Initial Environmental Examination

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India: Visakhapatnam-Chennai Industrial Corridor Development Program – Tranche 2

Development of Road for External Connectivity to Routhusuramala Cluster

Package No: VCICDP/APRDC/05

Prepared by Government of Andhra Pradesh for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 17 November 2022)

Currency unit – Indian rupee (₹)

₹1.00 = $0.012

$1.00 = ₹81.54

ABBREVIATIONS

ADB	-	Asian Development Bank
APPCB	-	Andhra Pradesh Pollution Control Board
APRDC	-	Andhra Pradesh Road Development Corporation
BC		Bituminous Concrete
BGL	-	Below Ground Level
BOD	-	Biological Oxygen Demand
BIS	-	Bureau of Indian Standard
CPCB	-	Central Pollution Control Board
COVID19	-	Corona Virus Infectious disease of 2019
DBM		Dense Bituminus Macadam
DO	-	Dissolved Oxygen
DOE	-	Department of Environment
PMSC	-	Project Management and Supervision Consultant
EA	-	executing agency
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
EMOP	-	Environmental Monitoring Plan
ESO	-	Environmental and Safety Officer
GSB		Granualar Subbase
GOAP	-	Government of Andhra Pradesh
IEE	-	initial environmental examination
IMD	-	Indian Meteorological Department
IS	-	Indian Standard
MFF	-	Multi Tranche Financial Facility
MOEF	-	Ministry of Environment and Forests
MSL	-	Mean Sea Level
MW	-	Mega Watt
NSDP	-	Net State Domestic Product
NGO	-	Non-government organization
NH	-	National Highway
NO_x	-	oxides of nitrogen
PIU	-	Project Implementation Unit
PWD	-	Public Works Department
RF	-	Reserve Forest
ROW	-	right-of-way
WMM	-	Wet Mix Macadam

WEIGHTS AND MEASURES

dBA	-	decibels
°C	-	degree Celsius
km	-	kilometer
lpcd	-	liter per capita per day
m	-	meter
mgbl	-	meter below ground level
mm	-	millimeter
mld	-	million liters per day
km^2	-	square kilometer

NOTE

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

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EXECUTIVE SUMMARY

Project Description. The Asian Development Bank (ADB) approved on 20 September 2016 a multi-tranche financing facility (MFF) worth $500 million and a policy-based loan (PBL) worth $125 million for the Visakhapatnam–Chennai Industrial Corridor Development Program (VCICDP). ADB also approved on that day technical assistance (TA) worth $1 million for Capacity Development for Industrial Corridor Management in Andhra Pradesh and, on 26 September 2016, ADB administration of a $5 million grant from the Urban Climate Change Resilience Trust Fund under the Urban Financing Partnership Facility.

The VCICDP complements ongoing Government of Andhra Pradesh efforts to enhance industrial growth and create high-quality jobs. It has three outputs: (i) corridor management strengthened and ease of doing business improved, (ii) Visakhapatnam–Chennai Industrial Corridor (VCIC) infrastructure strengthened, and (iii) institutional capacity, human resources, and program management enhanced. The MFF and grant support priority infrastructure investments in the VCIC, and the PBL and TA support policy reform and institutional development in the state. The Department of Industries and Commerce (DOIC) of the Government of Andhra Pradesh is the MFF executing agency. The implementing units are Andhra Pradesh Industrial Infrastructure Corporation (APIIC), Transmission Corporation of Andhra Pradesh, Andhra Pradesh Road Development Corporation (APRDC), and Greater Visakhapatnam Municipal Corporation (GVMC).

Impact and Outcome. The impact of VCICDP will be an increased contribution of the manufacturing sector to the state's GDP, trade, and employment. The outcome will be enhanced growth and competitiveness of the VCIC. The Program-based Loan (PBL) will support policy reforms and institutional development in the state's industrial sector (Output 1); and the multitranche financing facility (MFF – two tranches) will support priority infrastructure investments in VCIC (Outputs 2 and 3). The VCICDP will develop two industrial clusters in the Visakhapatnam node—Rambilli and Nakapalli—and two clusters in the Srikalahasti–Chittoor node: Naidupeta and Chittoor–South.

Outputs. The outputs of Tranche 2 of VCICIDP are:

(1) Output 1: Visakhapatnam industrial node infrastructure strengthened. This will (i) develop internal infrastructure in the start-up area of the 160-hectare Rambilli industrial cluster; (ii) develop internal infrastructure in the start-up area of the 441-hectare Nakkapalli industrial cluster with a bulk water transmission line; (iii) widen the 13.8 kilometer (km) Atchuthapuram–Anakapalli road with features friendly to the elderly, women, children, and persons with disabilities (EWCD) for better access to National Highway 16; (iv) improve a 4.4 km access road to the Nakkapalli cluster with EWCD-friendly features; and (v) improve awareness and knowledge among the community members including women in Rambilli and Nakapalli industrial clusters and along Atchuthapuram to Anakapalli roads. Internal infrastructure in these clusters will include roads, storm water drains, water supply systems, and electric power distribution systems. Target industries in the Visakhapatnam node include pharmaceuticals, transport equipment, electronics and information technology, and textiles.

(2) Output 2: Srikalahasti–Chittoor industrial node infrastructure strengthened. This will (i) develop internal infrastructure in the start-up area of the 938-hectare Chittoor–South industrial cluster, (ii) improve a 9.5 km access road to the Chittoor-South industrial cluster with EWCD-friendly features, (iii) improve an 8.7 km access road to the Naidupeta industrial cluster with EWCD-friendly features, and (iv) improve awareness and knowledge among the community

members including women in Chittoor–South industrial cluster. Internal infrastructure in the start-up area of the Chittoor–South cluster will include internal roads, storm water drains, water supply systems, and electric power distribution systems. Target industries in the Srikalahasti–Chittoor node include machinery, food processing, electronics and information technology, and textiles.

(3) Output 3: Sustainable, green, and integrated industrial development enhanced. This will (i) roll out an updated marketing action plan for investment promotion; (ii) enhance skills of people including socially vulnerable and economically weak people; (iii) establish green corridor model operational guidelines at industrial cluster level; (iv) develop a disaster risk management plan to strengthen industrial cluster resilience under extreme weather; (v) formulate a plan for the sustainable operation and maintenance (O&M) of start-up industrial clusters; (vi) roll out a toolkit with gender-responsive and socially inclusive guidance, to integrate industrial and urban planning including industry housing in areas adjacent to industrial clusters; (vii) prepare and implement gender mainstreaming guidelines of DOIC; and (viii) disseminate knowledge of innovative corridor program designs including gender equality and socially inclusive intervention results, to other industrial clusters across the region.

This IEE for package VCICDP/APRDC/05 pertains to the output 2 for the Srikalahasti-Chittoor node for the development of external road connectivity to Routhusuramala Industrial Cluster.

Purpose of the Initial Environmental Examination. ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirement for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. The subproject selection criteria in the MFF's Environmental Assessment and Review Framework (EARF) have been used for screening to ensure the succeeding subprojects will not be potential Category A for environment. Project 2 of the MFF is Category B for environment per ADB SPS, 2009 and requires preparation of initial environmental examination (IEE) report.

This IEE has prepared for Package No. APRDC/05 - Connectivity to Routhusuramala Cluster (Part of South Block of Proposed Yerpedu - Srikalahasthi Node) following the EARF, Government of India laws and policies, and ADB SPS environmental requirements. This IEE will be included in the bid and contract documents. Under EIA Notification 2006 (amended 2009, 2011, and 2013) all new state highways, or expansion of existing state highway outside hilly terrain above 1000 m above mean sea level (amsl) and or ecologically sensitive areas are exempted from the process of obtaining environmental clearance.

Subproject Scope. APRDC has finalized the design standards for roads in rural and built-up areas which will be applicable to VCICDP subprojects to ensure safety of road users. As the roads under the project are intended to improve better connectivity to VCIC, it is intuited that all the connectivity roads under the project would be developed at least to 2-lane standard. The improvement schemes so suggested on the basis of the study would relieve traffic congestion, provide traffic safety along the route and bring about savings in vehicle operating and total transportation costs. The improved road conditions would promote user comfort, safety and environmental standards. In addition to the above the better road condition will help to decrease the air and noise pollutions and reduce GHG emissions.

Package No. APRDC/05 - Connectivity to Routhusuramala Cluster (Part of South Block of Proposed Yerpedu - Srikalahasthi Node) subproject includes widening of the existing road to a 2-lane configuration. The sub project Neleballi to Pallamala on Tada-Srikalahasti Road section passes mainly through two districts from 0+000 Km to 3+200 km comes under Nellore district and remaining part of the road falls in Chittoor district. The length of the proposed project is 9.461

kilometers (having the existing road length as 2.50 km and realignment/bypass length of 6.961 km) having a design speed of 100 km/hr (Ruling), 80km/hr (Minimum) 65 km/hr adopted for shorter length project road stretches (<20km length). The improvement work will be undertaken along the existing alignment and the requirement for additional land is being ascertained to accommodate the proposed improvement work. There are no environmentally critical areas in the project road. Sufficient length of crash barriers along with Road Signages are being provided throughout the project. In line with APRDC's design standards for roads, the subproject has considered road safety elements based on road safety experts' suggestions and specific components as proposed under the road safety program to be implemented during the operations stage.

Description of the Environment The 9.461 km sub project road passes mainly though plain and rolling terrain. The topography of the region is mixed type with combination of horizontal and vertical curves. The land use is mixed type with sections of agricultural land on plains and small/medium size industries in clusters. There exists a tar plant and stone quarry beside the project road. Roadside plantation is observed at few places on the project road. There are no protected areas, forests, wetlands, mangroves, or estuaries in or near the subproject locations. The subproject road is not passing through any wildlife sanctuary, national park, tiger reserve, protected area or any other similar eco-sensitive areas. There are no physical cultural resources along the 9.461 km road stretch. Most of the project road is covered by roadside vegetation.
It is found that about 109 trees existing along the subproject road will be impacted. The major species impacted along the ROW envisaged are mango tree, coconut, palm, neem, and eucalyptus.

Potential environmental impacts and mitigation measures. The subproject is unlikely to cause significant adverse impacts because: (i) most of the individual components involve straightforward construction and operation, so impacts will be mainly localized; (ii) in most cases the predicted impacts are localized and likely to be associated with the construction process at isolated locations and are produced because the process is invasive, involving excavation, obstruction at specific construction locations, and earth movements; and (iii) being located mainly along roads and built-up area will not cause direct impact on terrestrial biodiversity values. The potential adverse impacts can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Civil works will be implemented by contractors to be engaged by APRDC. The design and requirements are in accordance with Indian Bureau of Standards which follows international good practices.

During construction, impacts will likely arise from the earthworks, materials storage, construction wastes, workers camp/s, and disturbance to residents, businesses, and traffic. These temporary impacts are common for construction activities in rural / urban areas, and there exist well-developed methods for their effective mitigation. Contractor and subcontractor will be required to submit a site-specific environmental management plan (SEMP) prior to start of works and to ensure: The contractor will identify the source of construction material and procure from approved sources. This material includes aggregate sand and borrowed earth. Details of borrow areas and aggregate suppliers are mentioned in the IEE (refer tables 2-5, 2-6 and Appendix – 14). The following will be adhered to during project implementation: i) earthworks will be conducted during the dry season to avoid difficult working conditions that prevail during the monsoon; (ii) stockyards are located at least 300m away from watercourses; (iii) fuel and lubricant storage areas are located away from drainage; (iv) construction wastes are minimized and disposal facilities are identified; (v) locations of workers camps, if needed are approved by implementing agency; (vi) wastewater are prevented from entering into streams, watercourses, or irrigation channels; (vii)

open burning of solid wastes is strictly prohibited and strict segregation, reuse and recycling activities within the construction site and workers camp; (viii) area sensitive receptors are factored in work schedule and construction methodology; (ix) coordinate with social safeguards team for potential disturbances to roadside shops and vendors; and (x) traffic management and road signages are coordinated with APRDC and local traffic police.

During operation, impacts will likely arise from road safety issues, and repair and maintenance activities. To address road safety issues, the design of the road follows APRDC design standards and VCICDP Project 2 includes suggestions provided by a road safety expert during the design phase to prepare the road safety program. Potential impacts during maintenance phase will include repair and maintenance activities similar in nature with construction impacts but of lesser duration and significance.

Environment Management Plan. This IEE includes an environmental management plan (EMP) to avoid and mitigate potential impacts and risks identified in the environmental assessment. The EMP covers general mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.

As this IEE and EMP is included in the bid and contract documents, the contractor and subcontractors are required to (i) comply with the measures relevant to the contractor in the IEE and the EMP; (ii) make available a budget for all such environmental measures; (iii) provide the implementing agency with a written notice of any unanticipated environmental risks or impacts that arise during construction, implementation or operation of the subproject that were not considered in the IEE and the EMP; (iv) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and (v) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.

The contractor will be required to submit a submit to the project implementing unit (PIU) the site-specific environmental management plan (SEMP) prior to start of works to ensure site-specific conditions and mitigation measures are appropriate, practical and applicable. The SEMP will include (i) mitigation measures in line with the EMP included in this IEE including; (ii) contractor's roles and responsibilities in obtaining statutory clearances, stakeholders engagement, consultations, and grievance redressal; (iii) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (iv) monitoring program as per SEMP; and (v) budget for SEMP implementation. PIU will review the SEMP, supervise its implementation, and advise contractors on any corrective actions, if required. A copy of the approved SEMP will be kept on-site and available to stakeholders at all times.

Indicative EMP Cost. Based on the mitigation measures and monitoring program as specified in the EMP of this IEE, the indicative budget for implementation is **₹30,73,000**. The cost includes cost towards compensatory afforestation for 109 trees that will be impacted, monitoring for air quality, water quality, and noise levels for baseline and during construction, capacity building, workforce, administrative and other costs (such as public consultation and information disclosure, and GRM implementation). The costs to implement mitigation measures related to construction and execution of works (signs, barricades, warning systems, traffic management, occupational health and safety, waste management and disposal, etc.) are to be covered as part of the civil works.

Consultation, Disclosure, and Grievance Redress Mechanism. The stakeholders were involved during the IEE through public consultations and on-site discussions. The views expressed by stakeholders were incorporated in the IEE and project design. IEE will be made available to the public through the ADB and APRDC websites, and contractors during construction period. The consultation process will continue during project implementation to ensure that stakeholders are fully engaged in the project and can participate in its development and implementation. A grievance redress mechanism is described within IEE to ensure that public grievances are recorded and addressed quickly.

Implementation Arrangement. The implementation arrangements put in place for the MFF, and Project 1 will continue for Project 2. Program management unit (PMU) established within Directorate of Industries by DOIC (EA), is responsible for planning, implementation, monitoring and supervision, and coordination of MFF. PMU is supported by Project implementation units (PIUs) established in Andhra Pradesh Road Development Corporation (APRDC) which will implement road infrastructure subprojects under Project 2. PMU and PIUs are supported by a Project Management and Supervision Consultant (PMSC). The institutional roles and responsibilities of PMU and PIUs are established to ensure environmental safeguards are implemented and complied with during design, construction, and operation phases. PMU is staffed with safeguards officers to oversee and ensure environmental and social safeguards compliance. APRDC has three environmental safeguards managers (one each in Rajahmundry, Vizag and Tirupati) to oversee the day-to- day implementation of SEMPs by the contractors and ensure safeguards compliance. PMSC team with an environment specialist and a health and safety specialist based in PMU and supported by two field-based environmental engineers in Vizag and Chittoor Nodes will assist APRDC and PMU in implementation, monitoring, and reporting on environmental safeguards. Contractors will be responsible for implementing the mitigating measures during the design/construction phase, and APRDC and PMU will be responsible for monitoring.

Monitoring and Reporting. PMU will be responsible for overall environmental safeguards compliance of the project. APRDC, with support from PSMC, will submit monthly monitoring reports to PMU. PMU will consolidate the monthly reports and will send semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports on its website.

Conclusions and Recommendations. Based on the findings of the IEE, the connectivity road improvement subproject is unlikely to cause any significant, irreversible or unprecedented environmental impacts. It is a small road improvement section of 9.461 km with potential impacts that will be localized, temporary in nature and can be addressed through proven mitigation measures. Hence, the classification of the subproject as Category B per ADB SPS, 2009 is confirmed and no additional study or environmental assessment is required to be conducted.

The Contract for this package has been awarded and any changes during implementation in the alignment / design will be included and IEE shall be updated accordingly.

Recommendations are as follows:

- IEE including EMP was part of the bid and contract document.
- Obtained statutory clearances prior to award of contract and ensured conditions/requirements are incorporated in the subproject design and documents.
- during bidding stage, orientation on the environmental safeguard requirements is provided to interested bidders.

- upon mobilization of the contractors, PMU and PIU to provide a safeguards orientation per IEE and project administration manual.
- contractor to appoint environmental safeguards nodal person responsible for environmental safeguards compliance, occupational health and safety and core labor standards.
- submit to PIU the site-specific EMP (SEMP) and other subplans as required; and
- Prepare and implement tree management plan for removal of trees in road right of way and to carryout afforestation
- Conduct baseline monitoring of air, noise, water etc before the start of civil works, and conduct periodically during the works as per the environmental monitoring plan
- PMU and PIU to closely monitor contractor's implementation of the SEMP and provide guidance on corrective actions on a timely manner.

I. INTRODUCTION

A. Background

1. The Visakhapatnam-Chennai Industrial Corridor Development Program (VCICDP) has been taken by the Government of Andhra Pradesh (GoAP) with ADB loan assistance to support infrastructure development, and policy and institutional reforms to stimulate economic growth and employment generation. will complement the ongoing efforts of the GoAP to enhance industrial growth and create high quality jobs. The VCICDP comprises a multitranche financing facility (MFF), a grant, and a policy-based loan (PBL). The MFF and the grant will support priority infrastructure investments in the Visakhapatnam-Chennai Industrial Corridor (VCIC) and the PBL will support policy reforms and institutional development in the state.

2. The road improvement subprojects that have been identified for the MFF include: (i) Rajangaram–Samarlkot (also known as "ADB Road", 29 km), (ii) Anakapalli–Atchuthapuram (13.78 km), and (iii) connectivity roads to the industrial clusters of Nakkapalli, Rambilli and Chittoor. Project 1 of the MFF includes Rajangaram–Samarlkot (ADB Road) while Project 2 will include Anakapalli–Atchuthapuram road improvement and three connectivity roads. The implementing agency is the Andhra Pradesh Road Development Corporation (APRDC).

3. Andhra Pradesh Industrial Infrastructure Corporation Limited (APIIC) a wholly owned undertaking of Government of Andhra Pradesh (GoAP) has a mandate to develop industrial areas across the state. APIIC has developed around 300 Industrial Parks spread over an extent of 121,655 acres and in addition it has also developed sector specific industrial parks and special economic zones at strategic locations across the state. The project roads are located in the State of Andhra Pradesh (AP) and can be referred as part of external connectivity to coastal corridors. The variation order V of Package-1 of additional roads falls under three districts of AP namely Nellore, Chittoor and Visakhapatnam (Vizag).

4. Visakhapatnam (nicknamed as Vizag and sometimes known by its historical name (Waltair) district is situated in the Eastern Ghats and on the coast of Bay of Bengal on the east. The city is known for heavy industries, steel plant, seaport, natural harbour and shipyard. The main objectives of the improvements are to improve the regional, as well as inter and intra state transport flows, and in doing so improving access to services, and making the State attractive to developers and investors. To fulfil the above objectives and due considerations to environmental feasibility of above road section, Initial Environmental Examination (IEE) was carried out for this section.

B. Purpose of the Initial Environmental Examination

5. ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirement for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. The subproject selection criteria in the MFF's Environmental Assessment and Review Framework (EARF) have been used for screening to ensure the succeeding subprojects will not be potential Category A for environment. Project 2 of the MFF is Category B for environment per ADB SPS, 2009 and requires preparation of initial environmental examination (IEE) report.

6. This IEE has been prepared for Package No. APRDC/05 - Connectivity to Routhusuramala Cluster (Part of South Block of Proposed Yerpedu - Srikalahasthi Node) following the EARF, Government of India laws and policies, and ADB SPS environmental

requirements. In line with APRDC's design standards for roads, the subproject has considered road safety elements as per suggestions by the road safety expert based on the road safety program. This IEE will be included in the bid and contract documents. The subproject is not listed under Schedule 1 of the Government of India's Environment Protection Act (EPA) and Environment Protection Rules (EPR) therefore this IEE is not required to be approved by the Andhra Pradesh State Environmental Impact Assessment Authority (SEIAA). However, the subproject requires to meet Government of India requirements related to prevention of pollution, occupational health and safety, and labor standards. A section on required statutory clearances is included in this IEE.

7. **Name and Address of the Individual Institution Preparing the Report.** The project proponent is:

Project Management Unit
Visakhapatnam-Chennai Industrial Corridor Development Program
Commission on Industries
Government of Andhra Pradesh

8. The subproject will be implemented by APRDC through its network at district level. The detailed project preparation has been assigned to Roughton International Ltd, UK in association with SATRA Infrastructures Management Services Private Ltd. The IEE report has been prepared by APRDC with support from technical assistance consultants and Detailed Project Report consultants (M/s SATRA Infrastructures Management Services Pvt Limited with address at Centre Pont Building near Rasoolpura Metro Station, Begumpet, Hyderabad).

9. Initial screening and identification of potential impacts were conducted using ADB's rapid environmental assessment (REA) checklist (Appendix 1) and the scope of the IEE was determined using a "No Mitigation Scenario - Scoping Checklist" (Appendix 2). The study team visited the road alignment and nearby areas to identify the potential impacts (both positive and negative), met local people and conducted meetings, brainstorming sessions, field examinations, and data gathering.

10. The IEE report follows the recommended outline per ADB SPS and primarily:

(i) meets both Government of India's EPA and EPR.
(ii) provides information on the project and its environmental requirements.
(iii) provides the baseline physical, ecological, cultural and socioeconomic environments and resources in and surrounding the project's area of influence.
(iv) identifies and assesses potential environmental impacts arising from the implementation of the project.
(v) recommends measures to avoid, mitigate, and compensate the adverse impacts.
(vi) presents information on stakeholder consultations and participation during project preparation.
(vii) recommends a mechanism to address grievances; and
(viii) includes an environmental management plan.

II. DESCRIPTION OF THE SUBPROJECT

A. Need and Relevance of the Subproject

11. The Visakhapatnam-Chennai Industrial Corridor Connectivity Project is vital from the point of connecting various industrial corridors to the National Highways for the ease in transportation of goods and inviting various industries by providing other infrastructure facilities like water, power etc.

12. The implementation of various subproject items will have the following direct benefits:

(i) Improved quality of life for the rural population in the project influence area (10 km radial distance from the Project road), this as a result of better access to markets, health, education and other facilities;
(ii) A more efficient and safe road transport system through reduced travel times, reduced road accidents, reduced vehicle operating and maintenance costs and reduced transportation costs for goods.

13. Road widening is required for improving the connectivity to industrial cluster.

14. The subproject Neleballi to Pallamala on Tada-Srikalahasti Road section has been proposed to implement and upgrade to two lane road on priority base. The project road passes mainly through two districts from 0+000 km to 3+200 km comes under Nellore district and remaining part of the road falls in Chittoor district. The project road passes mainly though plain and rolling terrain. The topography of the region is mixed type with combination of horizontal and vertical curves. The land use is mixed type with sections of agricultural land on plains and small/medium size industries in clusters. There exists a tar plant and stone quarry beside the project road. Roadside plantation is observed at few places on the project road.

15. The length of the proposed project is 9.461 kilometers (having the existing road length as 2.50 km and realignment/bypass length of 6.961 km) having a design speed of 100 km/hr (Ruling), 80km/hr (Minimum) 65 km/hr adopted for shorter length project road stretches (<20km length).

16. The improvement work will be undertaken along the existing alignment and the requirement for additional land is being ascertained to accommodate the proposed improvement work. There are no environmentally critical areas in the project road.

Table 1: Description of APRDC-APIIC Connectivity Roads

As per ToR			As Per Design
S. No	**Name of the road project**	**Length (Approx) (in km)**	**Proposed Length (in km)**
1	External Connectivity to Naidupeta industrial Cluster with NH – 16	6.9	8.700
2	**Connectivity to Routhusuramala Cluster (Part of South Block of Proposed Yerpedu – Srikalahasthi Node)**	10.3	**9.461**
3	External Connectivity to Nakkapalli Cluster, Visakhapatnam District (Kagitha to Patimeda)	16	4.427
Total		**33.2**	**22.588**

Figure 1: Map Showing various APIIC-Industrial Clusters along the VCIC Corridor

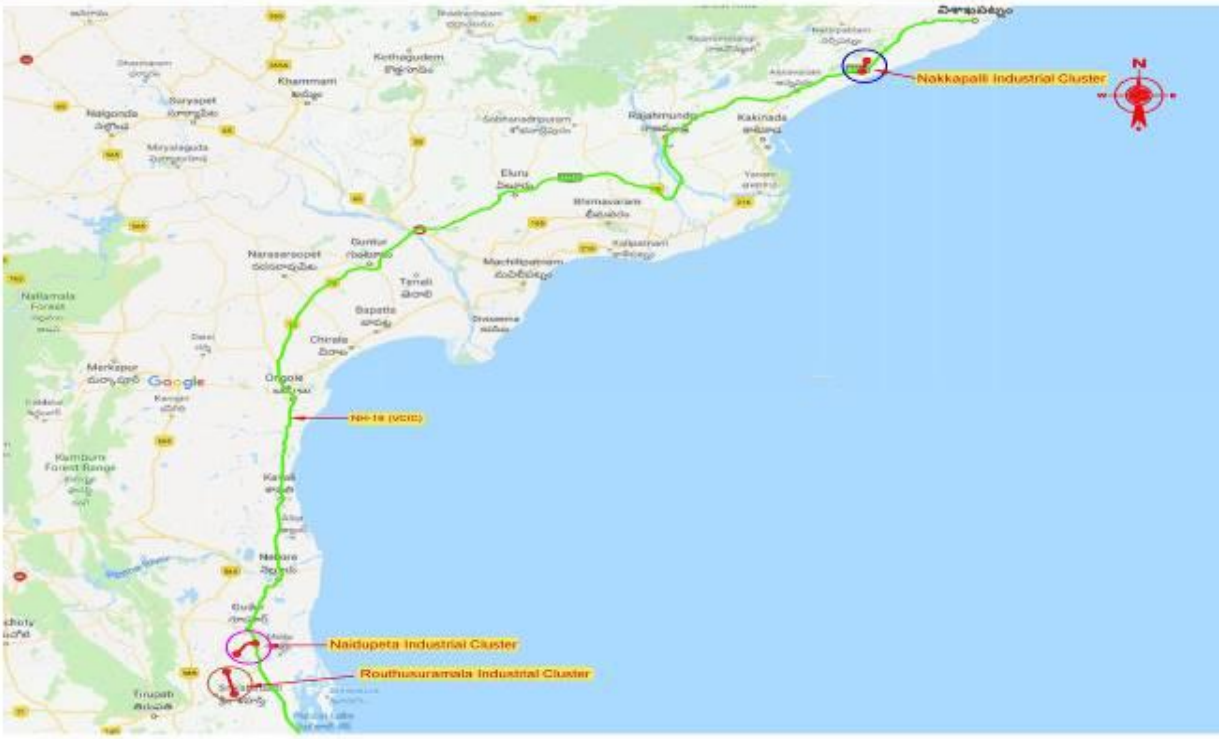


Figure 2: Routhusuramala Cluster (Neleballi to Pallamala Village)

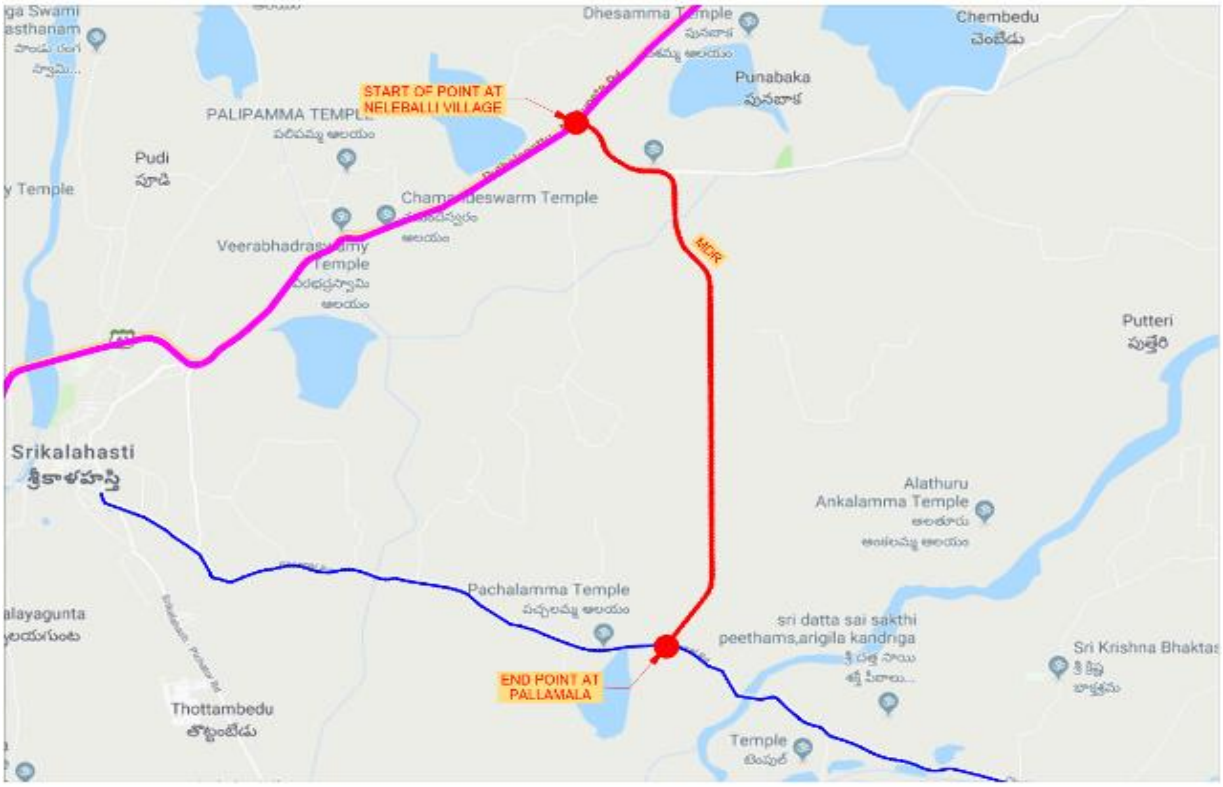
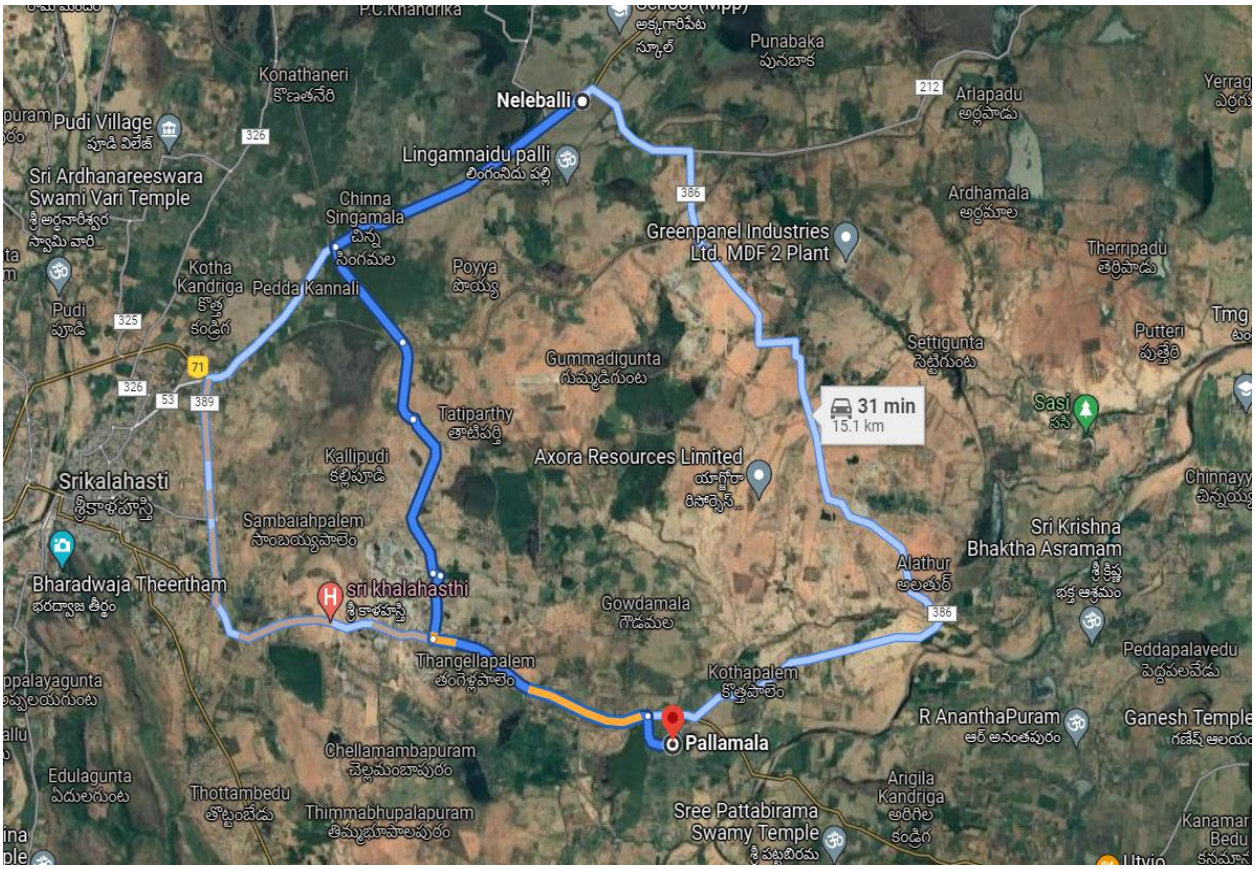


Figure 3: Routhusuramala Cluster (Neleballi to Pallamala Village) – Surrounding Area



B. Existing Scenario

17. The entire project road is classified as ODR (Other District Road) throughout its length i.e., from 0/000 to 5/060. The project road starts at KM 0/000 (KM 163/200 of NH-71), Tirupathi - Naidupeta Road near Neleballi Village and ends at 5/060 near Routhusuramala village as shown in Figure 2. The villages along the project road are Neleballi, Gummadigunta, Routhusuramala, Bhavanisankarapuram, Gowdamala, Kothapalem and Pallamala. The subproject involves re-construction and widening of 9.207 km stretch of Routhusuramala cluster.

