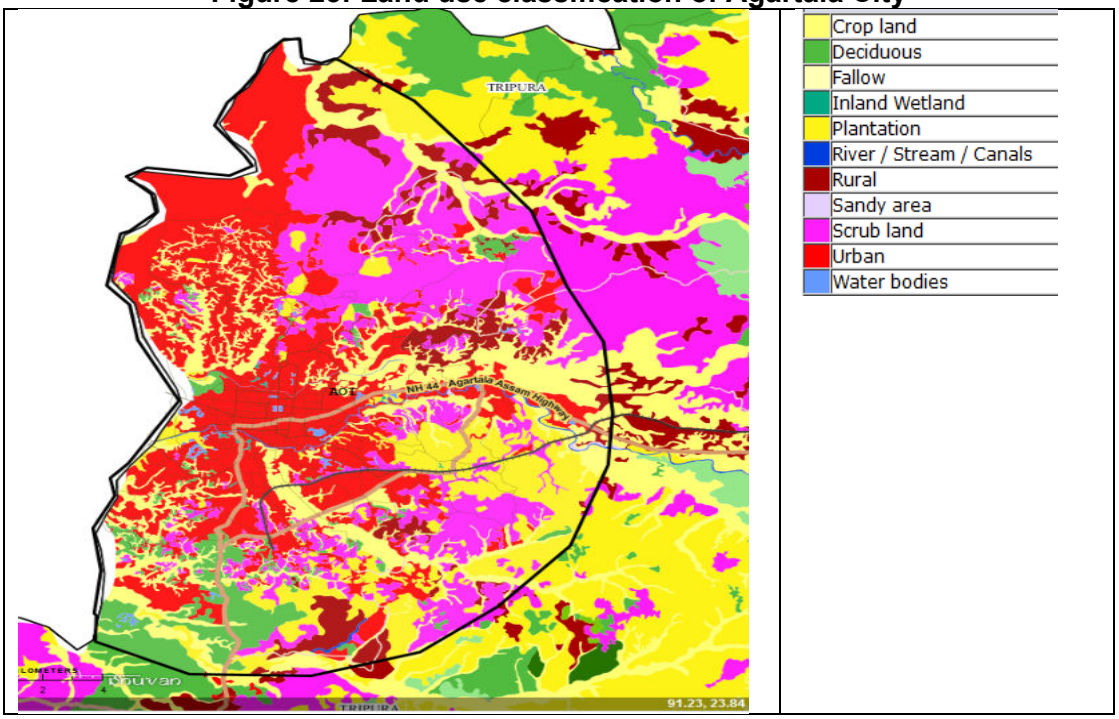
Table 18: Key Biodiversity Areas

Sr. No	Area name	Distance
1	Gumti Wildlife Sanctuary	50 km
2	Rema-Kalenga Wildlife Sanctuary	50 km
3	Rudrasagar Lake	50 km
4	Sepahijala	50 km
5	Trishna Wildlife Sanctuary	50 km

D. Economic Development

119. **Land Use**: - The Landuse and land classification of Agartala City as performed using Bhuvan-India Geo-platform of ISRO shows that the entire Agartala City Falls under the urban land use with some water bodies spread across the city. Figure 23 shows the land use classification of Agartala City.

Figure 23: Land use classification of Agartala City



Source: ISRO Bhuvan Map.

120. **Commerce, Industry and Agricultural: -** Tripura's gross state domestic product for 2004 is estimated at $2.1 billion in current prices. The economy of Tripura is agrarian. More than 50 per cent of its population depends on agriculture for livelihood and contribution of agriculture and allied activities. Tripura is characterized by low income, overwhelming percentage of population below the poverty line, income leakage, and unemployment. The state is predominantly rural in character (85.29%). Average land holding size is 0.97 hectare. 90% of the cultivators are either small or marginal.

121. **Trade and Commerce.** There are two small industrial estates, with a total number of 36 industrial units and with a total capital investment of INR 56.575 million. Other than the 2 industrial estates, there are 17 other significant industries in Agartala. These industries, as per records, are not in the category of large and medium industries. Wholesale trade in the city is functioning mostly in the Gole Market area and spreads haphazardly mixing with the retail trade. There are 9 markets maintained by AMC within erstwhile Municipal limits, of which, Battala and Maharaj Ganj Bazaar are the main service and distribution centres of Greater Agartala.

122. **Agriculture.** Agriculture and allied activities is the mainstay of the people of Tripura and provides employment to about 64% of the population. There is a preponderance of food crop cultivation over cash crop cultivation in Tripura. At present about 62% of the net sown area is under food crop cultivation. Paddy is the principal crop, followed by oilseed, pulses, potato and sugarcane. Tea and rubber are the important cash crops of the State. Handicraft, particularly hand-woven cotton fabric, wood carvings and bamboo products, are also important. The subproject areas are not located in agricultural lands.

E. Infrastructure

123. **Water Supply.** The people of Agartala get their water from piped water supply systems operated by the Public Health Engineering Department (PHED), private and community wells and the two rivers that run through the city. Although about 70% of the population of the area is served by central water supplies, water is available for only a few hours a day in most parts of the city. PHED's water supply systems have two main sources, comprising the Haora River and groundwater. Distribution of water is partly through distribution reservoirs and partly through direct pumping. Major parts of the distribution system pipelines are obstructed by iron deposits. The water supply system is unmetered. The major problems with the water supply system are under utilization of the capacity of the two treatment plants, under production from the ground water sources, ineffective treatment for iron removal, absence of proper disinfection and a substantial amount of unaccounted for water (UFW), presently about 35% of production.

(i) **Sewerage and Sanitation.** Agartala city is not covered by an underground sewerage system at present. Although about 90% of households have cistern or pour flush latrines, about 10% use pit latrines. Open defecation is widespread among lower income group people especially those living along rivers and drains and in rural areas. The ground water table being very high there is a high risk of contamination of wells.

(ii) **Drainage.** Although GAPA has numerous storm water drains and two major rivers flowing through it, the city suffers from recurrent flood problems. During normal rainfall of about 3 to 4 hours, the central part of Agartala gets flooded. Although there is adequate fall in most parts of the city to support a gravity drainage system, some parts of the city are on low-lying land and drainage problem is more evident. The most severe problems arise when a combination of tidal conditions in the Brahmaputra basin and high rainfall cause the waters in the Haora and Katakhal Rivers to be higher than the city. Several pumps have been provided to lift the water out of the city during these seasons. Most of the main drains are masonry-lined, but the feeder drains are earth-lined and in a poor condition with silt and vegetation choking them.

(iii) **Industrial Effluents.** Industries within the city area have no separate treatment facility. The industries are required to treat their own effluents before disposal and are not allowed by the Agartala Municipal Council (AMC) to connect to the local drainage network.

(iv) **Solid Waste.** An estimated 200 tons/day of solid waste is generated within the city. Only 50% of the waste generated is collected and transported. The waste dumped haphazardly along roads, drains and open areas leading to unhygienic conditions. The collected waste is dumped at DC Nagar Lunga, about 12 Km away from Agartala city.

(v) **Transportation.** The Assam – Agartala – Sabroom Road (NH-44) connects Argatala with Silchar, Guwahati and other towns of Assam. The total length of roads in the city is approximately 390 km with a road density of about 4.2 km per km2. The road system is planned, well defined and geometrical in the central core area, following a gridiron pattern. In the outer areas, it is more haphazard and ill planned. The mixed traffic and encroachments along roads like the Motor Stand to Subhash Market road, Hariganga Basak Road upto the Post Office Chowmani etc, leads to high levels of congestion in the city especially in the central business district area. The presence of cycle rickshaws adds to the congestion.

124. **Housing and Amenities**: 98% used houses primarily as residences while less than 2% had residence cum other use. 65.5% of the households lived in good condition houses, 29.4% in livable houses and about 3% in dilapidated houses. 1.9% used residence cum other use. Census households by type of structure for 56.3% of households were permanent and for 42.3% were semi-permanent and temporary were less than 1 %. In terms of availability of Latrines, 98% of the households reported having latrines within the premises. 47.7 % households Flush/pour flush latrine connected to septic tank. Only 9.4 % of the households had piped sewer system. 28.2% had pit latrine with slab ventilated improved pit and 7 % had pit latrine without slab in open pit. For assets available at household level, 82.9 % had televisions and 67.9% had mobile phones, 42.6% owned bicycles, 23.6% reported owning motorcycles and 5.9% had car/jeep or van. 7.5% households owned TV, Computer/ Laptop, Telephone/mobile phone and Scooter/ Car.

125. **Health and Educational Facilities** There are good educational facilities in Tripura state, which serve both Agartala urban people and inhabitants of surrounding villages and towns in the hinterland. There are about 21 colleges in Agartala comprising Medical college, Degree college, Nursing college, Polytechnic college and Open university. Percentage of literacy according to 2011 census is 93.88, higher than the national literacy rate. There are also 9 nos. nursing home and hospital at Agartala. One Government Medical College is also located at Agartala.

126. **Educational Institutions**: Agartala being a well-developed city and capital of the state, it is home to several educational institutions, and this can be easily seen in the map given here. Some of the educational institutions in the city include B.Ed. College, Hindi H.Sec School, Ram Nagar School, Bijoy Kumar School, MTB Girls School, Vani Vidypeeth, Government Women's College, Govt. Law College among others.

F. Social and Cultural Resources

127. **Demography: -** The total estimated population of AMC limits as per 2011 census is 399,668. Population density of GAPA increased to 41% person per hectare in the year 2001 in compared to 38% in 1991. There are two major racial groups, namely the Indo-Aryans represented by the Bengalis and the Indo-mongoloid represented by communities like the Tripuris, the Reangs, the Noatis, the Kukis, the Halams, the Chakma, the Mogh and the Lushai. The percentage of Scheduled Tribe population to the total city population is estimated to be around 4%. The scheduled tribe populations living in the city is well integrated with the mainstream

and is gainfully employed. The literacy rate in Agartala is the highest among the localities of Tripura.

128. **History, Culture and Tourism: -** One of the earliest kings of Tripura was Patardan B.C. 1900, long before the Manikya Dynasty. According to folklore, Chitrarath, Drikpati, Dharmapha, Loknath Jivandharan were important kings during the time of B.C. in Agartala.

129. In the past, Tripura served as the capital to several Hindu kingdoms. Although a timeline of the rulers has not been found, records reveal that the area has been ruled by as many as 179 Hindu rulers, starting from the mythological King Druhya to the last King of Tripura, Kirit Bikram Kishore Manikya. Tripura also came under Mughal rule. The state came under the governance of the British in 1808. Much later the ancient capital of the then Princely State 'Swadhin Tripura' was at Rangamati (Udaipur, South Tripura) by the bank of the river Gomati. In 1760 it was shifted by the Maharaja Krishna Chandra Manikya Bahadur (r.1829–1849) of Manikya Dynasty to present old Agartala by the bank of the river Haora/Saidra and was named 'Haveli'. Due to frequent invasion of the Kukis and also to keep easy communication with the British Bengali, the Maharaja Krishna Chandra Manikya started the process of shifting the capital from Old Haveli to New Haveli (present Agartala) in 1849.

130. During the British Raj, Agartala was the capital of the 'Hill Tippera' state, it became a municipality in 1874–75, and in 1901 had a population of 9,513. The princely state always remained as cake piece to the British and many other invaders. For example, when Arakhan soldiers attacked the old capital of the state the king of Tripura responded by defeating the entire troop. The Agartala Municipality was established during the reign of Maharaja Bir Chandra Manikya (1862–1896) within an area of 3 square miles (8 km^2) having a population of only 875 by a royal proclamation in the last part of 1871. A.W.S. Power, the first British political agent for Tipperah was also appointed as the Chairman of the Agartala Municipality in 1872 who held office from 1872–73. The municipality located at the crossing of latitude N 23° 50' and longitude E 91°17' covering 3 km^2. Area during that period.

G. Physical Cultural Resources and Sensitive Receptors

131. **Ujjayanta Palace** is a representative example of neoclassical style of early 20th century designed by Sir Alexander Martin for Maharaja Radha Kishore Manikya. The complex of site area 800 acres comprises of the two storied Palace building with central dome, symmetrically landscaped grand entrance promenade in between two ponds, Chhatris, Rear garden, North gate and *Astabal*.

132. The palace has historical association to the Manikya dynasty, the rulers of Tripura before merger into India. Ujjayanta palace presently accommodates the State Museum of Tripura from 2011, formerly being used as State Legislative Assembly. The site has provided opportunities for tourist attraction, knowledge source and social cohesion, as it also accommodates the Tourism Department office and a restaurant.

133. It is a Landmark structure in the city of Agartala with significant architectural, aesthetic, cultural value and huge associational value with the inhabitants of the state. It provides contextual value as it is historically and visually linked to its surroundings.

H. Other Religious Buildings

134. Agartala has plenty of religious and cultural places. Though Hinduism is the main religion of the place, other religions like Islam, Buddhism and Christianity are also have their place. The city has a lot of temples, churches, mosques and monastery, some of which are over 150 to 200 years old. Some of the famous religious institutions include Buddha Mandir, Mother Theresa Ashram, Ramkrishan Ashram Vidyamandir among many others. The city has a Universal Prayer Hall, where people can come and pray.

135. There are few sensitive receptors like college, community center near the proposed sub-project. The significant PCR's and sensitive receptors identified are given in Table-19. The impact of the project and the necessary mitigation measures are provided in the EMP Section

Table 19: PCR and Sensitive Receptors around Ujjayanta Palace site

Sr. No.	PCR & Sensitive receptors	Approx. Distance from the Ujjayanta Palace Site
1	 Durgabari Temple	290 m
2	 Lakshminarayan bari Temple	290 m

Sr. No.	PCR & Sensitive receptors	Approx. Distance from the Ujjayanta Palace Site
3	 Jagannathbari Temple	230 m
4	Agartala Municipal Corporation Library	150 m
5	MTB High School	433 m
6	Children Park	365 m
7	Sukanta Academy	390 m
8	Women's College, Agartala	370 m

I. Environmental Setting of Ujjayanta Palace: -

136. Location of the project site from nearby facilities and amenities are shown in Table 20.

Table 20: Environmental Setting of Ujjayanta Palace

Sr. No.	Place Description	Distance from the site
1	Elevation above Mean Sea Level	Varying from 14 m to 17 m
2	Nearest Highway	NH 8 passing within the Agartala city at around 0.37 Km from project site south direction
3	Nearest railway station	Agartala Railway Station at around 4.59 Km, South direction
4	Nearest airport / airstrip	Agartala Airport at around 7 Km North West direction
5	Nearest city	Proposed project is within the city limits of Agartala
6	Rivers	Haora river at around 1.58 Km on the Southern side of the project site.
7	Hills/valleys	None
8	National Parks/ Forest areas	There is no Protected forest area within 10 km of radius. Nearest Wildlife Sanctuary- Sepahijila at 19 km. Nearest National Park- Clouded Leopard at 20 km.
9	Wildlife Sanctuary	None
10	Core Biosphere reserve	None
11	Wetland	MBB lake/ College Tilla lake is at 1.32 Km from the Palace Boundary. College Tilla lake is identified among the 7 important inland wetlands of Tripura in terms of biodiversity conservation.
12	International Border	India Bangladesh border at around 2.9 Km from the project site at West direction

137. The excess C&D waste for construction will be processed at C&D waste management site at DC Nagar, 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 in Agartala is attached as Appendix 14.

V. ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

A. Introduction

138. 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. The impacts may be in Physical, Biological, Socio-economic, Cultural and Environmental. But it must be kept in mind that the impacts of project activities are not always negative, it may be positive as well. The attempt should be to minimize the negative impacts by applying necessary mitigation measures and to maximize the positive impacts. Based on the severity and extent of impacts, the impacts may be classified as high, medium and low.

139. 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 and Pre-Construction Phase** - 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.

140. 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).

141. 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.

142. 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.

143. In the case of this project (i) most of the individual elements are relatively small and involve straightforward construction and operation, so impacts will be mainly localized and not greatly significant (ii) most of the predicted impacts are associated with the construction process (iii) being located in an urban area, will not cause direct impact on biodiversity values. The project will be in properties held by the local government hence, land acquisition and encroachment on private property will not occur.

B. Design Impact

144. **Design Impact** Includes impacts arising from Design, including technology used, scale of operation / throughput, waste production, discharge specifications, pollution sources and ancillary services. These impacts arise from the design of the project including the technology used, scale of operation/throughout, waste production, discharge specification, pollution sources, and ancillary services.

145. The structures are designed as per IS1893 part 1 considering Seismic Zone V (Very severe) and coefficient of Z=0.36. Steel structures are designed considering IS 875 Part 3 for wind load. The wastewater generated from the food court and toilets will be processed in septic tanks.

146. The various design features that are included in the subproject will improve the existing condition of the Ujjayanta palace complex as follows:

(i) Improved lighting in the area will increase the safety of the users in the night-time.
(ii) The provision of safety railings at strategic locations will reduce the chances of accidents.
(iii) The improved Solid waste management provisions provided Provision of toilets in the design will improvement in the aesthetics of the area.
(iv) Large amount of landscaping will improve the overall biodiversity of the area
(v) The project envisages attracting visitors in large numbers, as a measure to restrict the access to designated areas and to ensure the safety of people moving in the pathways and public zones, railings are provided.

C. Pre-Construction Phase Impacts

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

148. **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 deemed necessary to 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. All locations would be included in the design specifications and on plan drawings. 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:

149. **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.

150. **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. To mitigate the potential environmental impacts, locations of quarry site/s and borrow pit/s (for loose material other than stones) would be included in the design specifications and on plan drawings.

151. 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.

152. 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.

153. **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 guidelines based on following principles 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

154. **Location Impacts**: Includes 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. The subprojects are selected in such a way that it does not have any impact on main building of palace.

155. **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 deemed necessary to 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. Construction work camps shall be located at least 200 m from residential areas. 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 management plan for soil, excavated earth material and other construction wastes will be as follows:

156. **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.

157. **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.

158. **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) 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
(iv) 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.

159. 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. The mitigation measures to minimize the transboundary pollution are:

(i) The contractor shall try to procure/ source the material from the nearest possible authorized mines.
(ii) The transportation of raw material should be done in covered vehicles.
(iii) The vehicles used for the transportation of raw material should have valid PUC certificate and should be well maintained to avoid noise pollution.

160. **Ujjayanta Palace Complex:** The project involves innovative use of open spaces, beautification of garden, rejuvenation of existing fountains, appropriate discharge of drain and facade lighting. The benefits of renovation and restoration of the Ujjayanta Palace Complex project are as follows:

(i) Ujjayanta Palace being in the heart of Agartala City, renovation and restoration of the garden will result in a major tourism attraction of Agartala.
(ii) The beautification will enhance the aesthetics as well as the fountains and cascade arrangements will help to improve and maintain the water quality of the lake and central water channel.
(iii) One tree of Albizia sp, which is a common species, will be felled for the renovation of *Astabal* into shopping arcade.

Tree proposed to be cut

161. **Mitigation Measures**

(i) Compensatory forestation will be done in consultation with the Forest Department. Govt. of Tripura as per the notification No. F1.7(44)/FPR/FP/2001/Part-II/19.630-720 dated 20/10/2010.

162. **Utilities:** Considering the proposed activities for the palace garden, no utility shifting will be required. In the proposed project improvement of the existing utilities are proposed such as, improvement in illumination, water channels, fountains, pathway and general ambience etc. Existing drains will be modified and covered.

163. For cleaning and maintenance purpose a drainage network is also proposed and the drained water will be collected in the water bodies. To mitigate the adverse impacts due to process of improvising the drainage lines, the following measures will be followed:

(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 disruption of the drainage line.
(iv) In case of disruption of water supply, alternative supply, through tankers, shall be restore immediately by the contractor without any extra cost.

164. **Social and Cultural Resources.** Tripura is an area of large numbers of temples (some of them are historic) and other religious sites, so there is a risk that any work involving ground

disturbance can uncover and damage archaeological and historical remains. For this subproject, excavation will occur in open area which is located inside the boundary of Ujjayanta Palace, so it could be that there is a low risk of such impacts. Nevertheless, ASCL/ PIU will:

(i) Consult Agartala Municipal Corporation (AMC) to obtain an expert assessment of the archaeological potential of the site;
(ii) Consider alternatives if the site is found to be of high risk;
(iii) Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available;
(iv) Follow the protocol for chance finds (Appendix 20) in any excavation work;

E. Construction Phase Impacts

165. Construction phase impacts mainly related to site clearing, earthworks, machinery and vehicles operation and workers. Construction site impacts include soil erosion, dust emission, noise generation, traffic congestion and liquid & solid waste generation. Construction impacts are short term. The various activities in the construction phase and their respective aspects and impacts on environment are elaborated in Table 21. The impacts are further discussed in detail in this section.