C. Subproject Scope

18. The length of the proposed project is 9.461 (having the existing road length as 2.50 km and realignment/bypass length of 6.961 km) having a design speed of 100 km/hr (Ruling), 80km/hr (Minimum) 65 km/hr adopted for shorter length project road stretches (<20km length). The sub project Neleballi to Pallamala on Tada-Srikalahasti Road section has been proposed to implement and upgrade to two lane road on priority base. The project road passes mainly through two districts from 0+000 km to 3+200 km comes under Nellore district and remaining part of the road falls in Chittoor district.[1]

[1] The strip map with an overlay of the alignment of proposed road improvement, existing ROW and finalized new ROW shall be prepared and included in the updated IEE after contractor is mobilized and prior to start of construction.

1. Start Point of the Project Road

19. The project road starts at km 0/000 (KM 163/200 of NH-71), Tirupathi - Naidupeta road near Neleballi Village.

Figure 4: Start Point of the proposed subproject road

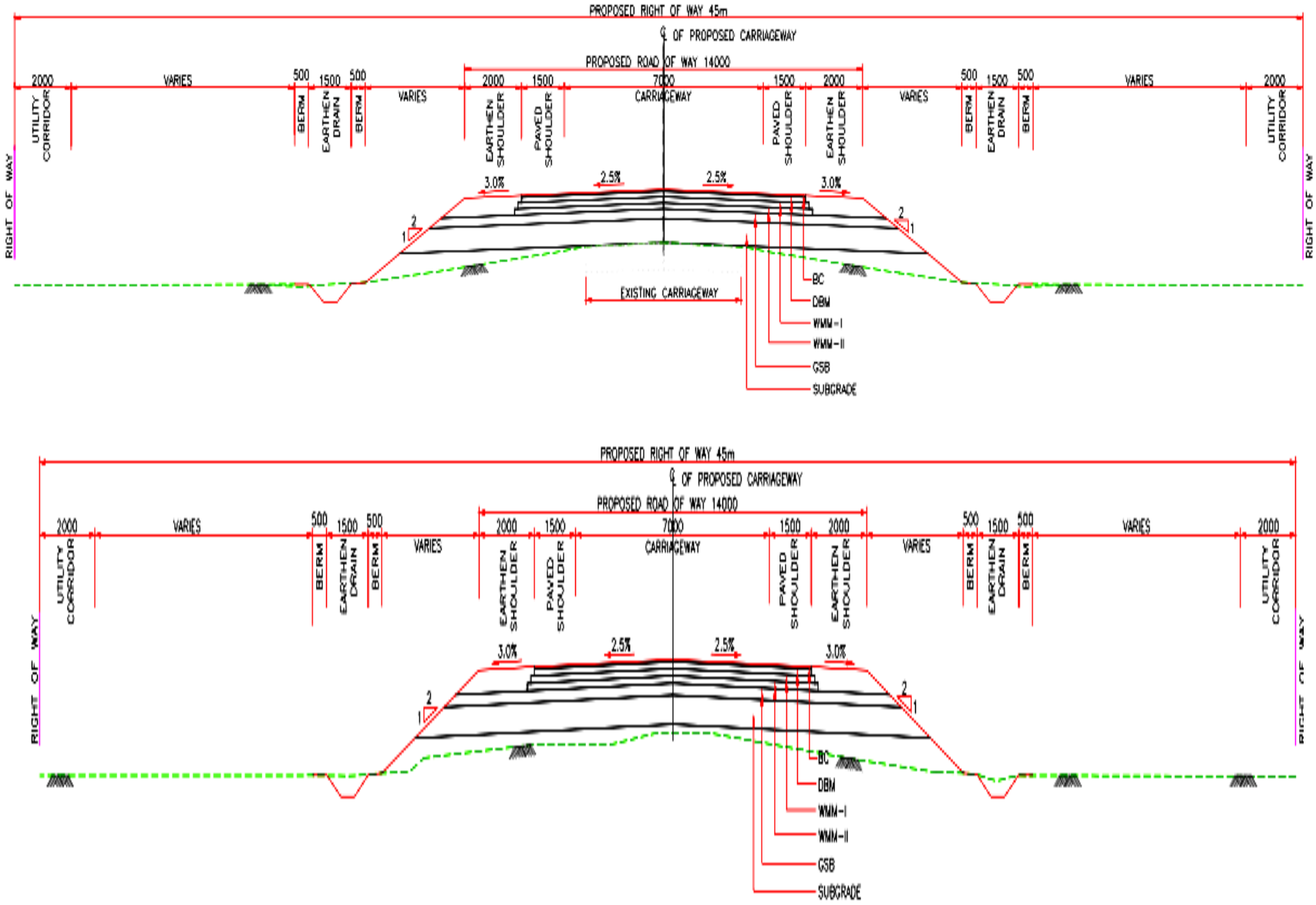
2. End Point of the Project Road

20. The End point of the project road is located at km 5/060 near Routhusurmala village.

Figure 5: End Point of the proposed subproject road

21. The typical cross section of road is shown in Figure below:

Figure 6: Typical Cross Section



22. The various improvement components are:

Table 2: Description of Road Section

Road Section	Distance in km	District	Summary of General Road Condition & Environmental Features	Likely Scope of Road Improvement Work
Connectivity to Routhusurama la Cluster (Part of South Block of Proposed Yerpedu – Srikalahasthi Node)	9.461	Visakha patnam	The project road is a part of VCIC corridor. The topography of the region is plain terrain. The land use is mixed with habitations at few settlements. Road site plantations at a few places, stone quarry and a tar plant are besides the project road.	The improvement work includes widening of the existing carriageway to 2 lane configurations.
			Most of the project road is covered by roadside vegetation. It is found that about 109 trees existing along the project road.	Cross drainage structures shall be rehabilitated and replaced as found necessary

D. Details of Structures

Table 3: Cross Drainage Structures

Cross Drainage Structures

S.No	Existing Chainage (Km)	Topo Chainage (Km)	Design Chainage (Km)	Details of Inventory				Improvement Proposal							Co-ordinates		Remarks
				Type of Structure	No. of Spans	Span/Dia	Deck width (m)	Improvement Proposal	Type	No of Spans	Span/Dia	Top Slab thickness	Wall thickness	Bottom Slab thickness	X	Y	
1	0+200	9+456	0+205	Pipe	2	0.6	7.90	Reconstruction	Box	1	2.00	0.25	0.25	0.30	367164.17	1525858.686	
2	0+850	-	0+835	Pipe	1	0.40	10.30	Reconstruction	Box	1	2.00	0.25	0.25	0.30	367517.567	1525359.505	
3	0+920	8+706	0+937	Slab	1	1.80	6.50	Reconstruction	Box	1	2.00	0.25	0.25	0.30	367602.724	1525302.249	
4	1+100	8+538	1+107	Slab	1	2.80	6.20	Reconstruction	Box	1	3.00	0.30	0.30	0.35	367746.205	1525212.486	
5			1+228					New Construction	Box	1	2.00	0.25	0.25	0.30	367860.088	1525172.256	
6			1+723					New Construction	Box	1	2.00	0.25	0.25	0.30	368307.077	1525015.445	
7		-	1+977					New Construction	Box	1	2.00	0.25	0.25	0.30	368377.918	1524776.459	
8			2+759					New Construction	Box	1	2.00	0.25	0.25	0.30	368490.49	1524011.09	
9		-	2+964					New Construction	Box	1	2.00	0.30	0.30	0.35	368621.66	1523854.146	new construction on existing road
10	3+250	-	3+223	Pipe	3	0.60	10.10	Reconstruction	Box	1	4.00	0.40	0.40	0.45	368793.5	1523659.732	Overtopping 0.60m above RL

S.No	Existing Chainage (Km)	Topo Chainage (Km)	Design Chainage (Km)	Details of Inventory				Improvement Proposal							Co-ordinates		Remarks
				Type of Structure	No. of Spans	Span/Dia	Deck width (m)	Improvement Proposal	Type	No of Spans	Span/Dia	Top Slab thickness	Wall thickness	Bottom Slab thickness	X	Y	
11			3+588					New Construction	Box	1	2.00	0.25	0.25	0.30	369030.428	1523382.572	new construction on existing road
12	-		4+262	-	-	-	-	New Construction	Box	2	3.00	0.30	0.30	0.35	369380.848	1522827.631	Realignment
13	-		4+502	-	-	-	-	New Construction	Box	1	2.00	0.25	0.25	0.30	369427.228	1522591.427	Realignment
14			4+897					New Construction	Box	1	2.00	0.30	0.30	0.35	369503.203	1522204.509	
15	-		4+969	-	-	-	-	New Construction	Box	2	3.00	0.30	0.30	0.35	369517.217	1522133.142	Realignment
16	-		5+219	-	-	-	-	New Construction	Box	1	2.00	0.25	0.25	0.30	369565.3	1521888.265	Realignment
17	-		5+487	-	-	-	-	New Construction	Box	1	2.00	0.25	0.25	0.30	369577.767	1521623.479	Realignment
18	-		6+160	-	-	-	-	New Construction	Box	1	3.00	0.30	0.30	0.35	369400.758	1520973.374	Realignment
19	-		6+527	-	-	-	-	New Constructio	Box	1	2.00	0.25	0.25	0.30	369303.752	1520619.335	Realignment

S.No	Existing Chainage (Km)	Topo Chainage (Km)	Design Chainage (Km)	Details of Inventory				Improvement Proposal				Top Slab thickness	Wall thickness	Bottom Slab thickness	Co-ordinates		Remarks
				Type of Structure	No. of Spans	Span/Dia	Deck width (m)	Improvement Proposal	Type	No of Spans	Span/Dia				X	Y	
20	-		6+941	-	-	-	-	New Construction	Box	1	2.00	0.30	0.30	0.35	369194.33	1520219.984	Realignment
21	-		7+380	-	-	-	-	New Construction	Box	1	2.00	0.25	0.25	0.30	369080.898	1519796.695	Realignment
22	-		7+895	-	-	-	-	New Construction	Box	1	2.00	0.25	0.25	0.30	368947.409	1519298.737	Realignment
23	-		8+344	-	-	-	-	New Construction	Box	1	3.00	0.30	0.30	0.35	368831.086	1518865.147	Realignment
24	-		9+434	-	-	-	-	New Construction	Box	1	3.00	0.40	0.40	0.45	368258.019	1517950.993	Realignment

Parallel Drains:

Trapezoidal unlined drain proposed on both side of the alignment.

Requirements of Crossings and PUP/VUPs etc:

Nil

E. Major and Minor Bridges

23. Project road passes through 4 minor brides at km 0+374,0+755, 2+322, 8+905 and one major bridge at km 8+172

S.No	Existing Chainage	Design Chainage	Type of bridge	Details of existing bridge					Improvement Proposal				Remarks
				Type of Superstructure	Type of Substructure	Span	Total length in (m)	Deck width (m)	Improvement Proposal	Span	Total length of new Bridge (m)	Deck width of New Bridge (m)	
1	-	8+172	Rcc I-Girder	-	-	-	-		New Construction	5 x 15	75	1 x 16	Realignment

S.No	Existing Chainage	Design Chainage	Type of bridge	Details of existing bridge					Improvement Proposal				Remarks
				Type of Superstructure	No. of Spans	Span/Dia	Total length in (m)	Deck width (m)	Improvement Proposal	Span	Total length of new Bridge (m)	Deck width of New Bridge (m)	
1	9+296	0+374	Slab	Stone Masonry	2	3.00	6	6.50	Reconstruction	2 x 10	20	1 x 16	
2	8+891	0+755	Slab	Stone Masonry	2	1.60	3.2	6.10	Reconstruction	1 x 10	10	1 x 16	
3	7+185	2+322	MNB	RCC Slab	2	12.00	24	4.30	Reconstruction	2 x 12	24	1 x 16	Unlined canal
4	-	8+905	-	-	-	-	-	-	New Construction	3 x 10	30	1 x 16	Realignment

F. Proposed Improvement Components

24. **Traffic Considerations**. The traffic characteristics of the existing road were studied to evaluate the potential of the existing road and identify the major issues to develop various components of the proposed improvement work.

G. Proposed Improvements

25. Based on the traffic projections and capacity analysis, the project road has been recommended to develop to 2 lanes with Paved Shoulder standard.

26. Horizontal geometry will be based on IRC: 38-1988 “Guidelines for Design of Horizontal Curves for Highways and Design Tables (First Revision)” and vertical geometry will be based on IRC: SP 23-1993. Existing gradients in some sections are steep approaching the limiting values or even more than the exceptional values in some stretches. But due to site constraints only minor easing has been feasible.

27. Side drains unlined, lined and lined with cover will be designed for the project road.

28. Major junctions at start and end points of both ends are proposed for improvement as per geometrics laid down in IRC: SP: 41-1994 subject to roadside structures/features constraints.

29. Pavement profile will have a 200 mm, 250 mm, 85 mm, and 40 mm thicknesses for GSB, WMM, DBM, and BC, respectively.

30. Lay bays/parking areas and wayside amenities are proposed as these may be required based on present and projected traffic volume considerations. Bus bays and rest areas will be constructed at required locations.

31. By passes / Re-alignment Requirements: One major re-alignment/bypass (5.76 km) have been proposed along the project road (from Ch. 3+700 to Ch. 9+461) near Routhusuramala settlement.

32. Road safety measures are proposed as per IRC: SP: 44-1996 like road delineators, signage, metal beam crash barriers (at sharp curves and bridge approaches) and guideposts (to delineate the edge of formation).

33. Various Signage's proposed along the project road are:

Table 4: Details of Traffic Signage Proposed

S. No	Signboards	Routhusuramala
	Length of the Project Road	**9.207**
1	60 cm equilateral triangle (Warning Sign)	-
2	60 cm circular (Mandatory Sign)	42
3	90 cm circular (Mandatory Sign)	3
4	80 mm x 60 mm rectangular (Information Sign)	-
5	60 cm x 45 cm rectangular (Information sign)	8
6	60 cm x 60 cm square (Information Sign)	-
7	90 cm high octagon (Stop Sign)	5
8	Direction and Place Identification Signs up to 0.9 m^2 Size Board.	10
9	Direction and Place Identification Signs with size more than 0.9 m^2 size Board.	-
10	Gantry Signs	2
11	Cantilever signs	-
12	Reassurance Sign	4
13	0.5*0.6 Sigle Chevaron (cautionary)	82
14	0.45*0.9 Hazard markers	58
Total		**214**

34. The road improvement subproject will be implemented in 24 months and as one construction package (Package No. VCICDP/APRDC/05).

35. **Construction materials required and borrowed area.** The different materials required for constructions of proposed road are mentioned in the Table below:

Table 5: Quantity of construction materials required for Nelaballi to Pallamala Road (from km 0+000 to km 9+207)

Neleballi- Pallamalla (From 0+000 km to 9+207 km)			
S. No	**Item Description**	**Unit**	**Approx. Quantity**
1	Borrow Area	Cum	2,91,571
2	Fine Aggregates	Cum	11,003
3	Course Aggregates	Cum	1,05,788
4	Steel	MT	1,362
5	Cement	MT	5,433
6	Bitumen	MT	1,810

36. The quantity of borrow soil required is 2,91,571 cubic meters of soil. The borrow areas used will be Government authorised sources. Road alignments are situated as such that no habitations nor forest areas will be encroached upon.

37. The contractor will source the material from authorized suppliers in the vicinity of the subproject. The contractor will include a copy of valid licenses of these suppliers in the monitoring reports submitted to APRDC. All prescribed precaution and mitigation measures will be implemented during construction period.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Safeguard Policy Statement

38. ADB SPS requires borrowers to meet a set of requirements (Safeguards Requirements 1) when delivering environmental safeguards for projects supported by ADB. The objectives are to ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process. Hence, APRDC is required to comply with these requirements. Summary of the step-by-step process is discussed below in this section. Detailed discussions are provided in the ADB SPS.[2]

39. **Screening and Categorization.**[3] Subprojects are to be screened for their expected environmental impacts and are assigned to a specific category (Footnote 6). Categorization is to

[2] ADB. 2009. *Safeguard Policy Statement*. Manila.

[3] Per ADB SPS, (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

be based on the most environmental sensitive component. However, for subproject(s) with component(s) that can trigger Category A or with potentially significant adverse impacts that are diverse, irreversible, or unprecedented, PMU shall examine alternatives to the subproject's location, design, technology, and components that would avoid, and, if avoidance is not possible, minimize adverse environmental impacts and risks, and to meet Category B categorization. The rationale for selecting the subproject location, design, technology, and components will be properly documented, including, cost-benefit analysis, taking environmental costs and benefits of the various alternatives considered into account. The "no action" alternative will be also considered. In general, criteria that can trigger subproject's 'Category A' are in Section V below.

40. **Environmental Assessment.** Environmental assessment shall include description of environmental and social baseline to provide an understanding of current conditions forming the benchmark against which subproject impacts are assessed. Environmental impacts and risks will be analyzed for all relevant stages of the project cycle, including design and planning stage, construction, operations, decommissioning, and post-closure activities such as rehabilitation or restoration. The structure and composition of the typical IEE report is provided in Annex to Appendix 1 of ADB SPS. The IEEs of sample subprojects prepared during the ADB loan processing stage[4] may be used as model documents for VCICDP subprojects.

41. **Environmental Planning and Management.** The PMU and PIUs shall prepare environmental management plan (EMP) to be included in the IEE report. The EMP shall describe and address the potential impacts and risks identified by the environmental assessment. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the subproject's impact and risks. The EMP shall include the proposed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.

42. **Public Disclosure.** APRDC, through PMU, shall submit to ADB for disclosure on ADB website so affected people, other stakeholders, and the public can provide meaningful inputs into the subproject design and implementation:[5]

(i) final IEE upon receipt;
(ii) a new or updated EIA/IEE and corrective action plan prepared during subproject implementation, if any; and
(iii) environmental monitoring reports submitted during subproject implementation upon receipt.

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

[4] Subproject packages for which IEEs have been prepared during project processing include (i) APIIC/05: Providing water supply to industrial clusters/NIMZs in southern region (including Krishnapatnam node and Sri City, (ii) APIIC/06: Development of major infrastructure and utilities in start-up area of Chittoor south cluster, (iii) APIIC/09 Development of major infrastructure and utilities in Start-up area of Nakkapalli cluster (iv) APIIC/08 Development of major infrastructure and utilities in Start-up area of Atchuthapuram (Rambilli) cluster (v) APIIC/07: Providing bulk water supply and summer storage of 95 MLD to Atchuthapuram cluster, and (vi) APRDC/07: Widening of Atchuthapuram-Anakapalli Road to 4 lane,.

[5] Per ADB SPS, 2009, prior to disclosure on ADB website, ADB reviews the "borrower's/client's social and environmental assessment and plans to ensure that safeguard measures are in place to avoid, wherever possible, and minimize, mitigate, and compensate for adverse social and environmental impacts in compliance with ADB's safeguard policy principles and Safeguard Requirements 1-4."

43. **Consultation and Participation.** PMU and PIUs shall carry out meaningful consultation[6] with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

44. **Grievance Redress Mechanism.** APRDC, through PMU, shall establish a mechanism to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the subproject's environmental performance. The grievance mechanism shall be scaled to the risks and adverse impacts of the subproject.

45. **Monitoring and Reporting.** PMU shall monitor, measure and document the progress of implementation of the EMP. If necessary, PMU will identify the necessary corrective actions, and reflect them in a corrective action plan. PMU will 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.

46. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during subproject implementation, PMU shall 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.

47. **Pollution Prevention and Control Technologies.** During the design, construction, and operation of the subproject the PMU and PIUs shall apply pollution prevention and control technologies and practices consistent with international good practices, as reflected in internationally recognized standards. 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 will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

48. **Occupational Health and Safety.** PMU[7] shall ensure that workers[8] are provided with a safe and healthy working environment, taking into account risks inherent to the sector and specific classes of hazards in the subproject work areas, including physical, chemical, biological, and radiological hazards. PMU shall ensure to take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by (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

[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 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, PMU shall ensure that the responsibilities on occupational health and safety as described herein 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.

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.

49. PMU shall ensure to apply preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines.[9] PMU shall also adhere to necessary protocols in response to emerging infectious diseases such as the corona virus disease (COVID-19) consistent with the guidelines of relevant government healthcare agencies and the World Health Organization.

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

51. **Physical Cultural Resources.** PMU is responsible for siting and designing the subproject to avoid significant damage to physical cultural resources. Such resources likely to be affected by the subproject will be identified, and qualified and experienced experts will assess the subproject's potential impacts on these resources using field-based surveys as an integral part of the environmental assessment process. When the proposed 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.

52. **Environmental Audit.** When the subproject involves existing activities or facilities, PMU is responsible to ensure that relevant external experts will perform environmental audits to determine the existence of any areas where the subproject may cause or is causing environmental risks or impacts. If the subproject does not foresee any new major expansion, the audit constitutes the environmental assessment for the subproject.

53. **Bidding and Contract Documents.** IEEs and EMPs are to be included in bidding and contract documents and verified by the PIUs. The PMU and PIUs shall also ensure that bidding and contract documents include specific provisions requiring contractors to (i) comply with all other conditions required by ADB,[10] and (ii) to submit to PIU, for review and approval, a site-specific 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 can commence prior to approval of SEMP. A copy of the EMP or approved SEMP will be kept on site during the construction period at all times. Non-compliance with, or any deviation from, the conditions set out in the EMP or SEMP constitutes a failure in compliance and shall require corrective actions.

[9] World Bank Group, 2007. *Environmental, Health, and Safety General Guidelines.* Washington, DC.

[10] Contractors to comply with (i) all 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 with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

54. **Conditions for Award of Contract and Commencement of Work.** PMU shall not award any Works contract for a subproject until (i) relevant provisions from the EMP are incorporated into the Works contract; and (ii) the IEE is updated to reflect subproject's detailed design and PMU has obtained ADB's clearance of such IEE. For "design, build, and operate" type contracts, PMU shall ensure no works for a subproject which involves environmental impacts shall commence until (i) relevant provisions from the EMP are incorporated into the Works contract; and (ii) the IEE is updated to reflect subproject's detailed design and PMU has obtained ADB's clearance of such IEE.

B. Government Environmental Legislations

55. The Ministry of Environment, Forests and Climate Change (MoEFCC) has the overall responsibility to set policy and standards for the protection of environment along with the Central Pollution Control Board (CPCB). This includes air, noise and water quality standards and the requirements for the preparation of Environmental Impact Assessment (EIA) statements for development projects. The list of statutes, policies, regulations and responsible agencies is given below in Table 6.

Table 6: List of Statutes, Policies, Regulations and Responsible Agencies

Sl. No.	Agency	Statute / Policy
1	Ministry of Environment and Forests	Environment (Protection) Act 1986
		Forest (Conservation) Act, 1927 Forest (Conservation) Act, 1980 (as amended in 1998) Forest (Conservation) Rules, 1981
2	Pollution Control Boards (State)	Water (Prevention and Control of Pollution) Act 1974 as amended in 1988 Air (Prevention and Control of Pollution) Act 1981 as amended in 1987
3	Environment and Forest Department	Wildlife (Protection Act), 1972
4	Department of Transport; and Department of Policy	Motor Vehicle Rules, 1989 Motor Vehicle Act, 1988 Rules of Road Regulations, 1989
5	Archaeological Survey of India, Directorate of Archaeology	Ancient Monuments and Archaeological Sites and Remains Act, 1958
6	Revenue Department	Land Acquisition Act, 1894

56. The following requirements are particularly important for the subproject and need special attention in order to avoid any delays for a project:

(i) Under EIA Notification 2006 (amended 2009, 2011, and 2013) all new state highways, or expansion of existing state highway outside hilly terrain above 1000m above mean sea level (amsl) and or ecologically sensitive areas are exempted from the process of obtaining environmental clearance.

(ii) Further, under the same notification, it is stated that any state highway projects will be treated as category A if located in whole or in part within 5 km from of: (a) protected areas notified under the Wildlife (Protection) Act,1972; (b) critically

polluted areas as notified by the CPCB from time to time; (c) notified eco-sensitive areas; and (d) 5 km from interstate boundaries and international boundaries.

(iii) As per the Forest Conservation Rules (1981, amended 2003) a forestry clearance from Department of Forests is required for diversion of forest land fornon-forest purpose. Processing of the forestry clearance entails two stages: stage I and stage II. Amongst other requirements stage I clearance requires the applicant to make payments for compensation of forestry land that will be acquired and trees that will be cut under the project. Accordingly, timely allocation of budget for this purpose by the applicant is necessary to expedite the clearance process.

(iv) Cutting of trees in non-forest land require a tree cutting permit from the local forestry department. All trees cut under a project must be compensated by compensatory afforestation as required by the State Forest Department.

(v) Placement of hot-mix plants, quarrying and crushers, batch mixing plants, discharge of sewage from construction camps requires No Objection Certificate (CTE and CTO) from State Pollution Control Board prior to establishment.

(vi) Permission from Central Ground Water Authority is required for extracting groundwater for construction purposes.

Table 7: Applicable Government of India Environmental Legislations and Specific Requirements

SN	Legislation	Requirements for the Subproject	Applicability
1	National Environment Policy (NEP), 2006	Project should adhere to the NEP principle of enhancing and conservation of environmental resources and abatement of pollution	The policy governing the environmental rules and legislations and is applicable to all the subprojects.
2	EIA Notification, 2006	Environmental Clearance (EC)	This subproject is not included in Schedule 1 of EIA Notification therefore does not need environmental clearance from SEIAA.
3	Water (Prevention and Control of Pollution) Act, 1974 amended 1988 and its Rules, 1975	Consent for establishment (CFE) and consent for operation (CFO) from APPCB; and Compliance to conditions and disposal standards stipulated in the CFE and CFO	Applicable to construction activities of the subproject
4	Air (Prevention and Control of Pollution) Act, 1981, amended 1987 and its Rules 1982	CFE and CFO from APPCB as applicable; and Compliance to conditions and emissions standards stipulated in the CFE and CFO.	Applicable to construction activities of the subproject. For the subproject, the following will require CFE and CFO: (i) diesel generators; (ii) and (iii) vehicles emitting air pollutants.
5	Environmental (Protection) Act, 1986 amended 1991 and the following rules/notifications: Environment (Protection) Rules, 1986 including amendments;	Solid waste and sludge generated at proposed facilities shall be disposed in accordance with the MSWM Rules; Compliance with noise standards;	Applicable to construction activities of the subproject

SN	Legislation	Requirements for the Subproject	Applicability
	Municipal Solid Wastes (Management and Handling) Rules, 2000; Noise Pollution (Regulation and Control) Rules, 2000; Environmental Standards of CPCB; and Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2009.	Compliance to environmental standards (discharge of effluents); Restriction of activities (including construction, tree cutting, etc.) in the notified zones. There are no eco sensitive zones in or near the subproject locations; Rules defines and classifies hazardous waste provides procedures for handling hazardous waste; Requires Pollution Control Board's consent for handling hazardous waste; and Procedure for storage of Hazardous waste and provides procedures for recycling, reprocessing or reuse, important and export of hazardous waste.	
6	Contract Labour (Regulation and Abolition) Act, 1970 The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	Department of Labour, GoAP as principle employer; Contractor shall register with Labour Department, GoAP if inter-state migrant workmen are engaged; Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses from home and back, etc.;	Contractors to obtain license from designated labour officer

SN	Legislation	Requirements for the Subproject	Applicability
7	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996	Cess should be paid at rate not exceeding 2% of the cost of construction as may be notified; The employer 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.; and The employer has to obtain a registration certificate from the Registering Officer	Applicable to any building or other construction work and employ 10 or more workers
8	The Child Labour (Prohibition and Regulation) Act, 1986	No child below 14 years of age will be employed or permitted to work in all the subprojects.	No child below 14 years of age will be employed or permitted to work in all the subprojects.
9	Minimum Wages Act, 1948	All construction workers should be paid not less than the prescribed minimum wage.	Applicable to construction activities of the subproject
10	Workmen Compensation Act, 1923	Compensation for workers in case of injury by accident.	Applicable to construction activities of the subproject
11	Equal Remuneration Act, 1979	Equal wages for work of equal nature to male and female workers.	Applicable to construction activities of the subproject
12	AP State Environment Policy	Follows the National Environment Policy, 2006; and Project implementation should adhere to the policy aims.	Applicable to construction activities of the subproject
13	The Motor Vehicles Act, 1988	Standards for vehicular pollution and prevention control. The authority also checks emission standards of registered vehicles, collects road taxes, and issues licenses; In August 1997, the Pollution under Control Certificate (PUC) program was launched in an attempt to crack down on the vehicular emissions in the States; and All the vehicles that will be used in construction of the subproject will have to	Applicable to construction activities of the subproject

SN	Legislation	Requirements for the Subproject	Applicability
		comply with the PUC norms set down under this act	
17	Public Liability and Insurance Act 1991	Protection from hazardous materials and accident	Applicable to construction activities of the subproject
18	National Environment Appellate Authority Act (NEAA) 1997	Grievance's process and procedures	Applicable to construction activities of the subproject
19	Explosive Act 1984 – for transporting and storing diesel, bitumen, etc.	Safe transportation, storage and use of explosive material	Applicable to construction activities of the subproject
20	Permission for use of water for construction purpose from irrigation department	Use of surface water for construction	Applicable to construction activities of the subproject To be obtained prior to initiation of any work involving use of surface water for construction
21.	CRZ Notification, 2019	Proposed project road/identified borrow areas may attract CRZ Notification, 2019	Contractor is not allowed to procure construction material from CRZ notified areas.
22.	Minor Mineral and concession Rules	For opening new quarries. Regulate use of minor minerals like stone, soil, river sand etc.	Applicable While opening of a new quarry is not anticipated, any required approval or license shall be secured by the contractor.
23	The Mining Act (1952)	The mining act has been notified for safe and sound mining activity. The construction of road subprojects will require aggregates. These will be procured through mining from riverbeds and quarries	Applicable The contractor will secure any required approval or license for procuring the materials.

57. **Government Regulatory Body.** The Andhra Pradesh Pollution Control Board (APPCB) is the main state-level regulatory agency that is responsible environment protection and pollution control. APPCB through its 19 Regional Offices across the state regulates environmental protection related activities. Subproject towns across the Visakhapatnam Chennai Industrial Corridor are under the jurisdiction of different Regional Officer's and they will monitor the Subprojects operation and compliance with the standards.

58. APPCB monitors the environmental parameters to check whether or not it meets the standards stipulated in its consent order. Surveillance monitoring by APPCB staff, at least once a year, by visiting the project sites and collecting the sample and testing at APPCB laboratory, and specific monitoring in case of public complaints.