Table 21: Activity, Aspects and Impacts during Construction Stage

Sr. No.	Phase	Impact	Remarks
1	CONSTRUCTION - Site Preparation for construction of pergolas, food court, public toilets, fountain, and amphitheater.	• Air pollution • Health Hazard • Soil and possible ground water contamination • Noise Pollution • Water Pollution • Damage to Flora and fauna	• During construction, emission of dust and combustion gases from vehicle movement and diesel generator (DG). • Dust generation during levelling and grading. • The • Possible fuel/oil leakage. • Generation of Noise. • Generation of hazardous wastes including spent lubricants, coolants and sanitary waste. • Angling and floating deck construction would be in water which would affect the lake water condition. • The existing flora and fauna would have to be removed for construction activity. • Workers involved in construction activity will generate waste both solid and liquid if their accommodation is nearby the site.
2	CONSTRUCTION - Shifting of materials to the site	• Air pollution • Health Hazard • Noise Pollution • Damage to Flora and fauna	• Dust emission from the vehicular movement and loose material movement for site preparation. • Dust accumulation on adjacent plants and trees due to vehicle movement. • Emission of combustion gases from vehicle and diesel generator (DG). • Generation of noise from vehicles and generator.
3	CONSTRUCTION - Actual construction activity	• Air pollution • Damage to Flora and fauna	• Excavation work will lead to formation of dust causing damage to nearby flora and fauna and air pollution.

Sr. No.	Phase	Impact	Remarks
		• Water Pollution • Risk to human safety and occurrence of accidents. • Hindrance to accessibility.	• The existing flora and fauna would have to be removed for construction activity. • Requirement for aggregate/earth. • Soil Erosion and Slumping possible if the construction material is used from the same site. • The construction works like excavation, etc., may result in occurrence of accidents due to human errors. • This will impact the workers as well as the general public visiting the site. • The haphazard disposal of construction may cause hindrance to access for visitors
4	CONSTRUCTION - Site activities and labour camp	• Conflicts with local community; disruption to traffic flow and sensitive receptors	• The transportation of raw materials and wastes will lead to disturbance in traffic, causing discomfort to local people specially the visitors to the palace and JN Bari, LN Bari and Durgabari temples. • The dust and noise generated from the construction activities cause problems to sensitive receptors like Children Park, MTB High School, Agartala Municipal Library, temples etc.,

166. **Impact on Land Use**: Since the project is revival and restoration of an existing Ujjayanta Palace Complex, this development will turn the existing garden to more interactive garden. The topography of the area will not change due to the excavation and refilling. There will not be any major loss of vegetation also. Excavated earth of quantity around 1500 cum may temporarily affect the land use obstructing the access to by-roads, roadside premises, and houses. Excavated earth and the spoils will be readily disposed, and immediate backfilling works will be done

167. **Impact on topography, soil and geology:** The project activities are not large enough to affect these features; so there will be no impacts. However, movement of heavy construction vehicles may disturb and consolidate the soil, which will negatively affect soil environment.

168. **Mitigation Measures**

(i) Contact of paint and construction material (cement, concrete etc.) shall be avoided with soil.
(ii) Tarpaulin cover shall be spread over the ground during painting activity.
(iii) Prepare a plan for use and movement of construction vehicles within the area based on the nature of soil
(iv) Vehicles/equipment movement shall be confined to dry areas with hardened soil; no vehicle/equipment shall enter the damp areas, water areas, vegetative areas and areas with soft soil.

169. **Air Quality:** The impact on air quality is expected in the form of dust or transportation impacts which will be minimal and temporary. Emissions from construction vehicles, equipment, and machinery used for excavation and transportation may induce impacts short term and temporary air quality impacts in the construction sites. The impact will be confined within the project boundary and is expected to be negligible outside the plant boundaries.

170. **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), washing down vehicles as they leave the site, and sealing surfaces to the extent possible to minimize the dust.
(ii) Spraying of water during dry weather to reduce dust emission.
(iii) Stockpiles of raw/ waste material, demolition debris, excavated earth etc., shall be covered with tarpaulin during the entire construction activity.
(iv) Vehicles carrying demolition debris from site shall be covered with tarpaulins while entering and leaving the site will always be covered.
(v) Alternate day cleaning shall be done for dust particles deposited on the structures of Ujjayanta palace due to the construction activity for the entire construction period.
(vi) Ensure valid Pollution Under Control (PUC) Certificates for all vehicles and equipment used in the construction activity
(vii) The approach roads and vehicles will be kept in good condition to minimize automobile exhaust.

171. **Immediate road restoration**: Excavation and refilling activities disturb the top soil, and under the influence of wind, traffic, pedestrians, and other activities etc., produces dust. There is large potential to generate significant quantities of dust after refilling the trench, and prior to road relaying. It is a common practice not to restore the road immediately after refilling the trench to allow enough time for the refilled material to stabilize naturally. Given the dry and windy conditions, and heavy traffic and other activities along the roads, the refilled trenches with loose topsoil along the roads will generate maximum dust and create very unhealthy conditions. Moreover, as the barricades/dust screens will have removed after the trench is refilled, there will be absolutely nothing to control the dust generation. Dust control activities like wetting of topsoil will not be effective given the site conditions. It is therefore necessary to restore/relay the road surface immediately or take suitable steps to arrest the dust. Soil consolidation technique shall be used so that road can be restored immediately.

172. **Noise:** Maximum construction works will be conducted during the daytime. Increase in noise level may be caused by excavation, transportation of equipment, materials, and people. This impact is negative but short-term, and reversible by mitigation measures.

173. **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) Major construction works shall be limited to day light hours (6 AM to 6 PM) for all the works located within the town
(iii) Provide prior information to the local public and tourism department about the work schedule
(iv) Minimize noise from construction equipment/ pneumatic drills by using silencers, fitting jackhammers with noise-reducing mufflers and
(v) Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at 10 m or more from the vehicle/s

(vi) Wherever required, personal protective equipment such as ear plugs, earmuffs etc. shall be provided to the persons working in high noise areas

174. **Surface water Quality:** The excavation activity will be avoided during the monsoon season, thus minimizing the chances of impact on surface water quality. In unavoidable case of excavation during rains, there may be temporary impacts like flooding of construction sites, mixing of construction waste and material within the runoff, etc. This may lead to silting and blockage of drains and water bodies. These potential impacts are temporary and short-term duration only.

175. **Mitigation Measures:**

(i) Stockpiles shall be at least 5 m from the adjacent Rajbari and Jagannath bari lake 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 Rajbari and Jagannathbari lakes. 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) Place storage areas for fuels and lubricants away from any drainage leading to water bodies as mentioned in EMP.
(v) Dispose any wastes generated by construction activities in designated areas/ proposed parking area as per the EMP.
(vi) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas

176. **Groundwater**: Proposed project activities do not interfere with groundwater regime, no groundwater usage/ abstraction is proposed, and the activities do not affect groundwater quality.

177. **Construction and Demolition waste:** There will be demolition of existing drains and pathways for modification of drains and construction of new pathways as well as the demolition of existing redundant structure for the construction of food court. The quantity of spoil generated is around 415 cum. The baluster railing, steps and footing & beam for pergola will generate excavated earth of quantity around 4858 cum and may temporarily affect the land use obstructing the access. Demolition of redundant structure will generate about 13.2 tons of steel as demolition waste. 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. Out of the total waste around 1859 cum of excavated earth and entire 415 cum of brick waste will be reused for backfilling. The spoil and excavated earth will be sent at DC Nagar disposal site after getting NOC from AMC.

178. **Mitigation measures:**

(i) Restrict the demolition work only during day time between 6 am to 6 pm.
(ii) Vehicles carrying demolition debris from site shall be covered with tarpaulins while entering and leaving the site will always be covered.
(iii) The debris shall not be disposed on walkways or pathways under any circumstances.
(iv) The construction and demolition waste generated from the subproject shall 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.

(v) Out of the total excavated earth of 4858 cum, 1859 cum earth shall be reused in construction works and the rest shall be stored as the DC Nagar Lunga site for future use.
(vi) Avoid stockpiling of excess excavated soils as far as possible
(vii) Avoid disposal of any debris and waste soils in the forest areas and in or near water bodies/ ponds
(viii) Coordinate with implementing agency and AMC for beneficial uses of excess excavated soils like for in landscaping in public parks and levelling in low lying areas or immediately dispose to designated areas.
(ix) Immediate use of construction spoils and excavation spoils as filling materials Spoil Management Plan (SMP) 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.

179. **Landscape and Aesthetics**: The proposed project will improve the aesthetics and landscape of the Palace premises. This will be positive impact.

180. **Impact on Ecological Resources**: There will not be any ecological impacts due to the proposed project.

181. **Solid waste**: There will be generation of solid waste from construction activities and due to the labours in labour camp. The construction waste will be stored in proposed parking area for future reuse and the excess waste will be disposed in DC Nagar Lunga site. The municipal solid waste generated from construction site and labour camp will be collected in bins and will be handed over to the AMC collection vehicles.

182. **Mitigation Measures**

(i) Waste bins are proposed for collection of municipal solid waste generated from the construction site and labour camp.
(ii) The construction waste generated from the project will be stored in site for future reuse.
(iii) Waste minimization, recycling and/or reuse
(iv) Proper disposal of non-recyclable waste
(v) Immediate use of construction spoils as filling materials
(vi) Use of excavation spoils for filling

183. **Impact on Ecological resource**: There is cutting of 1 tree of Albizia species in the *Astaba*l area. During construction of pergolas in water, filling of earth will be done in the lakes adjacent to the Ujjayanta Palace. This activity will temporarily have negative effect on the micro-climatic conditions of the area.

184. **Mitigation Measures**

(i) Compensatory forestation will be done in consultation with the Forest Department. Govt. of Tripura as per the notification No. F1.7(44)/FPR/FP/2001/Part-II/19.630-720 dated 20/10/2010.

185. **Generation of Spoil and disposal:** In case of disposal of the earth within the lake turbidity will be increased.

186. **Mitigation Measures**

(i) The construction wastes generated from the site shall be stored at proposed parking layout and reused for construction, the excess waste shall be disposed to AMC landfill at DC Nagar lunga.
(ii) Not to dispose any construction materials in the lake or any nearby waterbody which may pollute the waterbody and aquatic fauna
(iii) 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.
(iv) Details of the proposed Water Quality Monitoring Program will be included in the environment management plan

187. **Accessibility**: Ujjayanta Palace being in the heart of Agartala City, renovation and restoration of the garden may cause the traffic congestion for short period of time due to construction activities. Potential impact is negative, but it is for short term and reversible by mitigation measures. The contractor will be required to:

(i) Provide prior information to the local public about the work schedule
(ii) Transportation of the material shall be avoided during peak hours to avoid traffic congestion. Traffic management plan is attached as Appendix 11.

188. **Socio-Economic – Income**. The subproject components will be in Government land. Since the project doesn't involve any change in land use or procurement of land, no displacement of people is envisaged. Hence, there is no negative social impact of the project on the area.

189. **Socio Economic- Employment**: Manpower will be required during the construction period. This can result in generation of contractual employment and procurement of raw materials from the location market will increase in local revenue. Thus, potential impact is positive and long-term. The construction contractor will be required to:

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

190. **Impact on Socio Cultural Resources**: The project renovation and restoration of the existing Ujjayanta Palace complex will increase the overall importance of the monument by improving the face value of the project. This will also increase the social significance of the area. As the place is already in use as a tourist place and the proposed activity will help to enhance the existing purpose of the place. Additional toilet block and drinking water facilities shall be proposed considering increase in number of visitors to the place.

191. Adequate toilet blocks shall be there to accommodate the visitors even at peak hours. Special blocks shall be there for old age and handicapped personnel. A facility for changing the diaper and feeding place for the babies shall be made available at this facility. Facility of wheelchairs for handicapped shall be available at the parking facility. This can be issued with security and with minimum charges. The ramps shall be provided for the movement of wheelchairs at the locations as per requirement.

192. To achieve the cleanliness of the facility, the dedicated food section shall be available. Plastics and eatables prohibited areas shall be declared in the campus of the Palace. Since the

project does not involve any change in land use or procurement of land, no displacement of people is envisaged. So, there is no negative social impact of the project on the area.

193. **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.

194. **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,[12] ADB's Intrem Guidelines for COVID (Appendix 19), WHO Interim Guidance (and its updates) on Water, Sanitation, Hygiene and Waste management for the COVID19 virus (Appendix 18), and Sector Specific (Water and Sanitation) Guidelines;[13]
(iii) 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[14] 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,

[12] https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES
[13] https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B-%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES
[14] 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 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 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.

195. 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.

196. **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 roadways, hence safety risk to community is to be considered with special emphasis to children, women and elderly. The contractor will be required to:

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

(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.

197. **Maintaining Core Labour Standard**. The Contractor and ASCL are responsible for ensuring that international CLS[15] –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.

198. **Workers/ Labour Camps**. Operation of worker / labour 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

199. **Sensitive Receptors**: Since the work is being conducted in an urban sensitive area where there are temples along the main entrance gate of the palace, the excavation works around the palace will create nuisance and health hazard. 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 (Colleges and religious centers).

(i) No material should be stocked in this area; material shall be brought to the site as and when required

[15] 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) 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; material should be in place before school starts;
(v) Notify concerned colleges 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.

F. Guidelines for COVID -19

200. Construction sites operating during the Covid-19 pandemic need to ensure they are protecting their WORKFORCE and minimizing 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.

G. Workers Camp

201. Masks (homemade[16] 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.

H. Updates on COVID-19

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

202. 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

I. 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

J. Emergency contact

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

K. Operational & Maintenance Impacts

203. The operational impacts of the proposed project are beneficial and have positive impact on the people in general, society, economy and health and sanitation of the project are, resulting in overall improvement. The conservation of nature in an urban environment has direct impact on people and has many health benefits.

204. There are some negative impacts during the operation stage, the impacts and mitigation measure for operation phase are listed in Table 22.

Table 22: Impacts and Mitigation Measures – Operation phase

Sr. No.	Activity	Impact	Mitigation measures
1	Influx of visitors due to increased recreational amenities -	Unsafe condition for visitors	• As a measure to restrict the access to ongoing construction area (if any) to ensure the safety of people moving in the pathways and public zones, railings shall be provided
		Probability of Snake bite	• Regular maintenance and monitoring • Provision of anti-venom kit and training for the same to the working staff and security.
		Sewerage generation due to increase influx	• The existing toilet block shall be refurbished and be provided with Septic Tank and soak pit.

Sr. No.	Activity	Impact	Mitigation measures
			• Sewage generated from proposed toilet shall be treated using bio-digester. • The contractor shall ensure the proper functioning of the toilets and the sewage treatment facilities. • In no circumstances the sewage generated from the toilets shall flow to the palace lake. • Water quality of the Palace lake to be monitored as per monitoring plan • Sludge generated from bio digestors and septic tank will be cleaned by AMC.
		Generation of Solid waste due to tourist's footfall. Environmental pollution - Potential impact on soil, groundwater, and surface water nearby the disposal site	• Roadside bins shall be provided in the palace area for visitors to collect the waste. • Dedicated Bins shall be provided for the waste collection from cafeteria and eateries • For sweeping purpose, full time sweepers should be employed to ensure the cleanliness of the surrounding area. Sweepers to be equipped with broom, dust pan, safety jacket, safety mask, gloves, shoes and a 120-liter two wheeled HDPE bin. • Bins of 1100 litre capacity shall be placed to collect all the waste generated in Palace premises and eventually transfer it to waste collection vehicle of AMC. • The place should be declared as 'No Plastic Zone'
		Air pollution from vehicle movement increased due to increase in number of visitors and traffic congestion.	• Traffic shall be diverted properly to avoid congestion • Parking facility shall be available with appropriate entry and exit space • Air quality around Palace to be monitored as per monitoring plan

L. Heritage Safety Mitigation Measures

205. A detailed Heritage Impact Assessment (HIA) is done for this project based on the tourism importance of the site. Following general mitigation measures are highlighted in the report for protection of this heritage palace premises.

Table 23: Mitigation Measures – Heritage Safety

Sr. No.	Mitigation Measures	Compliance
1.	Encouraging the local commercial organization towards the use of Corporate Social Responsibility for upgrading the present state of heritage resources in the Palace complex.	Local PSUs like ONGC and GAIL shall be encouraged for contributing in the revival of Ujjayanta Palace. A consultation meeting was held with ONGC official on 11-12-2019

Sr. No.	Mitigation Measures	Compliance
		regarding CSR aspect, details of the same are attached in Appendix 15.
2.	Management Plan for the Ujjayanta Palace complex keeping in mind the needs of the functional buildings in the premises.	Will be developed by the contractor, necessary instruction incorporated in the bid document
3.	Conservation Plan for individual heritage structures.	Will be developed by the contractor, necessary instruction incorporated in the bid document
4.	Connecting Heritage back to the people with the help of heritage trail linking all the underused network of open spaces within the assessment area of the project.	A heritage trail integrating the heritage structure as well as the open spaces is proposed under the project. Same is given in Appendix 16.
5.	Several unattended and derelict public open spaces are presently located around the site. The proposal is to link these open spaces which would enhance the overall character of the place.	A heritage trail integrating the heritage structure as well as the open spaces is proposed under the project. Same is given in Appendix 16.
6.	Protection Integration and improvement, upkeep, maintenance of the open spaces, temple sites, lakes in the surroundings.	All the open spaces and lakes are integrated in this project. Their protection will be under the operation and maintenance program. The maintenance of the facilities is considered, and cost provision is made for the same.

VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

206. 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.

207. **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.

B. Public Consultation

208. The public consultation and disclosure is a continuous process throughout the project implementation, including project planning, design and construction. During IEE preparation stage, public consultations were conducted near proposed sites and other part of town to access the awareness of general public, present use of Palace complex, safety and security problems, lack of public utilities, migratory and local plants and birds species, other suggestions. Local residents, businesspersons (vendors, hawkers, shopkeepers etc.), college staff and students

Government officials, women residents were consulted during public consultations. Details of public consultations done are given in Appendix 6.

C. Public Participation during the Preparation of the IEE

209. 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.

210. 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 businesspeople near the work sites
(ii) Public representatives of the town
(iii) Agartala Municipal Corporation
(iv) Agartala Smart City Limited
(v) Department of Tourism, Government of Tripura

2. Secondary Stakeholders are:

(i) Other concerned government institutions (Pollution Control Board)
(ii) NGOs working in the affected communities
(iii) Other community representatives (prominent citizens, religious leaders, elders, women's groups)
(iv) The beneficiary community in general
(v) ADB as the funding agency.

211. Most of the stake holders have already been 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. The minutes of meeting of stakeholder consultation held on 04-12-2018 for the subproject is attached as Appendix 6.

D. Consultation & Disclosure

212. A public consultation for Agartala Town was conducted on December 4, 2018 at Agartala to discuss the proposed project, benefits of the project and likely environmental issues and mitigation measures. The consultation was done with all sections of the people near to the Ujjayanta Palace, by visiting individual shops, tourists and Ujjayanta Palace employees etc,. Public Consultation was done on 23-10-2019. Total 27 people were consulted in the public consultation including 9 females and 18 males, the attendance sheet and photographs are attached as part of Appendix 6, the key points discussed and came out during the public consultation are as follows;

(i) Owners of the commercial establishments situated on the eastern lake edge and Thakurpalli road were informed about the proposed project component and

informed that the probable dust emissions will be controlled by water sprinkling and the raw material and excavated earth stockpiles will not be dumped haphazardly so that it can cause inconvenience to shop owners and the customers visiting these shops.

(ii) Shop owners asked that the construction activity shall not be done at nighttime, it was informed to them that no activities will be carried out at night so that it will result in inconvenience to the people residing surrounding the palace premises.

(iii) Rikshaw pullers were informed about proposed project and they expressed their satisfaction that the project after completion will increase the number of tourists visiting the palace.

(iv) The tourists visiting the palace were informed that the proposed revival and restoration of the Ujjayanta Palace and eastern lake development will increase the beatification of the palace premises which will be a tourist attraction and the tourists can enjoy the benefits of the project works after completion of the project.

(v) Tourists were informed that the stockpiling will not be done in way that will hinder the accesses.

(vi) The security guards and staff of Ujjayanta Palace were informed about the proposed project and informed them about the barricading and other safety aspects covered during the construction to prevent entry of tourists in the construction areas. The security guards expressed their cooperation for the project implementation.

213. There were several formal and informal stake holder engagement and consultations done for the proposed project. The outcomes of the consultations are given below:

(i) It was informed that Ujjayanta Palace is not listed as a heritage building in Archaeological Survey of India (ASI) state heritage building list. Department of higher education vide its letter dated 09-10-2019 informed on the same. The letter is attached as Appendix 8.

(ii) It was discussed that Façade lighting and Fountain lighting colour scheme has already been approved by Hon'ble Chief Minister, Tripura on 13-08-2018. Hence, no need to change the colour scheme.

(iii) Tourism Department confirmed that Light & Sound shows including sitting arrangement has already considered in separate project.

(iv) It was informed that dedicated parking zone is there opposite to the entry plaza for visitors.

214. The discussion was done with Ms. Samamita, curator, Tripura state museum. She added that there is shortage of basic facilities like drinking water, toilet blocks for visitors. She further added visitors are using toilet blocks available for the office staff and raised concern regarding the surveillance of the palace and the access of outsiders from back side of the palace. These points raise issue of the security of the building.

215. PMC team presented the components of the Ujjayanta Palace project to Director, Tourism, Government of Tripura Ms. Vishwasree Boga, IAS on 14-05-2019, the director has asked to include the following components in the project;

(i) Setting up of arts and crafts outlets in the *Astabal* area and setting up of toilets and drinking water facility for the outlets' owners near north gate, the comments have been incorporated in the design by PMC.

(ii) Lake side edges shall be free from shopping kiosks, as it may result in disposal of solid waste in the lakes, the comments have been incorporated by the PMC.
(iii) Rear garden shall have open air theatre to host temporary exhibition and cultural activities for promoting tourism, same has been incorporated in the DPR by PMC.

E. Future Consultation and Disclosure

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

1. Consultation with PSUs for involvement in project under CSR

217. ASCL will conduct the consultation with PSUs like Oil and Natural Gas Corporation (ONGC) and Gas Authority of India Limited (GAIL) who are operating in Tripura for the CSR funding in the proposed Revival and Restoration of Ujjayanta Palace Complex project. A meeting was held on 11-12-2019 with ONGC official for the involvement of ONGC in Ujjayanta Palace Complex, the minutes of the meeting and the related attendance sheet and photographs are attached in appendix 15.

2. Consultation during Construction

218. 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.

219. 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.

220. 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.

221. 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.

222. 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.

F. Information Disclosure

223. 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.

224. 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.

225. 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.

226. 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.

227. 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. Documents will also be available on the website of Agartala Smart City website

(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)

228. 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

VII. GRIEVANCE REDRESS MECHANISM

A. Common Grievance Redress Mechanism (GRM)

229. 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.

230. 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.

231. **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.

232. **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 Appendix10.

233. **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 7. 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.

234. 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.

235. **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.

236. **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.

237. **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 24 below:

Table 24: 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

238. **Process and Timeframe:**

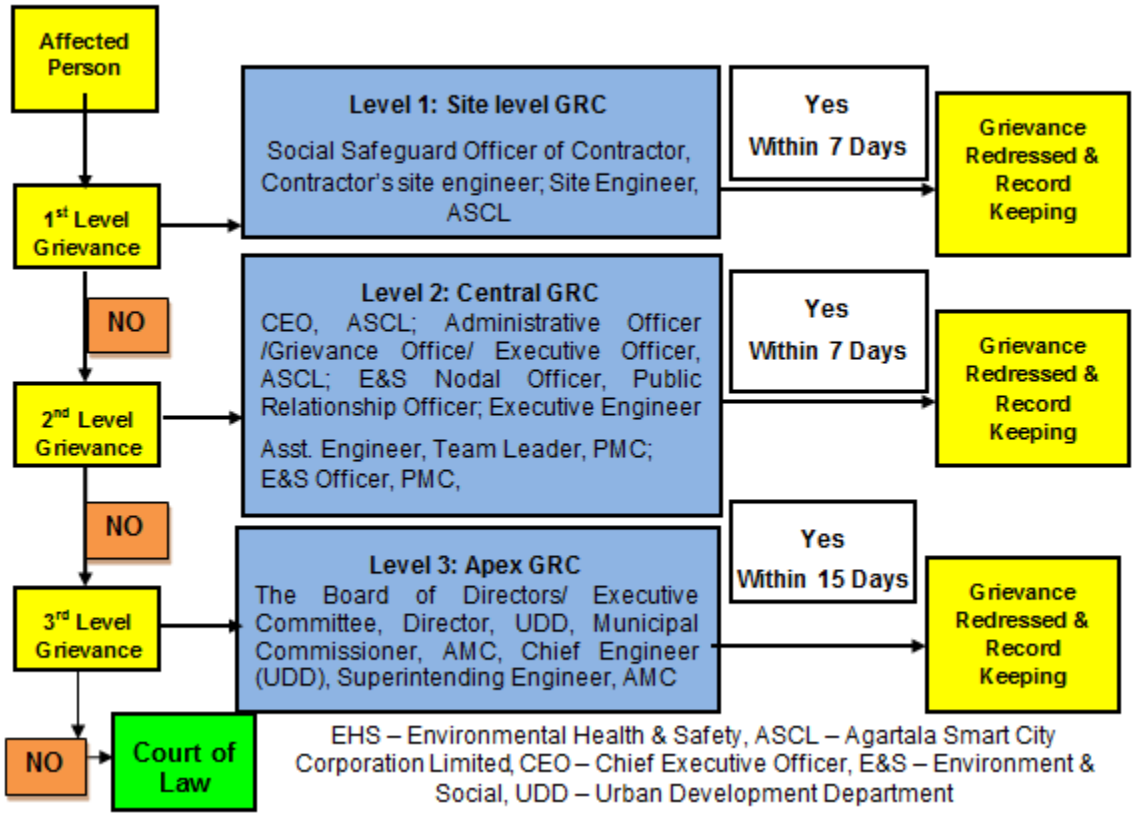
(i) **1st level grievance**: In case of grievances that are immediate and urgent in the perception of the complainant, concerned officer of PIU will direct the contractor to and ensure that it is resolved. If the grievance is not under the contractor scope, but under the project, PMC (field office) will 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

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

Figure 24: Grievance Redressal Mechanism



240. 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.

241. 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.

242. **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.

243. **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.

244. **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.

245. **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.

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

247. **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.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

248. 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.

249. Environmental Management Plan (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.

250. A copy of the EMP must always be kept on work sites. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. 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. 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.

251. This site specific EMP will be included in the tender and contract documents. The provisions set out in the EMP 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.

252. **EMP Boundary**: This EMP is application for the construction work site of the Ujjayanta Palace Complex Revival and Restoration project. 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 shown in Figure 25.

253. **Sensitive Receptors**: There are environmental and health sensitive receptors like Religious areas (Jagannath Bari Tempe, Lakshminarayan Bari Temple), Institutional areas (Women's College, Pura Library, MTB High School and Sukanta Academy) around the Ujjayanta Palace premises, Children park opposite to palace entrance gate, Rajbari lake and Jagannath Bari lake in the palace premises are also environmentally sensitive receptors. The sensitive receptors identified are shown in the Figure 26.

254. **Construction activities:** The construction activities that are required for the Ujjayanta Palace Revival and Restoration are listed below:

(i) Renovation and Restoration of Front Palace Gardens and Facade Illumination
(ii) Revival of North gate and transformation of *Astabal* Structure
(iii) Proposal for New Food Court
(iv) Rear garden revival with multi-activity plaza and Amphitheatre
(v) Proposal for Visitor Parking
(vi) Eastern lake edge development

Figure 25: EMP Boundary for Construction works

255. It is recommended that the environmental specialist of PIU, PMC and the contractor shall conduct a Joint field verification. To ensure environmental safeguard, the following activities and plans are to be implemented at the preconstruction stage to ascertain that all measures are taken to minimize environmental damage:

256. **Traffic Management Plan**- Thakurpalli road being one of the major roads of the Agartala city and palace left boundary road connecting Thakurpalli road to Northgate is the important connecting road and has vehicle movement in day time. Traffic management plan should be framed for construction and operation phase to avoid any hinderance to the public. The plan should take into consideration the type and proportion of vehicles along the Thakurpalli road and connecting road. Traffic management plan should also suggest measures for parking for vehicles engaged in the construction activity.

257. **Spoil Management**- A detailed spoil management plan shall be developed to avoid land or water contamination due to un-scientific dumping of spoil generated during the construction phase of the project as the Ujjayanta palace is an important tourist destination of Agartala city and the Rajbari and Jagannath bari lakes are adjacent to the construction sites.

Figure 26: Sensitive Receptors around Ujjayanta Palace Premises

258. **Environmental Risk Assessment**: The environmental aspects and impacts are identified with the aim to control/ prevent pollution to the environment 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.

259. **Risk Assessment methodology**: The methodology adopted for assessment of environmental impacts and aspects during the preconstruction, construction and operation stage of the proposed Revival and Restoration of Ujjayanta Palace Complex project is presented below in Figure 27:

Figure 27: Risk Matrix

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

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**	

260. For development of a detailed site specific EMP, the entire subproject area is classified into various components and individual EMP for each component during the Pre-construction, construction and operation stage is enumerated in following tables

(i) A comprehensive EMP of pre -construction phase to address all the aspects of environment management throughout the proposed components of the subproject is prepared and tabulated in Table 25
(ii) EMP for Renovation and restoration of front palace garden and Facade illumination (Table 26 and Figure 28)
(iii) EMP for Revival of North gate and Transformation of *Astabal* (Table 27 and Figure 30)
(iv) EMP for New food Court and Visitor Parking (Table 28 and Figure 30)
(v) EMP for Rear Garden Revival with multiactivity plaza and amphitheater (Table 29 and Figure 31)
(vi) EMP for Eastern lake edge development and water activities (Table 30 and Figure 32)

261. A comprehensive EMP to holistically address all the aspects of environment management throughout the proposed components of the subproject is prepared and tabulated in Table 31.

Table 25: Pre-Construction phase Environmental Management Plan for Renovation and restoration of front palace garden

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Pre-Construction Stage								
Submission of updated environmental management plan (EMP)/site environmental plan (SEP); EMP implementation and reporting	Unsatisfactory compliance to EMP	1	5	5	• 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 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.	For all locations	Contractor	PMU environmental specialist
EMP Implementation Training	irreversible impact to the environment, workers, and community				• Project manager and all key workers will be required to undergo training on EMP implementation including spoils/waste management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labor laws, applicable environmental laws, etc.	For all locations	Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Environmental monitoring of baseline conditions of air, noise, water and soil	To establish base line environmental conditions	1	5	5	• Environmental monitoring through NABL approved laboratory	For all locations	Contractor	PMU environmental specialist
Utilities	Telephone lines, electric poles and wires within proposed project area	2	3	6	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and • Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services.	For all locations	Contractor	PMU environmental specialist
Construction work camps, stockpile areas, storage areas, and disposal areas.	Conflicts with local community; disruption to traffic flow and sensitive receptors	2	5	10	• Total around 60 workers are expected for construction work. Contractor shall set up toilets with septic tank and soak pit at labour camp. There will be generation of around 24 Kg per day of solid waste and 6.48 KLD of sewage from the labour camps. • Contractor shall arrange potable drinking water for workers in camp. • Shall provide adequate number of separate toilets for male and female workers. • Contractor shall provide bins for storage of solid waste and hand over the collected solid waste to AMC collection vehicles for processing. • Fuel provision shall be made available in camp like LPG so that no tree cutting is involved for fuel wood.	Labour camp area	Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					• Take extreme care in selecting sites to avoid direct disposal to water body which will inconvenience the community. • 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) site is minimum 250 m away from sensitive locations like settlements, ponds/ lakes or other water bodies.			
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	3	5	15	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to award of civil works. • Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction • Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc.	For all locations	Contractor	PMU environmental specialist
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	Mines listed by Tripura Government as specified in the website: http://trpenvis.nic.in/test/natural_resources.html	Construction Contractor	ASCL

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					• 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			

Table 26: Construction and operation Phase EMP for Revival of front palace garden and Facade illumination

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction Stage								
Site Clearance activities	Temporary Loss of greenery due to clearing of lawn in front garden area	3	2	6	• Clearing of vegetation should be strictly as per layout. • Clearance area should be marked with highly visible marking. • Mark and barricade the work area	Front palace garden	Construction Contractor	PMU environmental specialist
	Disruption to visitors of Ujjayanta lake	5	2	10	• As the construction work is expected to disrupt visitors of Ujjayanta Palace, notice shall be served well in advance to the Ujjayanta Palace	Front palace garden	Construction Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					authorities, Tourism department etc.,			
Demolition of existing heritage structures and removal existing pipelines and fixtures of water fountain & channel	Air pollution due to dust emission	3	2	6	• 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.	Front palace garden	Construction Contractor	PMU environmental specialist
	Noise generation	5	2	10	• Restrict the demolition work only during day time between 6 am to 6 pm.	Front palace garden	Construction Contractor	PMU environmental specialist
	Soil and water contamination	3	3	9	• Around 240 cum of demolition debris in the form of broken bricks, RCC waste and 280 sq m of broken plaster will be generated. The Contractor shall suitably dispose of the unutilized debris materials at the centralized facility of DC Nagar Lunga site of AMC after necessary permission. • The old removed pipelines and fixtures shall be stored at the proposed parking layout as shown in Figure below to avoid contamination of soil.	Front palace garden	Construction Contractor	PMU environmental specialist
	Hinderance to movement	3	2	6	• The debris shall not be disposed on walkways or pathways under any circumstances.	Front palace garden	Construction Contractor	PMU environmental specialist

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 for pergolas, pathways, embankment etc.,	Dust Generation from excavation	5	2	10	• Water sprinkling on surface of dry areas	Stockpile area	Construction Contractor	PMU environmental specialist
	Siltation of lake waters	2	3	6	• Stockpiles shall be at least 5 m from the adjacent Rajbari and Jagannath bari lake waters			PMU environmental specialist
	Noise generation from excavation	5	2	10	• Restrict the construction work only during day time between 6 am to 6 pm.	Front palace garden	Construction Contractor	PMU environmental specialist
Construction of pathways, embankment and pergola with seating arrangements.	Dust Generation and Air Quality degradation	5	3	15	• Alternate day cleaning shall be done for dust particles deposited on the structures of Ujjayanta palace due to the construction activity for the entire construction period. • Water sprinkling shall be done to control dust emission twice a day in dry areas like material stock piles, etc., • Stockpiles of raw/ waste material, demolition debris, excavated earth etc., shall be covered with tarpaulin during the entire construction activity.	Front palace garden	Construction Contractor	PMU environmental specialist
	Siltation of Rajbari and Jagannathbari lakes and degradation of water quality	3	3	9	• The Contractor shall not excavate bed of the lakes at any location for borrowing earth for embankment construction. • Contractor shall construct silt fencing at the edges of the Rajbari and Jagannathbari lakes to prevent entry of soil and silt in the lakes.	Front palace garden	Construction Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					• Contractor shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment laden water does not drain into lakes			
	Impact on water flow to Rajbari and Jagannath bari lakes	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 Rajbari and Jagannathbari lakes. • Contractor shall take all necessary measures to prevent any blockage to the water flow.	Front palace garden	Construction Contractor	PMU environmental specialist
	Noise impact on sensitive receptors	5	2	10	• Provide prior information to the identified sensitive receptors like MTB High School, Sukanta Academy and Children Park's authorities about the work schedule. • Construction work shall be limited to day light hours (6 AM to 6 PM) for all the works. • 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 contractors exposed to high noise levels.	Front palace garden and sensitive receptors	Construction Contractor	PMU environmental specialist

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
Handling of Bitumen for road works in front garden area	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 adjacent Rajbari and Jagannathbari lake to phenolic compounds. • Workers at site shall be trained on environmental damages of bitumen on soil and water	Front palace garden	Construction Contractor and EHS officer of Contractor	PMU environmental specialist
	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	Front palace garden	Construction Contractor and EHS officer of Contractor	PMU environmental specialist
Operation Stage								
Influx of visitors in front garden area	Water and soil contamination due to generation of solid waste and sewage from Front garden	3	2	6	• Provide bins at regular intervals for dropping of solid wastes like water bottles, tea cups, empty packets etc., • The solid waste generated by visitors shall be collected and handed over to the AMC collection vehicles by the O&M contractor. • Septic tank with soak pits shall be provided for the toilet wastewater processing near South gate.	Front garden area	O&M Contractor	PMU

Figure 28: Construction site plan for Front Garden

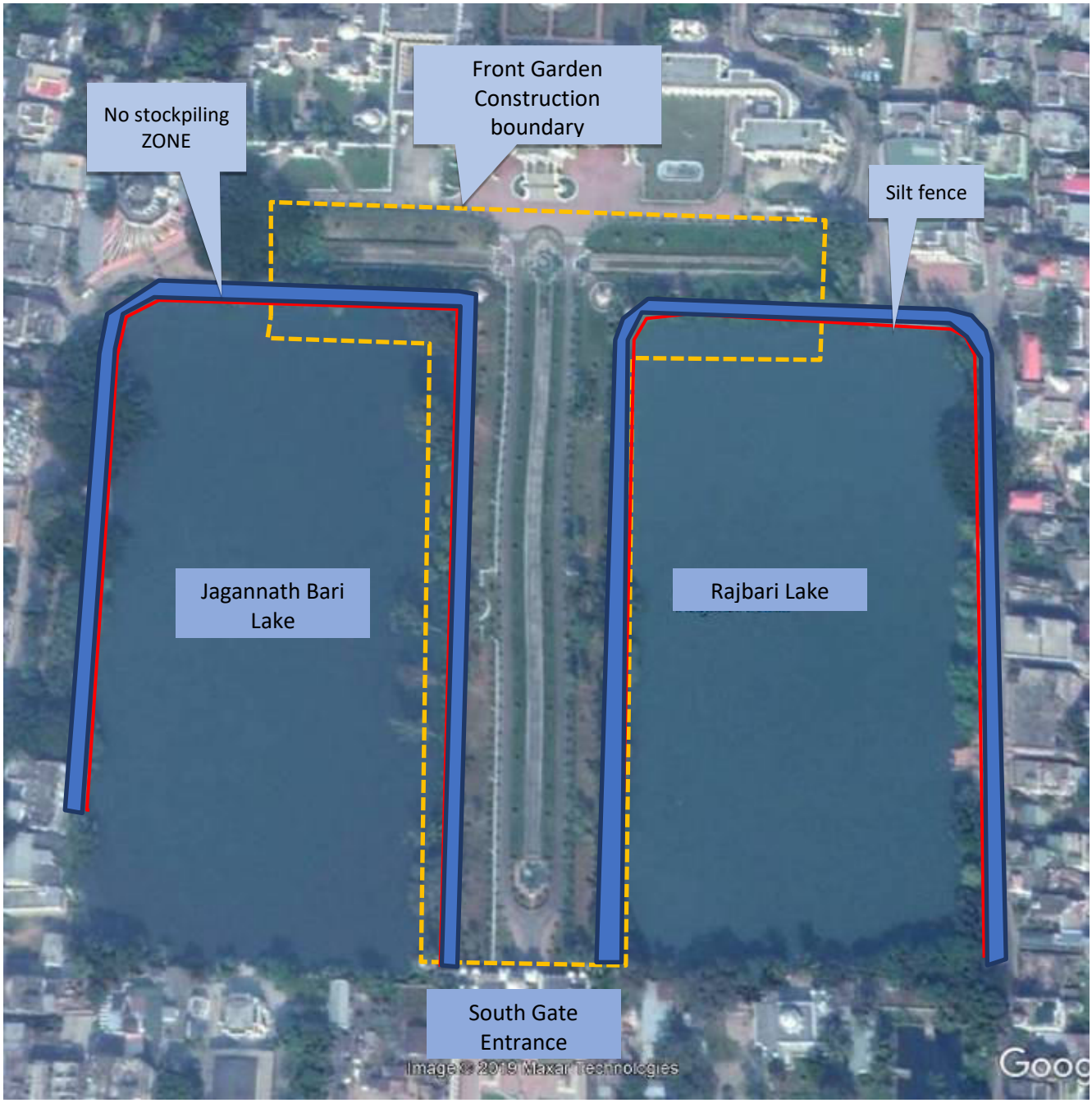


Table 27: Environmental Management Plan for Revival of North gate and Transformation of *Astabal*

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
Construction Stage								
Site Clearance activities	Tree cutting	3	2	6	• Only 1 tree of Albizia species, which is a common species identified near *Astabal* area under the project shall be cut after receiving clearance from the Forest Dept. (as applicable) and after the receipt of ASCL's written permission in this regard. • Compensatory plantation will be done as per Forest Dept. Letter no. F.11-13/WFD/Deptt.0prnt/2018-19/11595-597 dated 27-02-2020. (Appendix 17) The compensatory plantation cost will be included together with Smart Roads compensatory plantation budget.	North gate and *Astabal* area	Construction Contractor	PMU environmental specialist
Renovation of *Astabal* and North gate and Constructio	Dust Generation due to construction and vehicle movement	5	3	15	• Water sprinkling shall be done to control dust emission twice a day in dry areas like stock piles.	North gate and *Astabal* area	Construction Contractor	PMU environmental specialist

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
n of toilets at North Gate					• Stockpiles of raw/ waste material, demolition debris, excavated earth etc., shall be covered with tarpaulin during the entire construction activity. • Covering of material or waste laden vehicles with tarpaulin and restricting speed limit of vehicles <20 kmph.			
	Generation of waste from scrapping	2	2	4	• Contractor shall ensure that no waste disposed of in the Rajbari and Jagannathbari lakes. • 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.	North gate and *Astabal* area	Construction Contractor	PMU environmental specialist
	Noise impact on surrounding area	5	2	10	• Construction work shall be limited to day light hours (6 AM to 6 PM) for all the works.	North gate and *Astabal* area	Construction Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					• 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.			
	Hindrance to traffic movement on connecting road	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	Connecting road from Thakurpalli road to North gate	Construction Contractor	PMU environmental specialist
Operation Stage								
Influx of visitors in *Astabal* shopping area	Water and soil contamination due to generation of solid waste and sewage from *Astabal* amenities	3	2	6	• Provide bins at regular intervals for dropping of solid wastes like water bottles, tea cups, empty packets etc., • The solid waste collected from the shopping outlets shall be collected and handed over to the AMC collection vehicles by the *Astabal* O&M contractor. • Septic tank with soak pits shall be provided	North gate and *Astabal* area	O&M Contractor	PMU

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
					for the toilet wastewater processing.			