59. **ADB SPS Additional Requirements on Pollution Control, Health and Safety.** Following requirements of ADB SPS, PMU and PIUs shall apply pollution prevention and control technologies and practices consistent with international good practice as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and

Safety Guidelines. 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, 2009.

Table 8: Applicable WHO Ambient Air Quality Guidelines

Table 1.1.1: WHO Ambient Air Quality Guidelines[7,8]		
	Averaging Period	Guideline value in µg/m³
Sulfur dioxide (SO_2)	24-hour 10 minute	125 (Interim target-1) 50 (Interim target-2) 20 (guideline) 500 (guideline)
Nitrogen dioxide (NO_2)	1-year 1-hour	40 (guideline) 200 (guideline)
Particulate Matter PM_{10}	1-year 24-hour	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter $PM_{2.5}$	1-year 24-hour	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Table 9: World Bank Group's Noise Level Guidelines

Table 1.7.1- Noise Level Guidelines[54]		
	One Hour L_{Aeq} (dBA)	
Receptor	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational[55]	55	45
Industrial; commercial	70	70

C. International Environmental Agreements

60. Table 10 below lists the relevant international environmental agreements that India is party to, and their relevance to various subprojects under VCICDP.

Table 10: International Environmental Agreements Relevant to Subproject

International Environmental Agreement	Years	Relevant Provisions	Remarks
Ramsar Convention on Wetlands of International Importance	1971	The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. According to the Ramsar list of Wetlands of International Importance, there are 25 designated wetlands in India which are required to be protected.	There is one Ramsar site in Andhra Pradeshi.e. Kolleru lake tis situated 260 kms away from the project area.
Convention on the Transboundary Movements of Hazardous Wastes and Their Disposal	1989	To protect human health and the environment against the adverse effects of hazardous wastes. This aims at (i) reduction of hazardous waste generation, promotion of environmentally sound management (ii) restriction of transboundary movements, and (iii) a regulatory system for transboundary movements.	Wastes generated from the construction sites may fall in hazardous waste category. The waste will be managed in accordance with the country laws and will be disposed within the country, and therefore will not attract this convention
Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972)	1972	This Convention defines and provides for the conservation of the world`s heritage by listing the natural and cultural sites whose value should be preserved.	Not applicable for the subproject. There are a few places of worship of local significance which will be shifted in consultation with the stakeholders. The details are provided in the RP prepared for the subproject.
Convention on Biological Diversity	1992	This provides for a framework for biodiversity and requires signatories to develop a National Biodiversity Strategy and Action Plan.	Not applicable for the subproject. There are no critically endangered species in the immediate vicinity of the subproject and subproject activities are not expected to have significant impact on the biodiversity of the area.
United Nations Framework Convention on Climate Change (UNFCCC),	1993	The UNFCC is an international environmental treaty with the main objective to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system.	Not applicable to the subproject. The subproject will help in reduction of the GHG emissions during the operation phase as less traffic congestion is expected once Atchuthapuram–

International Environmental Agreement	Years	Relevant Provisions	Remarks
		India signed the UNFCC on 10 June 1992 and ratified it on 1 November 1993. The project will ensure that all construction activities will not significantly increase the GHG emissions and ensure that design of all infrastructure are resilient climate change impacts.	Anakapalli road is operational.

IV. ANALYSIS OF ALTERNATIVES

A. With- and Without-Project Alternatives

61. 'Without-project' or 'do-nothing' Alternative'. The existing road is a single road. In the absence of the proposed subproject, the road will continue to have frequent traffic congestions, reduced flow of traffic (commercial as well as domestic), regular maintenance costs on existing road and inadequate access to highways, ports and other key towns and commercial centers in the state.

62. With Project Alternative. This project road widening and upgrading will improve connectivity between nodes to Kakinada port which is the VCIC gateway. The implementation of various project items will have the following direct benefits:

(i) Improved quality of life for the rural population in the project influence area (10 km radial distance from the subproject road): this as a result of better access to markets, health, education and other facilities;
(ii) The derived stimulus for local economic activity; and
(iii) A more efficient and safe road transport system through reduced travel times, reduced road accidents, reduced vehicle operating and maintenance costs and reduced transportation costs for goods. The proposed subproject will be the best alternative to overcome the afore mentioned threats that is likely to occur in the absence of this subproject. With the implementation of the subproject, the following direct benefits will be experienced:
    (a) a more efficient and safe road transport system through reduced travel times, reduced road accidents, reduced vehicle operating and maintenance costs and reduced transportation costs for goods; and
    (b) intra-state connectivity to Visakhapatnam, Kakinada, Ongole and Nellore districts and also port connectivity to Kakinada port and Krishnapatnam port.

63. The 'with project' alternative will contribute to the realization of the industrial clusters as part of the industrial corridor.

B. Location and Design Alternatives

64. In general, the horizontal alignment of the project road follows that of the center line of the existing road. The land use is mixed with habitations at few settlements, Industrial and agriculture

in rural area. Most of the project road is covered by roadside vegetation. The improvement work includes widening of the existing carriageway to 2 lane configurations.

65. The benefits of the widened road will be improved road safety, lower vehicle operating costs and decreased journey times. The initial proposed road was re-aligned with sections of road to be widened on both sides to minimize the impact on people, structure and places of worship.

66. In a number of locations, the road design has taken into account the location of the trees along the road edge. At some locations along the project road, vegetation including trees, obscure visibility. Where the design team consider this to be unsafe, trees will have to be removed. Where visibility is not an issue, trees may still have to be removed to accommodate road widening.

C. Technological alternatives

67. There is no practical alternative to the proposed widening of the existing road to improve existing conditions. A cement concrete paved road structure would provide a construction alternative but the issues surrounding this construction would be similar, if not greater, than the proposed asphalt concrete road widening.

68. Therefore, it is concluded that in order to get maximum economic and social benefit from the existing highway road, widening and upgradation needs to be completed. This will not only have regional and national benefits but will impact positively on the local residents living along the project road. Without the project, it is anticipated that the benefits of the existing road and increased activity will not be fully realized.

V. DESCRIPTION OF THE ENVIRONMENT

69. A brief description about the existing environment, including its physical and ecological resources, economic development of the region, and issues relating to quality of life are presented in this section. Broad aspects on various environmental parameters (geology, soil, topography, climate, land use, water resources, water quality, air quality, noise quality, tourism, cultural resources etc.) which are likely to be affected (direct or indirect) by the proposed road improvement project are covered. These aspects are covered in broader geographic extent to present the entire project region.

A. Physical Environment and Resources

70. **Topography, Geology, and Soil.** Andhra Pradesh is the eighth largest state of the country has a geographical area of 1.6 lakh km^2, which constitutes 5.05% of the land area of the country. The project area lies between latitude 17041' 23" north and longitude 8300'8.45" east and latitude 17033'50" north and longitude 82 058'44.57" east.

71. The project area lies between 13.2218° N, 79.1010° E and 14.2581° N, 79.9193° E. The soil type in the area is mainly red-clayey soil with sandy loam to clayey loam in texture. Stratigraphically, the project area mainly comprises Archaeans, Lametas, Deccan Trap and Recent formation.

72. **Climate.** The climate of Andhra Pradesh varies considerably, depending on the geographical region. Monsoons play a major role in determining the climate of the state. Summers last from March to June. In the coastal plain, the summer temperatures are generally higher than

the rest of the state, with temperature ranging between 20 °C and 41 °C. July to September is the season for tropical rains in Andhra Pradesh. The state receives heavy rainfall from the southwest monsoon during these months. About one third of the total rainfall in Andhra Pradesh is brought by the northeast monsoon. October and November are when low-pressure systems and tropical cyclones from the Bay of Bengal, along with the northeast monsoon, bring rains to the southern and coastal regions of the state. November, December, January, and February are the winter months in Andhra Pradesh. Since the state has a long coastal belt, the winters are not very cold. Winter temperature ranges from 12 °C to 30 °C.

73. The Visakhapatnam district has a tropical maritime climate. Average annual rainfall is 1116 mm, and monthly rainfall ranges from nil rainfall in January to 207.5mm in October. October is the wettest month of the year. The mean seasonal rainfall distribution is 673.5 mm during southwest monsoon (June–September), 271.8 mm. during northeast monsoon (October–December), 10.9 mm. rainfall in Winter (January–February) and 159.6 mm in summer (March-May). The percentage distribution of rainfall, season-wise, is 60.36% in southwest monsoon, 24.36% in northeast monsoon, 0.97% in winter and 14.3 % in summer.

74. The salient climatic features of the state are as follow: (i) average annual rainfall is 1116 mm (ii) humidity - 72 to 84%, (iii) wind - light to moderate, and (iv) mean temperature - summer-32.8-34 °C; winter-17.5-19.3 °C.

75. **Natural Hazards** Andhra Pradesh coastal belt is prone to having potential natural hazards such as cyclones and depressions. Cyclones are rare in Bay of Bengal from January to March. Isolated cyclones forming in south Bay of Bengal move towards west-north-west and hit Tamil Nadu and Sri Lanka coasts.

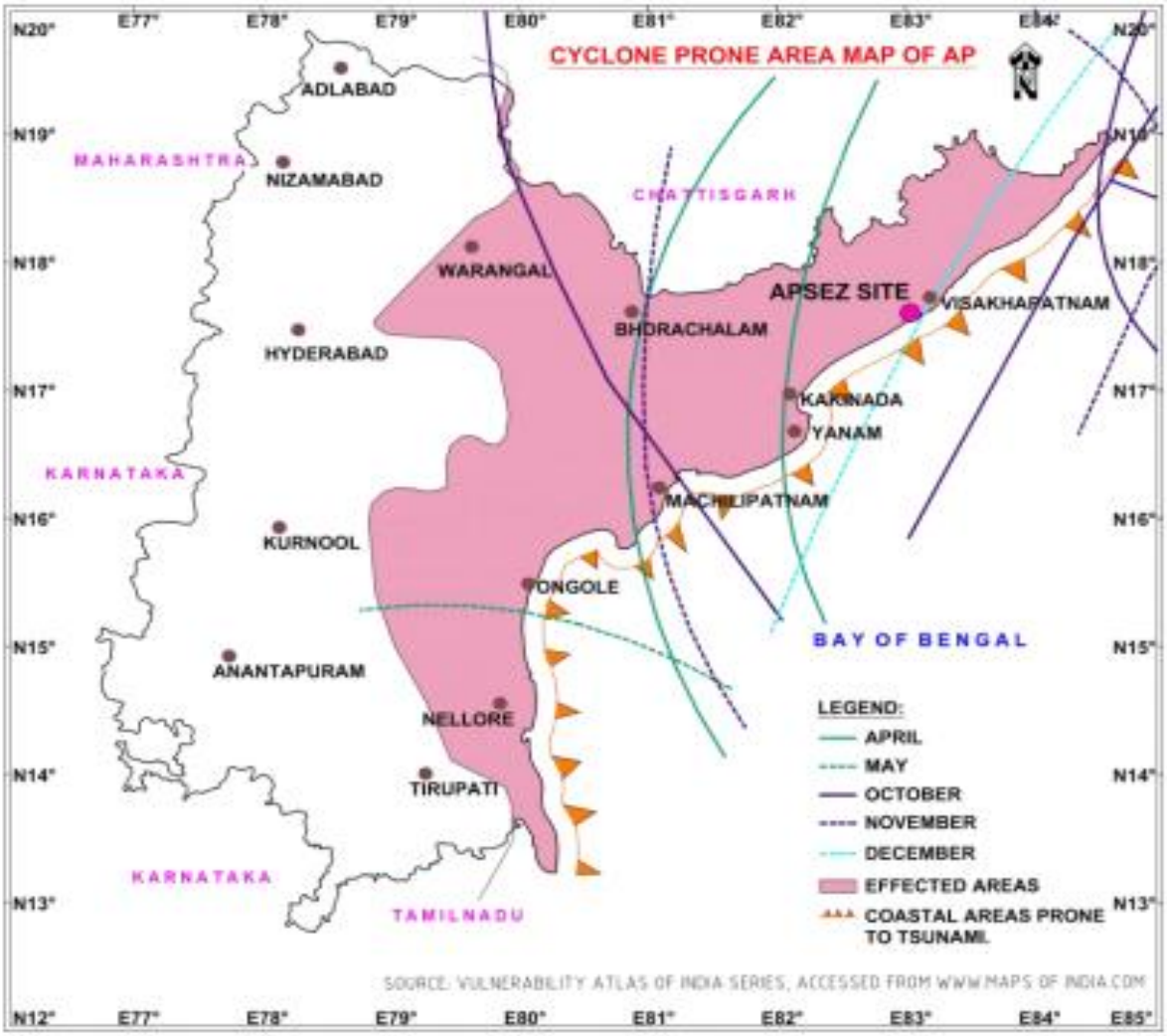
76. In April and May, these form in south and adjoining central Bay of Bengal and move initially towards north-west and north; and then re-curve towards north-east striking Andhra-Orissa-West Bengal-Bangladesh coasts in May.

77. Most of the monsoon (June – September) storms develop in central and north of Bay of Bengal and move towards west-north-west affecting Andhra-Orissa-West Bengal coasts.

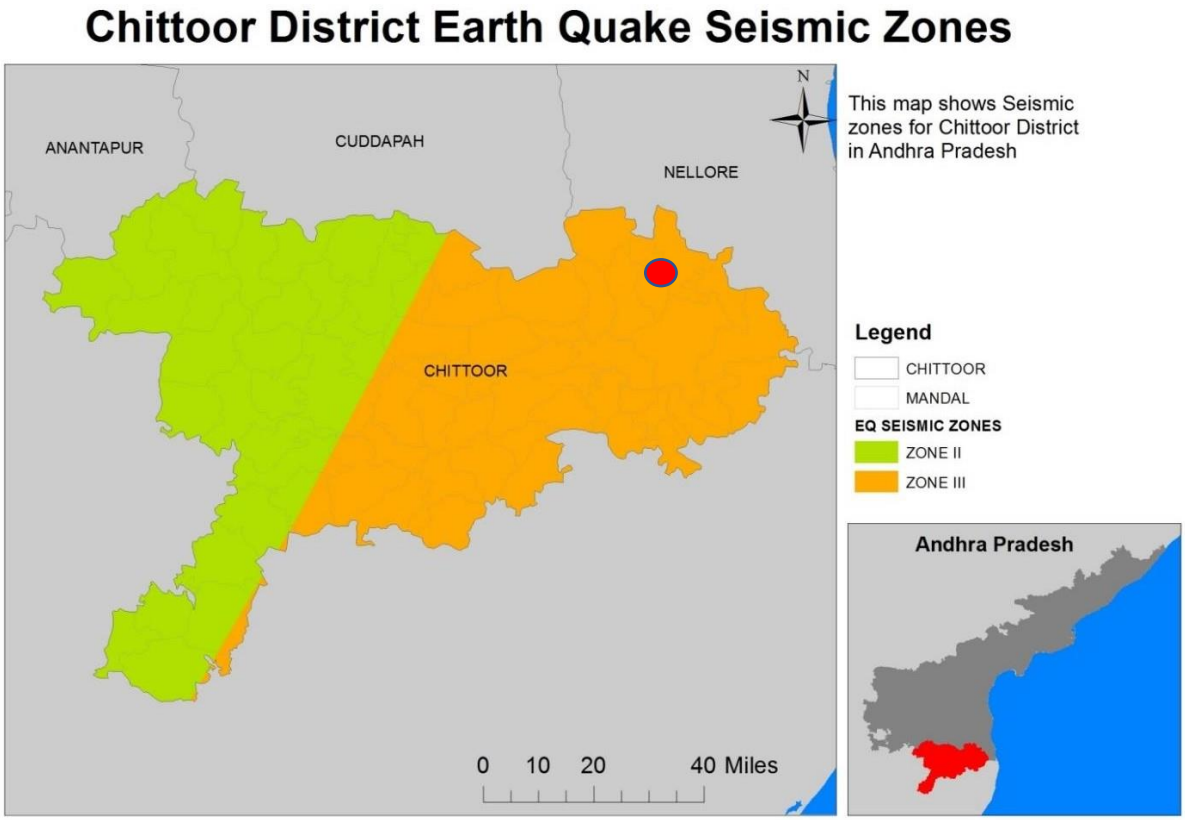
78. Post monsoon (October – December) storms form mostly in south and central Bay of Bengal, re-curve between 150 and 180N affecting Tamil Nadu-Andhra-Orissa-West Bengal.

79. Cyclone prone areas of Andhra Pradesh are shown below:

Figure 7: Cyclone Prone Area Map of Andhra Pradesh



80. **Siesmicity.** The Routhusuramala cluster falls under Seismic Zone – III and are in the moderate risk zone.



B. Water Resources and Water Quality

1. Nellore district

81. The district is underlain by variety of geological formations comprising from the oldest Archaeans to Recent Alluvium. Hydro geologically these formations are classified as consolidated (Hard), semi-consolidated (Soft) and unconsolidated (Soft) formations. Ground water occurs in all most all geological formations and its potential depends upon the nature of geological formations, geographical set up, incidence of rainfall, recharge and other hydrogeological characters of the aquifer. Among the consolidated formations gneisses are relatively good aquifers. Schistose formations also form potential aquifers when the wells tapping contact zones with intrusives.

82. In the consolidated formations ground water occurs under unconfined to semiconfined conditions. Ground water is developed in these formations by dug wells, dug cum bore wells and bore wells tapping weathered and fractured zones. The yield of the dug wells are in the range of 15 to 35 m^3/day and reduce considerably during peak summer periods. The occurrence of fractures in these formations is limited to 40 to 60 m bgl and occasionally extends down to 70 to 80 m bgl. The bore wells in these formations generally tap the weathered and fractured zones. The yields of the bore wells generally range between 80 and 350 m^3/day. The higher yields are limited to the available thickness of fractured zones.

83. The quality of ground water is as important as quantity. Ground water from shallow as well as deeper aquifers of consolidated formations of the district is generally good. All along the coast both shallow and deeper aquifers are saline. However, along the coast limited potable ground water zones do exist at shallow levels but they may not sustain for heavy withdrawals.

84. As per the ground water resources of the district all the mandals fall under Safe category, hence no area/mandal has been notified. *(Source: Ground water brochure, Nellore district, Andhra Pradesh by CGWB, Ministry of Water Resources).*

2. Chittoor district

85. More than 90% of the district is underlain by crystalline formations and the remaining area by semi-consolidated formations. The degree and depth of weathering varies from place to place in crystalline formations and hence the potentiality of shallow aquifers also varies. Ground water occurs under unconfined conditions in weathered portion and semi-confined to confined condition occurs in fractures, joints at deeper depths. Ground water in weathered formations is developed by dug wells.

86. The Nagari Quartzites are mostly confined to uplands and hilly areas, which are covered by forest. These formations are massive and compact and possess meagre ground water potential. The ground water development is very less and there is not much habitation in these formations. The alluvium is confined to mostly riverbanks and stream courses with varying width and depth. Ground water development in this formation is mostly by filter points and dug wells. The well yields vary from 3 to 10 lps. with drawdown of 2 to 6 m. They can sustain pumping for 6 to 8 hours/day with fast recovery of water levels.

87. The ground water in the district is in general suitable for both domestic and irrigation purposes. The Electrical Conductivity ranges from 750 to 3000 micro-Siemens/cm at 25 deg. C. Fluoride concentration in ground water is within the permissible limit.

88. Water sampling locations will be identified close to the final road alignment or areas where proposed subproject activities may occur. The water quality results will be collected from these locations after contractor mobilization and prior to start of construction at site.

C. Air Quality

89. As the road passes through the agriculture lands and industrial areas, where a greater number of trees (From topographic data, 109 trees, 51 on left side and 58 on right side of various species exist within PROW of road) are existing all along the road, the air quality is within the permissible limits. Nevertheless, location specific issues of air pollution do exist (particularly in the project areas) and air pollution does feature as one of priority environmental issues of the project areas.

90. Dust, vehicular emissions are the main causes of pollution in the roadside settlements, villages. Industrial air pollution is mainly confined to areas in the coastal region, where most industries are located. The levels of pollution are far lower and smaller in scale and air pollution is not a significant issue in rural areas because road traffic is very low. In the project area there are no major industrial activities taking place and also the density of traffic on project road is very less. The air quality is reported within permissible limits in these areas.

91. Negative air quality impacts during construction are likely to result from three main sources, viz. (i) emissions from construction equipment, including delivery trucks, (ii) fugitive dust from earth-moving operations and demolition, and (iii) localised increased traffic congestion in construction areas.

92. Ambient air quality tests were conducted along the subproject area AAQ testing was done in April 2018 and two times in one week and the results are enumerated in the Table below:

Table 11: Ambient Air Quality in the Project Area

S. No	Parameters Location	PM 10 µg/m³	PM 2.5 µg/m³	SO_x µg/m³	NO_x µg/m³
NAAQS Limit		100	60	80	80
WHO Ambient Air Quality (24-hour guideline t)		50	25	20	40 (annual)
1	Neleballi	65	38	14	18
2	Routhusuramala	52	33	09	16
3	Pallamala	62	45	18	21

93. ADB SPS requires that the subproject applies pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as World Bank Group's EHS Guidelines. It is observed that all the AAQ values were found to be well within the limits as per the National standards at all the monitoring locations. The test results of particulate matter are exceeding the WHO guideline limits.[11]

Table 12: WHO Ambient Air Quality Guidelines

Table 1.1.1: WHO Ambient Air Quality Guidelines[7,8]		
	Averaging Period	Guideline value in µg/m³
Sulfur dioxide (SO_2)	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline)
Nitrogen dioxide (NO_2)	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM_{10}	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter $PM_{2.5}$	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

[11] There has been no major development in the area that may subsequently contribute towards air pollution. The contractor after mobilization will conduct air monitoring along the subproject area prior to start of construction.

D. Noise Level

94. As per the result of reconnaissance survey, it is expected that noise is neither a major issue in the majority of project area nor expected to be a problem except where the project road passes through the settlements, market areas, and junctions at village areas at busy junctions small contribution to the noise levels are expected, but still the ambient noise quality is expected to be well within the permissible limits.

95. It is expected that noise will be generated during construction activities like operation of heavy machinery, blasting works, the haulage of construction materials to the construction yard and the general activities at the yard itself. Concrete mixing and material movements will be primary noise generating activities and, most likely, will be uniformly distributed over the entire construction period. Noise barriers and other measures - for example the prohibition of certain types of construction activity and the appropriate timing of construction activities - may be required to mitigate these effects.

96. Noise monitoring in the subproject locations were conducted including junctions and near habitations. Noise monitoring was conducted from 6am to 10pm and 10pm to 6am for 24 hrs during the month of April 2018.[12]

97. The details are as enumerated below.

Table 13: Noise Level in the Project Area

S. No	Parameters Location	Leq - Day in dB (A)	Leq – Night dB (A)
1	Neleballi	46	34
2	Routhusuramala	32	18
3	Pallamala	49	41
	WBG-Noise level guidelines (Residential, institutional, educational areas)	55	45
	National Noise Level standards (Residential areas)	55	45

[12] There has been no major development in the area that may subsequently contribute towards noise pollution. The contractor after mobilization will conduct noise monitoring along the subproject area prior to start of construction. A strip map with sensitive receptors along the road will be prepared and included in the updated IEE.

E. Quarries

98. Stone quarry present along the project road may be used. From chainage 2+500 km to 2+900 km, at left hand side, there exists a mined-out quarry at a distance of 8 to 10 m. The depth of the quarry varies from 8 to 10m. These are licensed quarries and a valid copy of that shall be verified by the contractor.

99. **Mitigation Measures for Quarry area:**

(i) Development of green belt (2 Tier & 3 Tier) on the boundary of the quarry to reduce the particulate matter entering into the environment.
(ii) Sprinkling of water on the vehicles plying road, dust generating areas and stock yards.
(iii) Provision of crash barrier at the head of the mined-out quarries
(iv) Regular maintenance of the vehicles plying in the quarry area.

Figure 8: Quarry area & Tar Plant

F. Traffic surveys and data analysis

100. The existing road is mainly having a small traffic flow comprising of two-wheelers, cars, and other private vehicles. At present, the commercial and industrial activity is not significant in the area resulting in minimal traffic volumes on that account.

G. Ecological Resources

1. Vegetation

101. More than the one third of the area in the District is covered by forest. The forests are of moist and dry deciduous type. The common species available in them are Guggilam, Tangedu, Sirimanu, Kamba, Yagisa, Nallamaddi, Gandra, Vepa etc.

102. Bamboo shrubs are sparsely scattered. But forest area in the district has been showing a quiescent decline since 1955-1956 perhaps due to podu practice, indiscriminate grazing and browsing. To stem this, regeneration programmes are being carried out.

103. Andhra Pradesh is endowed with rich and diverse forest resources and it is a reservoir of biodiversity. The forest area of the state is 94,689 km^2 constituting 0.71% of the geographical area of the state and 12.44% of the forest area of the country. Legally this area has been classified

into "Reserved Forest, Protected Forest and Unclassified Forest", which constitute 65.36%, 32.84% and 1.7% of the forest area respectively.

104. Detailed EIA (Environment Impact Studies) for this industrial cluster is completed and latest air quality data, water quality data, noise monitoring data, groundwater quality data, soil properties and details on existing flora & fauna are included in the report.

2. Details of Trees along the Project Road

105. From topographic data, 109 trees (51 on left side and 58 on right side of various species exist within PROW of road. Table 14 shows the distribution of trees along the project road. The major species envisaged are coconut, palm, neem, eucalyptus etc.

Table 14: Trees along the Project Road

Trees in PROW			
Tree	**LHS**	**RHS**	**Total**
Tree palm	15	6	21
Neem	2	1	3
Tree Other	32	51	83
Tree Coconut	2	0	2
Total	**51**	**58**	**109**

H. Wildlife and Protected Area Network

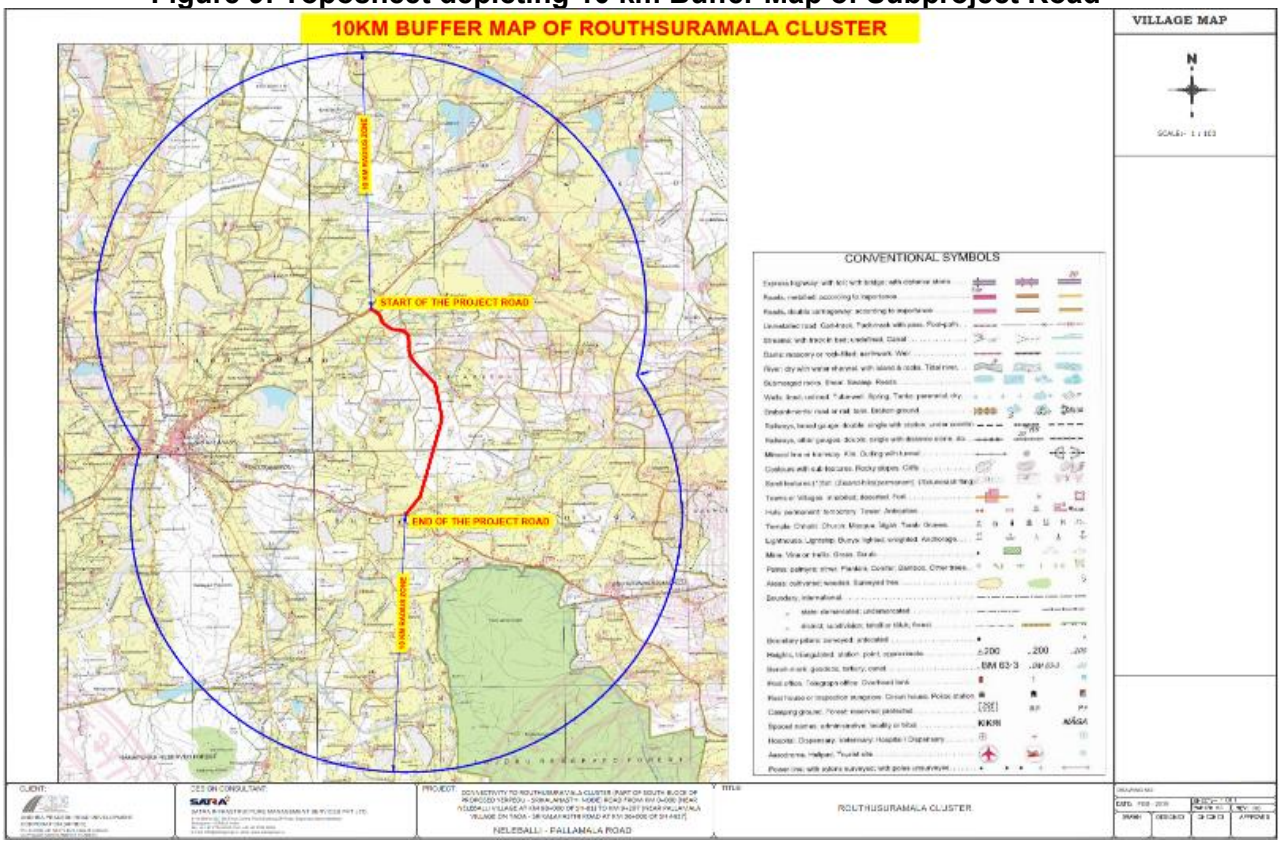
106. The project road does not pass through the forest area and wildlife/protected area network, and these don't exist within project influence area. A biodiversity proximity assessment using the IBAT[13] was conducted for the larger area. This report provides an indication of the potential biodiversity-related features - protected areas, key biodiversity areas and species. It provides an early indication biodiversity concern and can provide valuable guidance in making decisions. Based on initial assessment no protected areas and key biodiversity areas or features were observed in the radial distance of up to 10 km.

107. The IBAT study was generated in 2018 and preliminary assessment revealed no protected or key biodiversity areas with 10 kms of site. A copy of the latest IBAT report generated in February 2022 is attached as Appendix 12 for reference. The detailed list of various IUCN category species found in the wider 50 km area has also been provided in the report.

108. While the wider area (50 km) depicts presence of IUCN Red category species, further discussions with the local people and forest officials during the due diligence revealed that there are no critically endangered species found close to the subproject site. Detailed EIA study conducted for the Chittoor South Industrial cluster also endorses that the subproject area does not have any critically endangered species within its vicinity.

[13] IBAT (Integrated Biodiversity Assessment Tool) proximity assessment report conducted on 15 February 2022 has been provided as Appendix 12.

Figure 9: Toposheet depicting 10 km Buffer Map of Subproject Road



I. Economic Development

109. Andhra Pradesh has undertaken considerable industrial growth particularly in the major industrial sectors such as fertiliser, agro-products, edible oil-refineries & bio-fuel plants, Information technology, thermal power generation, etc. Presence of ports such as the Kakinada port has provided additional advantage to Andhra Pradesh to become a gateway to the East.

110. The major occupational pattern of the people in the state includes:

(i) Cultivators followed by
(ii) Agricultural laborers
(iii) Workers in Household Industries and
(iv) Other workers

J. Common property resources

111. Various common property resources like temples, tombs, well, Hand pumps, toilets, etc., are found along the project road. There are about 7 CPRs with in the PROW. However, a total of 111 electric poles (Left side 62 and Right side 49 are with in PROW).

112. The below CPRs are the least affected number. To mitigate these impacts, R&R budget has been prepared and presented in the Social Assessment Report.

Table 15: List of Common Property Resources

Common Property Resources in PROW			
Details	**LHS**	**RHS**	**Total**
Transformer	1	1	**2**
Hand pump	1	0	**1**
Temple	1	0	**1**
Bore-well	1	1	**2**
Bus stop	1	0	**1**
Total	**5**	**2**	**7**

K. Economic Activities

1. Agriculture and Forestry

113. **Nellore district**. Nellore is also famous for quality rice production and aqua (prawn and fish) culture. About 70 percent of the total work force is dependent upon agriculture either as farmers or as agricultural labour. The main crops are rice paddy and sugar cane. It is particularly famous for a rice breed called "Molagolukulu". Other crops are cotton, lemon and oil seeds (like peanuts) and horticultural seeds. The total forest area in the district is 2.62 lakh hectares. The forest area is concentrated in Venkatagiri, Udayagiri, and Podalakur mandals and is covered by bamboo, Cashew, Casurina, Eucalyptus and shrubs.

114. **Chittoor district**. While 4.51 lakh hectares are under forests, which constitute 30.09 per cent of the total area, the forest wealth is not very rich, but provides scope for certain strategic units. Beedi leaves and firewood are the major forest products, while bamboo and Rosewood are found extensively in C-giri Mandal. Good quality timber is available in Puttur and Madanapalle Mandals. Red gram, horse gram, sunflower and coconut cops are grown respectively.