Figure 29: Construction site plan for *Astabal* and North gate

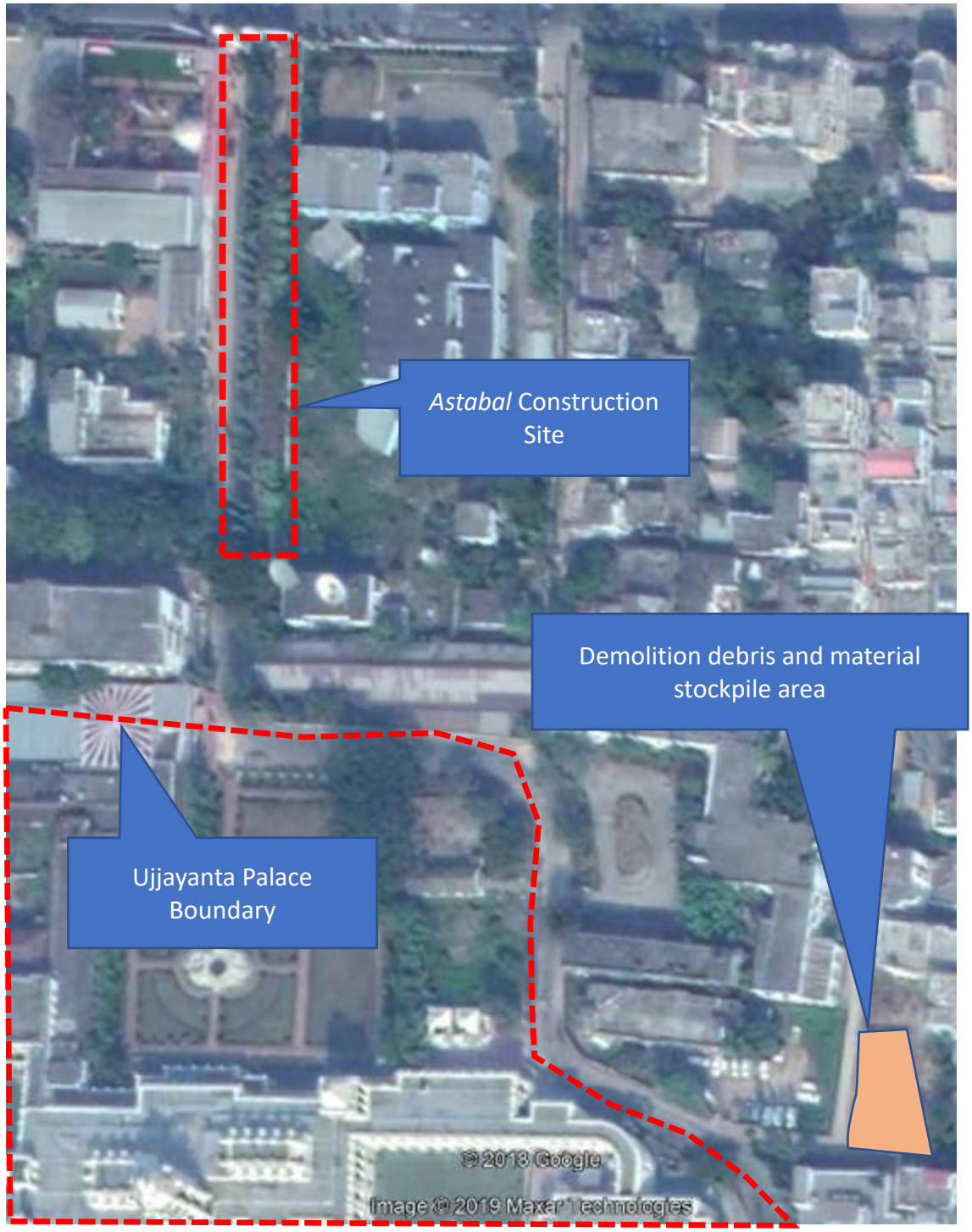


Table 28: Environmental Management Plan for New Food Court and Visitors Parking area

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
Construction Stage								
Demolition of existing structure for proposed food court	Air pollution due to dust emission	3	2	6	• Provision of tin sheet barricading shall be made for prevention of dust emission out of site. • 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	Food Court	Construction Contractor	PMU environmental specialist
	Noise generation	5	2	10	• Provision of tin sheet barricading for prevention of noise going out of site. • Restrict the demolition work only during day time between 6 am to 6 pm • Provide ear plugs to workers exposed to the noise in the site	Food Court	Construction Contractor	PMU environmental specialist
	Soil and water contamination	3	3	9	• Around 139 cum of demolished broken bricks, 8000 kgs of steel, 93 cum of demolished RCC waste. The Contractor shall suitably dispose of the unutilized debris materials at the centralized facility of DC Nagar Lunga site of AMC after necessary permission.	Food Court	Construction Contractor	PMU environmental specialist
	Hinderance to traffic in connecting road	3	2	6	• The debris shall not be disposed on road, walkways or pathways.	Food Court	Construction Contractor	PMU environmental specialist
Excavation of soil for food	Noise generation from excavation	5	2	10	• Restrict the construction work only during day time between 6 am to 6 pm.	Food Court	Construction Contractor	PMU environmental specialist

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
court structures	Danger due to deep excavation and chances of accident	3	5	15	• Consult with AMC in identifying deep excavation for columns and piles foundations at food court sites • Provide hard barricades and sign boards to warn of dangerous conditions	Food Court	Construction Contractor	PMU environmental specialist
Construction works of food kiosks, visitors parking lot, boundary wall etc.,	Hindrance to traffic movement on connecting road	5	2	10	• Do not close the road completely, ensure that work is conducted onto edge of the road; allow traffic to move in connecting road. • In unavoidable circumstances of road closure, provide alternative routes, and ensure that public is informed about such traffic diversions.	Connecting road from Thakurpalli road to North gate	Construction Contractor	PMU environmental specialist
Operation Stage								
Influx of visitors due to increased recreational amenities	Water and soil contamination due to generation of food waste and sewage from food court	3	2	6	• The food waste collected from the restaurants shall be collected and handed over to the AMC collection vehicles by the restaurant operator. • Septic tank with soak pits shall be provided for the toilet wastewater processing, without directly letting in to the open drains.	Food Court	O&M Contractor	PMU

Figure 30 Construction site plan for Food Court and Visitors Parking area

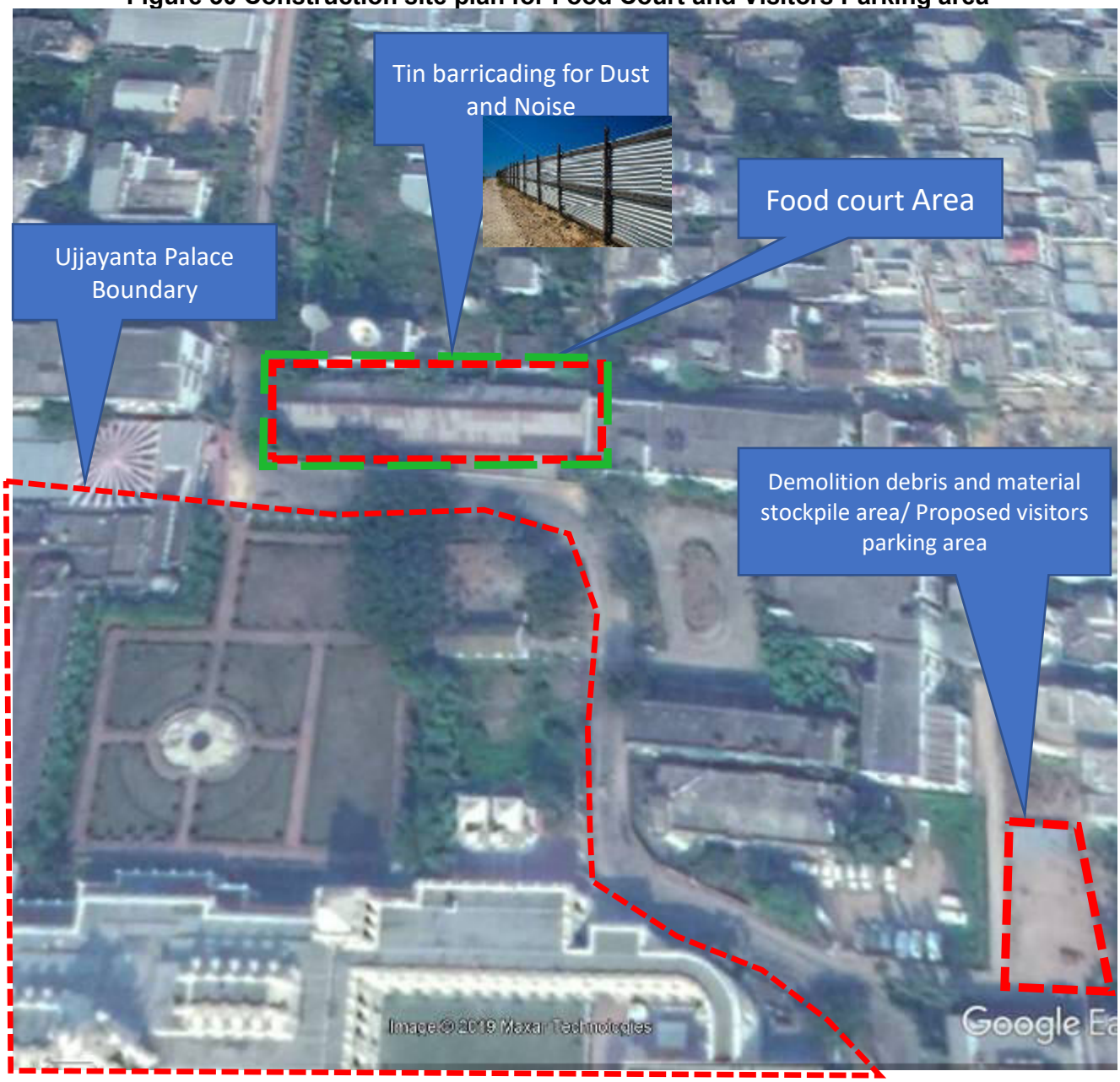


Table 29: Environmental Management Plan for Rear Garden, Multiactivity plaza and Amphitheatre

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
Construction Stage								
Site Clearance activities	Temporary Loss of greenery due to clearing of lawn in rear garden area	3	2	6	• Clearing of vegetation should be strictly as per layout. • Clearance area should be marked with highly visible marking.	Rear Garden area	Construction Contractor	PMU environmental specialist
	Soil Erosion	3	2	6	• The topsoil removed from the rear garden area shall be stored in stockpiling area proposed in the parking premised of the proposed plan as shown in Figure 33 • Site grading and excavation to be undertaken during dry season and top soil to be preserved and relocated after construction activities. • Completed earthworks to be sealed and/or re-vegetated at the earliest with the help of landscape expert.	Rear Garden area	Construction Contractor	PMU environmental specialist
Construction of multiactivity plaza and amphitheater	Dust Generation due to construction	5	3	15	• Alternate day cleaning shall be done for dust particles deposited on the structures of Ujjayanta palace due to the construction activity for the entire construction period. • Water sprinkling shall be done to control dust emission twice a day in dry areas like temporary raw material and waste stock piles, • Stockpiles of raw/ waste material, demolition debris, excavated earth etc., shall be covered with tarpaulin during the entire construction activity.	Rear Garden area	Construction Contractor	PMU environmental specialist

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
	Noise generation	5	2	10	• Construction work shall be limited to day light hours (6 AM to 6 PM) for all the works. • Provide ear plugs to all workers working in high noise (80 dbA) generating areas.	Rear Garden area	Construction Contractor	PMU environmental specialist
	Hindrance to traffic movement on connecting road	5	2	10	• The vehicles plying construction materials shall not be parked on roads	Rear Garden area	Construction Contractor	PMU environmental specialist

Figure 31: Construction site plan for Rear garden

Table 30: Environmental Management Plan for Eastern Lake Edge Development and Revival of Eastern Lake

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
Construction Stage								
Demolition of existing brickworks and plastering	Air pollution due to dust emission	3	2	6	• Regular Water spraying on dry 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	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
	Noise generation	5	2	10	• Restrict the demolition work only during day time between 6 am to 6 pm and the noise level shall be below <80 dBA so that it should not affect the Agartala Town Library.	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
	Soil and water contamination	3	3	9	• Around 36 cum of demolished broken bricks, 5200 kgs of steel and 468 m^2 of broken plastering material will be generated. The Contractor shall suitably dispose of the unutilized debris materials at the centralized facility of DC Nagar Lunga site of AMC after necessary permission.	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
	Hinderance to traffic in connecting road	3	2	6	• The debris shall not be disposed on adjacent road, walkways or pathways. • Complaint register shall be kept at the construction site, the grievances registered by the general public related to nuisance and disturbance to movement shall be addressed immediately.	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
Excavation of soil and Stockpile	Dust Generation from stockpiles	5	2	10	• Water sprinkling on surface of temporary stockpiles	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					• Covering of stockpiles with tarpaulins			
	Runoff from stockpiles contaminating water	2	3	6	• Stockpiles shall be at least 5 m away from the adjacent Rajbari lake water	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
	Siltation of lakes	5	3	15	• Excavated earth shall be stored in designated stockpiling area as shown in Figure 32. • Excavated earth stockpile shall be covered so that sediment laden water does not drain into nearby watercourse.	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
Construction of pathways and Construction of viewing deck and provision of floating jetty	Dust Generation	5	2	10	• Water sprinkling shall be done to control dust emission twice a day in dry areas like stock piles • Stockpiles of raw/ waste material, demolition debris, excavated earth etc., shall be covered with tarpaulin during the entire construction activity.	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
	Siltation of Rajbari lake and degradation of water quality	5	3	15	• The Contractor shall not excavate bed of the lakes at any location for borrowing earth for embankment construction. • Contractor shall construct silt fencing at the edge of the lake to prevent entry of soil and silt in lake water. • Contractor shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment laden water does not drain into lakes	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist

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 to Rajbari lake	2	2	4	• Contractor shall ensure that no construction materials like earth, stone, waste disposed off in a manner that block the flow of water to and from the Rajbari lake. • Contractor shall take all necessary measures to prevent any blockage to the water flow.	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
	Noise impact on sensitive receptors	5	2	10	• Construction work shall be limited to day light hours (6 AM to 6 PM) for all the works. • Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at 10 m or more from the vehicles & equipment.	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
	Hindrance to traffic movement on connecting road	5	2	10	• 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. • Construction vehicles shall not be parked on the road after work completion.	Eastern Lake Edge area	Construction Contractor	PMU environmental specialist
	Fall hazard	3	5	15	• Provide temporary barricades on the edges of the lakes to prevent fall of workers or public • Lifejackets shall be provided by the contractor during the construction period at the site	Eastern lake development	Construction Contractor	PMU environmental specialist
Operation Stage								

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
Influx of visitors due to increased recreational amenities	Fall hazard and other Unsafe acts and conditions	3	5	15	• As a measure to ensure the safety of people moving in the pathways and public zones, railings shall be provided at edges of Rajbari lake • Lifejackets shall always be available, and Rescue Divers shall be present during the recreational water activity in Rajbari lake area	Eastern Lake Edge area	O&M Contractor	PMU
	Water and soil contamination due to generation of solid waste	3	2	6	• Provide bins at regular intervals for dropping of solid wastes like water bottles, tea cups, empty packets etc., • The bins shall be emptied daily, and solid waste shall be handed over to AMC collection staff. • The people littering the place shall be fined.	Eastern Lake Edge area	O&M Contractor	PMU

Figure 32 Construction site plan for Eastern Lake Development

Figure 33: Site Plan for Storage and stockpiling in the proposed parking area

Table 31: Comprehensive Environmental Management Plan for Ujjayanta Palace Revival and Restoration

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
Construction Stage								
Site Clearance activities	Temporary Loss of greenery due to clearing of lawn and tree cutting	3	2	6	• Clearing of vegetation should be strictly as per layout. • Clearance area should be marked with highly visible marking. • Only 1 tree of Albizia species is identified near *Astaba*l area under the project shall be cut after receiving clearance from the Forest Dept. (as applicable) and after the receipt of ASCL's written permission in this regard. • Compensatory plantation will be done as per Forest Dept. Letter no. F.11-13/WFD/Deptt.0prnt/2018-19/11595-597 dated 27-02-2020. The compensatory plantation cost will be included together with Smart Roads compensatory plantation budget.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
	Disruption to visitors of Ujjayanta lake	3	2	6	• As the construction work is expected to disrupt visitors of Ujjayanta Palace and lakes, notice shall be served well in advance to the Ujjayanta Palace authorities, Tourism department etc.,	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
Demolition of existing structures	Air pollution due to dust emission	3	2	6	• 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	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
	Noise generation	5	2	10	• Restrict the demolition work only during day time between 6 am to 6 pm	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	Soil and water contamination	3	3	9	• Around 523 cum of demolition debris will be generated in the form of broken bricks, demolished RCC and broken plaster. The Contractor shall suitably dispose of the unutilized debris materials at the centralized facility of DC Nagar Lunga site of AMC after necessary permission	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
	Hinderance to traffic in connecting road	3	2	6	• The debris shall not be disposed on road, walkways or pathways. • Complaint register shall be kept at the construction site, the grievances registered by the general public related to nuisance and disturbance to movement shall be addressed immediately.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
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	PMU environmental specialist
	Dust generation and air pollution due to	3	2	6	• The vehicles speed shall be adhered to specified limits of 15 Kmph in site to avoid dust generation	Mining area	Construction Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	transportation of materials				• The vehicles transporting materials and entering site shall have PUC certificates and shall be in good condition.			
	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.	Mining areas	Construction Contractor	PMU environmental specialist
Excavation of soil and Stockpile	Dust Generation from stockpiles	5	3	15	• Water sprinkling on surface of stockpiles • Covering of stockpiles with tarpaulins	Stockpile area	Construction Contractor	PMU environmental specialist
	Runoff from stockpiles contaminating water	2	3	6	• Stockpiles shall be at least 5 m from the Rajbari and Jagannathbari lake water	Stockpile area	Construction Contractor	PMU environmental specialist
	Noise generation from excavation	5	2	10	• Restrict the construction work only during day time between 6 am to 6 pm.	Stockpile area	Construction Contractor	PMU environmental specialist
	Siltation of lakes	3	3	9	• Excavated earth shall be stored in designated areas as shown in Figure 33. • 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.	Stockpile area	Construction Contractor	PMU environmental specialist
	Danger due to deep excavation and chances of accident	3	5	15	• Consult with AMC in identifying deep excavation areas on construction sites • Provide hard barricades and sign boards to warn of dangerous conditions	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
Usage of Construction	Dust generation from vehicle movement	5	2	10	• Limit of vehicle speed to 20 kmph within site.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
vehicles and equipment					• Periodical air quality monitoring shall be done during construction and operation phase.			
	Emissions from vehicles and equipment	3	2	6	• The vehicles shall be maintained regularly. • Vehicles and machineries working in premises shall have valid PUC certificate.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
	Noise generation due to operation of vehicles n equipment	5	2	10	• The vehicles and equipment shall be maintained properly to reduce the noise. • Enclosures and silencers shall be provided for high noise generating equipment.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
	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. • The storage area shall in the designated area in the proposed parking lot during the entire construction stage as per the site plan shown in Figure 33. • DG sets, oil/ fuel consuming equipment shall be placed in concrete platforms.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
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 locations in premises shall be in the designated area in the proposed parking area as per the site plan shown in Figure 33. • Periodic Water quality monitoring shall be done to check the impact of leakage/ spillage on water bodies.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
Construction works	Dust Generation	5	3	15	• Alternate day cleaning shall be done for dust particles deposited on the structures of Ujjayanta palace due to the construction activity for the entire construction period. • 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. • Periodic Air quality monitoring shall be done at selected locations to check the impact of developmental activity	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
Construction works	Siltation of Rajbari and Jagannathbari lakes and degradation of water quality	3	3	9	• The Contractor shall not excavate bed of the lakes at any location for borrowing earth for embankment construction. • Contractor shall construct silt fencing at the edges of Rajbari and Jagannathbari lakes throughout the entire stretch of construction area. The fencing shall be provided prior to commencement of the work. • Contractor shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment laden water does not drain into lakes	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist

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 to Rajbari and Jagannath bari lakes	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 Rajbari and Jagannathbari lakes. • 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.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
	Noise impact on sensitive receptors	5	2	10	• All Construction plants and equipment used in construction shall strictly conform to the MOEFCC/ CPCB noise standards. • Construction work shall be limited to day light hours (6 AM to 6 PM) for all the works. • 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 receptors. • Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at 10 m or more from the vehicles & equipment.	Ujjayanta Place Construction premise and sensitive receptor locations	Construction Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					• 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 as shown in Figure 33. • Avoid disposal of any debris and waste soils in and around the lakes' premises. • Coordinate with PIU for beneficial uses of excess excavated soils or immediately dispose to DC Nagar Lunga site.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist
	Hindrance to traffic movement on connecting road	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	Connecting road from Thakurpalli road to North gate	Construction Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
	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 • No work should be conducted near the Jagannathbari and Lakshminarayan bari temples during religious congregations. • Material transport to the site should be arranged considering Ujjayanta Palace College timings. • Implement all measures suggested elsewhere in this report - dust and noise control, public safety, traffic management, strictly at these sites.	Sensitive areas	Construction Contractor	PMU environmental specialist
	Fall hazard	3	5	15	• Provide temporary barricades on the edges of the lakes to prevent fall of workers or public • Lifejackets shall be provided by the contractor during the construction period at the site	Eastern lake development	Construction Contractor	PMU environmental specialist
Storage, handling and disposal of surplus excavated earth, Demolition Debris, construction wastes	Air Pollution due to loading and transportation of wastes	5	2	10	• Around 2000 cum of surplus excavated earth, 93 cum of demolished RCC wastes and 748 m^2 of broken plaster 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.	Ujjayanta Place Construction premise	Construction Contractor	PMU environmental specialist

Activity	Impact	Likelihood (Score)	Consequence (Score)	Risk Score (consequence x likelihood)	Environmental Management Measures	Approximate Location	Responsible for Implementation	Responsible for Supervision
					• The vehicles carrying wastes shall be checked for their PUC certificate and its fitness.			
	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	PMU environmental specialist
	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	PMU environmental specialist
Operation Stage								
Influx of visitors due to increased recreational amenities	Fall hazard and other Unsafe acts and conditions	3	5	15	• As a measure to ensure the safety of people moving in the pathways and public zones, railings shall be provided at edges of ○ Rajbari lake ○ Jagannath bari lake • Rescue divers and Lifejackets shall be available in Rajbari and Jagannath bari lake areas during recreational and musical fountain hours.	Commercial lake development zones	O&M Contractor	PMU
	Water and soil contamination due to generation of solid waste and sewage from Front garden	3	3	9	• There will be generation of around 50 kgs of solid waste and 12 KLD of sewage generation during operation phase. • Provide bins at regular intervals for dropping of solid wastes like water bottles, tea cups, empty packets etc., • The solid waste generated by visitors shall be collected and handed over to	Ujjayanta Palace Complex	O&M Contractor	PMU

Activity	**Impact**	**Likelihood** (Score)	**Consequence** (Score)	**Risk Score** (consequence x likelihood)	**Environmental Management Measures**	**Approximate Location**	**Responsible for Implementation**	**Responsible for Supervision**
					the AMC collection vehicles by the O&M contractor. • Septic tank with soak pits shall be provided for the toilet wastewater processing near South gate.			

B. Institutional Arrangement

262. 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[17] will be responsible for implementing the Project, while the PIUs[18] 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.

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.

263. 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.

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

C. Safeguards Implementation Arrangement:

265. **Project Management Unit**. 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 Social) will be supported by environmental specialist of PMC team. The Nodal Officer 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:

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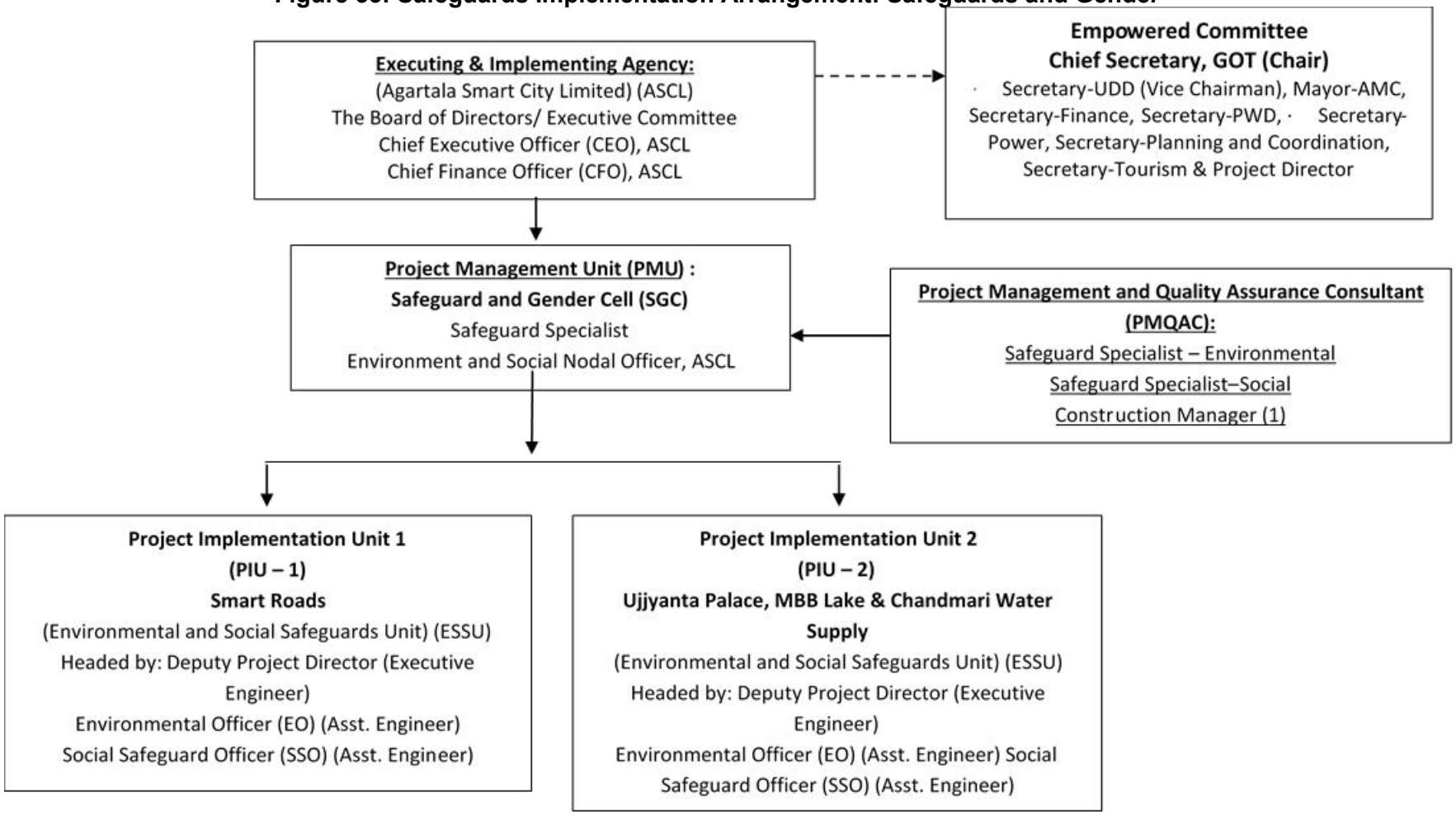
[17] A Project Management Unit (PMU) will be set up comprising of senior management from ASCL.

[18] 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.

Figure 33: Safeguards Implementation Arrangement: Safeguards and Gender



266. **Nodal Officer (Environmental and Social) at PMU. Environmental Safeguard 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 9);
(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.

267. **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:

268. **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

269. PMQAC 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 PMQAC.

(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

270. **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.

271. 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;

272. **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.

273. 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 32: 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. (vii) Assist in addressing any grievances brought about through the Grievance Redress	(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 (ix) Coordinate with national and state level government agencies	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**
	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.	(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 impacts or ineffective mitigation measures found during the course of implementation.	(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, (vi) conduct continuous public consultation and awareness;	(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**
		(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 (ii)Prepare EHS plan and take approval from PIU and Ensure	(i) Implement EMP. (ii) Implement corrective actions if necessary. (iii) Prepare and submit monitoring reports including pictures to PIU (iv) Comply with all applicable legislation, is conversant with the	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	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.	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

274. 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.

275. 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.

276. The following table 33 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 33: 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	PIU cost
2.EMP implementation (1 day) • 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	PIU cost
3. Plans and Protocols (1 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	PIU cost Contractors cost as compliance to contract provisions on

Description	Target Participants	Estimate (INR) — (Lump sum)	Cost and Source of Funds
			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	PIU Cost
5. Contractors Orientation to Workers on EMP implementation (OH&S, core labor laws, spoils management, community health, awareness on HIV-AIDS etc.,) Activities related to COVID-19 are covered in the bidding documents, respective BOQ.	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

277. 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 PMI/ PWG office for reference. Construction Supervision Specialist will review and advise contractors for corrective actions if necessary. Monthly report summarizing compliance and corrective measures taken will be prepared by Construction Supervision Specialist to be reviewed and endorsed by ASCL. 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, PIU will draft, review, and submit to ADB, 6-monthly (twice a year) EMP implementation progress report. Once concurrence from the ADB is received the report will be disclosed in the Project website. ADB will review project performance against the ASCL's 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. The Sample format for Environmental Monitoring Report is given in Appendix 9.

278. **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.

279. **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.

280. **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.

281. **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.

282. **Monitoring of Groundwater**: The groundwater samples shall be taken from representative locations periodically and analyzed for necessary corrective actions, if any.

283. 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 34.

Table 34: 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	--

Table 35: Environmental Monitoring Plan

Sr. No.	Type	Locations	Parameters	Period and Frequency	Institutional Responsibility	
					Implementation	Supervision
Pre- Construction Phase						
1	Ambient Air Quality	4 locations	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

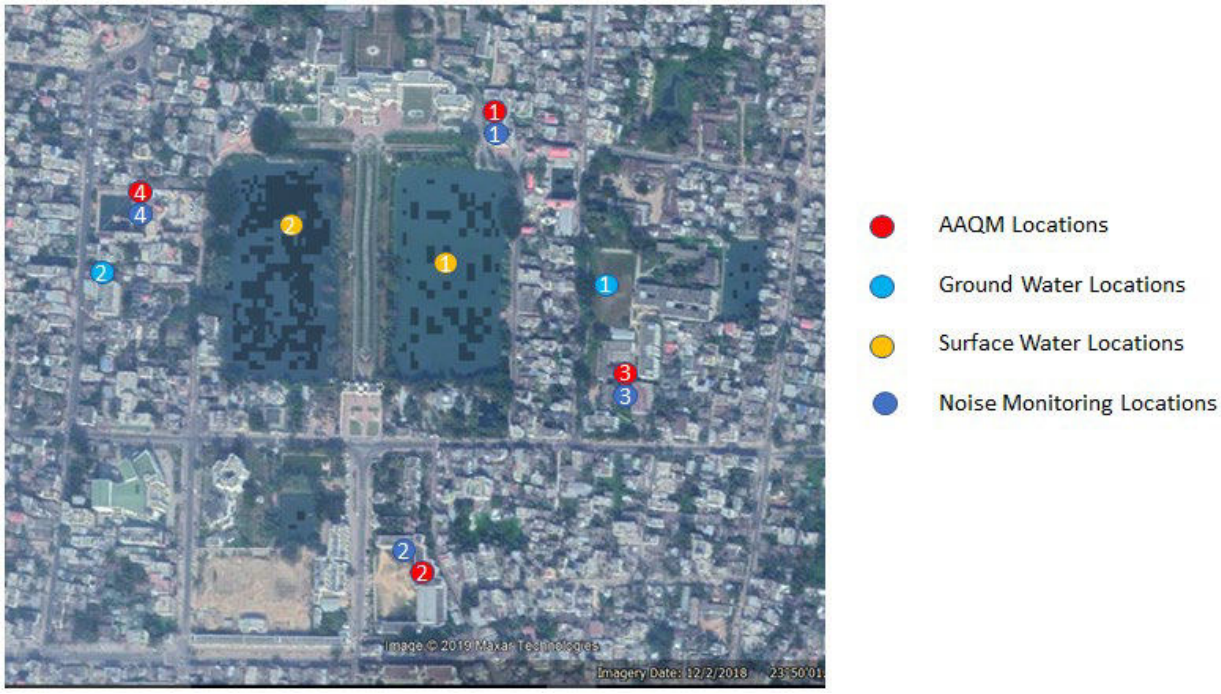
Sr. No.	Type	Locations	Parameters	Period and Frequency	Institutional Responsibility	
					Implementation	Supervision
2	Surface Water	2 locations	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals	once	Contractor through MoEFCC approved agency	PIU
3	Ground Water	2 locations	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	4 locations	24hrly Day and Nighttime Leq levels	once	Contractor through MoEFCC approved agency	PIU
Construction Phase						
1	Ambient Air Quality	4 locations	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. (hr. for CO) average samples once in a quarter	Contractor through MoEFCC approved agency	PIU
2	Surface Water	2 locations	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100 ml), Heavy Metals	once in a quarter	Contractor through MoEFCC approved agency	PIU

Sr. No.	Type	Locations	Parameters	Period and Frequency	Institutional Responsibility	
					Implementation	Supervision
3	Ground Water	2 locations	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100 ml), Heavy Metals	once in a quarter	Contractor through MoEFCC approved agency	PIU
4	Noise	4 locations	24 hourly Day and Night time Leq levels	once in a quarter	Contractor through MoEFCC approved agency	PIU
Operation Phase						
1	Ambient Air Quality	4 locations	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 a quarter	O&M Contractor through MoEFCC approved agency	PMU
2	Ground Water	2 locations	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100 ml), Heavy Metals	once in a quarter	O&M Contractor through MoEFCC approved agency	PMU
3	Surface Water	2 locations	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals	once in a quarter	O&M Contractor through MoEFCC approved agency	PMU
4	Noise	4 locations	24hrly Day and Night time Leq levels	once in a quarter	O&M Contractor through MoEFCC approved agency	PMU

Sr. No.	Type	Locations	Parameters	Period and Frequency	Institutional Responsibility	
					Implementation	Supervision
5	Implementation 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	PIU and PMU

284. The monitoring locations for environmental parameters are given in figure 34 below. The monitoring locations are selected based on the PCRs and sensitive receptors identified surrounding the project site. Total 4 AAQM, 4 Noise, 2 Surface Water and 2 Ground Water Monitoring locations are identified.

Figure 34: Environmental Monitoring Locations of Ujjayanta Palace



F. EMP Implementation Cost

285. 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. Mitigation that is the responsibility of ULBs will be provided as part of their management of the project, so this also does not need to be duplicated here. Cost for the capacity building program is included as part of the project. The EMP cost includes the cost for providing water supply and sanitation facilities 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, the cost of EMP is given in Table 36.

Table 36: Estimated amount for implementation of EMP during construction & Operation phase

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
A	**Implementation staff**						
1	EHS Engineer	Construction	Per month	11	50,000	5,50,000	Civil Works Contract
B	**Monitoring measures**						
Pre- Construction Phase							
1	Periodic air quality monitoring during pre-construction stage at locations specified. 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 and Construction	Nos.	4	8,000	32,000	Civil Works Contract
2	Surface Water quality monitoring during pre-construction phase at locations given. The sampling shall be carried out once and cover all parameters as per IS10500 including heavy metals	Pre-Construction and Construction	Nos.	2	10,000	20,000	Civil Works Contract
3	Ground Water quality monitoring during pre-construction phase at locations given. The sampling shall be carried out once and cover all parameters as per IS10500 including heavy metals	Pre-Construction and Construction	Nos.	2	10,000	20,000	Civil Works Contract
4	Noise quality monitoring at specified areas. 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	Pre-Construction and Construction	Nos.	4	2000	8,000	Civil Works Contract
Construction Phase							
1	Periodic air quality monitoring during construction stage at locations specified. 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 except for monsoon for 3 quarters for 11 months.	Construction	Nos.	12	8,000	96,000	Civil Works Contract

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
2	Surface Water quality monitoring during construction phase at locations given. The sampling shall be carried out once in quarter except for monsoon for 3 quarters for 11 months and cover all parameters as per IS10500 including heavy metals	Construction	Nos.	6	10,000	60,000	Civil Works Contract
3	Ground Water quality monitoring during construction phase at locations given. The sampling shall be carried out once in quarter except for monsoon for 3 quarters for 11 months and cover all parameters as per IS10500 including heavy metals	Construction	Nos.	6	10,000	60,000	Civil Works Contract
4	Noise quality monitoring at specified locations. Each monitoring schedule shall be over a duration of 12 hours (6AM to 6PM), once in quarter except for monsoon for 3 quarters for 11 months. The monitoring shall be carried out in accordance with CPCB norms	Construction	Nos.	12	2000	24,000	Civil Works Contract
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 quarter except for monsoon for 3 quarters for 1 Years.	Operation Phase	Nos.	12	8,000	96,000	PIU
2	Surface Water quality monitoring during operation phase at locations given. The sampling shall be carried out once in quarter except for monsoon for 3 quarters for 1 years and cover all parameters as per IS10500 including heavy metals.	Operation Phase	Nos.	6	10,000	60,000	PIU
3	Ground Water quality monitoring during operation phase at locations given. The sampling shall be carried out once in quarter except for monsoon for 3 quarters for 1 years and cover all parameters as per IS10500 including heavy metals.	Operation Phase	Nos.	6	10,000	60,000	PIU

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
4	Noise quality monitoring at specified locations. Each monitoring schedule shall be over a duration of 12 hours (6AM to 6PM), once in quarter except for monsoon for 3 quarters for 1 Years). The monitoring shall be carried out in accordance with CPCB norms.	Operation Phase	Nos.	12	2000	24,000	PIU
	Subtotal (B)					**5,60,000**	
C	**Capacity Building**						
1	Introduction and sensitization to environment issues	Pre-Construction	Lumpsum			50,000	PIU
2	EMP implementation	Construction	Lump sum			100000	PIU
3	Plans and Protocols	Construction	Lump sum			50,000	PIU
			Lump sum			75,000	Civil works contract
4	Experiences and best practices sharing	Construction/Post-Construction	Lump sum			30,000	PIU
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, respective BOQ.	Prior to dispatch to worksite	Lumpsum			30,000	Civil works contract
	Subtotal (C)					**3,35,000**	
D	**Civil Works**						
1	Cost for 1 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	Nos.	1	7000	7000	Civil Works Contract
2	Regular water sprinkling (at least 2hrs per day) 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	Construction	hours	480	310	1,48,800	Civil works contract

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
	earthwork is deemed to be already covered under civil works. (Code No. 0130, Building Works PWD SoR 2017 PWD Basic Rate:Page-1)						
3	Construction of shelters for workers.	Construction	lumpsum			300000	Civil works contract
4	Providing Water Supply Facility for the workers.	Construction	Lump sum			200000	Civil works contract
5	Provision of Portable Toilets for construction workers at workers' camp (Market Rate).	Construction	Nos.	4	40000	1,60,000	Civil works contract
6	Provision of Portable Toilets for construction workers at construction site (Market Rate).	Construction	Nos.	2	40000	80,000	Civil works contract
7	Providing Personal Protective Equipment to the labours during the construction phase of the project.	Construction	cost/ person/ annum	50	1,000	50,000	Civil works contract
8	Waste bins for segregation of waste at Workers' camp (Market Rate)	Construction	Nos.	4	3123	12,492	Civil works contract
9	Waste bins for segregation of waste at Construction site (Market Rate)	Construction	Nos.	4	3123	12,492	Civil works contract
10	First Aid Boxes for the construction site (Market Rate)	Construction	Nos.	3	1964	5,892	Civil works contract
11	First Aid Boxes for the workers camp (Market Rate)	Construction	Nos.	2	1964	3,928	Civil works contract
12	Installation of a steel portatable barricade with horizontle 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, horizontle rail painted (2 coats) with yellow and white stripes, 150 mm width with an angle of 450, 'A' frame painted with 2 coats	Construction	Nos	20	2,493.9	49,878	Civil works contract

Sr. No.	Description	Stage	Unit	Quantity	Rate (Rs)	Amount (Rs)	Cost Covered by
	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 of 240)						
13	Providing and fixing of retro-reflectorised 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 aluminium 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. 800 mm x 600 mm rectangular Unit = Each Taking output = one traffic sign (Sr. No. 8.4 Ref. to MoRTH Spec. 801, MoRT&H Analysis, Tripura PWD Page 152 of 388)	Construction	Per unit	5	2,417.60	12,088	Civil works contract
14	Disposal of surplus earth, demolished old plaster, RCC waste, brick waste and other wastes/ rubbles into the Landfill site of Agartala Municipal Corporation (10 km from proposed Ujjayanta Palace project site) (Sl. No. 1.1.1 SOR 2017:PWD (Buildings), Tripura/ Mechanical Carriage. SH:01-Page:2)	Construction	cum	1456.6	204	2,97,146	Civil works contract
15	Providing Silt fencing along Eastern and Western lake 3 edge each as shown in EMP for protection of lake water body from siltation (Market Rate)	Construction	RMT	1200	340	4,08,000	Civil works contract
	Subtotal (D)					**17,47,716**	
	CAPEX					29,52,716	
	OPEX					2,40,000	
	GRAND TOTAL					**31,92,716.00**	

IX. CONCLUSIONS AND RECOMMENDATIONS

286. The process described in this document has assessed the environmental impacts of all elements of the Renovation on Ujjayanta Palace complex in Agartala. All potential impacts were identified in relation to preconstruction, construction, and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the project design or location were not significant.