2. Fishing

115. Fishing in Nellore coastline is extensively used by local fisherman. Large number of irrigations tanks and Penna is rich in fishery resources. Nellore is famous for shrimp culture. Nellore district is called the "Shrimp capital of India" due to its high production of cultured shrimp.

3. Industry

116. **Nellore district**. The handloom sector is a small scale industry and next to agriculture by the number of people depends on it. Venkatagiri and Patur are important handloom centers in the district noted for their traditional handcrafted fine cotton and silk sarees embroided with pure zari.

117. Krishnapatnam is a major port and market center situated at a distance of 20 km. The port is expected to become a world-class deep-water port. Iron ore and granite are being exported from Krishnapatnam to other countries like People’s Republic of China. One railway line links it with Venkatachalam on main railway line. Tada is at a distance of 80 km from Nellore with new industrial ventures like the Adidas factory and Tata's Leather Park. An International Leather park project is in progress developed at Krishnapatnam.

118. **Chittoor district**. According to the Industries Department, Government of AP, Chittoor has 16,562 Small Scale / Tiny industries with an investment of ₹304.98 crores and providing employment to 75151 persons. Food industries seem to be the dominating industrial group in the district, having a share of nearly 30% in the total number of units, 34% of total employment and

19% of investment. The rich Agro resources in the district provide ample opportunities for food processing industry. The second major industrial category is textile-based industry, comprising of small power looms, yarn twisting and dyeing, handlooms, and readymade garments industry.

4. Land Resources

119. **Nellore district.** The total Geographical area of the District is 13.08 lakh Hectares. Of this 20.09% is forest area. The rest is distributed among Barren and Uncultivable Land (10.56%) and Land put into Non Agricultural uses (18.68%). The net area sown forms 25.96% while cultivable waste and fallow (current and old) lands Constitute 17.75%. Land use pattern along the project road is also mixed type dominated by agriculture followed by small/medium scale industries.

120. **Chittoor district**. The district occupies an area of 15,359 km^2. Thirty percent of the total land area is covered by forests in the district. The rest is distributed Barren Uncultivable Land, cultivable waste land etc.

L. Land Use and Roadside Environments

121. The roadside environment is variable from urbanized town developments to rural agricultural areas, with intermediate semi-urban settlements and semi-rural open areas with occasional roadside dwellings and small businesses scattered throughout the route.

122. About 30% of the road length passes through the urban/built-up areas. For the remaining length the road passes through high cultivation/agriculture land.

M. Transportation

1. Nellore district:

123. **Roadways**: NH-5 serves the major towns of Sullurpeta, Naidupeta, Gudur, Nellore, Kovur and Kavali in the district. The nearest international airport is at Chennai, 170 km to the south. The national railway runs throughout the length of the district. Nellore is situated between Gudur Junction and Vijayawada Junction on the Chennai–Howrah main line. A railway line is being constructed from Krishnapatnam to Obulavaripalle to link up this port with Mumbai Railway line. Rail Line is completed up to Venkatachalam junction connecting Nellore, Chennai cities. Krishnapatnam Port is one of the important ports situated in the district on the coast of Bay of Bengal.

124. **Railways**: Nellore railway station is the major railway station of the district and is connected to major cities such as Visakhapatnam, Vijayawada, Hyderabad, Ahmedabad, Chennai, Bangalore, Tirupati amongst many others.

125. **Airways**: Tirupati Airport and The Chennai International airport are the nearest airports of the district and well connected via roads.

126. **Seaways**: The Krishnapatnam Port is located in the district and is all weather, deep water port.

2. Chittoor district:

127. **Roadways**: The district has an intricate network of roads with more than11,564 kms in length, crossing various villages and towns of the district. National highways which pass through the district account for 352 kms, while State highways account for 255 kms in the district. District roads, major and minor, account for 2407 kms. The recently taken over Panchayath roads under the control of Roads and Buildings Department account for 1498 kms, and Panchayath roads as such account for 7052 kms in the district. A fleet of buses provides transport services to all growth centers in the nook and corner of the district. The district has got a vehicle population of 1.98 lakhs including 7405 goods vehicles on road. The district is within reach of Chennai (formerly Madras) and Bangalore as it borders Tamil Nadu and Karnataka states respectively. These two metropolises are good sources of raw materials and market for the district.

128. **Railways**: The district has 280.82 kms of railway track, of which 157.78 kms are broad gauge, while the rest of 123.04 kms are meter gauge, Tirupati, Renigunta, Kuppam and Pakala are important broad gauge links. Super-fast express trains, passenger trains and goods trains run through the district connecting Bombay, Chennai, Bangalore, Calcutta, Delhi, Hyderabad etc., providing vital transport network for industrial raw materials and finished products. Since Tirupati is the abode of Lord Venkateswara, there are direct transport facilities from Tirupati and Renigunta to far off Delhi, Bombay, Calcutta, and near about Chennai, and other important places.

129. **Seaways**: Tirupathi is on the Air map of India and there are weekly flights are to Hyderabad, Vijayawada, Chennai and Bangalore. It also caters to the travelling needs of business executives.

N. Mineral Resources

1. Nellore District:

130. Nellore district is famous for good quality of Mica. The district is also rich in other minerals like quartz, silica, barites, vermiculate and laterite. Nellore district is a major producer of mica in the country and has enormous reserves of good quality mica in Gudur, Nellore and Rapur taluks. The mica pegmatities of Atmakur, Gudur, Kavali and Rapur Taluks have been mined for mica of commercial value for several decades. Occurrence of barytes is reported from southwest of Vinjamur with BaO content varying from 32% to 50%. Silica Sand useful in the glass industry and as foundry sand occurs at Ataknaithippa, in Sullurpet Mandal, Ballvelu, Chintavaram, Yerur of Chillakur Mandal. Mamidi of Muthukur Mandal, Pannamadugu of Tada Mandal, along the Coastal plains of the district. Barytes occurs at Vinjamur, Bandakindapalle, sankavarm, R.F Gundamadakala in Vinjamur Mandal. The mineral is off-coloured and occurs in Schists in association with quartzites. Quartz useful in glass and Ceramic industries occurs in association with pegmatites in Gudur Sydapuram Udaigir, Podakalur, Duttalur, Venkatagiri, Chejerla, Kaligiri, Vinjamur and Chillakur Mandals.

2. Chittoor District:

131. The district is not rich in mineral wealth. Steatite is the only mineral mined in the erstwhile Puttur and Gangadhara Nellore block areas of the district. However, the occurrence of gold, iron and Red moulding sand are also noticed in certain parts of the district. In Bisnatham area of the erstwhile Kuppam taluk, auriferous veins are 22 % wide and carry an average gold content of 5.190 wt. of gold per tonne. Iron ore occurs in intimate association with hematite in the erstwhile Vayalpad, Srikalahasti and Puttur Taluks.

O. Social and Cultural

1. Nellore district:

132. Nellore is considered one of the most tourist places in the state. Numerous temples, historical spots and beautiful national parks are the highlights of tourism. Sri Talapagiri Ranganatha Swamy Temple (30 km. from PIA) is one of the famous temples in Nellore district. The temple is more than 600 years old. The seven gold kalisams bring a unique beauty to the temple. There are several other important temples like Jonnawada for Mallikarjuna Swami Kamakshi temple on the banks of river Pennar. (40 km. from PIA) Somasila dam of Nellore is the biggest irrigation projects in Andhra Pradesh. Udayagiri Fort of Nellore has become one of the important tourist spot. The Udayagiri region is also famous for medicinal plants of the area.

2. Chittoor district:

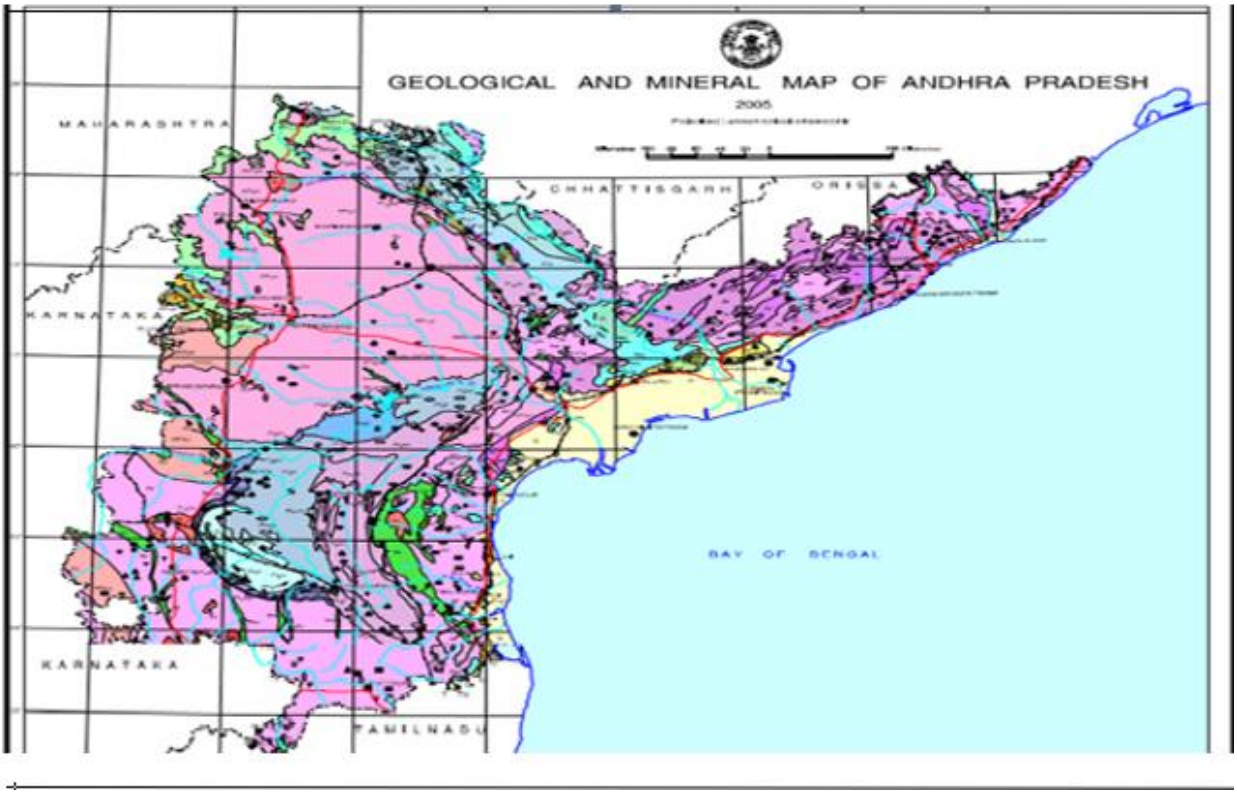
133. Some of the popular tourist places in Chittoor are Narayanvanam (120km.from PIA), Suruthapalle (150 km. from PIA), Bokkasam Palam (110 km from PIA), Srinivasa Mangapuram (70 km. from PIA), Srikalahasti (120 km. from PIA), Kanipaakam Temple (65 km. from PIA) etc.

134. This project is 48.7 kms from shore and the direction of coast is east.

P. Energy and Electric Power Potential

135. There are several power plants in Andhra Pradesh and around the project area. Simhadri Super Thermal Power Plant and Ramagundam Power plants of NTPC Limited are further expanding their capacities. There are also a lot of solar power generation activities coming up promoted by the Government’s power policy.

Figure 10: Geological & Mineral Map of Andhra Pradesh



VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Beneficial Impacts

136. The immediate benefits of road construction and improvement will come in the form of direct employment opportunities during construction for the roadside communities specially those engaged as wage laborers and petty contractors and suppliers of raw materials.

137. Improvement of the External Connectivity to Nakkapalli Industrial Cluster Road section to two-lane configuration will result in connectivity to the National Highway, smooth flow of traffic to benefit different stakeholders, reduction in travel time and lower vehicle operating cost, i.e., per kilometer vehicle operating cost from the general improvement work and an absolute saving in cost due to reduction in fuel consumption for the existing traffic. Improved access and reduced travel times and costs will be major stimuli to economic growth, particularly in semi-urban and rural areas. The better access of agricultural goods to market will be particularly important and a major contributor to poverty reduction.

138. Increased labor mobility will also occur. There is also the likelihood of the relocation of homes and businesses to new road-side locations.

139. The long-term effects of these roads on poverty reduction are, consequently, expected to be significantly positive.

140. During operation stage, road-side economic activities supporting transport like gasoline stations, automotive repair shops, lodging, and restaurants will increase due to increased number of vehicles. Increase in agro-industrial activities is also expected to take advantage of improved access to urban centers where there are higher demands and better prices of agricultural products.

B. Potential Negative Impacts

141. Initial screening and identification of potential impacts were conducted using ADB's rapid environmental assessment (REA) checklist (Appendix 1) and the scope of the IEE was determined using a "No Mitigation Scenario - Scoping Checklist" (Appendix 2). The study team visited the road alignment and nearby areas to identify the potential impacts (both positive and negative), met local people and conducted meetings, brainstorming sessions, field examinations, and data gathering. The succeeding paragraphs provide the potential negative impacts for pre-, during construction, and maintenance phases. Avoidance and mitigation measures are also discussed to ensure potential negative impacts are insignificant, site-specific and can be managed using established internationally accepted practices.

C. Pre-Construction Impacts

142. **Location and Design Issues.** The Connectivity to Routhusuramala Cluster (Part of South Block of Proposed Yerpedu - Srikalahasthi Node) subproject is not located in any eco-sensitive areas. There is no major bottleneck along the road requiring realignment/bypasses. Proposed widening will follow the existing alignment. As a result, minimal acquisition of any agricultural land is required. Impact on private and community structure is also reduced. Road and alignment design have considered all major preconstruction impacts and taken avoidance measures at an early stage of planning to have minimal impact due to location.

143. The improvements to the existing road for 2-lane configuration will require the need to cut vegetation along the project road. This will inevitably have a more significant impact and this matter is discussed in the following sections.

144. The road design team has taken into account the need for: (i) optimum siting and control of quarries; (ii) providing adequate cross-drainage structures/drains; (iii) providing side-drainage structures; (iv) mechanized construction methods and thereby, for example, reduced use of firewood for heating bitumen; (v) maximizing safety and thereby reducing traffic accidents; (vi) reducing travel times and, thereby, fuel consumption and emissions; (vii) Increased accessibility for residents to education, health facilities, markets etc., and for others who might come as tourist or other purposes; and Improving the socio-economic conditions of residents in the project area of influence.

145. As part of the engineering works for this work, the following have been the guiding principles in determining preliminary alignments and other matters concerning route. These principles are implemented during detailed design wherever possible and, if this is not possible, the appropriate adjustments shall be made on site during the construction phase:

(i) **Alignment:** Final alignment has been determined to avoid / minimize land acquisition, impact on structures, impact on water bodies, archaeological/cultural sites, interference with water sources, shifting of existing utilities etc.;
(ii) **Water bodies:** construction of culverts and bridges during lean flow period. If technically not feasible toe walls/retaining walls will be installed. Aggregate will be procured from existing licensed quarries;
(iii) **Tree Cutting:** restrict tree cutting to formation width. To the extent possible, road has been aligned on other side of dense vegetation/mature trees; A total of 109 trees have been enumerated in proposed ROW. However, the tree cutting will be restricted to toe line of the formation width. The mandatory compensatory plantation will be done on 1: 2 basis during the project implementation. A tree management plan shall be prepared, and its implementation monitored and reported in the SEMRs submitted to ADB. Tree management plan will also include details of presence of birds, nests etc., on ROW trees. All trees with nests should be marked. Before removal of trees a confirmatory survey should be conducted to reconfirm that there are no nests that will be impacted by tree cutting. In unlikely case of any protected species spotted, tree cutting should be stopped until further investigations are made, and mitigation measures are worked out and IEE updated and cleared by ADB. Irrespective of protected status, no bird nests should be disturbed, and tree should not be cut until the breeding time is concluded and fledglings fly off. Tree cutting shall be scheduled to avoid breeding season in consultation with forest department.
(iv) **Construction material Sourcing:** Borrow areas have been identified at non-agricultural land. Quarrying is not proposed as material will be sourced from existing licensed quarries
(v) **Dust and air pollution:** No new borrow areas/quarry sites to be opened for the project. Aggregates will be sourced from existing licensed quarries. Waste disposal sites and asphalt mixing sites have been sited away from habited areas;
(vi) **Noise and Vibration:** Time regulation for construction near sensitive receptors and residential areas. No crusher operation near these locations;
(vii) **Soil Erosion Cut and fill:** The design attempted to equalize cut and fill. Adequate erosion control measures included in design;

(viii) **Construction Camp and Waste Disposal:** No such facility is sited near any water bodies, forest area, and settlements; and
(ix) **Natural Hazards:** The project area is not located in a high seismic zone or high-risk zone from natural hazards perspective.

Table 16: Type of Potential Impacts at Pre-Construction

S. No.	Environmental Issue	Measures to be taken
1	Alignment	Final alignment should be determined so as to minimize land acquisition and the impact on people, animals and to avoid unfavourable geological condition and cultural relics.
2	Soil erosion	Temporary and permanent drainage systems should be designed to minimize the soil erosion.
3	Dust and air pollution	Borrow sites, waste disposal sites and asphalt mixing sites should be identified – keeping in mind environmental issues such as dust generation and noise pollution.
4	Cultural heritage	Any archaeological sites/remains identified along the alignment should be intimated to ASI prior to construction.

146. Construction camps, related contractor's facilities, borrow pits, and quarries will be established and be located in environmentally sound and socially safe areas. It is expected that construction materials for the road works will be mined only from approved quarries.

147. The following criteria will be applied when locating borrow areas:

(i) Borrow areas are not to be established in ecologically sensitive areas;
(ii) Villagers are to be consulted with respect to location of all borrow areas – these should ensure the safety of local communities and, if possible, should incorporate beneficial post construction features for the villages; and
(iii) Borrow areas are to be located away from the Corridor of Impact of the project road as well as 500 m away from settlements, so as to minimize visual impacts.

148. Regarding the setting-up of construction camps for laborers:

(i) These should be located at least 500 m away from settlements;
(ii) Living accommodation and ancillary facilities should be erected and maintained to standards and scales approved by the Engineer-in-Charge; and
(iii) Toilets and urinals should be provided in accessible places away from the Hot mix plant and mixing yard.

149. There are no adverse impacts expected on historical places/monuments. There are few religious structures/small places of worship which are coming within ROW and adjacent to existing carriageway. Adequate care will be taken to relocate these structures. Also, earthworks associated with the actual road construction/improvement works or deriving from secondary sites such as quarries or borrow pits, may reveal sites or artefacts of cultural/archaeological significance. In the event of such discovery, the concern authorities (Archaeological Survey of India) should be informed and the requirement to take such action should be incorporated in contract documents.

150. To minimize loss of vegetative cover and/or trees and soil erosion the following mitigation measures are adopted during the detailed design and construction stage of the project:

(i) The detail engineering design study is carried out for widening proposal in order to minimize the need for tree felling or removal of vegetation.
(ii) The detailed engineering design shall identify areas prone to erosion and include land stabilization as part of the design. While no major changes are expected, any future minor change in alignment or modifications will be included in the final IEE prepared by the contractor's engineer during project implementation.
(iii) The detail engineering studies, and construction activities will strictly enforce the environmental conditions put as part of the Environmental clearance and Consent conditions from the SPCB; and
(iv) The improvement of road will be done by adopting Environmentally Friendly Road Construction (EFRC) methods.

D. Construction Phase Impacts

151. **Climate and Air Quality.** The potential sources of air emission during the construction phase of the project are: (i) earth works during site preparation; (ii) operation of equipment, machines and vehicles; (iii) transport of construction materials; and (v) combustion of hydrocarbons particularly from the hot mix plants and process of heating bitumen. Most of the emissions will be in the form of coarse particulate matter which will settle down in close vicinity of construction site.

Table 17: Impact on Air Quality during Construction Stage

S. No	Impact	Source
1	Generation of dust (SPM)	Transportation and tipping of cut material - while the former will occur over the entire stretch between the cutting location and disposal site, the latter is more location specific and more intense; Transportation of raw materials from quarries and borrow sites; Stone crushing, handling, and storage of aggregates in asphalt plants. Site levelling, clearing of trees, materials loading/unloading at construction site, construction of bridges. Concrete batching plants. Hot mix plants – due to the mixing of aggregates with bitumen; and Construction of structures and allied activities
2	Generation of polluting gases including SO_2, NOx and HC	Hot mix plants; Large construction equipment, trucks and asphalt producing and paving equipment; The movement of heavy machinery, oil tankers etc. on steep slopes will cause much higher emissions of gases; Toxic gases released through the heating process during bitumen production; and Inadequate vehicle maintenance and the use of adulterated fuel in vehicles.

HC = hydrocarbons, NO_x = Oxides of Nitrogen, SO_2 = Sulphur Dioxide.

152. The stone aggregate will be sourced from licensed quarries. No new quarries shall be open for the project. The pollution related aspects to these quarries are independently complied by the quarry owners. The aggregate will be transported in the tarpaulin covered trucks. The following are the mitigation measures:

(i) Vehicles delivering loose and fine materials shall be covered.

(ii) Loading and unloading of construction materials in covered area or provisions of water fogging around these locations.
(iii) Storage areas should be located downwind of the habitation area.
(iv) Water shall be sprayed on earthworks periodically.
(v) Regular maintenance of machinery and equipment. Vehicular pollution check shall be made mandatory.
(vi) Hot mix plants should be located at least 1.5 km from the nearest habitation, school, hospital, archaeological site, forest, rivers, streams and lakes, 500 m from ponds, and national highway, 250 m from state highway, unless otherwise required by statutory requirements after securing a No-Objection Certificate (NOC) from the SPCB. Hot mix plant shall be fitted with stack of adequate height as may be prescribed by APPCB to ensure enough dispersion of exit gases.
(vii) Bitumen emulsion and bitumen heaters should be used to extent feasible.
(viii) Only crushers licensed by APPCB shall be used.
(ix) LPG should be used as fuel source in construction camps instead of wood.
(x) Regular water sprinkling of unpaved haulage roads.
(xi) Mask and other PPE shall be provided to the construction workers.
(xii) Diesel Generating sets shall be fitted with adequate height as per regulations (Height of stack = height of the building + 0.2 $\sqrt{}$ KVA. Low Sulphur diesel shall be used in DG sets as well as machineries; and
(xiii) Contractor should submit a dust suppression and control program to the APRDC prior to construction.

153. **Noise and Vibration.** The existing noise in the project area is within the permissible limits. During the construction period, noise will be generated from the operation of heavy machinery, the haulage of construction materials to the construction yard and the general activities at the yard itself. Concrete mixing and material movements will be primary noise generating activities and, most likely, will be uniformly distributed over the entire construction period. These construction activities are expected to produce noise levels in the range of 80 – 95 dB(A). Noise and vibration from construction and operation phase will be unavoidable but the impact will only be temporary and minimal and will only impact locations close to the alignment. In construction sites within 500 meters of a settlement, noisy operations should cease between 22:00 and 06:00 hrs. Regular maintenance of construction vehicles and machinery must also be undertaken to reduce noise.

154. Further to minimize noise impacts near sensitive receptors (particularly schools), operation of excavator and other heavy machineries will be carried out mostly during off-hours (7:00 am to 9:00 am and 3.30 pm to 7:00 pm) and on holidays (Saturday and Sundays). Baseline noise will be established for all sensitive areas prior to construction and follow up noise monitoring will be carried out during the construction.

155. No noise modelling is anticipated as there is minimal traffic on the existing road and increase in traffic during operation stage is not expected to be critical. There will be regular monitoring during construction.

Table 18: Likely Impact on Noise Quality in the Vicinity of the Project Area

Impact	Source
Increased noise levels causing discomfort to local residents, workers and local fauna.	Mobilization of heavy construction machinery; Accelerations/decelerations/gear changes – though the extent of impact will depend on the level of congestion and smoothness of the road surface;

	Excavation work for foundations; Construction of structures and other facilities; Crusher plants, Hot mix plants; and Loading, transportation and unloading of construction materials.

156. Typical noise levels associated with various construction activities and equipment are presented in Table 19 below:

Table 19: Typical noise levels of principal construction equipment's (Noise Level in dbA at 50 Feet)

Construction Equipment		**Construction Equipment**	
Bulldozer	80	Crane	75-77
Front end loader	72-84	Welding generator	71-82
Jack hammer	81-98	Concrete mixer	74-88
Crane with ball	75-87	Concrete pump	81-84
		Concrete vibrator	76
Excavation and earth moving		Air compressor	74-87
Bulldozer	80	Pneumatic tools	81-98
Backhoe	72-93	Bulldozer	80
Front end loader	72-84	Cement and dump trucks	83-94
Dump truck	83-94	Front end loader	72-84
Jack hammer	81-98	Dump truck	83-94
Scraper	80-93	Paver	86-88
Grading and compaction		Landscaping and clean-up	
Grader	80-93	Bulldozer	80
Roller	73-75	Backhoe	72-93
		Truck	83-94
Paving		Front and end loader	72-84
Paver	86-88	Dump truck	83-94
Truck	83-94	Paver	86-88
Tamper	74-77		

Source: U.S. Environmental Protection Agency, noise from Construction Equipment and Operations. Building Equipment and Home Appliance. NJID. 300.1 (31 December 1971).

157. The noise levels indicated for various construction activities/equipment, while far exceeding permissible standards, will occur only intermittently and be only temporary. Despite this, these extremely high sound levels present a real risk to the health of workers on- site.

Mitigation measures:

158. Noise barrier (Brick Wall) of 180 cm Width x 200 cm Height of length of 10 m is provided at temple location.

159. Since the anticipated post-construction volumes of traffic on the project road is expected to be low, impacts from higher noise levels will have little significance even though present noise levels in these areas are low. In these areas, the noise produced during construction will also not have a significant impact, if proper mitigation measures are taken. The traffic along the project road is as follows:

Table 20: Traffic Location

Neleballi-Routhusuramala Road		
Vehicle Type/Location	**Km 0+600**	
	ADT	**AADT**
Total Vehicles	1730	1841
Total PCU	2326	2482

Table 21: Total Projected Traffic Routhusuramala Cluster Project Road

Year	Total Vehicles	Total PCU
2018	1841	2482
2023	2871	3703
2028	4298	5425
2033	6296	7852
2038	9017	11172
2043	12627	15706
2048	17758	22149

160. Mitigation Measures should include:

(i) Construction machinery should be located away from settlements.
(ii) Careful planning of machinery operation and the scheduling of such operations can reduce noise levels. The use of equipment emitting noise not greater than 90 dB(A) for an eight-hours operation shift and, when possible, the siting of

construction yards at least 500 metres from residential areas should be adhered to;

(iii) Controlled blasting should only be carried out with prior approval from the Engineer in charge.

(iv) Contractors should be required to fit noise shields on construction machinery and to provide earplugs to the operators of heavy machines.

(v) Blasting should be conducted only during day-light hours; and

(vi) Only controlled blasting shall be conducted, if necessary.

161. **Vibration:** The proposed subproject road passes through surrounding agricultural areas for most of its length and there are very few structures or sensitive receptors close to the road areas. Any potential impacts due to vibration is expected to be minimal.

E. Impact on Land and Soil, Topography and Aesthetics.

1. Topography and Appearance

162. Construction activities of the project roads will bring permanent changes in the local-level topography and appearance of the project site. There will be a loss in aesthetic beauty of the project area mainly due to the earthwork. However, this is usually a temporary phenomenon limited to the construction stage and the stage immediately following it. Proper re-vegetation activities and natural resumption of site stabilization generally bring back the previous look of the area. The following table elaborates potential effects on the topography and appearance and appropriate mitigation measures.

Table 22: Potential effects and mitigation measures

S. No	Construction activity	Potential effect on topography and appearance	Mitigation
1	Stone quarrying	Scarring of landscape and potential landslides (rockslides/falls). There may be permanent changes in the landscape.	Stone quarrying should only be undertaken in legally approved areas. Controlled and environmentally friendly quarrying should be carried out to minimise landslides and erosion.
2	Earthwork from borrow areas	Scarring of landscape due to unearthing activities, minor but permanent changes in landscape.	Borrow areas should be in legally approved locations. As soon as construction activities are complete, they should be re-vegetated and brought back as far as possible to their previous appearance.
3	Waste disposal	Disposal of cut soils and debris at improper locations such as hillside below the road will make the area look untidy and unattractive.	Cut off material should be used to widen the road or disposed of at proper disposal sites.
4	Establishment of labour camps	Disposal of waste and litter at improper locations and deforestation for fire-wood will	Provision and allocation of proper waste disposal bins and sites are required. A supply of cooking gas should be

S. No	Construction activity	Potential effect on topography and appearance	Mitigation
		make the area look dirty and unattractive.	provided by the contractor to eliminate the use of fire wood.

163. **Loss of Productive Soil and Change in Land Use.** Road widening and improvement is limited to available ROW and encroachment on agricultural land is expected to be minimal. Following set of mitigation measures will be implemented with regards to conversion of agricultural lands. Mitigation measures include:

(i) The topsoil from the productive land shall be preserved and reused for plantation purposes. It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion.
(ii) Ensure that the land taken on lease for access road, borrow areas, construction camp is restored back to its original land use.

164. **Soil Erosion/Silt Runoff.** Soil erosion may take place near cutting areas, at steep and uncompacted embankment slope, and wherever vegetation is cleared. Accumulated eroded soil will result to siltation, embankment damage, and drainage problem. Loss of soil due to runoff from earth stockpiles may also lead to siltation. Mitigation measures include:

(i) Bank protection measures shall be taken at erosion prone areas.
(ii) Provision of side drain to guide the water to natural outfalls.
(iii) Retaining walls with parapets and breast walls have been included in the design to check erosion.
(iv) When soil is spread on slopes for permanent disposal, it shall be buttressed at the toe by retaining walls.
(v) Side slopes of the embankment shall not be steeper than 2H: 1V. Turfing of embankment slopes shall be done along the stretch; and
(vi) IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration.

165. **Borrow Areas and Quarries.** Need for opening borrows areas and quarries are not anticipated. However, if requirement emerged, it may cause some adverse impacts if left unrehabilitated. It may pose risk to people, particularly children and animals of accidentally falling into it as well as become potential breeding ground for mosquitoes and vector born disease. Illegal quarrying may lead to unstable soil condition; destroy the landscape of the terrain, air, and noise pollution. Opening of new quarries is not envisaged due to the proposed subproject. Quarry material will be sourced from existing licensed quarries8. The dredging and use of dredged material, if involved, may have its impact in terms of localized sedimentation level increase and dispersion of pollutants present in the dredged material in the river water. Contractor is required to submit a borrow area management plan including the details on top soil conservation, procedures for opening/closing and restoration of borrow area etc. The plan is required to be approved by the Engineer. Detailed borrow area management plan Will be provided post award of Contract and before commencement of work by the Contractor.Mitigation measures include:

(i) Borrow areas if required, shall not be located near forest areas. The edges of borrow sites shall be no closer than 3 m from any fence line or boundary.
(ii) Adequate clearance shall be provided for the construction of catch drains.

(iii) Borrow sites shall have adequate drainage outlets unless the relevant landowner has agreed that the borrow area is to create a permanent tank or dam. Cut batter slopes shall not be steeper than 3 to 1 and shall be left by the Contractor in a tidy and safe condition to the satisfaction of the Engineer. Written clearance from the landowner/village head shall be obtained before leaving a site.
(iv) Obtain statutory approval from competent authority as detailed in chapter II (recent policy initiatives on mining of minor mineral)
(v) Borrow pits shall be selected from barren land/wasteland to the extent possible.
(vi) Borrow areas should not be located on cultivable lands except in the situations where landowners' desires to level the land. The topsoil shall be preserved, and depth shall be restricted to the desired level.
(vii) Borrow areas should be excavated as per the intended end use by the owner.
(viii) The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and amount that can be borrowed.
(ix) The dredged material from the riverbank shall be tested for presence of heavy metals and other pollutants before its reuse.
(x) The depths in borrow pits to be regulated so that the sides shall not be steeper than 25%, to the extent possible, borrow areas shall be sited away from habited areas. Borrow areas shall be levelled with salvaged material or other filling materials which do not pose contamination of soil.
(xi) Monitoring of rehabilitation plan of borrow areas.

166. **Compaction and Contamination of Soil.** Compaction of haulage roads and construction camp area due to movement of construction vehicles, machineries and equipment, and due to sitting of construction camps and workshops. Soil may get contaminated due to inappropriate disposal of liquid waste (lubricating oil and fuel spills, waste oil and lubricant and vehicle/equipment washing effluent) and solid waste (fuel filters, oily rags) likely to be generated from repair and maintenance of transport vehicles, construction equipment and machinery.

167. Soil may also get contaminated due to inappropriate disposal of domestic solid waste and sewage from construction camps. Sub soil contamination may also be attributed to scarified bitumen wastes, operation of the emulsion sprayer and laying of hot mix, storage and stock yards of bitumen and emulsion, excess production of hot mix and rejected materials. Mitigation measures include:

(i) Fuel and lubricants shall be stored at the predefined storage location. The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils.
(ii) Unavoidable waste shall be stored at the designated place prior to disposal. To avoid soil contamination at the wash-down and re-fuelling areas, "oil interceptors" shall be provided. Oil and grease spill and oil-soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to APPCB/ MoEF authorized refiners.
(iii) Movement of construction vehicles, machinery and equipment shall be restricted to the designated haulage route.
(iv) Approach roads shall be designed along the barren and hard soil area to reduce the compaction induced impact on soil.
(v) The productive land shall be reclaimed after construction activity.
(vi) Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp; and

(vii) Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste. Non-biodegradable and non-sellable waste shall be disposed of to an authorized land fill site. If land fill site not available, then burial of the waste in a secured manner shall be ensured.

168. **Surface Water Resources - Siltation and Deterioration in Surface Water Quality.** The temporary pollution of water bodies from spillage of chemicals and oil at construction sites and waste from construction camps may occur. Accidental oil and chemicals spills can contaminate the ponds close to alignment. Mitigation measures include

(i) Construction works near waterways/water bodies shall not be undertaken during the monsoon season.
(ii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies.
(iii) No construction camp within 500m of any water body.
(iv) Locate all parking, repair, and fuel and hazardous material storage area away from any water body. Vehicle parking and maintenance areas shall have waterproof floors from which drainage is collected and treated to legal standards.
(v) Refuel vehicles only in dedicated areas with waterproof floors from which drainage flows to an oil/water separator before discharge.
(vi) Collect all waste oil, store in sealed damage-proof containers and dispose it to recyclers.
(vii) All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean up.
(viii) Temporary retention ponds, interception drains, and silt traps are installed to prevent silt laden water from entering adjacent water bodies/waterways; and
(ix) The slopes of embankments leading to water bodies should be modified and re-channelized to prevent entry of contaminants.

169. **Alteration of Surface Water Hydrology/Drainage.** Diversion of rivers and major streams construction is not envisaged. Reconstruction/new construction of culverts will be done during lean flow period. Diversion of some nallahs may be required for a very short period and their courses will be maintained as soon as construction is completed.

170. **Groundwater.** Water for construction purpose will be sourced mainly through river sources. Suitable arrangement for drinking water in the campsite will be managed by contractor without affecting availability to local community. The area is not classified as critical semi-critical or overexploited by CGWB. However, uncontrolled abstraction can deteriorate the situation. Contamination of groundwater is not envisaged since construction camps, if any will have septic tanks or mobile toilets depending on the number of workers in the camp.
Mitigation measures include:

(i) Requisite permission shall be obtained for abstraction of groundwater.
(ii) The contractor shall make arrangements for water required for construction in such a way that the water availability and supply to nearby communities remain unaffected.

171. **Impact due to Construction Debris/Waste.** Debris can be generated by dismantling of pavement. Quarry dust and unused iron bars or damaged support structures constitute significant wastes. Mitigation for solid waste from construction camp has been given in construction camp section. Mitigation measures include:

(i) The existing bitumen surface can be utilized for paving of crossroads, access roads, and paving works in construction sites and camps, temporary traffic diversions, haulage routes etc.
(ii) All excavated materials from roadway, shoulders, verges, drains, cross drainage and the like will be the property of the APRDC and will be used for backfilling embankments, filling pits, and landscaping.
(iii) Unusable debris material should be suitably disposed at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner.
(iv) Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.
(v) Following consideration shall be made during selection of dumping sites.
(vi) 1.5 km from habitation and forest areas and 500 m from ponds.
(vii) Dumping sites do not contaminate any water sources, rivers etc.
(viii) Public consent from the village council has to be obtained before finalizing the location; and
(ix) Form works will be re-used to the extent possible, more than 20 times as dictated by good practice. All stripped formworks will be examined for any damage and rectified in the workshop for re-use.

F. Ecological Resources

172. There are no national parks, wildlife sanctuaries or any other similar eco-sensitive areas in the subproject location. No wildlife movement was reported/observed. Subproject road passes through a plain terrain. No diversion of forest land is required. Removal of the existing road-side vegetative cover and uprooting of about 109 trees is anticipated due to the project. To avoid any air / dust / noise related impacts in this area, necessary measures are outlined in the EMP such as use of IS approved equipment, no noisy construction during nighttime, avoiding material stacking and storage close to the area and efficient management of traffic near residential and these areas.

173. **Impacts due to Construction Camp and Immigration of Workers.** Poor siting and improper management of construction camp may lead to several adverse impacts on environment viz: (i) loss of vegetation due to use of wood as fuel for cooking; (ii) deterioration in nearby surface water quality; (iii) compaction and contamination of soil due to uncontrolled disposal of solid waste; and (iv) poor sanitation may result to transmission of communicable diseases among the workers and the host communities to include sexually transmitted disease, diseases from improper handling and supply of foodstuffs, poor water supply, insect-borne diseases, and alcoholic and drug. Mitigation measures include:

(i) No productive land will be utilized for construction camp. All sites must be graded, ditched, and rendered free from depressions to avoid water stagnation.
(ii) Accommodation and ancillary facilities including recreational facility for workers shall be erected and maintained to standards and scales approved by the resident engineer. All camps should maintain minimum distance of 500 m from habitation and water bodies.
(iii) All construction camps shall be provided sanitary toilet with provision of septic tanks attached with soak pits. Storm water drains shall be provided for the flow of used water outside the camp. Drains and ditches shall be treated with bleaching powder on a regular basis. Garbage bins must be provided in the camp and

regularly emptied and disposed of in a hygienic manner. LPG cylinders shall be provided as fuel source for cooking to avoid any tree cutting.

(iv) At every workplace, the Contactor will ensure that a readily available first-aid unit;

(v) Workplaces away from regular hospitals shall have indoor health units. Suitable transport shall be provided to approach the nearest hospital. At every workplace an ambulance containing the prescribed equipment and nursing staff shall be provided.

(vi) The Contractor will ensure the good health and hygiene of all workers to prevent sickness and epidemics. These include the HIV/AIDS prevention program to reduce the risk and transfer of HIV virus. Activities under the program include monthly information, education, and communication campaigns to workers, drivers, delivery crew, and communities on the risk.

(vii) The Contractor will provide adequate and safe water supply for the use of the workers. The Contractor will ensure that all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. No alcoholic liquor or prohibited drugs will be imported to, sell, give, and barter to the workers of host community; and

(viii) Migrant workers may be the potential carriers of various diseases. Local community may get exposed to the diseases carried by migrant workers. Regular health check-up and immunization camps shall also be organized for the workers and nearby population.

174. **Safety of Construction Workers and Accident Risk to Local Community.** The following safety aspects: (i) safety of construction workers, (ii) safety of road users including pedestrians and cyclists, (iii) safety to cattle, (iv) safety of local community including additional measures required for the safety of children, women, elderly, and persons with disabilities), (iv) unsafe/ hazardous traffic conditions due to construction vehicle movement need to be considered during design and construction stage, and (v) conduct of safety audit. Impact and mitigations due to blasting operation as already been detailed in Noise and Vibration section.

175. Requirement of underpasses for cattle is not envisaged as movement of the cattle will be alongside the road for accessing any water pond or grazing area, which is the present practice. Water ponds are available for livestock drinking along both sides of the road and the subproject will not impact any restriction on the movement of local community and livestock.

176. Pedestrian crossings, shelter area and level crossings will be incorporated along the road and finalized during the detailed design. This will be based on the result of the traffic study that is being conducted for estimating the traffic flows and estimated traffic volumes over time once the subproject is completed. Mitigation measures include:

(i) During the construction phase, contractors shall be required to adopt and maintain safe working practices. Internationally accepted and widely used safety procedures should be followed during (i) road works (ii) handling of large construction equipment and machineries, (iii) handling of chemicals and hazardous materials and inflammable substances (iii) welding (iv) electrical works etc.;

(ii) Contractor shall arrange all PPEs for workers, first aid and firefighting equipment at construction sites. An emergency plan shall be prepared duly approved by engineer in charge to respond to any instance of safety hazard;

(iii) To avoid disruption of the existing traffic due to construction activities, comprehensive traffic management plan shall be drawn up by the concessionaire. Traffic in construction zones shall be managed as per the provisions of IRC SP 55.
(iv) After construction is completed in a particular zone, it shall be opened for normal operation. All diversions/access roads should be closed before start of normal operation; and
(v) Use of retro-reflectorized traffic signs, and cantilever/gantry type overhead signs, thermoplastic road marking paints, delineators, traffic cones, empty bitumen drums, barricades, and flagmen will be used to ensure traffic management and safety. Conduct of regular safety audit on safety measures adopted during construction. The audit will cover manpower and their safety, machinery, temporary works, equipment and vehicles, materials storage and handling, construction procedures, environment, site safety guidelines, and miscellaneous services.

177. VCICDP Health and safety plan[14] in response to COVID-19 is 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 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 PMU approval. In accordance with the government guidelines, the respective agreed measures are in place before resumption of the specific 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.

178. **Obstruction and Disruption of Traffic.** Disruption of access to infrastructure or social resource due to construction activity will cause nuisance and to a certain extent additional cost to the public in terms of longer travel period due to diversion or heavier traffic. It will also pose risk of accident to road users (pedestrians and motorists) especially at night if these blockages and disruption are not clearly demarcated. Works may pose greater risk to children, women, elderly persons, and persons with disabilities. Mitigation measures include:

(i) The contractor will submit a Traffic Plan to the Project Engineer at least two weeks before the construction starts that will result to obstruction. This Plan will recommend for approval, the safe and convenient temporary diversion of traffic during construction, design of barricades, delineators, signs, markings, lights, and flagmen, among others; Traffic plan shall include measures and safe passages for the safety of road users, including measures that are required to ensure safety of children, women, elderly persons and persons with disabilities.
(i) For widening of existing carriageway and part of it will be used for passage of traffic, paved shoulder will be provided on one side of the existing road by the contractor with the following minimum requirements:
(ii) At least one 3.5 m lane to remain to traffic at all times;

[14] Please refer Appendix 16.

(iii) The surface used by the through traffic will be firm bituminous compacted surface free of defect;
(iv) The maximum continuous length over which construction under traffic may take place is limited to 750 m;
(v) Construction activity will be restricted to only one side of the existing road;
(vi) On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. These paved diversions will comply with standards on junctions and temporary cross drainage; and
(vii) Transportation of quarry material to the construction sites through heavy vehicles shall be done through existing major roads to the extent possible. This will restrict wear and tear to the village/minor roads. Small vehicles/un-motorized vehicle can also be used for its further transportation to the construction sites from temporary storage areas.

179. **Transport and Storage of Materials.** The construction material primarily will consist of aggregate, sand, cement, bitumen, lubricating oil and fuel for vehicle and construction equipment. These will be primarily stored temporarily at construction camps. The oils, fuels, and chemicals will be stored on concreted platform with spills collection pits. The cement will be stored under cover. All these temporary storage areas will be located at least 150 m away from the habitat.

180. **Impact on Land and Private Properties.** The assessment made in resettlement plan shall be referred for exact loss of private properties and measures to compensate such losses. Besides monetary compensation for any loss of private trees, compensatory afforestation and extensive plantation is incorporated in the EMP. Income restoration measures/livelihood options for vulnerable group/resource poor sections and other affected persons as recommended by social development/resettlement expert shall be implemented and the details are provided in the RP prepared for the project.

181. **Impact on Common Property Resources (CPRs).** There are various types of community structures/ facilities/utilities along the proposed alignment as per Table below. Geometric adjustments have been made to minimize the loss to any such facilities. Alternate access must be provided to these structures during construction stage. All community structures likely to be dismantled shall be suitably relocated. For exact extent of impact on these structures and mode of compensation, resettlement / land acquisition plan shall be referred.

182. There are about 7 CPRs with in the PROW. A total of 111 electric poles (Left side 62 and Right side 49 are with in PROW).

183. Various common property resources like temples, tombs, well, borewell, toilets, etc., are found along the project road. There are about 07 CPRs with in the PROW.

Table 23: List of Common Property Resources

Common Property Resources in PROW			
Details	**LHS**	**RHS**	**Total**
Transformer	1	1	**2**
Hand pump	1		**1**
Temple	1		**1**
Borewell	1	1	**2**
Bus Stop	1		**1**

Common Property Resources in PROW			
Total	**5**	**2**	**7**

184. **Impact on historical monuments / religious structures.** There are no adverse impacts expected on historical places/monuments. However, there are few religious structures/idols which are coming within ROW and adjacent to existing carriageway. Care must be taken to relocate these structures. Also, earthworks associated with the actual road construction / improvement works or deriving from secondary sites such as quarries or borrow pits, may reveal sites or artefacts of cultural/archaeological significance. In the event of such discovery, the concern authorities (Archaeological Survey of India) should be informed and the requirement to take such action should be incorporated in contract documents.

G. Operation and Maintenance Phase Impacts

185. **Road Maintenance.** Lack of proper maintenance may deteriorate the road condition over the years resulting into numerous problems such as rise in accidents, disruption of transportation services, tree survival. APRDC must allocate adequate resources and logistics to ensure that the road is being maintained and intended benefits are generated thereof.

186. **Road Safety**. There may be potential safety risks associated with transportation of hazardous chemicals, raw materials, wastes, etc. by industrial trucks. Improper traffic management, poor road maintenance or potential accidents caused by heavy truck or troller movement may pose potential risk to the nearby community.

187. The traffic control plans shall be established which will contain details of diversions, traffic safety arrangements, safety measures for night-time traffic and precautions for transportation of hazardous materials. Timing and scheduling to be done so that transportation of dangerous goods is done during least number of people and other vehicles on the road. The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow.

188. On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. Restriction of construction activity to only one side of the existing road. The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from “Engineer”.

189. Use of adequate signage’s to ensure traffic management and safety. Conduct of regular safety audit on safety measures.

190. **Soil Erosion and its Cumulative Impacts.** The consequences of soil erosions are far wider than repair and maintenance of the road. Along the project road, the inflow of water into ponds during rains causes erosion of the embankment besides seepage of water into embankments and subgrade resulting in softening of the subgrade. This may also increase siltation in water bodies. Project design includes provisions of retaining walls/retaining walls for the protection. Regular checks shall be made to ensure its effectiveness.

191. **Air Pollution.** Likely rise in traffic after road improvement may cause air and noise pollution in the vicinity of the project. Vehicular emission will be the principle source of pollution during operation stage. Atchuthapuram–Anakapalli road is located in thickly vegetated and open agricultural land which will provide adequate dispersion dynamics of gaseous pollutants.

Vegetation acts as sink to air pollutants. Further, the improved road condition will facilitate free flow of traffic thereby reducing the emission level significantly.

192. **Noise Pollution.** Noise level is likely to increase due to increased traffic. Effective traffic management and good riding conditions shall be maintained to reduce the noise level throughout the stretch and speed limitation and honking restrictions may be enforced near sensitive locations. The effectiveness of noise mitigation should be monitored and if need be, solid noise barrier shall be placed.

193. **Water Pollution.** Accidental oil spillage, washing of vehicles, used engine oils can contaminate the nearby water bodies. Expansion joints and drainage spouts may be choked due to silt and vegetation growth. In order to prevent water pollution, washing of vehicles near streams and ponds will be prohibited. Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season. Rejuvenation of the drainage system by removing encroachments/ congestions will be regularly conducted.

194. **Ribbon Development/Encroachment of ROW.** Increase in economic activities results in ribbon development along highways. This may cause congestion to road users and increase in accident. APRDC shall explore options like avenue plantation and/or fencing and initiating regulatory provisions to stop encroachment of ROW.

H. Indirect, Induced and Cumulative Impacts

195. The volume of vehicle movements that will be generated and the likely closure/blocking of some roads/lanes during construction will cause traffic build-up and choke points. There will be slower mobility, longer travel time, slower delivery of goods, people and services than usual during this time. A greater number of people will be exposed to safety hazards from traffic and constricted road space. Coupled with disruption of economic activities and social services from interrupted power supply due to relocation of power poles and/or accidental damages, production outputs will suffer some slowdown. Severe dust falling on vegetation would have some effect on the fields. Apart from the applicable mitigation measures for direct impacts during construction, the coordination with the relevant community and village authorities, social service institutions and business associations should enable further mitigation of indirect and induced the impacts. As such, the proposed road works will not generate cumulative impacts of high magnitude and significance in terms of dust, noise, water resources contamination, soil contamination, impact on aquatic habitats, traffic, blocking of accesses, health and safety hazards and disruption to social services and economic activities. The grievance redress mechanism will be disclosed (through public meetings, display at strategic places and media) to the communities affected by the cumulative impacts.

196. While the project is already located close to urban and semi-urban areas, better and available employment opportunities and transport operations may lead to rapid urbanization in future. The key drivers of impact due to rapid urbanization are (i) people influx; and (ii) vehicle influx.

197. **People Influx.** As population increases exponentially due to rapid and unplanned urbanization, chances are local ecosystem would be unable to cope with the extra stress due to increase in resource utilization load. The major category of impact because of people influx can lead to impacts on Water (usually the case when resource is already in a depleted state and unable to sustain the load due to heightened people influx and may lead to further degradation in water quality of surface water or on the depletion of groundwater table); Solid Waste (In-adequate

collection measures and capacity for treatment of municipal solid waste, excessive load on treatment system might lead to disposal of untreated or partially treated waste directly drained to water stream); Land (change in land usage, land use area and available catchment area lead to higher run-off thus causing depletion of water table and removal of top nutrients from soil).

198. **Vehicle Influx.** The movement of goods and people would also increase due to better transport operations and a wider road network. There may be an impact on the air quality because of increased emissions. The increase influx of vehicle would cause increase in PM, SOX, NOX levels in ambient air. The GHG emissions are also likely to increase. Fast flow of traffic may also result in increased probability of road accidents. However, an element of the same may also be reduced due to less congestion and smooth flow of traffic. Mitigation measures include:

(i) RFID tagged internal combustion vehicles to cap their numbers and levying additional toll tax / cess for their entry into the area may be considered.
(ii) Promoting uptake of electric vehicles and setting up allied infrastructure. Framing an EV policy in line with state policy to increase its use and provide incentives; and
(iii) Conducting Air and Noise Modelling Studies and comparing them with the traffic projections for the area and plan pro-active measures for reduction / control of air and noise emissions.

199. **Adaption to Climate Change.** A separate climate risk assessment has been conducted for the overall VCICDP project considering climate risks to project subcomponents located in areas prone to potential cyclones, heavy rains and flooding. While the subproject components do not face significant climate risks, suitable mitigation measures highlighted in the climate risk study will be considered for implementation.

200. **Greenhouse Gas Emissions.** Greenhouse gas (GHG) emissions that will be generated from the construction and operation of the project facilities are expected to be minimal. Emissions during construction will derive from the use of energy, including gasoline, diesel and electricity, by construction machinery and vehicles and by consumption of construction materials, traffic congestion for short durations, etc. Loss of tree cover will also contribute towards reduction of carbon sink. After construction is completed, twice the number of trees will be planted as per the regulatory norms. GHG emissions are expected to be reduced due to increased tree plantations, reduced traffic congestion and implementation of measures such as solar lights along the road sections and near junction areas.

I. Unanticipated Impacts during Construction and Operation

201. In the event, unanticipated impacts become apparent during project implementation, APRDC through PMU will: (i) inform and seek ADB's advice; (ii) assess the significance of such unanticipated impacts; (iii) evaluate the options available to address them; and (iv) update the IEE including EMP. ADB will help the borrower mobilize the resources required to mitigate any adverse unanticipated impacts or damage.

202. **Disaster management**. In cases of emergency or disaster, Under the Section 39 and 40 of National Disaster Manage Act 2005, it is mandatory on the part of Departments of the State Government, to adopt a continuous and integrated process of planning, organizing, coordinating, and implementing measures which are necessary and expedient for prevention as well as mitigation of disasters. APRDC shall follow the 'Departmental Disaster Management Plan for Roads & Buildings Department' also accessible at

(https://apsdma.ap.gov.in/dmplans_files/department_dmplans/Departmental%20Disaster%20Management%20Plan%20for%20Roads%20&%20Buildings%20Department.pdf)

VII. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

203. Meaningful consultations were carried out during detailed design and IEE preparation. All the five principles of information dissemination, information solicitation, integration, coordination, and engagement into dialogue were incorporated in the consultation process. A framework of mitigating different environmental impacts likely from the project was strengthened and modified based on opinions of all those consulted, especially at the micro level by setting up a dialogue with the village people from whom information on site facts and prevailing conditions were collected. This will be continued during the implementation of the project through grievance redress mechanism.

204. Public consultations were held to allow the incorporation of relevant views of the stakeholders in the final project design, mitigation measures, implementation issues, and enhance the distribution of benefits. Stakeholder's consultations were held with intent to understand their concerns, apprehensions, overall opinion and solicit recommendations to improve project design and implementation. Informal meetings, interviews were organized covering the entire project design stage. Consultations provide affected public a platform to ensure incorporation of their concerns in the decision-making process and foster co-operation among officers of APRDC, the community and the stakeholders to achieve a cordial working relationship for smooth implementation of the project. It inculcates the sense of belongingness in the public about the project.

205. The discussions were designed to receive maximum inputs from the participants regarding their acceptability and environmental concerns arising out of the sub-project. They were given the brief outline of the project to which their opinions were sought particularly in identifying and mitigating any potential adverse impact.

206. Consultation with the stakeholders, beneficiaries, and community leaders were carried out using standard structured questionnaires as well as unstructured questionnaires. Questionnaire survey/discussions were designed to obtain background information and details of general environmental issues that concern people in the project area. In addition, environmental issues were discussed with relevant organizations, government officials, beneficiaries, community leaders and experts. In addition, personal discussions with officials, on site discussion with affected stakeholders, and reconnaissance visits have also been made to the project area.

207. All types of stakeholders were identified to ensure as wide coverage as possible like Residents, shopkeepers and businesspeople who live and work along the road specially the project affected persons, road users/commuters, executing agency, government institutions whose remit includes areas or issues affected by the project (state environment and forest department, Pollution Control Board (PCB), Irrigation Department, Public Health Engineering (PHED) Department and most importantly the beneficiary community in general.

208. **Summary of issues.** The informal consultation generally started with explaining the project, followed by an explanation to potential impacts. Participant's views were gathered regarding all aspects of the environment which may have direct or indirect impact on local people. Key issues discussed were:

(i) Awareness and extent of the project and development components;

(ii) Benefits of the project for the economic and social upliftment of community;
(iii) Labor availability in the project area or requirement of outside labour;
(iv) Local disturbances due to project construction work;
(v) Necessity of tree felling etc. at project sites;
(vi) Impact on water bodies, water logging and drainage problem if any;
(vii) Environment and health;
(viii) Flora and fauna of the project area; and
(ix) Socio-economic standing of the local people.

A. Consultations with Local People/Beneficiaries

209. The consultations with the affected people has been carried out and details are attached in Appendix 9.

	
	
Section of the Participants during the Consultations	Section of the Participants during the Consultations

Table 24: Summary of Consultation Outcome

Concerns and Issues	Mitigation measures proposed / Reason for not being able to address the concern
Meeting in Routhusuramala Village on 01.06.2018- Participants 10 (including 3 women)	
The number of houses will be dismantled due to construction of the road.	Proper resettlement site will be developed.
Fair compensation on the basis of impact assessment of houses (on market rate). Facilities of issue of free House site, Pattas and construction of Houses for the affected houses to be given.	Will be provided.
Fair compensation for land (on market rate) and residual and to the affected household.	Will be provided as per the provisions of the New Act and Rules of the State.
In this village1 Families is affected.	Affected families need to be relocated as per the provision of LA.
Impact on shop and commercial structure in government land.	No
1 Resident will be affected in this village.	Family residents who are affected may be considered for houses under IAY Scheme. Government may consider providing any government vacant land for purpose shop commercial business.
Agriculture Cultivation will be affected in this village.	Suitable compensation need to be given by the Government as per the LA, otherwise alternative source of livelihood may be consider.
Pollution and health related problems at the time of construction work.	Necessary mitigation measures proposed in the EMP.
Impact on rural water and drain system due to construction work.	Will not affect, only after utility shifting the civil work will start.
Provision for irrigation water flow from one side to the other.	Any such existing facilities will be maintained.
Participation of local leaders or public representative in compensation.	The compensation will be determined as per the new LA Act and the Joint Collector will be the competent authority.
Payment of compensation amount before starting the construction work.	Yes, all compensation will be paid before civil work commences.
Creation of employment for local people during the construction of the road.	Provision has been made in the contract to engage local labourers.
Meeting in Basavanagunta Village on 02.06.2018 - Participants 12 (including 4 women)	
The number of houses will be dismantled due to construction of the road.	Proper resettlement site will be developed.
Fair compensation on the basis of impact assessment of houses (on market rate). Facilities of	Will be provided.

Concerns and Issues	Mitigation measures proposed / Reason for not being able to address the concern
issue of free House site Pattas and Construction of Houses for the affected houses to be given.	
Fair compensation for land (on market rate) and residual and to the affected household.	Will be provided as per the provisions of the New Act and Rules of the State.
In this village 4 Families affected.	Affected families need to be relocated has per the provision of LA.
Agriculture Cultivation will be affected in this village.	Suitable compensation need to be given by the Government as per the LA, otherwise alternative source of live-hood may be consider.
Impact on religious structures (CPR Three) and compensation.	Impact will be assessed, structures valuated and compensation will be provided at replacement cost for rebuilding at a suitable place.
4 Residents will be affected in this village.	Families residents who are affected may be consider for houses under IAY Scheme. Government may consider providing any government vacant land for purpose shop commercial business. Impact indicates that subproject settlement site about 270 DH considering that in impact admin higher in Kagitha and Patimeda village settlement.
Road winding is limited to 20 mts on both sides suggested now.	Impact on land and religious structures and shop will be reduced.
Timeline of the civil work starting and ending.	All details will be shared before implementation.

PUBLIC CONSULTATION AT DOMMARAMITTA	
Venue: Dommaramitta	**Date:** 1-06-2018 **Time:** 9.00 A.M
Participants: From the DPR Consultants: S Babu Praveen, Asst. Professor Sociology, Y.Madhu, Social and R&R Specialist.	
Public Participated: Potential Project Affected Persons	
The Village heads, Public Representatives, The Residential House Owners, Land owners, Housewife's, from the Village .	
The participants list is enclosed with name of the person, nature of affecting designation with mobile numbers with signature.	
The villagers participated from the affected villages at Dommaramitta	
The village representatives S.Subba Rao , S.Uma Maheswari,S.Padma,S Nirmala, S.Sujata,S.Subhasini and other participated.	
The Public Consultation started at 9:00 AM with the WEL-COME Speech. The Social Expert Mr.Y. Madhu narrated the importance of VCIC project corridor to the participants and requested every participant to express their views, opinion, suggestions, and objections regarding the proposed road either social or environmental issues.	

The Social Environmental and Technical and Satra consultants, explained clearly about the project social, environmental issues and nature of affecting of settlements, common property resources (CPRs), water bodies, trees, and etc., The Technical Expert informed about the technical specification of proposed road such as existing RoW and proposed RoW, curves improvements and importance of usage of existing ADB Road and the proposed RoW at village sections in order to reduce the affecting settlement and LA to the participants.

210. Issues Discussed in the Public Consultations are:

(i) Brief introduction of the project, importance, implementation and funding agency.
(ii) Loss of structure like Residential, Commercial, Residential & Commercial, CPRs and others.
(iii) Loss of Agriculture Lands.
(iv) Compensation for the affecting structures and lands.
(v) Affecting of CPRs.
(vi) Resettlements and Rehabilitation sites.
(vii) Road safety and health (HIV/AIDS).
(viii) Water bodies affecting.
(ix) Gender issues.
(x) Loss of Trees.
(xi) Vulnerable persons,
(xii) Other issues.

211. **Suggestions.** Due to expansion of the road at village portion, government school compound, temple and houses may be affected. Hence bypass road may be considered to be formed, making use of Government lands.

212. Government must ensure that villagers are not losing the shops and livelihood. So government must consider formation of new Bypass road.

213. The affected families are majority of them are poor agriculture families who cannot afford for house construction, if they lose their house in road construction the government may kindly consider to take up the house construction under IAY scheme.

214. Most of villagers are from poor and Harijana families, majority opinion to form new Bypass road.

215. For widows the Government has to provide widow pension as well as house construction under IAY scheme.

PUBLIC CONSULTATION AT ROUTHUSURAMALA	
Venue: Routhusuramala	**Date: 2-06-2018 Time: 4.00 P.M**
Participants: From the DPR Consultants: S Babu Praveen, Asst.Professor Sociology, Mr. Y.Madhu, Social and R&R Specialist, Public	
Participated: Potential Project Affected Persons, The Village heads, Public Representatives, The Residential House Owners, Land owners, Housewife's, Village Youth groups, Agriculture Labourers, Business men, Vulnerable People.	
The participants list is enclosed with name of the person, nature of affecting designation with mobile numbers with signature. The villagers participated from the affected villages at Rothusuramala. The Social and Environmental Experts and Technical Team from Roughton and Satra Consultants participated. The village representatives K.Yohan,	

G.Mani, T.Ravi, K.Ramanamma, K.Indiramma, N.Prashanti, K.Megana, K.Vajramma,K.Parandammayya
The Public Consultation started at 4:00 PM with the narrated the importance of VCIC project corridor to the participants and requested every participants to express their views, opinion, suggestions, and objections regarding the proposed road either social or environmental issues.
The Social Environmental and technical team of Roughton and Satra consultants, explained clearly about the project social, environmental issues and nature of affecting of settlements, common property resources (CPRs), water bodies, trees, and etc. The technical expert informed about the technical specification of proposed road such as existing RoW and proposed RoW, curves improvements and importance of usage of existing ADB Road and the proposed RoW at village sections in order to reduce the affecting settlement and LA to the participants.
The President requested the participants to respond one by one based on the nature of affecting. The participants positively responded and started questioning, expressing their views, suggestions, alternative practices etc.

216. Issues Discussed in the Public Consultations are:

(i) Brief introduction of the project, importance, implementation and funding agency.
(ii) Loss of structure like Residential, Commercial, Residential & Commercial, CPRs and others.
(iii) Loss of Agriculture Lands.
(iv) Compensation for the affecting structures and lands.
(v) Affecting of CPRs.
(vi) Resettlements and Rehabilitation sites.
(vii) Road safety and health (HIV/AIDS).
(viii) Water bodies affecting.
(ix) Gender issues.
(x) Vulnerable persons.
(xi) Loss of trees.
(xii) Other issues.

217. **Suggestions:** Due to affected house the road should be by pass from External Connectivity to Routhusuramala Cluster, all the villagers are with small population and poor people.

218. The existing road is more prone to accidents at village and people ready to give agriculture lands for new road formation.

219. Compensation should be given for the land owners as per the private market rate. As per the private market rate one cent cost is 7 lakhs whereas the Government rate per 1 Acre of Agriculture land is 4 to 5 lakhs.

220. Alternative source of livelihood is to be provided, as majority of poor and affecting due to road construction they will be losing their house. Hence road alignment is to be considered from the left side.