287. There are no environmentally sensitive areas within or nearby Ujjayanta Palace premises. There is no Protected Forest area within 10 km of radius. Nearest Wildlife Sanctuary- Sepahijila at 18 km. The Ujjayanta Palace is mostly surrounded by urban areas, and Ujjayanta Palace attracts many visitors and tourist and various measures are included to avoid any negative impact tourism and protect the heritage of palace.

288. There will be temporary negative impacts, arising mainly from construction dust and noise, hauling of construction material, waste and equipment on local roads (traffic, dust, safety etc.,), mining of construction material, occupation health and safety aspects. The works will be conducted along defined boundary of Palace within the urban area congested with people, activities and traffic, subproject is likely to significant impacts during construction. Impacts mainly arise from the construction dust and noise; from the disturbance of residents, businesses, traffic by the construction work, safety risk to workers, public, disposal of large quantities of construction waste, etc. These are all general impacts of construction in urban areas, and there are well developed methods of mitigation that are suggested in the EMP.

289. 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 PMU. Mitigation and monitoring measures, along with the project agency responsible for such actions, form part of the Environmental Management Plan.

290. Stakeholders were involved in developing the IEE through face-to-face discussions, on site meetings, and a city level consultation workshop, which was conducted for larger public participation in the project. Views expressed by the stakeholders were incorporated into the IEE and the planning and development of the project. The IEE will be made available at public locations and will be disclosed to a wider audience via the PMU and ADB websites. The consultation process will be continued during project implementation to ensure that stakeholders are engaged in the project and have the opportunity to participate in its development and implementation. The project's grievance redress mechanism will provide the citizens with a platform for redress their grievances, and describes the informal and formal channels, time frame, and mechanisms for resolving complaints about environmental performance.

291. The EMP will assist the project agencies and contractor in mitigating the environmental impacts and guide them in the environmentally sound execution of the proposed project. A copy of the updated EMP/ SEP shall always be kept on-site during the construction period. The EMP shall 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 shall constitute a failure in compliance.

292. The project will provide better and enhanced the heritage and cultural tourism in Ujjayanta Palace area. Therefore, as per ADB SPS, the project is classified as environmental category B and does not require further environmental impact assessment. This IEE shall be updated by PMU during the implementation phase to reflect any changes, amendments and will be reviewed and approved by ADB.

Appendix 1: REA Checklist

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

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: Revival and Restoration of Ujjayanta Palace

Sector Division: Building

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following areas:			
▪ Underground utilities		No	
▪ Cultural heritage site	Yes		The former palace of the kingdom of Tripura and presently converted to a museum. It is constructed during 1899 to 1901 by the King of Tripura, Maharaja Radha Kishore Manikya Source: Wikipedia
▪ Protected Area		No	There is no Protected area within 10 km of radius. Nearest Wildlife Sanctuary- Sepahijila at 17 km. Nearest National Park- Clouded Leopard at 20km. (Source: Wildlife and protected areas of Tripura Map by Wildlife Institute of India)
▪ Wetland		No	
▪ Mangrove		No	
▪ Estuarine		No	
▪ Buffer zone of protected area		No	
▪ Special area for protecting biodiversity		No	
▪ Bay		No	
B. Potential Environmental Impacts Will the Project cause…			
▪ Encroachment on historical/cultural areas?		No	
▪ Encroachment on precious ecology (e.g. sensitive or protected areas)?		No	Only one tree will be cut for the project, which is a common species.

Screening Questions	Yes	No	Remarks
▪ Impacts on the sustainability of associated sanitation and solid waste disposal systems?	Yes		During the construction stage, due to 60 construction workers there will be generation of around 24 Kg of solid waste and 6.48 KLD of sewage and during operation there will be generation of 60 Kg of solid waste and 12 KLD of sewage. The generated solid waste will be collected in bins and handed over to AMC collection vehicles and sewage generated will be treated in septic tank soak pits.
▪ Dislocation or involuntary resettlement of people?		No	
▪ Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		No	
▪ Accident risks associated with increased vehicular traffic, leading to loss of life?	Yes		During construction, movement of the vehicles to the location may cause unwanted vehicular congestion towards south side of the Palace. Increased visitors number and related vehicles may lead accidents during construction and operation phases.
▪ Increased noise and air pollution resulting from increased traffic volume?	Yes		Noise and air pollution are anticipated only during construction phase. During operation phase, with increased tourists traffic volume may increase.
▪ Occupational and community health and safety risks?	Yes		Occupational health and safety risks may occur during construction stage. This may occur due to vehicular movement as well as due to improper safety measures by the contractors abd workers.
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	Yes		Improper safety measures may lead to injury/ injuries to the workers during construction.
▪ Generation of dust in sensitive areas during construction?	Yes		Dust will generate during construction phase leading to problems in sensitive areas like AMC library, MTB high school, JN bari temple and Childrens park.
▪ Requirements for disposal of fill, excavation, and/or spoil materials?	Yes		The proposed constrcution will generate around 2999 cum of surplus excavated earth, 415 cum of brick waste, 748 m^2 of broken plaster and 13200 kgs of steel waste. The above wastes shall be disposed in AMC owned DC Nagar Lunga Site.
▪ Noise and vibration due to blasting and other civil works?	Yes		No blasting activity is envisaged. Temporary noise and vibration may generated during construction work
▪ Long-term impacts on groundwater flows as result of needing to drain the project site prior to construction?		No	
▪ Long-term impacts on local hydrology as a result of building hard surfaces in or near the building?		No	

Screening Questions	Yes	No	Remarks
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		No	Around 60 construction workers are required during consruction stage, this will not cause any bruden on the social infrastructure and services.
▪ Social conflicts if workers from other regions or countries are hired?		No	
▪ Risks to community safety caused by fire, electric shock, or failure of the buildings safety features during operation?		No	
▪ Risks to community health and safety caused by management and disposal of waste?	Yes		The solid waste and sewage generated from the Ujjayanta palace premises during operation phase, if not handled/ processed further the wastes will lead to water contamination in Rajbari and Jagannathbari lakes.
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		No	

A Checklist for Preliminary Climate Risk Screening

Screening Questions		Score	Remarks[19]
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	No such issue may affect the project
	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	No such issue may affect the project
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 humidityhydro-meteorological parameterslikely	0	No such issues may affect the project

[19] 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.

Screening Questions		Score	Remarks[19]
	affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	No such issue may affect the project
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	No problem will envisaged in future which likely affect the performance of project output

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.

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

Other Comments: The proposed subproject activity involves renovation of existing structures and no new area or infrastructure is proposed for construction and anticipated environmental impacts are very marginal and the construction activity does not impose any threat to the existing climatic conditions.

Appendix 2: No Mitigation Checklist

Renovation and Restoration of Ujjayanta Palace

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?	No	The project involves renovation and restoration of existing structures and construction of new facilities. The proposed renovation and developmental works will not alter the landuse of the area. The scope of subproject is divided 6 following components: - • Renovation and Restoration of Front Palace Gardens and Façade Illumination • Revival of North gate and transformation of *Astaba*l Structure • Proposal for New Food Court • Rear garden revival with multi-activity plaza and Amphitheatre • Proposal for Visitor Parking • Subproject involves construction of steps in the lake, this construction will obstruct the water movement temporarily.	Yes Revival and restoration works are proposed on existing infrastructures, construction of food court and vehicle parking are the only new construction proposed in the subproject. The landuse change during construction will be temporary in nature and the impact will be in a very limited area. There is no negative effect envisaged. However, aesthetically the development of the existing surrounding will have positive changes.
1.2	Clearance of existing land, vegetation and buildings?	Yes	1 tree will be cut near *Astabal* area for the development. There is removal of some shrubs that have grown in haphazard manner in the area. There is demolition of the redundant structure for construction of food court.	Yes. Since the tree is an old tree, the cutting of tree will impact significantly to the local fauna specially the birds. Other trees are being saved with proper alignment and plan. The demolition waste shall be disposed scientifically at the disposal facility of AMC.

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 design of structural foundation, but this involves small area.	No Geotechnical investigations will involve 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	• Renovation and Restoration of Front Palace Gardens in an area of 20674 m^2 and Façade Illumination • Revival of North gate and transformation of *Astaba*l Structure in an area of 745 m^2 • Proposal for New Food Court in an area of 1178 m^2 • Rear garden revival with multi-activity plaza and Amphitheatre in an area of 3662 m^2 • Proposal for Visitor Parking in an area of 916 m^2 • Eastern lake edge development in an area of 1114 m^2 The above-mentioned proposed works at Ujjayanta palace involves 4858 cum of Excavation for footings of Pergola, Amphitheatre seating, screen wall, flooring of seating, exhibition area, stair cases, open air theatre, parking area gate, boundary wall, paver stone, food court, toilet block, pavers in *Astabal* area etc., 1859 cum of Backfilling in boundary walls, pathways,	Yes. The excavation and unplanned storage of excavated earth will impact • Air Quality of surrounding area due to dust generation • Movement of visitors visiting to the Palace due to haphazard dumping • The run off from the dumping will pollute the palace lakes and cause siltation • The excavation will also lead to safety issue if not barricaded properly

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?
			parking area, food court and *Astabal* areas.	
1.6	Demolition works?	Yes	• Demolition of existing heritage structures will generate 240 cum of brick waste, 240 m^2 of broken plaster. • Demolition of existing structure for proposed food court will generate around 8000 Kgs of steel, 139 cum of brick waste and 93 cum of RCC waste. • Demolition of decapitated compound wall and MS railings on eastern edge will generate around 36 cum of brick waste and 468 m^2 of broken plaster waste and 5200 kg of steel.	Yes The demolished waste if not disposed/ reused will be impact • Aesthetics of the site. • Air quality of the surrounding area to due to dust generation during demolition • Noise generation during the demolition will cause uneasiness to the visitors as well as surrounding residents.
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	**Construction works**- the project will involve storage/ stockpiling of raw material and wastes, use of DG and cement concrete mixers. These have potential of land, water and air pollution in case of emissions, leakages, spillages and runoff.	Yes. The discharge in the form leakages, runoff etc. from the stockpiles or other construction works will degrade the water quality of the nearby waterbody. This will also cause land and air pollution if not managed appropriately.
			Labour Camp – there will be around 60 workers working at site and they will be given housing at labour camp. This will generate solid waste of 24 Kg/ day and liquid waste of 6.48 KLD. The solid and liquid waste if not handled and processed will affect the immediate vicinity of the camp site and nearby waterbodies.	Yes The establishment of labour camp will have significant impacts on environment due to: • Water and land pollution due to discharge of sewage from work camp • Loss of trees for fuelwood • Spread of diseases due to Ill health and unhygienic conditions
1.8	Above ground buildings, structures or earthworks including linear	Yes	• Construction of food court,	Yes. The excavation activities in the project will have

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?
	structures, cut and fill or excavations?		• walkways and eastern lake edge development. Excavated earth of quantity around 4858 cum and Demolition waste of around 508 cum may temporarily affect the land use obstructing the access to the visitors and employees of Ujjayanta Palace. This will also affect the Rajbari and Jagannath bari lakes by means of siltation due to run off.	significant environmental impacts due to: • Dust generation from stockpiles. • Dangers due to deep excavation and chances of accidents. Other impacts could be: • Runoff from stockpile of excavated soil • Noise generation from excavation • Siltation of Rajbari and Jagannathbari lakes
1.9	Underground works including mining or tunneling?	No		
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	Temporary sheds will be put up for storage of, construction material, backfill material. These yards and materials could affect aesthetics at the site, and mobility or free movement of pedestrians and vehicles.	Yes, If not stored properly the stored material will affect the accessibility of the people visiting to the park and palace, this may also cause inconvenience to pedestrians and vehicle movement in the area.
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	Yes	The construction camp will generate around 24 Kgs of solid waste per day and 6.48 KLD of sewage. The solid and liquid waste if not handled and processed will affect the immediate vicinity of the camp site and nearby waterbodies.	Yes. The sewage generated from the labour camp may cause pollution of nearby water bodies if not treated, solid waste from the labour camp may also cause land contamination as well as pollution of water bodies.
			During operation, Ujjayanta palace attracts around 1000	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?
			visitors per day and this will generate around 50 Kgs of solid waste per day and 12 KLD of sewage. There will be land contamination, water pollution in Rajbari lake and Jagannath bari lakes if the solid and liquid waste is not handled and processed properly.	The solid waste and sewage generated if not handled and processed will result in land contamination, damaging aesthetics of the Uajjayanta Palace and causing ground and surface water pollution.
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?	No		
1.21	New or diverted transmission lines or pipelines?	No		
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No		
1.23	Stream crossings?	No		
1.24	Abstraction or transfers of water from ground or surface waters?	No	No ground water abstraction is proposed for the project During construction at lake edges, a temporary barricade will be created to segregate the work zone	Yes. There would be temporary impacts on aquatic flora and fauna In case the construction is not planned section-

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?
			from the lake. Water from the construction/ work zone area will be pumped to the other side of the lake. Post construction the barricading will be removed.	wise, there will be impact to the aquatic life of the entire lake.
1.25	Changes in water bodies or the land surface affecting drainage or run-off?	No		
1.26	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Transportation vehicles for the movement of 60 workers/ personnel, construction equipment, and construction materials will generate dust and noise and affecting air quality and noise environment.	Yes. The dust and noise generated due to transportation of manpower and material will cause discomfort to the occupants of homes, shopping establishments, schools nearby Ujjayanta Palace and visitors visiting to the palace.
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	There will be around 1000 visitors visiting to the Ujjayanta palace on daily basis.	Yes. The facilities available at Palace premises will not be enough to meet the requirement of the increase in visitors footfall. There will be discharge of sewage and generation of solid waste due to the increased number of visitors. The sewage and solid waste if not handled/ processed will contaminate land and water and pose challenge to aesthetics of the Ujjayanta Palace.

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?
1.30	Introduction of alien species?	No		
1.31	Loss of native species or genetic diversity?	No	Local shrubs and one tree are required to be removed from *the* Palace premises and *Astabal* area for the construction activities.	The tree proposed to be cut is of common species. This will not cause loss of native species of genetic diversity.
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	The restoration is planned in the existing area	No The project is proposed in existing urban area and it will not have any impact on undeveloped or agricultural land.
2.2	Water?	Yes	During the construction phase, water would be used for construction purposes. During the operations phase water will be used for drinking, plantation and fountains.	No, The amount of water to be used during the construction phase is small quantities. 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 to the proposed project. The water for fountains will be reused.
2.3	Minerals?	Yes	820 cu.m of sand will be required for construction. This will be sourced from Government approved quarries.	Yes If material is not sourced from Government approved quarries, it is likely to have a significant impact to the aesthetics, topography and ecosystem at the sites or locations from where they are sourced or quarried. Transportation of aggregate will also cause air pollution.
2.4	Aggregates?	Yes	Aggregate of quantity 570 cu.m will be required for construction	
2.5	Forests and timber?	No		
2.6	Energy including electricity and fuels?	Yes	None. The required energy, electricity, and fuel during	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?
			construction activities, vehicle, equipment, and machinery operations are negligible compared to supply.	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 Leakage of discharge of Fuels like diesel, Petrol, and Oil & Grease will affect human health and environment.	Yes. Any discharge of these substances into the land or water environment 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 generate around 24 Kg/ day of solid waste and 6.48 KLD of sewage and the operation of Ujjayanta Palace and Park would generate 50 Kg/ day of solid waste and 12 KLD of sewage which are having potential to spread diseases if not treated and processed.	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	More interactive public space will improve the living conditions of visitors and residents.	Yes. This is a 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, hospitals, old age homes, shelters for differently abled and other vulnerable institutes in the project area surrounding.	No. As of current design no impact on vulnerable institutions is envisaged
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	Excavated earth of quantity around 5039 cum and Demolition waste of around 523 cum will be generated during the construction. The spoil if not readily disposed at safe site, will occupy the land and may create discomfort to the passer-by.	Yes, The storage, handling and disposal of these waste will cause environment impact owing to: • Air pollution due to loading/ unloading and transportation of wastes.

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?
				• Degradation of aesthetics of Ujjayanta palace and park. • Siltation of Rajbari and Jagannathbari Lakes if soil flows to the lake with runoff.
4.2	Municipal waste (household and or commercial wastes)?	Yes	The footfall of visitors to Ujjayanta Palace is envisaged to rise. Hence, solid waste in form of plastic & food material and liquid waste will be generated. There would be generation of municipal waste from construction camps (24 kgs) and during operation phase (50 kgs) due to influx of visitors.	Yes. Municipal solid waste generated during the project may cause contamination of land and Rajbari and Jagannathbari lakes if not managed appropriately.
4.3	Hazardous or toxic wastes (including radioactive wastes)?	Yes	Bitumen will be used for the retro fitting of road; the likely leakage and emissions will cause health and environmental impacts. Biocide will be used for removal of algae from the existing structures.	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. Usage of biocide may cause health impacts to workers if not handled properly.
4.4	Other industrial process wastes?	No		
4.5	Surplus product?	No		
4.6	Sewage sludge or other sludge from effluent treatment?	Yes	Sewage will be generated from the public toilets, if the sewage is released untreated it will result in water and soil contamination.	Yes, Untreated sewage will significantly impact the quality of water of the receiving water body and may also cause land contamination if not managed properly.
4.7	Construction or demolition wastes?	Yes	The proposed development works will generate both construction and demolition wastes. If the wastes are not handled properly, the waste may cause problem to the	Yes. Construction and demolition wastes generated or produced during construction phase will change 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?
			passerby. The waste may also end up in water body causing siltation.	aesthetics in the project area. Soil and small rock debris could clog drainages and could cause siltation of receiving bodies during monsoon season.
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 produce emissions.	Yes. The impact of these emissions is significant to the health of all human receptors around the 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 generate emissions. There will be dust generation during unloading of materials such as cement, aggregates, etc.	Yes. The impact of these emissions is significant to the health of all human receptors around the Ujjayanta palace surrounding areas.
5.4	Emissions from construction activities including plant and equipment?	Yes	Concrete batching and hot mix plants will cause emissions.	Yes. The impact of these emissions is significant to the health of all human receptors around the 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, 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.
5.6	Emissions from incineration of waste?	No		
5.7	Emissions from burning of waste in open air (eg slash	Yes	The locality of the worker's camp may be affected by the open burning of waste	Yes There will be significant impact of these

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?
	material, construction debris)?		generated from the worker's camp.	emissions on the health of all human receptors living in and around the construction and 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	Demolition activity and 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 Ujjayanta palace sites, including the workers.
6.2	From industrial or similar processes?	No		
6.3	From construction or demolition?	Yes	The noise generated from the construction and demolition works and operation of equipment and movement of vehicles may disturb the people residing nearby palace.	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	Operation of heavy machineries like concrete mixers used for construction work and vehicles transporting construction materials may generate noise that would cause inconvenience to nearby communities.	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. If this occurs, the impact to groundwater and surface waters, including aquatic species, is significant.
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	Handling of cement, paints, solvent and handling of concrete may affect the workers' health if not handled properly. Front garden 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	Yes. The impact of these substances to the environment or at the work sites, if released intentionally or unintentionally, will be very significant. This situation also poses danger to the health and lives of the workers. The explosion and spillage will result in human injury and may pose contamination 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?
			health and as well as environment.	land and water and thus it is a significant impact.
8.2	From events beyond the limits of normal environmental protection e.g. failure of pollution controls 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.	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?	No		
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?	No		
9.4	By placing increased demands on local facilities or services eg housing, education, health?	No		
9.5	By creating jobs during construction	Yes	Requirement of labour for the construction works prioritize	Yes, it is a positive impact, because 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 operation or causing the loss of jobs with effects on unemployment and the economy?		the local people hence, providing employment opportunities to the local people.	skills they learnt during their employment period can be utilized in the future in other similar kind of works. The project will create the employment opportunities in the region temporarily.
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?	No		
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?	No		
10.3	Will the project lead to after-use of the site which could have an impact on the environment?	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?
10.4	Will the project set a precedent for later developments?	Yes	The recreational place developed after the construction will increase the tourism opportunities, quality of life of Agartala citizens.	Yes, this will be a positive development and a positive impact.
10.5	Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?	No		

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,	No
• Watercourses or other waterbodies,	
• the coastal zone,	
• mountains,	
• forests or woodlands	
• 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?	
• 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, there will be improvement in the scenic beauty
• Transport routes which are susceptible to congestion or which cause environmental problems?	No Yes, the movement of construction material by vehicle may lead to traffic congestion for temporary period.
• Areas or features of historic or cultural importance?	No
Question 2 - Is the Project in a location where it is likely to be highly visible to many people?	Yes, the project area is at the city center and the palace is visited by the tourists all around the year. The project 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	No
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?	No
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 worshipping places like Jagannath temple, Lakshminarayan bari temple and Jain mandir and women's college.
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.	Yes. The Rajbari and Jagannath bari lakes are adjacent to the project area.
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?	Yes. The baseline data shows that ambient Air Quality **Concentration** for all pollutants are within the permissible limits as per NAAQS 2009. The water quality of the surface and ground water is also as per the ISO drinking water standards for most of the parameters. The noise levels in few areas are beyond the permissible levels as per the residential standards of noise Quality (NAAQS). This is attributed due to the various religious activities as well as road traffic.