221. Compensation should be given 3 times more than the normal once, otherwise alternative alignment is to be changed.

Table 25: Public Consultation conducted for widening of road from Neleballi to Routhusuramala and formation of new two-lane road from Srikalahasti-Yerpedu (Routhusuramala Road)

A. Minutes of Public Consultation

Date and Time of Consultation	Place	Agenda	Method	Participants details	Participants Number	
					Male	Female
25 January 2019	Thsildar Offices, B.N. Kandriga and Thottambedu	To inform the public about road widening project, conduct of socio-economic survey and record public concerns	Presentation Information sharing and Discussions	Public Women Village leaders APRDC Officials Revenue Officials PMSC Specialists (Public Communication) DPR Consultants (SATRA)	28	3

Issues raised	Issues raised by	Response
Land acquisition will be done as per the requirement. Land will be taken from both sides of the road. Before acquiring the land from the public, a socio-economic survey will be done to assess the status of the affected person and is required to plan resettlement. Village Revenue Officers need to support SATRA Data Collectors in doing socio-economic survey. Affected persons need to participate and provide necessary details to survey team.	Special Deputy Collector (SDC) APRDC	Information noted
Some villagers are having agriculture lands on both sides of the road. If government takes some part of the land in the widening, the rest land may not be useful for the farmers.	Public	SDC informed that the government will have no problem in acquiring total land, but the land near to the road will have good commercial value and hence it is better to keep the land instead of surrendering the whole land
Culverts need to be constructed to avoid excess water from the tank, Pallamelu village coming on the road	Public	SATRA to present the designs to the public and collect their opinion before finalization.
Compensation for registered, assigned, encroached lands, borewells, assets	Public	SDC informed that as per the new land act compensation will be paid to

		categories of lands acquired and also for houses and other assets. Valuation of houses is done by R & B Department, Trees by Forest, Agriculture crops by Agriculture and Horticulture crops by Horticulture Departments. SDC informed the public that the new land acquisition act will benefit public affected persons will be compensated for loosing houses and new houses will be constructed in government land. The compensation amount will be decided by the district revenue authorities and public required to participated in the consultation meetings with revenue officials.
There are many unemployed youth from affected families, will they get jobs in industries coming in the area	Public	Public Communication specialist, PMSC informed that, VCICDP has Skill Development component by which unemployed youth will be trained in suitable trade and opportunities will be available for employment
Some people have encroached lands near water bodies and are cultivating agriculture crops. Will they get compensation from the government for loosing livelihood	Public	SDC informed that encroachment of water bodies is not permitted under the government rules and the encroachers will not get any compensation.
Land for land is required	Public	SDC informed that for loosing houses, government will construct houses. But for loosing agriculture land, government will not provide land, only compensation will only be given.
Socio-economic survey to be conducted on on at Poyya, Bhavanisankara puram, Routhusuramala, Kothapalem and Pallamala villages on 30th and 31st January 2019.	SDC	Villages Revenue staff to mobilize the affected persons on the schedules dates for the socio-economic survey conducted by SATRA Agency

B. Action plan for the outcome of public consultation outcome

Issues raised in the public consultation	Proposed action plan / mitigation measures
Lack of information on compensation for various land and assets	More public consultation and information disclosure is required.

C. Photographs of Public Consultation

Photo-1 – Public Consultation	Photo-2 – Public Consultation

	
Location: B.N..Kandriga Village Date: 25.012019	Location: Thottambedu Mandal Meeting Hall Date: 25.01.2019

222. **Signature Sheets**. The signature sheets are attached Appendix 9.

B. Consultations with Women and Vulnerable Groups

223. Further consultations with only women and vulnerable households (female headed households, households below poverty line etc.) were conducted as part of the social safeguards studies. The purpose of these exclusive discussions was to ensure women were aware about the project and understand their concerns and expected benefits out of the project. This can be done further.

C. Disclosure of information

224. Information is disclosed through public consultation and making relevant documents available in public locations. The following documents will be submitted to ADB for disclosure on its 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.

225. **VCICDP PMU** will send written endorsement to ADB for disclosing these documents on ADB's website. VCICDP PMU will also provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.

VIII. GRIEVANCE REDRESS MECHANISM

226. **Project grievance redress mechanism**. A project-specific, three-tier GRM covers both environment and social issues. The GRM has been established to receive, evaluate, and facilitate the resolution of affected persons' concerns, complaints, and grievances about the social and environmental performance at project level. The GRM aims to provide a time-bound and

transparent mechanism to voice and resolve social and environmental concerns related to the project. Assessment of the GRM designed and implemented for Project 1 shows that the system was effective in timely resolution of grievances in a transparent manner.[15] The GRM will be disclosed to the affected communities and households prior to the mobilization of contractors in any subproject areas. The project GRC, supported by the PMSC consultants as well as the PMU and PIU safeguard officers will be responsible for timely grievance redress on environmental and social safeguards issues and responsible for registration of grievances, related disclosure, and communication with the aggrieved party. A complaint register will be maintained at field unit, PIU, and PMU levels with details of complaint lodged, date of personal hearing, action taken and date of communication sent to complainant. Contact details, procedures and complaint mechanism will be disclosed to the project affected communities at accessible locations and through various media (i.e., leaflets, newspapers, etc.). Samples of draft project leaflets, grievance registration forms and monitoring templates are in the resettlement framework.

(i) **1st Level grievance.** The phone number of the PIU office should be made available at the construction site signboards. The contractors and field unit staff can immediately resolve onsite, seek the advice of the PIU safeguard manager (social safeguards and communications/environment safeguards) as required, within seven days of receipt of a complaint/grievance.

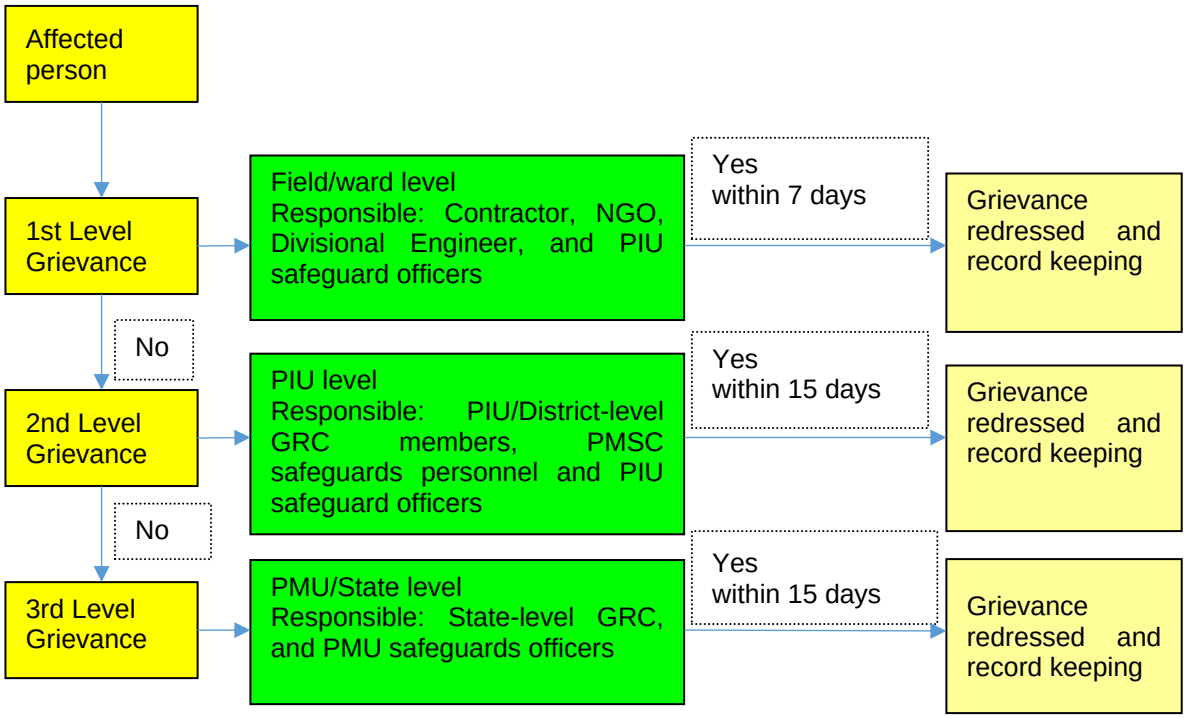
(ii) **2nd level grievance.** All grievances that cannot be redressed within 7 days at field/ward level will be reviewed by the GRC at district level-headed by Joint Collector. GRC will attempt to resolve them within 15 days. The PIU safeguard manager (social safeguards and communications/ environment safeguards) will be responsible to see through the process of redressal of each grievance.

(iii) **3rd Level Grievance.** All grievances that cannot be redressed within 15 days at district level will be reviewed by the GRC at state level-headed by the project director, PMU with support from district GRC, PMU officer - social safeguard and communications/officer-environmental safeguards, and PMC environment and social safeguards specialists. GRC will attempt to resolve them within 15 days. The PMU officer - social safeguard and communications will be responsible to see through the process of redressal of each grievance pertaining to social safeguards.

227. The multi-tier GRM for the project is outlined below (Figure 4), each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required. The GRC will continue to function throughout the project duration.

[15] Regular recording and resolution of grievances at field level indicates that the GRM structure is working effectively. No major grievance was received for project 1 and the GRM helped smoothen the process of project implementation. Hence the proposed architecture for the project 2 of VCICDP GRM remains similar, with some refinement and strengthening for the industrial startup areas, through (a) provision of help desks at each startup area which would serve as accessible platforms for grievance registration for local communities and (b) ensuring indigenous peoples' representation in the GRM structure at district level, for Chittoor–South startup area.

Figure 11: Grievance Redress Mechanism – Visakhapatnam–Chennai Industrial Corridor Development Program



GRC = grievance redressal committee, PIU = project implementation unit, PMU = project management unit, PMSC = project management and supervision consultant.

A. Grievance Redressal Committee

228. GRC consists of two-levels, one at district level and another at state/PMU level, to receive, evaluate and facilitate the resolution of displaced persons concerns, complaints and grievances. GRC at district level will receive, evaluate, and facilitate the resolution of displaced persons concerns, complaints, and grievances. The GRC will provide an opportunity to the affected persons to have their grievances redressed prior to approaching the State level LARR Authority, constituted by GOAP in accordance with Section 51(1) of the RFCTLARR Act, 2013. The GRC is aimed to provide a trusted way to voice and resolve concerns linked to the project, and to be an effective way to address displaced person's concerns without allowing it to escalate resulting in delays in project implementation. In case of any indigenous peoples impacts in subprojects, the GRC (at district level) must have representation of the affected indigenous people community, the chief of the tribe or a member of the tribal council as traditional arbitrator (to ensure that traditional grievance redress systems are integrated) or an independent indigenous peoples expert or an NGO working with indigenous people groups. GRC will also ensure that grievance mechanism established is gender inclusive in receiving and facilitating resolution of the IPs' concerns.

229. The GRC will continue to function, for the benefit of the displaced persons, during the entire life of the project including the defects liability period. The entire resettlement component of the project has to be completed before the construction starts, and pending grievances

resolved. Other than disputes relating to ownership rights and apportionment issues on which the LARR Authority has jurisdiction, GRC will review grievances involving all resettlement benefits, relocation, and payment of assistances. The GRCs will function out of each district where the subprojects are being implemented. The existing setup for coordination, monitoring, and grievance redress at district level which meets once a month, will be used for Project 2 of VCICDP. The GRC chaired by Joint Collector, will comprise of the Divisional/Project Engineer acting as its member secretary and the following members: (i) Revenue Divisional Officer/Sub- Collector of the division; (ii) project director, District Rural Development Agency; (iii) Chief Executive Officer, Zilla Parishad; (iv) District Panchayat Officer; (v) District Education Officer; (vi) District Medical and Health Officer; (vii) District Level representative of power distribution companies; and (viii) Superintendent, Rural Water Supply Panchayat Raj Department, three members from affected persons (with at least one being a woman affected person), team leader of the implementing consulting agency/NGO. The contact details of the GRC, PIUs safeguards manager, and the resettlement plan implementation NGO/agency will be included in the brochures to be circulated among all affected people as a first step in resettlement plan implementation.

230. The project director, PMU will be the appellate authority who will be supported by the PMSC and Safeguard Officer (social safeguards and communications/ environment safeguards) of PMU and concerned PIUs to make final decisions on the unresolved issues. Despite the project GRM, 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.

231. **Accountability Mechanism.** In the event that 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 at ADB headquarters or the ADB India Resident Mission. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.[16]

232. **Record-keeping.** Each of the PIUs of each town/city will keep records of grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions, and the date these were affected and final outcome. The number of grievances recorded and resolved, and the outcomes will be displayed/disclosed in the PMU office, PIU offices, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis. The sample grievance registration format is attached as Appendix 8.

233. **Periodic review and documentation of lessons learned.** The PMU Officer (social safeguard and communications/environmental safeguards) will periodically review the functioning of the GRM in each nodes and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

[16] ADB. Accountability Mechanism.

234. **Costs.** Costs involved in resolving the complaints (meetings, consultations, communication, and reporting/information dissemination) will be borne by the concerned PIU at town level while costs related to escalated grievances will be met by the PMU. Cost estimates for grievance redress are included in resettlement cost estimates.

235. **Capacity building.** Regular capacity building activities on social safeguards are proposed, including quarterly training for safeguards officers of PIUs in year 1, followed by semiannual training in years 2 and 3 of project implementation, and semiannual training for at least 40 staff of PMU, PIUs, and resettlement NGO in the first 3 years of project implementation. Capacity building training will be undertaken by PMSC social safeguards coordinator on safeguards issues of the projects, resettlement framework of VCICDP and ADB Safeguards Policy. The PIU safeguards managers will be further supported by the PMSC experts through on the job training for resettlement plan updating, implementation, complaint resolution and report writing on safeguards.

236. **Civil works contracts.** The PIUs 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 prohibition of child labor as defined in national legislation for construction and maintenance activities, on equal pay for equal work of equal value regardless of gender, ethnicity or caste, on elimination of forced or bonded labor; and (ii) the requirement to disseminate information on infectious diseases such as coronavirus disease and sexually transmitted diseases including HIV/AIDS to employees and local communities surrounding the project sites. Relevant provisions of the GESI AP will be shared with the contractors' responsibilities by the PMU and PIUs. Contractors will carry out all environmental and social mitigation and monitoring measures outlined in their contract and will maintain grievance registers and place GRM signboards at work sites. PMSC specialists will assist the PMU and PIUs in monitoring contractor's compliance activities.

237. **Prohibited investment activities.** Pursuant to ADB's Safeguard Policy Statement (2009), ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the Safeguard Policy Statement (2009).

IX. ENVIRONMENTAL MANAGEMENT PLAN

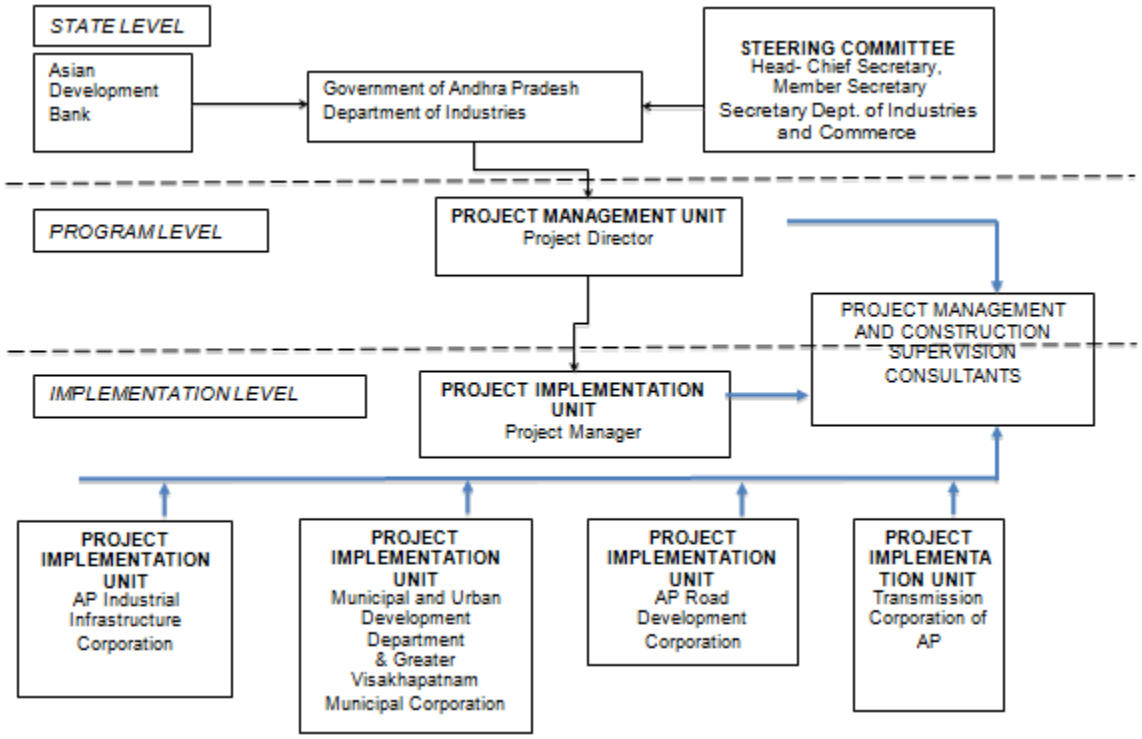
A. Institutional Arrangement

238. The effective implementation and close supervision of the environmental management to mitigate the environmental impacts, which are likely to arise due to the construction and operational phases of the Industrial area could be achieved through a suitable institutional mechanism. A proper institutional mechanism to understand and implement appropriate environmental management measures during various stages of the project is a pre- requisite and has a strong bearing for the overall success of the project management. Implementation of the Environmental Management measures shall become easy once an environmentally responsible Team with institutional arrangement and responsibilities are in place.

239. DOI is the executing agency. A PMU is established within the Directorate of Industries, which is under the DOI, for planning, implementation, monitoring and supervision, and coordination for both the PBL and MFF. PIUs, established in APIIC, APRDC, GVMC, and APTransco, will be responsible for implementing the MFF. PMU has recruited PMSC to provide support in implementation of VCICDP.

240. PMU will support PIUs in implementation, management and monitoring of the project. PMU and PIUs will be assisted by PMSC respectively. PIUs will appoint construction contractors to build infrastructure. Once the infrastructure is built and commissioned, the PIUs will operate and maintain the infrastructure. At state-level a Project Steering Committee (PSC) will be established to provide overall policy direction for the implementation of VCICDP.

Figure 12: Visakhapatnam-Chennai Industrial Corridor Development Program Subproject Implementation Arrangements



241. The GOAP will ensure that all the requirements prescribed in Schedule 5 of the framework financing agreement, and the following frameworks that have been prepared with respect to the Facility are complied with during the processing and implementation of VCICDP: (i) environmental assessment and review framework (EARF), (ii) resettlement framework, and (iii) indigenous peoples planning framework (IPPF).

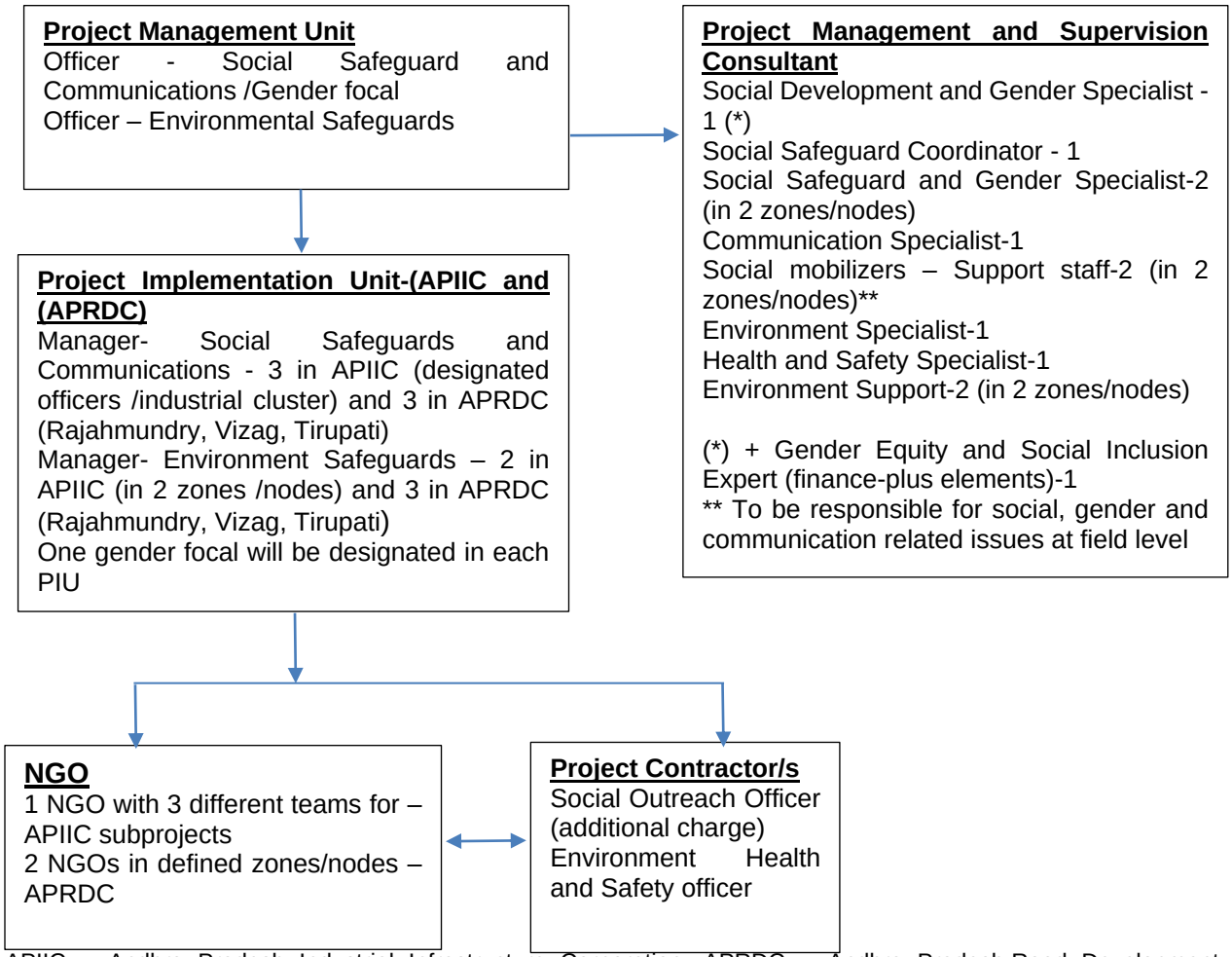
242. The safeguard frameworks cover the Facility specific information and requirements in accordance with ADB's Safeguard Policy Statement, 2009: (i) the general anticipated impacts of subprojects likely to be financed under the Facility on the environment, involuntary resettlement, and indigenous peoples; (ii) the safeguard criteria that are to be used in selecting projects; (iii) the requirements and procedure that will be followed for screening and categorization, impact assessments, development of management plans, public consultation and information disclosure , and monitoring and reporting; (iv) the institutional arrangements (including budget and capacity requirements) and government's and ADB's responsibilities and authorities for the preparation, review and clearance of safeguard documents.

243. The applicability and relevance of each safeguard framework for Tranche 2 has been reviewed and updated to ensure relevance and consistency with all applicable laws and regulations in India and Safeguard Policy Statement, 2009 as amended from time to time. In the

event that there is a discrepancy between the laws and regulations of India and ADB safeguard policies, the ADB safeguard policies will prevail. In addition, Government of India will carry out due diligence works on ongoing projects to assess the status of compliance with the safeguards-related plans and frameworks. For each project, GOAP is required to submit safeguard monitoring reports semiannually covering all the aspects and issues from perspectives of environment, land acquisition, and resettlement and indigenous people.

244. All executing and implementing agencies will ensure that VCICDP is implemented with active participation of all stakeholders, using participatory practices, and consultation will continue throughout implementation of the Investment Program. Disclosure of relevant information to these stakeholders will continue throughout implementation of the Investment Program. Safeguards will be the responsibility of the PMU and the respective PIUs. The PMU and PIUs will be supported by experts as part of the PMSC and resettlement plan implementation nongovernment organizations (NGOs). The safeguards implementation organogram is provided in Figure 5.

Figure 13: Safeguards Organogram – Visakhapatnam–Chennai Industrial Corridor Development Program



APIIC = Andhra Pradesh Industrial Infrastructure Corporation, APRDC = Andhra Pradesh Road Development Corporation, NGO = nongovernment organization.

B. Safeguard Implementation Arrangement

245. **Safeguards Implementation Arrangements**. The implementation arrangements put in place for the MFF, and Project 1 will continue for Project 2. Program management unit (PMU) established within Directorate of Industries by DOIC (EA), is responsible for planning, implementation, monitoring and supervision, and coordination of MFF. PMU is supported by Project implementation units (PIUs) established in Andhra Pradesh Industrial Infrastructure Corporation (APIIC) and Andhra Pradesh Road Development Corporation (APRDC), which will respectively implement industrial infrastructure and road sector subprojects under Project 2. PMU and PIUs are supported by a Project Management and Supervision Consultant (PMSC). Described below are the institutional roles and responsibilities of PMU and PIUs /APRDC to ensure environmental safeguards are implemented and complied with during design, construction, and operation phases. PMU is staffed with an environmental safeguards officer to oversee and ensure environmental safeguards compliance. APRDC has environmental safeguards managers (in Rajahmundry, Vizag and Tirupathi) to oversee the day-to- day implementation of SEMPs by the contractors and ensure safeguards compliance. PMSC team with an environment specialist and health and safety specialist based in PMU and supported by two field-based environmental engineers one in each Nodes[17] will assist APRDC and PMU in implementation, monitoring and reporting on environmental safeguards. Contractors will be responsible for implementing the mitigating measures during the design/construction phase, and APRDC and PMU will be responsible for monitoring.

246. **Program Management Unit (PMU). K**ey tasks and responsibilities of the PMU environmental safeguards officer with the support of PMSC are asfollows:

(i) confirm existing IEEs/EMPs are updated based on detailed designs and that new IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
(ii) confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
(iii) provide oversight on environmental management aspects of subprojects;
(iv) ensure SEMPs prepared by contractors are cleared by PIUs prior to commencement of civil works;
(v) establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan of the SEMPs;
(vi) facilitate and confirm overall 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) Oversee and ensure compliance with labour regulations and ADB SPS prohibited list by contractors and their subcontractors and suppliers etc.
(viii) supervise and provide guidance to the PIUs to properly carry out the environmental monitoring and assessments as per the EARF;
(ix) review, monitor and evaluate the effectiveness with which the SEMPs are implemented, and recommend necessary corrective actions to be taken as necessary;
(x) consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;

[17] The environmental engineers may be based at Vizag and Chittore /Vijaywada supporting the subprojects in two ends of the VCIC corridor.

(xi) ensure timely disclosure of final IEEs/SEMPs in locations and in a form and language accessible to the public and local communities; and
(xii) address any grievances brought about through the Grievance Redress Mechanism (GRM) in a timely manner.

247. **Project Implementation Units.** In APRDC Head Office, the safeguards managers of APRDC currently working on a World Bank Project will coordinate all environmental and social aspects of the projects. In APTransco, given the isolated locations of the proposed sub projects, the subprojects are under different Superintending Engineers and will implement thesubprojects through respective circle offices and a special projects cell. The respective Senior Engineers will be deputed/designated as safeguard compliance officers covering bothenvironment and social safeguards. In APIIC, the Senior Engineer will be deputed/designatedas safeguard compliance managers in addition to the environmental engineer. In GVMC, the Deputy Engineer will be deputed/designated as safeguard compliance officer in addition to the environmental engineer.

Table 26: PIU Environmental Safeguard Manager Tasks and Responsibilities

PIU Environmental Safeguard Manager	Tasks and Responsibilities
Environmental Safeguards –APRDC	include IEEs/EMPs in bidding documents and civil workscontracts; (ii) review and approve SEMPs prepared by contractors; oversee day-to-day implementation of SEMPs by contractorsincluding compliance with all government rules and regulations; (iv) take necessary action for obtaining rights of way; (v) oversee environmental monitoring by contractors; Ensure that workers are paid and treated according to the labour legislations and ADB's SPS prohibited list requirements (vii) take corrective actions when necessary;

PIU Environmental Safeguard Manager	Tasks and Responsibilities
	(vii) submit monthly environmental monitoring reports to PMU; conduct continuous public outreach and awareness buildingrelated to environmental management; address grievances brought about through the GRM in a timely manner; and (x) organize an induction course for the training of contractors in environmental management to be delivered by PMSC consultants
Senior Engineer Cum Compliance Officer (DE Level) – APTransco	Ensure complete payment and other resettlement assistants provided to the affected people prior to displacements (physical and economical) and starts of civil works in the affected areas; (ii) Coordinate with Safeguard Manager of PMU and ensure all social/environmental requirements if any are met.
Senior Engineer Cum Compliance Officer – APIIC	(iii) Coordinate with Safeguard Manager and ensure all social/environmental requirements are met.

Environmental Engineer - APIIC (not exclusive to this project)	include IEEs/EMPs in bidding documents and civil workscontracts; (ii) review and approve SEMPs prepared by contractors; oversee day-to-day implementation of SEMPs by contractorsincluding compliance with all government rules and regulations; (iv) take necessary action for obtaining rights of way; (v) oversee environmental monitoring by contractors; (vi) Ensure that workers are paid and treated according to the labour legislations and ADB's SPS prohibited list requirements (vii) take corrective actions when necessary; (viii) submit monthly environmental monitoring reports to PMU; conduct continuous public outreach and awareness buildingrelated to environmental management; address grievances brought about through the GRM in a timely manner; and organize an induction course for the training of contractors in environmental management to be delivered by PMSC consultants.
Deputy Engineer Cum Compliance Officer - GVMC	(i) Coordinate with Safeguard Manager and ensure all social/environmental requirements are met.
Environmental Engineer - GVMC	include IEEs/EMPs in bidding documents and civil workscontracts; (ii) review and approve SEMPs prepared by contractors; oversee day-to-day implementation of SEMPs by contractorsincluding compliance with all government rules and regulations; (iv) take necessary action for obtaining rights of way; (v) oversee environmental monitoring by contractors; (vi) take corrective actions when necessary; (vii) submit monthly environmental monitoring reports to PMU; conduct continuous public outreach and awareness buildingrelated to environmental management; address grievances brought about through the GRM in a timely manner; and (x) organize an induction course for the training of contractors in environmental management to be delivered by PMSC consultants

248. **Project Management and Supervision Consultants.** The PMU and PIUs will be assisted by PMSC which will be staffed with environmental, health and safety and social safeguard specialists to provide required assistance and regular progress report on safeguards implementation. The environmental specialist will have overall responsibility in implementation of environmental safeguards, including appropriate monitoring and reporting responsibilities. The PMSC environment specialist will provide support for both Project 1 and Project 2 subprojects. Key tasks and responsibilities of the PSMC environmental specialist is as follows:

(i) Update the EARF as required;
(ii) Update the IEEs including site- and subproject-specific EMPs for VCICDP subprojects; Prepare the IEEs and EMPs for subproject components;
(iii) Supervise EMP implementation;
(iv) Prepare a monitoring report of final site- and subproject-specific EMPs and communicate with the stakeholders, including ADB on the progress, of the subprojects including environmental safeguards compliance;
(v) Prepare semi-annual environmental safeguards compliance reports; and
(vi) Support the implementing agencies in preparing periodic financing requests and necessary environmental safeguard reports for subsequent tranches.
(vii) Establish a system to monitor environmental safeguards of the Project; prepare

indicators for monitoring important parameters of safeguards;

(viii) Ensure all requisite approvals and no objection certificates are in place to allow implementation, and that these are renewed in a timely manner where required;

(ix) Ensure that provisions and conditions of all necessary permits, consents, NOCs, etc., are incorporated in the IEEs;

(x) Take proactive action to anticipate the potential environmental impacts of the Project to avoid delays in implementation;

(xi) Assist PIUs in the establishment of GRC for IEE implementation;

(xii) Support the PIUs and PMU in the GRM implementation to address any grievances submitted in a timely manner and establish record keeping system forcomplaint and redressal status of the project;

(xiii) Assist the PIUs and PMU in the project GRM mechanism and complaint solution;

(xiv) Assist the PIUs and PMU for GRM record keeping for first tier complaint and redressed actions;

(xv) Ensure that the relevant environmental mitigation measures specified in the updated EMP will be incorporated into bidding documents and approved by the ADB prior to the issuance of the invitation for bidding;

(xvi) Closely monitor and supervise to ensure that all mitigation measures and monitoring requirements set out in the EMP are implemented and complied with throughout the project implementation, and when required, prepare or recommend necessary corrective actions to be taken and monitor its implementation;

(xvii) Conduct regular monitoring and ensure that contractors and their subcontractors comply with labour legislations and ADB SPS Prohibited list requirements; ensure that workers are paid and treated according to the labor legislations

(xviii) Provide on-the-job training programs to PIU staff involved in Project implementation for strengthening their capacity in managing and monitoring environmental safeguards; and

(xix) Assist the PIUs' safeguards officer to sensitize the turnkey contractors on ADB SPS, EARF, and GRM during detailed design and civil works implementation.