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.
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?	Yes, but in the positive way because the project is designed to improve the physical conditions at the site. The growth of flora and fauna will be in structured manner.
Question 11 - Are releases from the Project likely to have effects on the quality 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. The runoff may carry some amount of construction and demolition waste and cause siltation of water bodies. It also generates noise pollution by the movement of vehicles for transporting materials, and demolition 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?	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. Similarly, this project if properly implemented will have positive effect on the welfare of the local people by increasing tourism opportunities.

• Community cohesion and identity? • Cultural identity and associations? • Minority rights? • Housing conditions? • Employment and quality of employment? • Economic conditions? • Social institutions?	

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?

Prepared by:	
Designation and Office:	
Date:	

Appendix 3: National Ambient Air and Noise Quality Standards

Parameter	Location [a]	India Ambient Air Quality Standard (µg/m3) [b]	WHO Air Quality Guidelines (µg/m^3)		Applicable Per ADB SPS[e] (µg/m^3)
			Global Update [c] 2005	Second Edition 2000	
PM10	Industrial Residential, Rural and Other Areas	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-	20 (Annual) 50 (24-hr)
	Sensitive Area	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-	20 (Annual) 50 (24-hr)
PM25	Industrial Residential, Rural and Other Areas	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)	-	10 (Annual) 25 (24-hr)
	Sensitive Area	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)		10 (Annual) 25 (24-hr)
SO2	Industrial Residential, Rural and Other Areas	50 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-	50 (Annual) 20 (24-hr) 500 (10-min)
	Sensitive Area	20 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-	20 (Annual) 20 (24-hr) 500 (10-min)
NO2	Industrial Residential, Rural and Other Areas	40 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-	40 (Annual) 80 (24-hr) 200 (1-hr)
	Sensitive Area	30 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-	30 (Annual) 80 (24-hr) 200 (1-hr)
CO	Industrial Residential, Rural and Other Areas	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
	Sensitive Area	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
Ozone (O3)	Industrial Residential, Rural and Other Areas	100 (8-hr) 180 (1-hr)	100 (8-hr)		100 (8-hr) 180 (1-hr)
	Sensitive Area	100 (8-hr) 180 (1-hr)	100 (8-hr)		100 (8-hr) 180 (1-hr)
Lead (Pb)	Industrial, Residential, Rural and Other Areas	0.5 (Annual) 1.0 (24-hr)		0.5 (Annual)	0.5 (Annual) 1.0 (24-hr)
	Sensitive Area	0.5 (Annual) 1.0 (24-hr)		0.5 (Annual)	0.5 (Annual) 1.0 (24-hr)
Ammonia (NH3)	Industrial Residential, Rural and Other Areas	100 (Annual) 400 (24-hr)			100 (Annual) 400 (24-hr)
	Sensitive Area	100 (Annual) 400 (24-hr)			100 (Annual) 400 (24-hr)

Parameter	Location [a]	India Ambient Air Quality Standard (µg/m3) [b]	WHO Air Quality Guidelines (µg/m^3)		Applicable Per ADB SPS[e] (µg/m^3)
			Global Update [c] 2005	Second Edition 2000	
Benzene (C6H6)	Industrial Residential, Rural and Other Areas	5 (Annual)			5 (Annual)
	Sensitive Area	5 (Annual)			5 (Annual)
Benzo(o)pyrene (BaP) particulate phase only	Industrial Residential, Rural and Other Areas	0.001 (Annual)			0.001 (Annual)
	Sensitive Area	0.001 (Annual)			0.001 (Annual)
Arsenic (As)	Industrial Residential, Rural and Other Areas	0.006 (Annual)			0.006 (Annual)
	Sensitive Area	0.006 (Annual)			0.006 (Annual)
Nickel (Ni)	Industrial Residential, Rural and Other Areas	0.02 (Annual)			0.02 (Annual)
	Sensitive Area	0.02 (Annual)			0.02 (Annual)

[a] Sensitive area refers to such areas notified by the India Central Government.
[b] Notification by Ministry of Environment and Forests, Government of India Environment (Protection) Seventh Amendment Rules, 2009
[c] WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. *Global update 2005*. WHO. 2006
[d] Air Quality Guidelines for Europe Second Edition. WHO 2000.
[e] Per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

APPLICABLE AMBIENT NOISE STANDARDS

Applicable Ambient Noise Standards

Receptor/ Source	India National Noise Level Standards[a] (dBA)		WHO Guidelines Value For Noise Levels Measured Out of Doors[b] (One Hour LA_q in dBA)		Applicable Per ADB SPS[c] (dBA)	
	Day	**Night**	**07:00 – 22:00**	**22:00 – 07:00**	**Day time**	**Night time**
Industrial area	75	70	70	70	70	70
Commercial area	65	55	70	70	65	55
Residential Area	55	45	55	45	55	45
Silent Zone	50	40	55	45	50	40

[a] Noise Pollution (Regulation and Control) Rules, 2002 as amended up to 2010.
[b] Guidelines for Community Noise. WHO. 1999
[c] Per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

Appendix 4: Salient Features of Major Labor Laws

1) Workmen Compensation Act, 1923 - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

2) Payment of Gratuity Act, 1972 - Gratuity is payable to an employee under the Act on satisfaction of certain conditions on SEMParation if an employee has completed 5 years' service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

3) Employees' PF and Miscellaneous Provisions Act, 1952 - The Act provides for monthly contributions by the employer plus workers @10 % or 8.33 %. The benefits payable under the Act are: (a) Pension or family pension on retirement or death as the case may be; (b) deposit linked insurance on the death in harness of the worker; (c) payment of PF accumulation on retirement/death etc.

4) Maternity Benefit (Amendment) Act 2017- The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

5) Contract Labour (Regulation and Abolition) Act, 1970 - The Act provides for certain welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor.

6) Minimum Wages Act, 1948 - The employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employment.

7) Payment of Wages Act, 1936 - It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

8) Equal Remuneration Act, 1979 - The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.

9) Payment of Bonus Act, 1965 - The Act is applicable to all establishments employing 20 or more workmen. The Act provides for payments of annual bonus subject to a minimum of 8.33 % of wages and maximum of 20 % of wages to employees drawing Rs. 3,500/- per month or less. The bonus to be paid to employees getting Rs. 2,500/- per month or above up to Rs.3,500/- per month shall be worked out by taking wages as Rs.2,500/- per month only. The Act does not apply to certain establishments. The newly set up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of the Act.

10) Industrial Disputes Act, 1947 - The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

11) Industrial Employment (Standing Orders) Act, 1946 - It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the employer on matters provided in the Act and get the same certified by the designated Authority.

12) Trade Unions Act, 1926 - The Act lays down the procedure for registration of trade unions of workmen and employees. The trade unions registered under the Act have been given certain immunities from civil and criminal liabilities.

13) Child Labor (Prohibition and Regulation) Act, 1986 and it amendments - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labor is prohibited in Building and Construction Industry.

14) Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act, 1979 - The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.

15) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996 - All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay Cess at rate not exceeding 2% of the cost of construction as may be notified by the Government. The employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

Appendix 5: Spoils Management Plan

A. Spoil Management Plan

1. **Purpose and Application:** SMP is to describe how Contractor/ ASCL will manage the spoil generated and reused related to design, and construction works. This is an integral part of EMP. The objective of SMP is to reuse of spoil from works in accordance with the spoil management hierarchy outlined in this document.

2. **Objectives of SMP:** The objectives of SMP are:

- To minimize spoil generation where possible
- Maximize beneficial reuse of spoil from construction works in accordance with spoil management hierarchy
- Mange onsite spoil handling to minimize environmental impacts on resident and other receivers
- Minimize any further site contamination of land, water, soil
- Manage the transportation of spoil with consideration of traffic impacts and transport related emissions
-

3. Structure of SMP:

Section 1: Introduction of SMP
Section 2: Legal and other requirements
Section 3: Roles and responsibilities
Section 4: Identification and assessment of spoil aspects and impacts
Section 5: Spoil volumes, characteristics and minimization
Section 6: Spoil reuses opportunities, identification and assessment
Section 7: On site spoil management approach
Section 8: Spoil transportation methodology
Section 9: Monitoring, Reporting, Review, and Improvements

4. **Aspects and Potential Impacts**: The key aspects of potential impacts in relation to SMP are listed in Table below:

Key Aspect of Potential Impacts

Aspect	**Potential Impact**
Air Quality	Potential for high winds generating airborne dust from the stock piles
Sedimentation	Potential for sediment laden site runoff from spoil stockpiles and potential for spillage of spoil from truck on roads
Surface and Groundwater	Contamination of water (surface and ground water)
Noise	Associated with spoil handling and haulage and storage
Traffic	Impacts associated with spoil haulage
Land Use	Potential for spoil to be transported to a receivable site that doesn't have permission for storage/disposal
Design specifications	Limitations on opportunities to minimize spoil generation
Sustainability	Limited sites for storage, reuse opportunities

A. Spoil volumes, Characteristics and Minimization

5. **Spoil Volume Calculations.** Estimate the volumes of spoils produced from each of the construction site

6. **Characterization of Spoil**. Based on the type of spoil; characterization is done (sandstone, mix materials, reusable materials.

7. **Adopt Spoil Reduce, Reuse Opportunities.** An overview of the assessment methodology to be used is mentioned below.

- Consideration of likely spoil characteristics
- Identification of possible reuse sites
- Screening of possible reuse opportunities

8. **Identification of Possible Safe Disposal Sites for Spoil.** Those spoils which can't be reused shall be properly disposed in designated areas, such disposal areas should be identified in consultation with PMC, ASCL and AMC. Such disposal areas should be safe from environmental aspects and there should be any legal and resettlement related issues. Such areas need to be identified and prior cliental approval should be obtained to use it as spoil disposal area. The local administration must be consulted and if required permission should be obtained from them.

C. Storage and Stock Piling

9. **Stockpiling**. Spoils shall be stockpiled at locations at least 5 m away from water courses and covered.

10. **Transportation and Haulage Route.** Based on the above, the contractor will prepare a transport and route plan, and submit it to the PMC and ASCL for their review and approval.

D. Summary of Key Issues and Remedial Actions

11. Summary of follow up time-bound actions to be taken within a set timeframe.

Appendix 6: Public Consultation Details

AGARTALA SMART CITY LIMITED
(CIN: U74999TR2016SGC013499)
AGARTALA MUNICIPAL CORPORATION, 5TH FLOOR, CITY CENTRE, PARADISE CHOUMUHANI, AGARTALA, WEST TRIPURA- 799001

Minutes of the meeting

A Stakeholders Meeting related to "MBB College Revitalization" and "Renovation and Restoration of Ujjayanta Palace Complex", held on 04.12.2018 from 15:00 Hrs at fifth floor of Agartala Smart City Office Conference Hall.
This meeting has been called upon the observations received during the site visits and meetings held with the representatives of Asian Development Bank (ADB) from 12th to 16th of November 2018.

The following points have been discussed:

Sl. No.	Points discussed	Action taken
1	Heritage Building	It was informed that Ujjayanta Palace is not listed as a heritage building in Archaeological Survey of India (ASI) state heritage building list.
2	Façade lighting and Fountain lighting colour scheme	It was discussed that Façade lighting and Fountain lighting colour scheme has already been approved by Hon'ble Chief Minister, Tripura on 13-08-2018. Hence, no need to change the colour scheme.
3	Provision of light and sound show	Tourism Department confirmed that Light & Sound shows including sitting arrangement has already considered in separate project.
4	Parking facility for visitors' vehicle	It was informed that dedicated parking zone is there opposite to the entry plaza for visitors.

AGARTALA SMART CITY LIMITED

(CIN: U74999TR2016SGC013499)

AGARTALA MUNICIPAL CORPORATION, 5TH FLOOR, CITY CENTRE, PARADISE CHOUMUHANI, AGARTALA, WEST TRIPURA- 799001

Minutes of the Meeting

A Stakeholders Meeting related to "MBB College Revitalization"and "Renovation and Restoration of Ujjayanta Palace Garden", held on 04.12.2018 from15:00 Hrs at 5th floor of Agartala Smart City Office Conference Hall. The meeting notice was circulated vide this office letter No.4 (31)/ASCL/2018/2094-3008 Dated-30.11.2018.

This meeting has been called upon the observations received during the site visits and meetings held with the representatives of Asian Development Bank (ADB) from 12th to 16th of November, 2018.

The following points have been discussed:

Sl. No.	Points discussed	Action taken
01	Details of ownership of the land area under the scope of development.	Land Records and Settlement department agreed to provide MBB lake surrounding area land ownership details and areas by 6th December 2018. PMC has provided plot number that are falling within lake development are submitted to LRS department for details. AMC confirmed that lake is with fisheries department and any approval (Demolition/refurbishment/construction) for same will be provided by Fisheries department.
02	Demarcation/Identification of area for parking in MBB college.	HOD (Botany Dept., MBB college) along with the other House Members have expressed that after college hours, open space along MBB college road can be used for off-street parking for the visitors only, without any Civil modification. Accordingly PMC has been advised by the house not to consider parking space for the visitors by the side of MBB college road (MBB college gate to stadium by the left side) by providing retaining wall and filling of land thereon.

Sl. No.	Points discussed	Action taken
03	Check on the legal permissibility of the temporary structures erected for fishing, etc on the lake waters.	Legal permissibility of fishing decks (Permanent & temporary) to be discussed with Fisheries department. PMC will interact with the Fisheries department separately.
04	Lease details of lakes to Anglers society and relocation of fishing decks of Anglers society.	Lake lease details to be discussed with Fisheries department. PMC will interact with the fishery department separately.
05	Ownership details of Signage/ advertisements/ Hoardings and revenue generated from same.	AMC confirmed that signages/advertisements/hoardings within the lake development area can be removed.
06	Design and maintenance of proposed Botanical Garden by Botanical department of MBB College or the Tripura State Horticultural Society.	MBB college agreed that at the end of O&M period of five (5) years after completion, MBB college shall maintain the Botanical garden.
07	Apart from angling society fishing and repopulation any other user and activities within the MBB lake precinct.	AMC confirmed that apart from Angling society and Fisheries department no other stakeholder is involved in the precinct of MBB lake.
08	Viability and requirement of Ropeway.	Based on the present footfall and previous experience, Tourism department expressed their concern regarding viability of ropeway. Anyhow financial viability of same needs to checked once by PMC.
09	Viability and requirement of Bike track and smart biking system.	It was decided by all concerned that cycle track is not viable due to adverse impact on the ecology, biodiversity and unsuitable gradient along the lake bed.
10	Anticipated concerns like safety/security of women, children, lighting, walkway, solid waste disposal, or any other concerns that may arise due to the future development.	AMC agreed that at the end of O&M period of five (5) years after completion, AMC shall take care of Solid Waste or they may lease out same to third party.
		Joint site visit is proposed on 05.12.2018 with TSECL to check feasibility of relocation feeder transformer at near the Lake.
Revitalization & Renovation and Restoration of Ujjayanta Palace Garden		
1	Heritage Building	It was informed that Ujjayanta Palace is not listed as a heritage building in Archaeological Survey of India (ASI) state heritage building list.
2	Façade lighting and Fountain lighting colour scheme	It was discussed that Façade lighting and Fountain lighting colour scheme has already been approved by Hon'ble Chief Minister, Tripura on 13-08-2018. Hence, no need to change the colour scheme.

Sl. No.	Points discussed	Action taken
3	Provision of light and sound show	Tourism Department confirmed that Light & Sound shows including sitting arrangement has already considered in separate project.
4	Parking facility for visitors' vehicle	It was informed that dedicated parking zone is there opposite to the entry plaza for visitors.

06/12/18

(Er. R. Pal)
Executive Engineer
Agartala Smart City Limited

Enclo : List of attendance

AGARTALA SMART CITY LIMITED
(CIN: U74999TR2016SGC013499)
AGARTALA MUNICIPAL CORPORATION, 5TH FLOOR, CITY CENTRE, PARADISE CHOUMUHANI, AGARTALA, WEST TRIPURA- 799001

No.4 (31)/ASCL/2018/ 3025- 3040 Dated-06.12.2018

Copy to:

1) Managing Director, Agartala Smart City Limited.
2) The Chief Executive Officer, Agartala Smart City Limited (Municipal Commissioner, AMC).
3) The Director, Department of Revenue (Settlement Dept./Directorate of Land Records).
4) The Chairman Pollution Control Board.
5) The Director, Higher Education Department.
6) The Deputy Director Fisheries (Tripura West).
7) The Superintending Engineer, Agartala Municipal Corporation
8) The Senior Architect, PWD.
9) The General Manager (Tech), TSECL, Bidyut Bhavan, Agartala
10) The Director, Department of Forest/ Horticulture.
11) The Principal, MBB College, Agartala.
12) The Managing Director, Tripura Tourism Development Department.
13) The Curator, Tripura State Museum
14) Shri. D. K. Majumder, Conservation Assistant, Archaeological Survey of India, Udaipur Sub Circle.
15) The President, Angler's Society
16) The Team Leader, PMC (Project Management Consultant).

06/12/18

(Er. R. Pal)
Executive Engineer
Agartala Smart City Limited

Name of Project: Agartala Smart City Project (ASCP)- Revival and Restoration of Ujjayanta Palace Complex.

Date: 23 Oct 2019

Sr. No.	Name	M/F	Contact Number
1.	Bikash Saha	m	8974879510
2.	Kalpana Saha	F	9774999060
3.	[illegible]	[illegible]	7005579728.
4.	Debasish Saha	M	7005295912
5.	[illegible]	M	7005460428
6.	[illegible]	m	
7.	[illegible]	m	
8.	[illegible]	m	8731079831
9.	Bibash Banerjee	m	
10.	[illegible]	m	
11.	[illegible]	m	8131881476
12.	[illegible]	m	9862141021
13.	[illegible]	M	8974996189.
14.	[illegible]	F.	
15.	[illegible]	M	8794370688
16.	[illegible]	F	
17.	Hita Bose.	F	—
18.	S.K. Dutta	M	—

Name of Project: Agartala Smart City Project (ASCP)- Revival and Restoration of Ujjayanta Palace Complex.