249. **Civil works contracts and contractors.** IEEs including EMPs are to be included in bidding and contract documents and verified by the PIUs and PMU. The PMU and PIUs will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable laws and regulations relating to environment, health and safety; (ii) reinstate pathways, other local infrastructure, and agricultural land to at least to their pre-project condition upon the completion of construction; (iii) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation, international treaties for construction and maintenance activities;(b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; (c) no discrimination in respect of employment and occupation; (d) allow freedom of association and effectively recognize the right to collective bargaining, and (e) elimination of forced labor; and (iv) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

250. The contractor will be required to appoint a full-time Environment, Health and Safety (EHS) supervisor on-site to implement the EMP. Prior to start of construction, Contractor will be required to prepare and submit to PIU, for review and approval. a Site-specific EMP (SEMP). No works can commence until SEMP is approved by PIUPMU. Contractors will carry out all environmental mitigation and monitoring measures outlined in EMP, approved SEMP and their contracts. The contractor will be required to undertake day-to-day monitoring of the SEMP implementation and submit reports to the PIU on a monthly basis. A copy of the EMP/approved SEMP will always be

kept on-site during the construction period. Non-compliance with, or any deviation from, the conditions set out in the EMP/SEMP constitutes a failure in compliance and will require corrective actions. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. Key responsibilities of the EHS supervisor are:

(i) Prepare SEMP and submit to PMU/PIU for approval prior to start of construction;
(ii) Ensure implementation of SEMP and report to PIU/PMSC on any new or unanticipated impacts; seek guidance from the PMU/PIU/PMSC to address the new or unanticipated impact in accordance with the EARF, and ADB SPS;
(iii) Ensure that necessary pre-construction and construction permits are obtained;
(iv) Conduct orientation and daily briefing sessions to workers on environment, health and safety;
(v) Ensure that appropriate worker facilities are provided at the workplace and labor camps as per the contractual provisions;
(vi) Carry out site inspections on a regular basis and prepare site-inspection checklists/reports;
(vii) Record EHS incidents and undertake remedial actions;
(viii) Conduct environmental monitoring (air, noise, etc.,) as per the monitoring plan
(ix) Prepare monthly EMP monitoring reports and submit to PIU;
(x) Comply with labour legislations, and ensure that subcontractors also implement labor legislations requirements, through cascading of requirements to subcontractors—HR policy, labor management requirements, any worksite specific grievance redress mechanism.
(xi) Work closely with PIU Safeguards Officer and PMDSC Environmental Engineer to ensure communities are aware of project-related impacts, mitigation measures, and GRM; and
(xii) Coordinate with the PIU and PMDSC on any grievances received and ensure that those are addressed in an effective and timely manner.

Table 27: Institutional Roles & Responsibility: Environmental Safeguards

Phase	PMU / PIUs	PMSC	ADB
Appraisal stage of all Subprojects under the investment program	PMU / PIUs to review the REA checklists and draft EIA/IEE. PMU / PIUs to submit draft EIA/IEE to ADB for review and approval. PMU / PIUs to disclose on its website the approved EIA/IEE. PMU / PIUs to ensure disclosure of information throughout the duration of the subproject.	PMSC to conduct REA for each subproject using checklists and to prepare EIA/IEE	ADB to review the REA checklists and reconfirm the categorization. ADB will review and approve EIA reports (Category A) and IEE reports (Category B) subprojects. ADB to disclose on its website the submitted EIA/IEE report.

Phase	PMU / PIUs	PMSC	ADB
Detailed Design Phase of all Subprojects under the investment program	PMU / PIUs with the assistance of PMSC to incorporate the EMP, environmental mitigation and monitoring measures into contract documents. PMU / PIUs to obtain all applicable consents/permits/clearances PMU to submit to ADB final IEE for approval and disclosure at ADB website.	PMSC to revise the IEE and EMP in accordance with detailed design changes if warranted. PMSC to ensure incorporation of EMP in bid documents and contracts. PMSC to prepare inventory of utilities to be affected by the subproject.	ADB will review and approve updated EIA reports (Category A) and IEE reports (Category B) subprojects. ADB to disclose on its website updated EIA/IEE report.
Pre-construction Phase of all Subprojects under the investment program	PMU / PIUs to conduct public consultation and disclosure during IEE process and comments will be reflected in the IEE report. PMU / PIU to monitor the disclosure and public consultation. PIU and PMSC to approve contractor‘s proposed locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes. PMU to submit to ADB in prescribed format semi-annual Environment Monitoring Report 6 months after Loan effective date.	PMSC to ensure statutory clearances and permits from government agencies/other entities are obtained prior to start of civil works. PMSC to ensure disclosure of information prior to start of civil works and throughout the duration of the construction period. PMSC to approve contractor‘s site-specific environmental plan (such as traffic management plan, waste management plan, locations for camp sites, storage areas, lay down areas, and other sites/plans specified in the EMP). PMSC to conduct	

Phase	PMU / PIUs	PMSC	ADB
		baseline environmental conditions and inventory of affected trees	
Construction Phase of all Subprojects under the investment program	PMU / PIUs will review 6-monthly monitoring and EMP implementation report including the status of Project compliance with statutory clearances and with relevant loan covenants and submit the 6-monthly report to ADB and seek permission to disclose the same in the investment program web site.	PMSC to monitor the implementation of mitigation measures by Contractor. PMSC to prepare monthly progress reports including a section on implementation of the mitigation measures (application of EMP and monitoring plan) PMSC (as per EMP) will conduct environmental quality monitoring during construction stage (ambient air and noise, and water quality). PMSC to prepare the six-monthly monitoring report on environment by focusing on the progress in implementation of the EMP and issues encountered and measures adopted, follow-up actions required, if any.	ADB to review the 6 monthly report, provide necessary advice if needed to the PMU and approve the same. ADB to disclose on its website environmental monitoring reports.
Pre-operation Phase (Commissioning and Defect Liability Period)	PMU / PIUs to review monitoring report of PMSC on post-construction activities by the contractors as specified in the EMP PMU / PIU to review applicable consents requirements submit 6-monthly environmental monitoring report until project completion	PMSC to apply for the CTOs prior to commissioning. PMSC to monitor and approve post-construction activities by the contractors as specified in the EMP. prepare 6-monthly environmental monitoring report until project completion	ADB to review the 6 monthly report, provide necessary advice if needed to the PMUand approve the same.ADB to disclose on its website environmental monitoring reports.
Operation Phase of all Subprojects under the investment program	PIUs to conduct monitoring, as specified in the environmental monitoring plan. APPCB to monitor the compliance of the standards regarding drinking water quality, ground water, ambient air, effluent quality from treatment plant, noise, as applicable. submit 6-monthly environmental monitoring report until project completion	prepare 6-monthly environmental monitoring report until project completion	ADB to review the 6 monthly report, provide necessary advice if needed to the PMUand approve the same.ADB to disclose on its website environmental monitoring reports.

Notes: APPCB = Andhra Pradesh State Pollution Control Board, PMSC = Project Management Consultants, CTE = Consent to Establish, CTO = Consent to Operate, PMSC = Design and Supervision Consultant, EIA = Environmental Impact Assessment, EMP = Environmental Management Plan, IEE = Initial Environmental Examination, PMU = Project Management Unit; PIU = Project Implementation Unit; REA = Rapid EnvironmentalAssessment

251. **Institutional Capacity and Development.** To enhance the capacity of officials for effective implementation of proposed mitigation measures and monitoring the resultant effects, as well as create awareness amongst workers and public, the training and awareness program is planned. The PMSC environmental safeguards specialist is responsible for training PMU and APRDCs on environmental awareness and management in accordance with both ADB and government requirements.

Table 28: Training Program for Environmental Management

S. No	Target group	Subprojects	Method	Time frame
1	All staff of APRDC including PIU project staff involved in implementation of the project	Environmental Overview: Environmental Regulations, subproject related provisions of various Acts/ Guideline Procedures of EC and FC, process and methodology for IEE, EMPs	Lecture scum interaction	Before beginning of the implementation of the subproject.
2	Managers (Env) at PIU, Supervision Consultant's Environmental Specialists and Select NGOs	Implementation of EMPs: Basic features of an EMP, Planning, designing and execution of environmental mitigation and enhancement measures, monitoring and evaluation of environmental conditions – during construction and operation	Workshops and Seminars	Before the construction begins
3	Environmental officer, design team, Supervision Consultant, Construction Contractors 'staff	Environmentally Sound Construction Practices: Clean construction technology, alternative materials and techniques for construction, Waste Management and minimization in construction, pollution control devices and methods for construction sites and equipment, Environmental clauses in contract documents and their implications, protection of flora and fauna Environmental monitoring during construction	Workshops and Site visits	Before the construction

S. No	Target group	Subprojects	Method	Time frame
4	PIU and Supervision Consultant, NGOs and Community representatives	Monitoring Environmental Performance during Construction: Air, Water, Soil and Noise, tree survival Monitoring requirement and techniques, Evaluation and Review of results, Performance indicators and their applicability possible corrective actions, reporting requirements and mechanisms	Lectures, Workshop and site visits	During initial phases of construction
5	PIU and Supervision Consultant, NGOs and Community representatives	Long-term Environmental Issues in Project Management: Designing and implementing Environmental surveys for ambient air, noise, biological and water quality surveys, data storage, retrieval and analysis, contract documents and environmental clauses, risk assessment and management, contingency planning and management and value addition	Workshops and seminars	During Implementation of the subproject
6	Public/contractors workers	Awareness programs on environmental protection and measures being implemented by APRDC and their role in sustaining the measures taken including for noise pollution, air pollution, safety, soil conservation, and agricultural productivity enhancement	Workshops	During the course of construction and operations
7	APRDC Staff, Supervision Consultant, Engineering Staff of Contractor.	Restoration of sites viz borrow areas, construction Camps, Crushing units, HMP etc. and Reporting Formats/procedure	Lecture / Presentations	Before contractor demobilization

C. Environmental Management Plan and Monitoring Program

252. A general environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between PMO, RPMO, PIUs, consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (ii) provide a pro-

active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (iii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iv) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (v) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

253. The contractor will be required to (i) carry out all of the mitigation and monitoring measures set forth in the approved EMP; and (ii) 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, EMP and site-specific EMP (SEMP). The contractor shall allocate budget for compliance with these IEE, EMP and SEMP measures, requirements and actions. The contractor will be required to submit to PIU, for review and approval, 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; and (iii) monitoring program per EMP. No works can commence prior to approval of SEMP.

254. **Environment Monitoring Program.** The monitoring and evaluation are critical activities in implementation of the Project. Monitoring involves periodic checking to ascertain whether activities are going according to plan or not. It provides the necessary feedback for project management to ensure project objectives are met and on schedule. The reporting system is based on accountability to ensure that the environmental mitigation measures are implemented. Environmental monitoring program has the underlying objective to ensure that the intended environmental mitigations are realized and these results in desired benefits to the target population causing minimal deterioration to the environmental parameters. Such program targets proper implementation of the EMP. The broad objectives are:

(i) To evaluate the performance of mitigation measures proposed in the EMP;
(ii) To evaluate the adequacy of environmental assessment;
(iii) To suggest ongoing improvements in management plan based on the monitoring and to devise fresh monitoring on the basis of the improved EMP;
(iv) To enhance environmental quality through proper implementation of suggested mitigation measures; and
(v) To meet the requirements of the existing environmental regulatory framework and community obligations.

255. **Performance Indicators.** The significant physical, biological and social components affecting the environment at critical locations serve as wider/overall Performance Indicators. However, the following specific environmental parameters can be quantitatively measured and compared over a period of time and are, therefore, selected as specific Performance Indicators (PIs) for monitoring because of their regulatory importance and the availability of standardized procedures and relevant expertise. A comprehensive monitoring plan for all performance indicators has been prepared for all stages, this includes parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits, cost and responsibility for implementation and supervision. Performance indicators requiring quantitative measurements are:

(i) Air Quality with respect to PM2.5, PM10, CO, NO_x and SO_2 at selected location;

(ii) Water Quality with reference to DO, BOD, Oil and grease, COD, Suspended Solids and Turbidity, Alkalinity rivers/streams and water bodies at selected points;
(iii) Noise levels at sensitive receptors (schools, hospitals, community/religious places); and
(iv) Survival rates of trees planted as compensatory plantation to compensate for removal of roadside trees.

256. **Ambient Air Quality (AAQ) Monitoring.** Ambient air quality parameters recommended for monitoring road development projects are PM2.5, PM10, Carbon Monoxide (CO), Oxides of Nitrogen (NO_x) and Sulphur Dioxide (SO_2). These are to be monitored, right from commencement of construction activity at selected locations of plants and machinery, crushers on sites, excavation works etc. Data should be generated once in a season excluding monsoon in accordance with the National Ambient Air Quality Standards.

257. **Water Quality Monitoring.** The physical and chemical parameters recommended for analysis of water quality relevant to road development projects are pH, total solids, total dissolved solids, total suspended solids, oil and grease, COD, Chloride, Lead, Zinc and Cadmium. The location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are given in the Environmental Monitoring Plan. The monitoring of the water quality is to be carried out at locations identified along the project road during construction and operation phase in accordance with the Indian Standard Specifications – IS10500: 1991.

258. **Noise Level Monitoring.** The measurements for monitoring noise levels would be carried out at sensitive receptors and construction sites along the project roads. The Ambient Noise Standards formulated by the WHO for the day and night-time will be complied with.

259. **Tree Management Plan:** The contractor shall prepare tree management plan as part of EMP, which shall include (i) inventory of trees required to be removed for project , with details on size (girth), type and age (ii) proposed plan for compensatory afforestation/tree plantation, with details on proposed area/land identified for plantation, proposed type of saplings to be planted, nurseries identified and any other relevant requirements in line with Forest department/horticulture department. The contractor shall also include proposed timelines for plantation program as part of tree management plan. Tree management plan will also include details of presence of birds, nests etc., on ROW trees. Before removal of trees a confirmatory survey should be conducted to reconfirm that there are no protected bird species that will be impacted by tree cutting. In unlikely case of any protected species spotted, tree cutting should be stopped until further investigations are made, and mitigation measures are worked out and IEE updated and cleared by ADB. Irrespective of protected status, no bird nests should be disturbed, and tree should not be cut until the breeding time is concluded and fledglings fly off. Tree cutting shall be scheduled to avoid breeding season in consultation with forest department.

260. **Success of Re-vegetation.** Compensatory plantation will be taken up in lieu of tree cutting at 1:2 basis. These compensatory plantations will have to be monitored by the implementing agency with the help of the Forest Department. Such monitoring will be conducted through random samples. Such sampling should cover at least 5% of the area planted up. 75% survival rate shall be ensured.

Table 29: Environmental Management Plan for Proposed Road Section (Neleballi to Pallamala Road section)

Project Stage / Activity	Potential Impacts	Mitigations Measures	Location	Responsibility during Implementation	Responsibility during Monitoring
1**. Pre-Construction Stage**					
Widening options of project road	Location on agricultural land, trees/forests, wildlife habitat, unstable sites and religious/cultural sites. Change in widening option determined during the detailed design stage changing the scope or scale of environmental impacts predicted in the IEE.	Widening on other side of agricultural land, trees/forests, wildlife habitat and unstable sites. Widening should avoid religious/cultural sites. Additional environment studies for new alignments (if required).	Entire project length	APRDC / PMSC	APRDC
Location of construction camps and contractor facilities	Location in inappropriate locations such as close to the local communities, community drinking water source etc.	Construction camps should be located at least 500m away from community areas and away from water resources, and at least 1 km away from reserve / protected forest stretches. Village Forest Management Committees should be consulted before locating temporary project facilities	Project construction sites	APRDC / PMSC	APRDC
Location of quarry sites	Location in prohibited areas, forest areas	Only government approved quarry sites should be planned for project use	Environmentally and technically suitable sites near the project road	APRDC / PMSC	APRDC /Department of Geology and Mines

Project Stage / Activity	Potential Impacts	Mitigations Measures	Location	Responsibility during Implementation	Responsibility during Monitoring
		Quarries should not be located in reserved/protected forest stretches			
Location of borrow pits	Location in unstable areas or close to village	Location in environmentally sound areas and away from villages Borrow areas should not be located in the locations of reserve / protected forest stretches.	Environmentally and technically suitable sites and near the project road	APRDC / PMSC	APRDC
Obtaining appropriate NOC/permits	Delays in processing permits causing further delay in initiation of project construction	Processing of NOC/permits on a timely basis.		APRDC / PMSC	PMU
Preparation of project detailed design and contract bidding documents	Exclusion of environmental management and mitigation measures hence lack of EFRC during construction	Incorporation of all mitigation measures into the project detailed design and contract bidding documents		APRDC /Design Consultant	PMU
Removal of encroachment /structures along the road.	Loss of livelihood and structures.	Compensation against loss of structures and should be rehabilitated as per the provisions of resettlement plan.	locations where resettlement required	APRDC / PMSC	PMU
COVID-19 Response	Spread of infection which causes serious symptoms like difficulty in breathing, chest pain and loss of speech or movement. If not	Taking cognizance of situation at time of mobilization, the Contractor shall undertake a COVID risk assessment of project area and prepare a	All work sites, camps, offices, facilities etc.,	APRDC / PMSC / Contractor	PMU / Contractor

Project Stage / Activity	Potential Impacts	Mitigations Measures	Location	Responsibility during Implementation	Responsibility during Monitoring
	treated, it will lead to death	COVID Response and Management Plan (C-R&MP) and submit to PMU and PMSC for approval. The preparation of C-R&MP shall consider guidance of Government of India, World Health Organization, International Labour Organization, International Financial Corporation and World Bank's interim guidance note etc. The key points on COVID Response and Management measures is at **Appendix 16**. The contractor shall submit a Monthly monitoring and progress report to PMU and PMSC.			
2. **Construction Stage**					
Earth removal from borrow areas	Scarring of landscape due to improper disposal of debris Soil erosion Disruption of local drainage Siltation in nearby water bodies, hence, negative effects on aquatic ecology	Disposal of debris at proper disposal site Proper re-vegetation of borrow areas Provision of appropriate drainage structures / facilities	Borrow area, water bodies	Contractor	APRDC

Project Stage / Activity	Potential Impacts	Mitigations Measures	Location	Responsibility during Implementation	Responsibility during Monitoring
Removal of vegetation and uprooting of trees (about 109)	Change in micro level habitat/environment. Soil erosion. Scarring of landscape.	Removal of only necessary vegetation. Re-vegetation of the space available within ROW immediately after earth removal activities. Prepare and implement tree management plan Conduct confirmatory surveys of birds, and nests to identify protected species If any protected species spotted, tree cutting should be stopped until further investigations are made, and mitigation measures are worked out and IEE updated and cleared by ADB. Irrespective of protected status, no bird nests should be disturbed, and tree should not be cut until the breeding time is concluded and fledglings fly off. Tree cutting shall be scheduled to avoid breeding season in consultation with	Entire project length with vegetation.	Contractor / Forest Department	APRDC

Project Stage / Activity	Potential Impacts	Mitigations Measures	Location	Responsibility during Implementation	Responsibility during Monitoring
		forest department. Removal of trees should be compensated with planting new trees at 1:2 ratio on available space along the road.			
Construction of culverts	Disruption of local stream course and aquatic hydrology.	Construction during dry season. Provision of appropriate drainage facilities and stream diversion structures.	Culvert location	Contractor/ APRDC	APRDC
Relocation of cultural properties	Disturbance to religious sentiments of the local communities	Religious structures should be left undisturbed, shifting (if required) shall be done in full cooperation with local people.	Locations of temples/shrines at km	Contractor/ APRDC / local community leaders	APRDC
Construction at sensitive locations	Increased noise level during construction and operation. Vibrational impacts due to running of heavy equipment and compacting during construction & heavy truck	Construction of suitable noise barriers at these locations. Vibration measurement and analysis for key receptors in the area of influence	Locations of schools, religious properties.	Contractors / APRDC Contractors / APRDC	APRDC APRDC

Project Stage / Activity	Potential Impacts	Mitigations Measures	Location	Responsibility during Implementation	Responsibility during Monitoring
	movements during operations.				

Table 30: Operations and Maintenance Phase

Project Stage / Activity	Potential Impact	Mitigation Measure	Location	Responsibility during Implementation	Responsibility during Monitoring
1.1 Anticipated risk of vehicle-animal collision and human-animal Conflict. 1.2 Accidents / Incidents / Traffic Safety	Accidents / Incidents due to heavy vehicular movement.	Mitigative measures may include (rumble strips, informatory /cautionary signage, solar street lighting, etc.) Traffic control measures, including speed limits, will be enforced strictly. Further encroachment of squatters within the ROW will be prevented. Monitor/ensure that all safety provisions included in design and construction phase are properly maintained Highway patrol unit(s) for round the clock patrolling. Phone booth for accidental reporting and ambulance services with minimum response time for rescue of any accident victims, if possible. Tow-way facility for the breakdown vehicles if possible.	At crossing locations	APRDC	APRDC To keep record of all such incidents / accidents
2.1 Air pollution due to due to vehicular movement	Air Pollution due to traffic	Roadside tree plantations shall be maintained at least with 70% survival rate. Regular maintenance of the road will be done to ensure good surface condition Ambient air quality monitoring. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption.	Throughout the Road	APRDC/Contractor	As per statutory requirements Site inspection

Project Stage / Activity	Potential Impact	Mitigation Measure	Location	Responsibility during Implementation	Responsibility during Monitoring
		Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipment.			
3.1a Noise due to movement of traffic 3.1b Vibration due to running of heavy trucks and increased traffic	Increased Noise / Inconvenience / disturbance to the community Vibrational impacts on nearby structure(s)	Effective traffic management and good riding conditions shall be maintained Speed limitation to 40 km/hour and honking restrictions near sensitive receptors Construction of noise barriers near sensitive receptors with consent of local community. Site specific design of the noise barriers will be prepared and included in the final SSEMP and provided to the Contractor for implementation. The effectiveness of the multi-layered plantation should be monitored and if need be, solid noise barrier shall be placed. Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road. Regular monitoring of nearby receptors close to junction areas.	Sensitive receptors as identified in IEE junction areas.	APRDC/Contractor	Noise monitoring as per noise rules, 2000 Discussion with people at sensitive receptor sites Discussion with people at sensitive receptor sites / APRDC

Project Stage / Activity	Potential Impact	Mitigation Measure	Location	Responsibility during Implementation	Responsibility during Monitoring
4.1 Water logging due to blockage of drains, culverts or streams	Land / health impacts	Regular visual checks and cleaning (at least once before monsoon) of drains to ensure that flow of water is maintained through cross drains and other channels/streams. Monitoring of water borne diseases due to stagnant water bodies.	Near surface Water bodies/cross drains/side drains	APRDC/Contractor	Site observation
5.1 Vegetation	Green Cover maintenance	Planted trees, shrubs, and grasses to be properly maintained. The tree survival audit to be conducted at least once in a year to assess the effectiveness.	Project tree plantation sites	APRDC/Contractor	Records and field observations. Information from Forestry Department
6.1 Accident Risk due to uncontrolled growth of vegetation	Aesthetic maintenance	Maintain shoulder completely clear of vegetation. Regular maintenance/trimming of plantation along the roadside No invasive plantation near the road.	Throughout the Project route	APRDC/Contractor	Visual inspection Check accident records
7.1Transport of Dangerous Goods	Community Safety	Existence of spill prevention and control and emergency responsive system Emergency plan for vehicles carrying hazardous material	Throughout the project stretch	APRDC/Contractor	Review of spill prevention and emergency response plan Spill accident records

Table 31: Site Specific Environmental Management Plan for Proposed Road Section (Neleballi to Pallamala Road section)

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
1.0 Construction Stage								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
1.1 Preparatory activities	Submit appointment letter of contractor's Environmental Engineer to PIU / PMU	ADB Project requirement	All contractors and sub-contractors	Approvals, attendance	PMU SEMR		Contractor/ company	APRDC / PMU
	Environmental Engineer (EE) will engage with PMSC and PMU Safeguard Officer to discuss in detail the EMP, seek clarification and recommend corresponding revisions if necessary. EE will prepare Contractors Environmental Implementation Plan based on the approved EMP, EMOP, and agreements reach during the meeting with PMSC and PMU-EO. Request PMSC copy of monthly monitoring formats and establish deadlines for submission.							

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	EE will submit for PMSC approval an action plan to secure all permits and approvals needed to be secured during construction stage which include but not limited to: i) operation of crushers and hot mix plants, ii) transport and storage of hazardous materials (e.g. fuel, lubricants, explosives), iii) waste disposal sites, iv) temporary storage location, iv) water use, and v) emission compliance of all vehicles.							
	Arrangements to link with government health programs on hygiene, sanitation, and prevention of communicable diseases will also be included in the action plan.							

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	EE will submit for approval of PMSC the construction camp / Worker's temporary sanitation and rest area layout, utilities shifting, etc. before its establishment.							
	No works will be initiated by the contractor until the site induction training is carried out by the EE / PMSC.							
1.2 Site induction	Site induction training includes but not limited to: i) discussion and review of EMP and EMoP detailing how specific environmental risks associated with their Scope of Work will be managed legal compliance, inspection and audits, and progress tracking and reporting; ii) environmental training and awareness needs shall be determined and documented via a training needs	ADB Project requirement	All contractors and sub-contractors	Approvals, attendance	PMU SEMR		Contractor/ Company	APRDC / PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	analysis prior to commencement; iii) Health and Safety Awareness Course, which details general environmental awareness and specific performance requirements expected on site; and iv) GRM.							
2.0 Air Pollution								
2.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	Contractor to submit location and layout plan for storage areas of construction materials agreed by Transport, loading and unloading of loose and fine materials through covered vehicles. Paved approach roads. Storage areas to be located downwind of the habitation area. Water spraying on earthworks, unpaved haulage roads and other dust prone areas. Provision of PPEs to workers.	MORT and H Specifications for Road and Bridge works, Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988 General Conditions of Bid Document	Throughout project road	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level < 100 g/m^3 Number of complaints should be zero.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	APRDC /PMU
2.2 Emission of air pollutants	Regular maintenance of	The Air (Prevention and	Asphalt mixing plants,	MI: Levels of HC,	Standards CPCB methods	Included in civil	Contractor	APRDC/PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
(SPM, SO2, NOX, CO) from vehicles due to traffic congestion and use of equipment and machinery	machinery and equipment. Batching, asphalt mixing plants and crushers at downwind (1 km) direction from the nearest settlement. Only crushers licensed by the APPCB shall be used DG sets with stacks of adequate height and use of low Sulphur diesel as fuel. LPG should be used as fuel source in construction camps (if any) instead of wood Ambient air quality monitoring Contractor to prepare traffic management and dust suppression plan duly approved by APRDC.	Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	crushers, DG sets locations	SO2, NO2, and CO. Status of PUC certificates PT: SO2 and NO2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is valid.	Review of monitoring data maintained by contractor	works cost		
3.0 Noise& Vibration								
3.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and	Site specific design of the noise barriers will be prepared and included in the final SSEMP and provided to the Contractor for implementation. All	Legal requirement Noise Pollution (Regulation and	Throughout project section especially at construction sites, residential and identified	MI: day and night Noise levels. Number of complaints from local people	As per Noise rule, 2000 Consultation with local people	Included in civil works costs	Contractor	APRDC/PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
operation of equipment and machinery	equipment to be timely serviced and properly maintained. Construction equipment and machinery to be fitted with silencers and maintained properly. Only IS approved equipment shall be used for construction activities. Timing of noisy construction activities shall be done during night time and weekend near schools, implement noisy operations intermittently to reduce the total noise generated. Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. Restrict construction near residential, built up and forest areas construction today light hours. Honking restrictions near sensitive areas PPEs to workers Noise monitoring as per EMoP.	Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT and H Specifications for Road and Bridge works	sensitive locations.	PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas.	Review of noise level monitoring data maintained by contractor Observation of construction site.			

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.0 Land and Soil								
4.1 Land use Change and Loss of productive / topsoil	Non-agricultural areas to be used as borrow areas to the extent possible. If using agricultural land, topsoil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use.	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations/Top soil storage area PT: Zero complaints or disputes registered against contractor by land owners	Review borrow area plan, site visits	Included in civil works cost	Concessionaire	APRDC / PMU
4.2 Borrow area management	No new borrow area will be opened. Use existing licensed quarries for securing construction material. If any NEW borrow area has to be opened, obtain EC from SEIAA before opening any new borrow area. Comply to EC conditions of SEIAA Non-productive, barren lands, upland shall be used for	IRC Guidelines on borrow areas and for quarries (Environmental protection Act and Rules, 1986; Water Act, Air Act) +Clause 305.2.2 MORTH Specifications for Road and Bridgeworks	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people.	Review of design documents and site observations Compare site conditions with APPCB conditions.	Included in civil works cost	Contractor	APRDC / PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	borrowing earth with the necessary permissions/consents. Depths of borrow pits to be regulated and sides not steeper than 25%. Topsoil to be stockpiled and protected for use at the rehabilitation stage. Transportation of earth materials through covered vehicles. Follow IRC recommended practice for borrow pits (IRC 10: 1961) for identification of location, its operation and rehabilitation Borrow areas not to be dug continuously. To the extent borrow areas shall be sited away from habited areas. Borrow areas shall be levelled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond.	Guidelines for Borrow Areas management		PT: No case of non-compliance to conditions stipulated by APPCB. Zero accidents. Zero complaints				

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.3 Quarry Operations	Aggregates will be sourced from existing licensed quarries. Copies of consent/ approval / rehabilitation plan for a new quarry or use of existing source will be submitted to APRDC. The contractor will develop a Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the approval to EA. Obtain environmental clearance from SEIAA in case of opening new quarry	Clause No.111.3 MORTH Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	New Quarry if needed	MI: Existence of licenses quarry areas from which materials to be sourced and Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of noncompliance to consent conditions and air quality meets the prescribed limit	Review of design documents, contractor documents and site observation. Compliance with SEIAA conditions in case of opening new quarries.	Included in civil works cost	Contractor	APRDC / PMU
4.4 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. Approach roads/haulage roads shall be designed along the barren and hard soil area to	Design requirement	Parking areas, Haulage roads and construction yards.	MI: Location of approach and haulage roads Presence of destroyed/comp acted agricultural land or land which has not be restored to its original	Site observation	Included in civil works cost	Contractor	APRDC / PMU /CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	reduce the compaction. Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. Land taken for construction camp and other temporary facility shall be restored to its original conditions			condition PT: Zero occurrence of destroyed/comp acted land and undestroyed land				
4.5 Contamination of soil due to leakage/ spillage of oil, bituminous and non-bituminous debris generated from demolition and road construction	Construction vehicles and equipment will be maintained and refuelled in such a fashion that oil/diesel spillage does not contaminate the soil. Fuel storage and refuelling sites to be kept away from drainage channels. Unusable debris shall be dumped in ditches and low-lying areas. To avoid soil contamination Oil Interceptors shall be provided at wash down and refuelling areas.	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no – contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	APRDC/PMU /CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	Waste oil and oil soaked cotton/ cloth shall be stored in containers labelled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. Bituminous wastes will be disposed off in an identified dumping site approved by the State Pollution Control Board							
5.0 Water Resources								
5.1 Sourcing of water during Construction	Requisite permission shall be obtained for abstraction of groundwater from Central Groundwater Authority. Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected.	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority.	Checking of documentation Talk to local people	Included in civil work cost	Contractor	APRDC/PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	Water intensive activities not to be undertaken during summer season.			Zero complaints from local people.				
5.2 Disposal of water during construction	Provisions shall be made to connect roadside drains with existing nearby natural drains.	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridgeworks	Throughout the Project section	MI: Condition of drainage system in construction site. Presence /absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods. Site observation and review of documents	Included in civil work cost	Contractor	APRDC /PMU
5.3 Alteration in surface water hydrology	Existing drainage system to be maintained and further enhanced. Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment.	Design requirement, Clause No 501.8.6. MORTandH Specifications	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	APRDC/PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.0 Management of Construction Waste/Debris								
6.1 Selection of Dumping Sites	Contractor to submit a waste/spoil disposal plan and get it approved by PMSC / PMU. Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies Dumping sites must be having adequate capacity equal to the amount of debris generated. Public perception and consent from the local community / village Panchayats has to be obtained before finalizing the location.	Design Requirement, MORTandH guidelines and General Conditions of Contract Document	At all Dumping/Disposal Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor.	APRDC/PMU
6.2 Reuse and disposal of construction and dismantled waste	The existing bitumen surface shall be utilized for paving of crossroads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. All excavated materials from	Design Requirement, MORTH guidelines and General Conditions of Contract Document	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction	Contractor records Field observation Interaction with local people	Included in civil works cost.		