Date: 23 Oct 2019

Sr. No.	Name	M/F	Contact Number
1.	Manik Lal Das	m	9774584558.
2.	Pradip Sarkar.	m	9862142729
3.	Parthasarathi Das	m	
4.	Dipendranath Kundu.	m.	9932017926
5.	[illegible]	F	—
6.	[illegible]	f	—
7.	[illegible]	F	—
8.	Parul Bala Saha	F	—
9.	Binod Rani	f	
10.			

Public Consultation with vendors of Laxminarayan Bari Temple

Public Consultation with Rikshaw Puller near Eastern Lake Edge

Public Consultation with Daily visitor to Eastern Lake Edge

Public Consultation with Tourists of Ujjayanta Palace

Public Consultation with Shop Owners near Ujjayanta Palace

Public Consultation with Security Staff of Ujjayanta Palace

Appendix 7 : Sample Grievance Registration Form

(To be available in English and local language, if any)

The **ASCL** welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.
Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	**Place of registration**				
Contact Information/Personal Details					
Name		**Gender**	**Male Female**	**Age**	
Home Address					
Village / Town					
District					
Phone no.					
E-mail					
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below: **If included as attachment/note/letter, please tick here:**					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
If – then mode: ▪ **Note/Letter** ▪ **E-mail** ▪ **Verbal/Telephonic**	
Reviewed by: (Names/Positions of Official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	▪ **Yes** ▪ **No**
Means of Disclosure:	

GRIVENCES RECORD AND ACTION TAKEN

Sr. No.	**Date**	**Name and Contact No. of Complainer**	**Type of Complain**	**Place**	**Status of Redress**	**Remarks**

Appendix 8: Letter from Director, Dept. of Higher Education on Ujjayanta Palace Building Heritage Status

EE(AP) 11/10/19

No.F.2 (471-1)-DHE/GTCA/2019/2007(2)
Government of Tripura
Directorate of Higher Education.

Dt. 9/10/2019

To
The Chief Executive Officer,
Agartala Smart City Ltd.

Subject: - Status of Ujjyanta Palace

Sir,

In inviting a reference to the subject cited above, I am to inform you that the issue regarding the status of Ujjyanta Palace has been examined by the Department based on the record available with the section of the Department. So far the records are available in the Department, it is to be stated that the Ujjyanta Palace despite of one of the oldest building in the State, it is yet not declared by the Govt. as a heritage building.

This is for favour of your kind information and doing the needful.

Yours faithfully,
9/10/19
(Saju Vaheed A. IAS)
Director
Higher Education

Copy to:-

The P.S. to the Secretary, Higher Education.

Appendix 9: SAMPLE MONTHLY REPORTING FORMAT FOR CONSTRUCTION SUPERVISION SPECIALIST

This template must be included as an appendix in the IEE that will be prepared for the project. It can be adapted to specific project as necessary.

a. Introduction

- Overall project description and objectives
- Description of sub Projects
- Environmental Category of the sub projects.
- Details of site personnel and I or consultants responsible for environmental monitoring

Overall project and sub project progress and status.

No.	Sub Project Name	Status of the Sub Project			List of works	Progress of works
		Pre- Construction	Construction	Operational Phase		

b. Compliance Status with National I State I Local Statutory Environmental Requirements

No	Sub Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

c. Compliance Status with Environmental Loan Covenants

No (List schedule and Paragraph Number of Loan Agreement)	Covenant	Status of Compliance	Action Required

d. Compliance Status with the Environmental Management and Monitoring Plan

- Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi -annual report send to ADB. Visual assessment and review of relevant site documentation during the routine site inspection needs to note and record the following
- What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries?

- If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads
- Adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain.
- Are their designated areas for concrete works and refueling?
- Are their spill kits on site and if there are site procedure for handing emergencies?
- Is there any chemical stored on site and what is the storage condition?
- Is there any dewatering activities, if yes, where is the water being discharged?
- How are the stockpiles being managed?
- How is solid and liquid waste being handled on site?
- Review of the complaint management system
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation Excellent/ Satisfactory/ Partially satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

Approach and methodology for environmental monitoring of the project

- Brief description on the approach and methodology used for environmental monitoring of each subproject

Monitoring of environmental IMPACTS on PROJECT SURROUNDINGS (ambient air, water quality and noise levels)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site	Date of Testing	Site Location	Parameters (Government Standards)		
			PM_{10} µg/m3	$S0_2$ µg/m3	$N0_2$ µg/m3
Site	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM_{10} µg/m3	$S0_2$ µg/m3	$N0_2$ µg/m3

Noise Quality Results

Site No.	Date of Testing	Site Location	LAeq (dbA) (Government Standard)	
			Day Time	Night Time
Site No.	Date of Testing	Site Location	LAeq (dbA) (Monitoring Results)	
			Day Time	Night Time

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.
- APPENDIXES
- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report

Appendix 10: SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

INTRODUCTION

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number
1. PMU			
2. PIUs			
3. Consultants			

- Overall project and sub-project progress and status

- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/ List of Works	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M)[a]	Contract Status (specify if under bidding or contract awarded)	If On-going Construction	
				%Physical Progress	Expected Completion Date

[a] If on-going construction, include %physical progress and expected date of completion.

II. COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS[a]

Package No.	Subproject Name	Statutory Environmental Requirements	Status of Compliance	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Established

[a] All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.
[b] Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)
[c] Specify if obtained, submitted and awaiting approval, application not yet submitted.
[d] *Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.*

III. COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

IV. COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT PLAN (REFER TO EMP TABLES IN APPROVED IEE/S)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise Implementation Status

Package Number	Components	Design Status (Preliminary Design Stage/ Detailed Design Completed)	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project	Remarks
			Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provi	Final IEE provided to Contractor/s (Yes/No)		

					de Link)		**Director ? (Yes/No)**	

- Identify the role/s of Safeguards Team including schedule of on-site verification of reports submitted by consultants and contractors.
- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.
- Include as appendix all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors.
- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below
- Provide the monitoring results as per the parameters outlined in the approved EMP (or site-specific EMP/construction EMP when applicable).
- In addition to the table on EMP implementation, the main text of the report should discuss in details the following items:

(i) **Grievance Redress Mechanism.** Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

(ii) **Complaints Received during the Reporting Period.** Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

- Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
- Identify muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads.
- Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these were intact following heavy rain;
- Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area.
- Confirm spill kits on site and site procedure for handling emergencies.
- Identify any chemical stored on site and provide information on storage condition. Attach photograph.
- Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.

- Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
- Provide information on barricades, signages, and on-site boards. Provide photographs.
- Provide information on
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary of Environmental Monitoring Activities (for the Reporting Period)[a]

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

[a] attach Laboratory Results and Sampling Map/Locations.

Overall Compliance with CEMP/EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

V. APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

- Brief description on the approach and methodology used for environmental monitoring of each subproject

VI. MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS (ambient air, water quality and noise levels)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)			
			PM10 µg/m^3	PM2.5 µg/m^3	SO2 µg/m^3	NO2 µg/m^3

Surface Water Quality Results

S. No.	Parameters	Results		
		Location-1 (Name)	Location-2 (Name)	Location-3 (Name)
	pH			
	Turbidity			
	Total Hardness			
	DO			
	BOD			
	COD			
	Chloride			
	Iron			
	TSS			

S. No.	Parameters	Results		
		Location-1 (Name)	Location-2 (Name)	Location-3 (Name)
	Arsenic			
	Cadmium			
	Fluoride			
	Potassium			
	Sodium			
	Calcium			
	Zn			
	Cr^{+6}			
	Magnesium			
	Copper			
	Manganese			
	Sulphate			
	Cyanide			
	Nitrate			
	Lead			
	Boron			
	Selenium			
	Aluminium			
	Total residual Chlorine			

Ground water Quality Results

S.No.	Parameters	Results		
		Location-1 (Name)	Location-2 (Name)	Location-3 (Name)
	pH			
	Total Alkalinity			
	Total Hardness			
	Chloride			
	Iron			
	TDS			
	Arsenic			
	Fluoride			
	Zn			
	Cr+6			
	Copper			
	Manganese			
	Sulphate			
	Phosphate			
	Nitrate			
	Lead			
	Phenolic Compound			

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Monitoring Results)	
			Day Time	Night Time

VII. SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- Other

Appendix 11: SAMPLE TRAFFIC MANAGEMENT PLAN (TMP)

Principles

1. One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

(i) the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
(ii) protection of work crews from hazards associated with moving traffic;
(iii) mitigation of the adverse impact on road capacity and delays to the road users;
(iv) maintenance of access to adjoining properties
(v) Avoid hazards in addressing issues that may delay the project.

Operating Policies for TMP

2. The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

(i) Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
(ii) Inhibit traffic movement as little as possible.
(iii) Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
(iv) Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
(v) Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
(vi) Train all persons that select, place, and maintain temporary traffic control devices.
(vii) Keep the public well informed.
(viii) Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

Analyze the impact due to street closure, if required

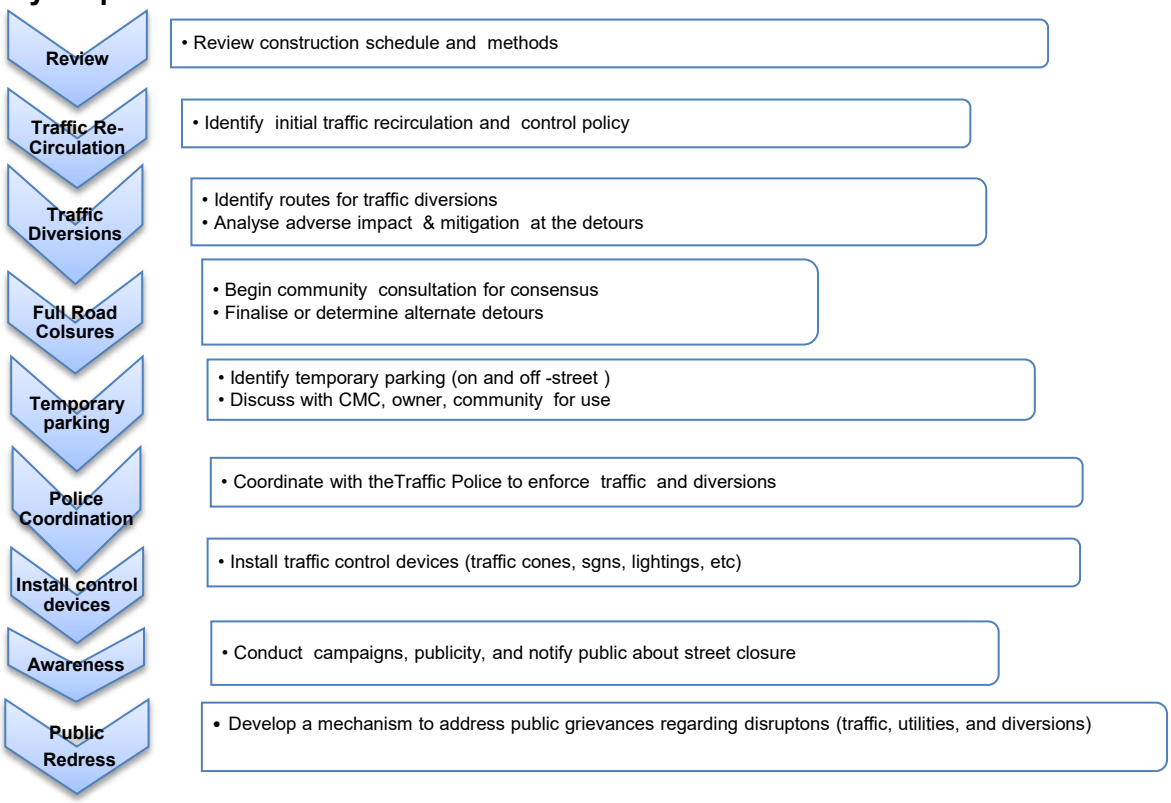
3. Apart from the capacity analysis, a final decision to close a street and divert the traffic should involve the following steps:

(i) approval from the PIU, local administration to use the local streets as detours;
(ii) consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
(iii) determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
(iv) determining if additional traffic control or temporary improvements are needed along the detour route;
(v) considering how access will be provided to the worksite;
(vi) contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
(vii) developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

4. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the Detour Street or public opposition, the full closure can be restricted to weekends

with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Policy Steps for the TMP



Public awareness and notifications

5. As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

6. The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

7. The ASCL/ PIU will also conduct an awareness campaign to educate the public about the following issues:

(i) Traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
(ii) Defensive driving behaviour along the work zones; and
(iii) Reduced speeds enforced at the work zones and traffic diversions.

8. It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

9. The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

(i) explain why the brochure was prepared, along with a brief description of the project;
(ii) advise the public to expect the unexpected;
(iii) educate the public about the various traffic control devices and safety measures adopted at the work zones;
(iv) educate the public about the safe road user behaviour to emulate at the work zones;
(v) tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
(vi) indicate the office hours of relevant offices.

Vehicle Maintenance and Safety

10. A vehicle maintenance and safety program shall be implemented by the construction contractor. The contractor should ensure that all the vehicles are in proper running condition and it comply with roadworthy and meet certification standards of Tripura Govt./ GoI. All vehicles to be used shall be in perfect condition meeting pollution standards of Tripura Govt./ GoI. The vehicle operator requires a pre state of shift checklist. Additional safety precautions will include the requirement for:

(i) Driver will follow the special code of conduct and road safety rules of Government of India
(ii) Drivers to ensure that all loads are covered and secured drivers to ensure operation equipment can’t leak materials hauled
(iii) Vehicles will be cleaned and maintained in designed places.

Install traffic control devices at the work zones and traffic diversion routes

11. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

(i) Signs
(ii) Pavement Markings
(iii) Channelizing Devices
(iv) Arrow Panels
(v) Warning Lights

12. Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal

roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

13. The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

14. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should always be equipped with reflective jackets and have traffic control batons (preferably the LED type) for regulating the traffic during nighttime.

15. In addition to the delineation devices, all the construction workers should always wear fluorescent safety vests and helmets to be visible to the motorists. There should be provision for lighting beacons and illumination for night constructions.

16. The ASCL/ PIU and contractor will coordinate with the local administration and traffic police regarding the traffic signs, detour, and any other matters related to traffic. The contractor will prepare the traffic management plan in detail and submit it along with the EMP for the final approval.

Appendix 12: IBAT PROXIMITY ANALYSIS REPORT

IBAT

Proximity Report

IND: AGARTALA SMART CITY PROJECT

Location: [23.8, 91.3]

Date of analysis: 11 July 2019

Buffers applied: 10km

Generated by: Ninette Pajarillaga

Company/Subscriber: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	0
IUCN Red List	84

Displaying project location and buffers: 10km

About this report

This report presents the results of [954-2901] proximity analysis to identify the biodiversity features and species which are located within the following buffers: 10km.

This report is one part of a package generated by IBAT on 11 July 2019 that includes full list of all species, protected areas, Key Biodiversity Areas in CSV format, maps showing the area of interest in relation to these features, and a 'How to read IBAT reports' document.

Data used to generate this report

UNEP-WCMC and IUCN 2018, Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net. August 2018

BirdLife International (on behalf of the KBA Partnership), 2018. Key Biodiversity Areas: June 2018 version.

IUCN, 2018. IUCN Red List of Threatened Species. Version 2017.3.

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Protected Areas

The following protected areas are found within 10km of the area of interest.
For further details please refer to the associated csv file in the report folder.

No protected areas within buffer distance

Key Biodiversity Areas

The following key biodiversity areas are found within 10km of the area of interest.
For further details please refer to the associated csv file in the report folder.

No KBAs within buffer distance

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.

Species name	Common name	IUCN Category	Taxonomic Class
Acropora rudis		EN	Anthozoa
Aetobatus ocellatus	Spotted eagle ray	VU	Chondrichthyes
Alopias pelagicus	Pelagic thresher	VU	Chondrichthyes
Alopias vulpinus	Common thresher shark	VU	Chondrichthyes
Anacyclus pyrethrum	Atlas daisy	VU	Magnoliopsida
Aonyx cinereus	Asian small-clawed otter	VU	Mammalia
Aquila heliaca	Eastern imperial eagle	VU	Aves
Aquila nipalensis	Steppe eagle	EN	Aves

Species name	Common name	IUCN Category	Taxonomic Class
Arctictis binturong	Binturong	VU	Mammalia
Arctonyx collaris	Greater hog badger	VU	Mammalia
Ardea insignis	White-bellied heron	CR	Aves
Asarcornis scutulata	White-winged duck	EN	Aves
Aythya baeri	Baer's pochard	CR	Aves
Aythya ferina	Common pochard	VU	Aves
Balaenoptera musculus	Blue whale	EN	Mammalia
Bayadera hyalina		VU	Insecta
Buceros bicornis	Great hornbill	VU	Aves
Carcharhinus hemiodon	Pondicherry shark	CR	Chondrichthyes
Carcharhinus longimanus	Oceanic whitetip shark	VU	Chondrichthyes
Carcharias taurus	Sand tiger shark	VU	Chondrichthyes
Carcharodon carcharias	White shark	VU	Chondrichthyes
Clanga clanga	Greater spotted eagle	VU	Aves
Clanga hastata	Indian spotted eagle	VU	Aves
Crocodylus palustris	Mugger	VU	Reptilia
Cuon alpinus	Dhole	EN	Mammalia

IBAT

Species name	Common name	IUCN Category	Taxonomic Class
Dermochelys coriacea	Leatherback	VU	Reptilia
Emberiza aureola	Yellow-breasted bunting	CR	Aves
Francolinus gularis	Swamp francolin	VU	Aves
Gallinago nemoricola	Wood snipe	VU	Aves
Glaucostegus obtusus	Widenose guitarfish	VU	Chondrichthyes
Glaucostegus typus	Giant shovelnose ray	VU	Chondrichthyes
Glyphis gangeticus	Ganges shark	CR	Chondrichthyes
Gyps bengalensis	White-rumped vulture	CR	Aves
Gyps tenuirostris	Slender-billed vulture	CR	Aves
Haliaeetus leucoryphus	Pallas's fish-eagle	EN	Aves
Halophila beccarii	Ocean turf grass	VU	Liliopsida
Helarctos malayanus	Sun bear	VU	Mammalia
Heliopora coerulea		VU	Anthozoa
Heritiera fomes		EN	Magnoliopsida
Hippocampus histrix	Thorny seahorse	VU	Actinopterygii
Hippocampus kelloggi	Great seahorse	VU	Actinopterygii
Hippocampus spinosissimus	Hedgehog seahorse	VU	Actinopterygii

Species name	Common name	IUCN Category	Taxonomic Class
Hippocampus trimaculatus	Three-spot seahorse	VU	Actinopterygii
Holothuria fuscogilva		VU	Holothuroidea
Holothuria lessoni		EN	Holothuroidea
Holothuria scabra		EN	Holothuroidea
Hoolock hoolock	Western hoolock gibbon	EN	Mammalia
Houbaropsis bengalensis	Bengal florican	CR	Aves
Isurus paucus	Longfin mako	EN	Chondrichthyes
Lamiopsis temminckii	Broadfin shark	EN	Chondrichthyes
Laticilla cinerascens	Swamp grass-babbler	EN	Aves
Leptoptilos dubius	Greater adjutant	EN	Aves
Leptoptilos javanicus	Lesser adjutant	VU	Aves
Lutrogale perspicillata	Smooth-coated otter	VU	Mammalia
Macaca arctoides	Stump-tailed macaque	VU	Mammalia
Macaca leonina	Northern pig-tailed macaque	VU	Mammalia
Maculabatis gerrardi	Whitespotted whipray	VU	Chondrichthyes
Manis crassicaudata	Indian pangolin	EN	Mammalia
Mobula birostris	Giant manta ray	VU	Chondrichthyes

IBAT

Species name	Common name	IUCN Category	Taxonomic Class
Mola mola	Ocean sunfish	VU	Actinopterygii
Negaprion acutidens	Sharptooth lemon shark	VU	Chondrichthyes
Neofelis nebulosa		VU	Mammalia
Neophocaena phocaenoides	Indo-pacific finless porpoise	VU	Mammalia
Nycticebus bengalensis	Bengal slow loris	VU	Mammalia
Ophiophagus hannah	King cobra	VU	Reptilia
Oryza malampuzhaensis		VU	Liliopsida
Panthera pardus	Leopard	VU	Mammalia
Pateobatis uarnacoides	Bleeker's whipray	VU	Chondrichthyes
Perdicula manipurensis	Manipur bush-quail	EN	Aves
Platanista gangetica	South asian river dolphin	EN	Mammalia
Prionailurus viverrinus	Fishing cat	VU	Mammalia
Python bivittatus	Burmese python	VU	Reptilia
Rhincodon typus	Whale shark	EN	Chondrichthyes
Rhynchobatus laevis	Smoothnose wedgefish	VU	Chondrichthyes
Rusa unicolor	Sambar	VU	Mammalia
Sonneratia griffithii		CR	Magnoliopsida