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal, MORTH guidelines should be followed. Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.			debris PT: No public complaint and consent letters for all dumping sites available with contractor				
7.0 Traffic Management and Safety								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
7.1 Management of existing traffic and safety	Detailed Traffic Management Plan shall be submitted by the contractor and approved by the PMSC. The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Timing and scheduling to be done so that transportation of dangerous goods is done during least number of people and other vehicles on the road. The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. On stretches where it is not possible to	Design requirement and IRC: SP: 27 -1984, Report Containing Recommendation of IRC Regional Workshops on Highway Safety The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948+Section 6 of Employer's Requirement of Bid Document	Throughout the project road especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, traffic demarcations, flag men etc. on site. Complaints from road users. No of accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	APRDC/PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. Restriction of construction activity to only one side of the existing road. The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". Use of adequate signage's to ensure traffic management and safety. Conduct of regular safety audit on safety measures.							
7.2 Pedestrians, animal movement	Temporary access and diversion, with proper drainage facilities. Access to the schools, temples and other public places must be maintained when construction takes place near them.	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to	Field observation Interaction with local people	Included in civil works cost.	Contractor	APRDC/PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	Fencing wherever animal movement is expected. Large number of box culverts has been proposed. All structures having vertical clearance above 2 m and not catering to perennial flow of water may serve as underpass for animals			schools, temples and public places. Zero complaints				
7.3 Occupational health and safety of construction workers	Contractors to adopt and maintain safe working practices. Usage of fluorescent and retro refectory signage, in local language at the construction sites Training to workers on safety procedures and precautions. Mandatory appointment of safety officer. All regulations regarding safe scaffolding, ladders, working platforms, gangway, stair wells, excavations, trenches and safe means of entry and egress shall be complied with.	Same as above	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor nonfatal accidents.	Site observation Review records on safety training and accidents Interact with construction workers	Included in civil works cost	Obligation of Contractor	APRDC/PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	Provision of PPEs to workers. Provision of a readily available first aid unit including an adequate supply of dressing materials. The contractor will not employ any person below the age of 18years Use of hazardous material should be minimized and/or restricted. Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or emergencies. Accident Prevention Officer must be appointed by the contractor. **COVID-19.** Taking cognizance of situation at time of mobilization, the Contractor shall undertake a COVID risk assessment of project area and prepare a COVID Response and Management Plan (C-R&MP) and							

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	submit to PMU and PMSC for approval. The preparation of C-R&MP shall consider guidance of Government of India, World Health Organization, International Labour Organization, International Financial Corporation and World Bank's interim guidance note etc. The key points on COVID Response and Management measures is at Appendix 16. The contractor shall submit a Monthly monitoring and progress report to PMU and PMSC.							
7.4 Community health and safety	Restrict access to construction sites only to authorized personnel. Physical separation must be provided for movement of vehicular and human traffic. Adequate signage must be provided for safe traffic movement Provision of temporary diversions	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people PT: Zero incident of accidents.	Site inspection Consultation with local people	Included in civil works cost	Contractor	APRDC/PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	and awareness to locals before opening new construction fronts.			Zero complaints.				
8.0 Site restoration and rehabilitation								
8.1 Clean-up Operations, Restoration and Rehabilitation	Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. All construction zones including riverbeds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Environmental officer. All the opened borrow areas will be	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp, borrow areas and construction sites, Presence/ absence of construction material/debris after completion of construction works on site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and levelled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	APRDC/PMU

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI) / Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	rehabilitated and 'Engineer' will certify							

261. Environmental monitoring will be done during construction on three levels:

(i) Monitoring the development of project performance indicators by APRDC;
(ii) Monitoring implementation of mitigation measures by the Contractor; and
(iii) Overall regulatory monitoring of environmental issues by COI.

262. In addition to regular monitoring on-site (at the project level) on EMP implementation of the mitigation measures, monitoring of key environmental parameters is proposed. Table below presents the indicative environmental monitoring program for the project, which includes environmental parameters, with a description of the sampling stations, the frequency of monitoring, applicable standards, and responsible agencies. This will be finalized based on site-specific EMP and monitoring program is commensurate to the impacts of the subproject.

Table 32: Environmental Monitoring Plan

Environmental Features	Aspect to be monitored	Time and Frequency of Monitoring	Location	Responsible Party
Physical Environment				
Air and Noise	Level of PM10, PM2.5 and SO2 and NOx Noise levels on dB (A) scale	Before commencement of any construction activities Once in every section while construction is ongoing Once after completion of construction activities	At selected locations	APRDC
Vibration	Vibration measurement and analysis of vulnerable structures	Identification of key sensitive receptors / vulnerable structures before start of construction. Measurement and analysis of vibrational impacts during construction and operation.	Flyover / Key junctions	APRDC
Water bodies	Concentration of sediments and presence of construction debris	Before start of construction activities During construction activities in the vicinity of each water body Once after completion of construction activities	Major water bodies	APRDC
	pH, BOD, COD, DO, TDS, NO3 and coliform	Same as above	Major water bodies	APRDC

Environmental Features	Aspect to be monitored	Time and Frequency of Monitoring	Location	Responsible Party
	Length of line drainage structures constructed and strengthened	During construction activities in the vicinity of each water body	Full length of project road	APRDC
	Length of damaged or missing line drains	Before start of construction activities Once after completion of construction activities	Full length of project road	APRDC
	Total number, type, and lengths of cross drainage structures including bridges constructed or strengthened	Before start of construction activities Once a year during construction activities Once after completion of all construction activities	Full length of project road	APRDC
	Number of weak cross drainage structures	Before start of construction activities Once a year during construction activities Once after completion of all construction activities	Full length of project road	APRDC
Geology	Number of cases of illegal quarrying or mining	Once a year after completion of construction activities	Entire project length	APRDC
Ecological Resources				
Flora	Total area of vegetative cover	Before start of construction activities Once a year during construction activities	Entire project section	APRDC
	Total number of trees	Before start of construction activities Once a year during construction activities	Entire project section	APRDC
	Average tree density	Before start of construction activities Once a year during construction activities Once after completion of all construction activities and thereafter once every year for 5-10 years depending on budget availability	Full length of project location	APRDC

Environmental Features	Aspect to be monitored	Time and Frequency of Monitoring	Location	Responsible Party
Social Environment				
Health	Number of accidents among construction workers	During construction activities	All construction sites along project road	APRDC, Contractor, local health officials
	Number of accidents due to moving traffic amongst local community members	Before start of construction activities Once a year during construction activities Once every year after completion of construction activities	All villages along project road	APRDC, Contractor, local health Officials
Travel time	Time taken to travel within each road section	Before start of construction activities After construction activities	Full length of project road	APRDC, Contractor,
	Number and extent of travel delays	During construction activities (throughout the year)	Full length of project road	APRDC, Contractor,

D. EMP Implementation Cost

263. 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 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. EMP implementation budget is shown below in Table below:

Table 33: Estimated Environment Management Cost

S. No	Activity	Amount in (₹)	To be included in Budget under	Remarks
1	**Tree Cutting and Compensatory Afforestation activities**			
a)	No of Trees affecting 109	2,18,000	APRDC-under VCIC project	No. Trees to be planted 218 Nos (1:2 basis) @2000/tree including maintenance for 5 Years by Contractor.
2	**Studies and Monitoring activities**			
a)	Environmental Management and Mitigation Costs	22,55,000	BOQ of Civil Works Cost (Details as given in the Table below)	
b)	Training	6,00,000	APRDC/APIIC under VCIC Project	
Total		**30,73,000**		

264. An estimation of Environmental Management and Mitigation Costs as included in the BOQ Items is provided in the Table below.

Table 34: Environmental Management and Mitigation Costs (Estimation)

Item No.	Description of Items	Unit	Estimated Quantity	Rate in (₹)	Amount (₹)
ENVIRONMENTAL MANAGEMENT AND MITIGATION COSTS (As included in the BOQ)					
A	**Mitigation Measures**				
1	Oil, Grease & Sludge Separator	No.	1.00	50,000.00	50,000.00
2	Silt Fencing	Rm	1.00	1,000.00	1,000.00
3	Relocation of drinking water sources	No.	1.00	50,000.00	50,000.00
4	Relocation of Hand pumps	No.	1.00	20,000.00	20,000.00
5	Desilting / Deeping of Ponds	No.	1.00	2,00,000.00	2,00,000.00
6	Digging of Wells	No.	-	3,00,000.00	-
B	**Monitoring of Environmental Attributes during Construction Phase**				
	Monitoring of Air Quality near Hot mix plants	No. of Samples	4.00	8,000.00	32,000.00
	Monitoring of Air Quality at Critical Locations	No. of Samples	16.00	8,000.00	1,28,000.00
	Monitoring of Noise Level at Equipment Yards	No. of Samples	16.00	3,000.00	48,000.00
	Monitoring of Noise Level at Critical Locations	No. of Samples	16.00	3,000.00	48,000.00

Item No.	Description of Items	Unit	Estimated Quantity	Rate in (₹)	Amount (₹)
	Monitoring of Water Quality	No. of Samples	8.00	6,000.00	48,000.00
	Monitoring of Soil Quality	No. of Samples	4.00	6,000.00	24,000.00
	Additional Soil Monitoring during Spills	No. of Samples	1.00	6,000.00	6,000.00
	Training – Environmental awareness	No of sessions	3	100,000	300,000
C	**Enhancement Measures**				
a)	Landscaping at Junction location	m^2	2,000.00	500.00	10,00,000.00
b	Surface Water Bodies	Nr.	1.00	3,00,000.00	3,00,000.00
	TOTAL				**22,55,000**

E. Staffing Requirement and Budget

265. Costs required for implementing EMP will cover the following activities:

(i) updating IEE, preparing and submitting reports and public consultation and disclosure;
(ii) application for environmental clearances; and
(iii) implementation of emp, environmental monitoring program, and long-term surveys.

266. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by PMU-ESS assisted by the PMU environmental safeguard officer. Therefore, no separate budget is required from PMU-ESS.

267. The cost of mitigation measures and surveys during construction will be incorporated into the contractor's costs, which will be binding on him for implementation. The contractors will conduct the surveys.

Table 35: Training Program for Environmental Management

Items	Pre-construction	Construction	
Training Title	Orientation workshop	Orientation program/ workshop for contractors and supervisory staff	Experiences and best practices sharing
Purpose	To make the participants aware of the environmental safeguard requirements of ADB and Government of India and how the project will meet these requirements	To build the capacity of the staff for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and Government of India	To share the experiences and best practices aimed at learning lessons and improving

Items	Pre-construction	Construction	
			implementation of EMP
Contents	Module 1: Orientation ADB Safeguards Policy Statement Government of India Environmental Laws and Regulations Module 2: Environmental Assessment Process ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements Review of environmental assessment report to comply with ADB requirements Incorporation of EMP into the project design and contracts	Roles and responsibilities of officials/contractors/consultants towards protection of the environment Environmental issues during construction Implementation of EMP Monitoring of EMP implementation Reporting requirements	Experiences on EMP implementation – issues and challenges Best practices followed
Duration	1 day	1 day	1 day on a regular period to be determined by COI, APRDC, and PMSC
Participants	Executing and implementing agencies, COI, and COI staff (technical and environmental) involved in the project implementation	COI APRDC Contractors	COI APRDC Contractors

X. MONITORING AND REPORTING

268. DOI will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the project's risks and impacts. In addition to recording information on the work and deviation of work components from original scope, PMU, APRDC, and PMSC will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome.

269. APRDC / PMSC will submit monthly monitoring and implementation reports to PMU, who will take follow-up actions, if necessary. DOI will submit semi-annual monitoring reports to ADB. The suggested monitoring report format is in Appendix 11. A site inspection checklist is attached at Appendix 15, which is to be filled by the PMSC/APRDC supervising staff and attached to monthly reports. Subproject budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public.

270. Compliance with loan covenants will be screened by the Department of Industries, Government of Andhra Pradesh.

271. ADB will review project performance against the DOI, GoAP, 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.

XI. CONCLUSIONS AND RECOMMENDATION

272. The road improvement subproject is unlikely to cause any significant, irreversible or unprecedented environmental impacts. The potential impacts are localized and temporary in nature and easy to mitigate.

273. Subproject road is not located in any environmentally sensitive areas. It does not passthrough any reserve forest area and no diversion of forest land is required. Widening and improvement will mostly be accommodated within available land. Land acquisition is required only for curve important and locations where protection works are proposed.

274. The environmental impacts attributable to the upgrading of the road sections pertains to tree cutting, temporary deterioration of environmental attributes/ambient during construction phase from land clearing, camp operations and community and occupational health and safety. These impacts are easily mitigated by adopting good construction practices and effective implementation of Environmental Management Plan (EMP). During operation stage, the main impacts are increase in mobile emissions, noise level, accident risk to motorist, pedestrian and animals. Road safety measures are proposed as per IRC: SP: 44-1996 like road delineators, signage, metal beam crash barriers and guideposts etc. Toe walls and stone pitching has been proposed on embankment slopes where ponds are abutting to avoid seepage into sub grade and erosion of road embankment. Any potential development induced impacts in future are not anticipated to be significant as the influx of people working at subproject area and its surroundings will not be substantial so as to lead to any major stress on the eco-system. There is no largescale influx of people expected in future due to the subproject as it is already a habited area, however stress on factors such as traffic congestion and safety will be minimized.

275. In general, the subproject received immense support from local people. The local people appreciate that improved connectivity will bear out several socio-economic positive benefits resulting to improved quality of life. The improved and widened road will also enable reduction in traffic congestion and improved safety along the road corridor.

276. The initial environmental examination of the subproject ascertains that the project is unlikely to cause any significant environmental impacts. No additional studies or need of undertaking detailed EIA is envisaged at this stage. The Executing Agency and APRDC shall ensure that EMP and EMoP are included in Bill of Quantity (BOQ) and forms part of bid document and civil works contract. The same shall be revised, if necessary, during project implementation or if there is any change in the project design and with approval of ADB.

277. The IEE shall be based on any changes in design / alignment prior to start of construction. The updated IEE will also include any additional impacts and mitigation measures required based on final design and alignment. The updated IEE shall be provided to ADB for review and disclosure.

278. Recommendations are as follows:

(i) ensure IEE including EMP is part of the bid and contract document;
(ii) obtain statutory clearances prior to award of contract and ensure conditions/requirements are incorporated in the subproject design and documents;
(iii) during bidding stage, orientation on the environmental safeguard requirements are provided to interested bidders;
(iv) upon mobilization of the contractors, PMU and PIU to provide a safeguards orientation per IEE and project administration manual;
(v) contractor to appoint environmental safeguards bnodal person responsible for environmental safeguards compliance, occupational health and safety and core labor standards;
(vi) Prepare and implement tree management plan for removal of trees in road right of way and to carryout afforestation
(vii) Conduct baseline monitoring of air, noise, water etc before the start of civil works, and conduct periodically during the works as per the environmental monitoring plan
(viii) submit to PIU the site-specific EMP (SEMP) and other subplans as required; and
(ix) PMU and PIU to closely monitor contractor's implementation of the SEMP and provide guidance on corrective actions on a timely manner.

Appendix 1: Rapid Environmental Assessment 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: IND/VCICDP-2/ Connectivity to Routhusuramala Cluster

Sector Division: SAUW / SARD

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		x	No cultural heritage site is located within the road ROW or vicinity.
Protected Area		x	The subproject road not located inside or adjacent to any notified protected area.
Wetland		x	None
Mangrove		x	None
Estuarine		x	None
Buffer zone of protected area		x	None
Special area for protecting biodiversity		x	No special biodiversity area is located close to or within subproject road.
Potential Environmental Impacts Will the Project cause…			

Screening Questions	Yes	No	Remarks
encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?	x		No encroachment of historical places. However, some religious structures and places of worship exist closer to the subproject. Disfiguration of landscape is not envisaged since it is widening / expansion / reconstruction of existing roads. Cut and fills are required only to improve the vertical profile of the road.
encroachment on precious ecology (e.g., sensitive or protected areas)?		x	No National Parks, wildlife sanctuaries or similar eco-sensitive areas along the project road.
alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		x	There is no perennial waterway being crossed by the sub-project road. All culverts construction will be done during lean flow period. There is no waterway or water bodies near cut and fill locations.
deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		x	A temporary earthen bund or silt fencing will be provided around the construction site to avoid any sedimentation in nearby areas during rainfall. Adequate sanitary facilities and drainage will help to avoid this possibility.
increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	x		Air pollution level is likely to be increased for short duration during construction period. Appropriate distance from settlement area and wind direction will be considered to locate air polluting facility like stone crushing unit etc. Use of environment friendly equipment/machineries will help to reduce air pollution.
risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and operation?	x		Workers may be exposed to dust and noise during construction activities. However, the exposure levels are likely to be short. Workers will be provided requisite PPEs to minimize such exposure and associated harmful occupational health effects. Traffic on road will be managed by implementation of adequate traffic management plan as provided in the EMP. No occupational health hazard is anticipated during operation phase.

Screening Questions	Yes	No	Remarks
noise and vibration due to blasting and other civil works?	x		Blasting is not involved. Ambient noise level is expected to increase in the range of 80-90 db (a) due to various construction activities, maintenance workshops, and earthmoving equipment. Although this level of noise exceeds national standards, their occurrence will be intermittent and co-terminus with the project construction. All stationary noise making equipment will be installed with acoustic enclosures. Timings of noise construction activities will be regulated near sensitive receptors. Quarry material will be procured from existing licensed quarries. Opening and operation of new quarry is not envisaged.
dislocation or involuntary resettlement of people?	x		Minimal since widening / improvement work will mostly be accommodated within available ROW.
dislocation and compulsory resettlement of people living in right-of-way?	X		Minimal since widening / improvement work will mostly be accommodated within available ROW.
disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	No significant impact is envisaged. Please refer RP/DDR prepared for the subproject.
other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?	x		Deterioration in ambient air quality will be localized and temporarily during construction. Regular water sprinkling to reduce the dust emission up to negligible standard will be practiced. Noise barriers at sensitive receptors and community place will be provided to avoid any stress. Extensive plantation along the highway and improved road conditions will improve the air quality of the area.
hazardous driving conditions where construction interferes with pre-existing roads?	x		Traffic management plan if required will be implemented by the contractor to prevent any hazardous driving condition in such situations.
poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?	x		Proper provisions for sanitation, health care and solid waste disposal facilities as included in the EMP will form a part of contract documents.
creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		x	No such risk anticipated. Borrow areas are mostly from upland and digging is minimal hence ponding of water is not envisaged.

Screening Questions	Yes	No	Remarks
accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?	x		Road widening and improvement will be undertaken along existing roads currently being used.
increased noise and air pollution resulting from traffic volume?	x		Increase in noise and air pollution is expected during construction phase from road travel, materials handling, earth moving, and fumes from heavy equipment and processing plants. During operation, increase in traffic may result in more vehicles emitting fumes.
increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?		x	This may happen due to accidental spillage. Adequate safety provisions have been proposed to avoid such situation.
social conflicts if workers from other regions or countries are hired?		x	Most of the workers will be locally hired.
large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		x	No such scenario is envisaged.
risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	x		Road construction involves handling of hazardous substances like fuel, lubricants and bitumen which poses risk during transport and storage.
community safety risks due to both accidental and natural causes, 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.	x		Adequate measures have been adopted to mitigate such risks. Awareness will be created amongst people and workers through information disclosure, safety signage and public consultation about safety aspects.

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: IND/VCICDP-2 Connectivity to Routhusuramala Cluster
Sector: Urban and Water Supply
Subsector:
Division/Department: SAUW / SARD

Screening Questions		Score	Remarks[a]
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?	1	While the average rainfall in the area is not very high, this region has experienced cyclones in the past. The last cyclone being in 2016.
	Would the project design (e.g., the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?	0	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g., prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g., construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g., annual power production) of project output(s) (e.g., hydro-power generation facilities) throughout their design lifetime?	0	

[a]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.

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): **Medium**

Other
Comments:_____
_____
_____

Prepared by: _____

Appendix 2: "No Mitigation Measures Scenario" Checklist

Connectivity to Routhusuramala Cluster
VCICDP–Project 2

Checklist 1: Scoping Checklist Part 1 - Questions on Project Characteristics

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc.)?				
1.1	Permanent or temporary change in land use, landcover or topography including increases in intensity of land use?	Yes	Land	Not significant
1.2	Clearance of existing land, vegetation and buildings?	Yes, partly	Land	Not significant
1.3	Creation of new land uses?	Yes, partly	Land (widening of existing road in the available ROW)	Not significant
1.4	Pre-construction investigations e.g., boreholes, soil testing?	Yes	Land, conducted and found ok	Not significant
1.5	Construction works?	Yes	Land, widening of road	Not significant
1.6	Demolition works?	No, Partly only in some cases	Land,	Not significant
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Land	Not significant
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?	Yes	Land	Not significant
1.9	Underground works including mining or tunneling?	No	Land, construction material to be sourced from exiting quarries, no new quarry to be mined.	Not significant
1.10	Reclamation works?	No	No	Not significant
1.11	Dredging?	No	No	Not significant
1.12	Coastal structures e.g., seawalls, piers?	No	No	Not significant
1.13	Offshore structures?	No	No	Not significant
1.14	Production and manufacturing processes?	No	No	Not significant
1.15	Facilities for storage of goods or materials?	Yes, temporary	Land, during construction	Not significant
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	Yes, temporary	Land, during construction	Not significant

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.17	Facilities for long term housing of operational workers?	No	No	Not significant
1.18	New road, rail or sea traffic during construction or operation?	No, existing road to be widened	Land	Not significant
1.19	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc.?	No	Land	Not significant
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No, partial disturbance during construction	Land / Air	Not significant
1.21	New or diverted transmission lines or pipelines?	No	No	Not significant
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	No	Not significant
1.23	Stream crossings?	No	No	Not significant
1.24	Abstraction or transfers of water from ground or surface waters?	No, temporary water use during construction	Land / water	Not significant
1.25	Changes in waterbodies or the land surface affecting drainage or run-off?	No	No	Not significant
1.26	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Land / Air	Not significant
1.27	Long term dismantling or decommissioning or restoration works?	No	Land	Not significant
1.28	Ongoing activity during decommissioning which could have an impact on the environment?	No	No	Not significant
1.29	Influx of people to an area in either temporarily or permanently?	Yes, temporary during construction	Land / Water	Not significant
1.30	Introduction of alien species?	No	No	Not significant

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.31	Loss of native species or genetic diversity?	No	No	Not significant
1.32	Any other actions?			
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?	Yes, construction material	Land	Not significant
2.2	Water?	Yes, during construction	Water	Not significant
2.3	Minerals?	No	No	Not significant
2.4	Aggregates?	Yes	Land	Not significant
2.5	Forests and timber?	No	Land	Not significant
2.6	Energy including electricity and fuels?	Yes	Land /Air	Not significant
2.7	Any other resources?			
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, temporarily during construction	Land	Not significant
3.2	Will the project result in changes in occurrence of disease or affect disease vectors (e.g., insect or water borne diseases)?	No	Water	Not significant
3.3	Will the project affect the welfare of people e.g., by changing living conditions?	Yes		Not significant
3.4	Are there especially vulnerable groups of people who could be affected by the project e.g., hospital patients, the elderly?	No		Not significant
3.5	Any other causes?			
4. Will the Project produce solid wastes during construction or operation or decommissioning?				
4.1	Spoil, overburden or mine wastes?	Yes		Not significant
4.2	Municipal waste (household and or commercial wastes)?	Yes		Not significant
4.3	Hazardous or toxic wastes (including radioactive wastes)?	Yes		Not significant
4.4	Other industrial process wastes?	Yes		Not significant
4.5	Surplus product?	Yes		Not significant

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
4.6	Sewage sludge or other sludges from effluent treatment?	Yes		Not significant
4.7	Construction or demolition wastes?	Yes		Not significant
4.8	Redundant machinery or equipment?	Yes		Not significant
4.9	Contaminated soils or other material?	Yes		Not significant
4.10	Agricultural wastes?	No		Not significant
4.11	Any other solid wastes?	No		Not significant
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		Not significant
5.2	Emissions from production processes?	No		Not significant
5.3	Emissions from materials handling including storage or transport?	Yes		Not significant
5.4	Emissions from construction activities including plant and equipment?	No		Not significant
5.5	Dust or odors from handling of materials including construction materials, sewage and waste?	Yes		Not significant
5.6	Emissions from incineration of waste?	No		Not significant
5.7	Emissions from burning of waste in open air (e.g., slash material, construction debris)?	No		Not significant
5.8	Emissions from any other sources?	No		Not significant
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?				
6.1	From operation of equipment e.g., engines, ventilation plant, crushers?	Yes		Not significant
6.2	From industrial or similar processes?	Yes		Not significant
6.3	From construction or demolition?	Yes		Not significant
6.4	From blasting or piling?	No		Not significant
6.5	From construction or operational traffic?	Yes		Not significant
6.6	From lighting or cooling systems?	Yes		Not significant
6.7	From sources of electromagnetic radiation	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?
	(consider effects on nearby sensitive equipment as well as people)?			
6.8	From any other sources?			
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, temporarily during construction		Not significant
7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?	Yes	Land / water	Not significant
7.3	By deposition of pollutants emitted to air, onto the land or into water?	Yes	Air	Not significant
7.4	From any other sources?			
7.5	Is there a risk of long-term build-up of pollutants in the environment from these sources?	No	Air	Not significant
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?	No, no explosives are expected to be used for blasting, etc.	Land / Air	Not significant
8.2	From events beyond the limits of normal environmental protection e.g., failure of pollution control systems?	No		Not significant
8.3	From any other causes?			
8.4	Could the project be affected by natural disasters causing environmental damage (e.g., floods, earthquakes, landslip, etc.)?	Yes, during cyclones	Land / Water	Not significant
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		Not significant
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g., schools, hospitals, social facilities?	No		Not significant

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
9.3	Through in-migration of new residents or creation of new communities?	No		Not significant
9.4	By placing increased demands on local facilities or services e.g., housing, education, health?	No		Not significant
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	Yes		Not significant
9.6	Any other causes?	No		Not significant
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?				
9.1	Will the project lead to pressure for consequential development which could have significant impact on the environment e.g., more housing, new roads, new supporting industries or utilities, etc.?	Yes, partly due to better connectivity and roads, local activity may increase in terms of commercial work or more ingress of people in the surroundings	Land / Water / Air	Not significant in the immediate future.
9.2	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 wastewater treatment, etc.) housing development extractive industries supply industries other?	Yes	Land / Water / Air	Not significant in the immediate future.
9.3	Will the project lead to after-use of the site which could have an impact on the environment?	No		Not significant

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
9.4	Will the project set a precedent for later developments?	Yes		
9.5	Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?	No		Not significant

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

Question - Are there features of the local environment on or around the Project location which could be affected by the Project? • Areas which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project? • Other areas which are important or sensitive for reasons of their ecology e.g. • Wetlands, • Watercourses or other waterbodies, • 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? • Inland, coastal, marine or underground waters? • Areas or features of high landscape or scenic value? • Routes or facilities used by the public for access to recreation or other facilities? • Transport routes which are susceptible to congestion or which cause environmental problems? • Areas or features of historic or cultural importance?	No
Question - Is the Project in a location where it is likely to be highly visible to many people?	No
Question - 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,	No

• public open space, • community facilities, • agriculture, • forestry, • tourism, • mining or quarrying	
Question - Are there any plans for future land uses on or around the location which could be affected by the Project?	No
Question - Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?	Yes, some settlements at small stretches along the existing alignment.
Question - 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, some places of worship
Question - Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project? For example: • groundwater resources, • surface waters, • forestry, • agriculture, • fisheries, • tourism, • minerals.	No
Question - Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage e.g., where existing legal environmental standards are exceeded, which could be affected by the project?	No
Question - 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 is prone to having cyclonic storms during monsoons.
Question - Is the Project likely to affect the physical condition of any environmental media? • The atmospheric environment including microclimate and local and larger scale climatic conditions? • Water – e.g., quantities, flows or levels of rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Soils – e.g., quantities, depths, humidity, stability or erodibility of soils? • Geological and ground conditions?	No
Question - Are releases from the Project likely to have effects on the quality of any environmental media?	No

• 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?	
Question - 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 - Is the Project likely to affect human or community health or welfare? • The quality or toxicity of air, water, foodstuffs and other products consumed by humans? • Morbidity or mortality of individuals, communities or populations by exposure to pollution? • Occurrence or distribution of disease vectors including insects? • Vulnerability of individuals, communities or populations to disease? • Individuals' sense of personal security? • Community cohesion and identity? • Cultural identity and associations? • Minority rights? • Housing conditions? • Employment and quality of employment? • Economic conditions? • Social institutions?	No

Checklist 3: Significance of Impacts

Questions to be Considered	
1. Will there be a large change in environmental conditions?	No
2. Will new features be out-of-scale with the existing environment?	No
3. Will the effect be unusual in the area or particularly complex?	No
4. Will the effect extend over a large area?	No
5. Will there be any potential for transboundary impact?	No
6. Will many people be affected?	No

7. Will many receptors of other types (fauna and flora, businesses, facilities) be affected?	No
8. Will valuable or scarce features or resources be affected?	No
9. Is there a risk that environmental standards will be breached?	No
10. Is there a risk that protected sites, areas, features will be affected?	No
11. Is there a high probability of the effect occurring?	No
12. Will the effect continue for a long time?	No
13. Will the effect be permanent rather than temporary?	No
14. Will the impact be continuous rather than intermittent?	No
15. If it is intermittent will it be frequent rather than rare?	No
16. Will the impact be irreversible?	No
17. Will it be difficult to avoid, or reduce or repair or compensate for the effect?	No

Appendix 3: Applicable Ambient Air Quality Standards for India Projects

Parameter	Location[a]	Applicable Standards Per ADB SPS[e] (µg/m^3)
PM10	Industrial Residential, Rural and Other Areas	20 (Annual)[c] 50 (24-hr)[c]
	Sensitive Area	20 (Annual)[c] 50 (24-hr) [c]
PM25	Industrial Residential, Rural and Other Areas	10 (Annual) [c] 25 (24-hr)c[c]
	Sensitive Area	10 (Annual) [c] 25 (24-hr)c
SO2	Industrial Residential, Rural and Other Areas	50 (Annual)b 20 (24-hr) [c] 500 (10-min) [c]
	Sensitive Area	20 (Annual)b 20 (24-hr)c 500 (10-min) [c]
NO2	Industrial Residential, Rural and Other Areas	40 (Annual) [b] 80 (24-hr) [b] 200 (1-hr) [c]
	Sensitive Area	30 (Annual) [b] 80 (24-hr) [b] 200 (1-hr) [c]
CO	Industrial Residential, Rural and Other Areas	2,000 (8-hr) [b] 4,000 (1-hr) b 100,000 (15-min) [d]
	Sensitive Area	2,000 (8-hr) b 4,000 (1-hr) b 100,000 (15-min) [d]
Ozone (O3)	Industrial Residential, Rural and Other Areas	100 (8-hr) [b] 180 (1-hr) [b]
	Sensitive Area	100 (8-hr) [b] 180 (1-hr) [b]
Lead (Pb)	Industrial, Residential, Rural and Other Areas	0.5 (Annual) b 1.0 (24-hr) b
	Sensitive Area	0.5 (Annual) [b] 1.0 (24-hr) [b]
Ammonia (NH3)	Industrial Residential, Rural and Other Areas	100 (Annual) [b] 400 (24-hr) [b]
	Sensitive Area	100 (Annual) [b] 400 (24-hr) [b]
Benzene (C6H6)	Industrial Residential, Rural and Other Areas	5 (Annual) [b]
	Sensitive Area	5 (Annual) [b]
Benzo(o)pyrene (BaP) particulate phase only	Industrial Residential, Rural and Other Areas	0.001 (Annual) [b]
	Sensitive Area	0.001 (Annual) [b]
Arsenic (As)	Industrial Residential, Rural and Other Areas	0.006 (Annual) [b]
	Sensitive Area	0.006 (Annual) [b]
Nickel (Ni)	Industrial Residential, Rural and Other Areas	0.02 (Annual) [b]

Parameter	Location[a]	Applicable Standards Per ADB SPS[e] (µg/m^3)
	Sensitive Area	0.02 (Annual) [b]

[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.

Appendix 4: Applicable Drinking Water Quality Standards for India Projects

Group	Parameter	Unit	Max. Concentration Limits[d]	Applicable Standards Per ADB SPS[a, b, c]
Physical	Turbidity	NTU	1 (5)	1 (5)
	pH		6.5 – 8.5	6.5 – 8.5
	Color	Hazen units	5 (15)	5 (15)
	Taste and Odor		Agreeable	Agreeable
	TDS	mg/l	500 (2,000)	500 (2,000)
	Iron	mg/l	0.3	0.3
	Manganese	mg/l	0.1 (0.3)	0.1 (0.3)
	Arsenic	mg/l	0.01 (0.05)	0.01
	Cadmium	mg/l	0.003	0.003
	Chromium	mg/l	0.05	0.05
	Cyanide	mg/l	0.05	0.05
	Fluoride	mg/l	1 (1.5)	1 (1.5)
	Lead	mg/l	0.01	0.01
	Ammonia	mg/l	0.5	0.5
Chemical	Chloride	mg/l	250 (1,000)	250 (1,000)
	Sulphate	mg/l	200 (400)	200 (400)
	Nitrate	mg/l	45	45
	Copper	mg/l	0.05 (1.5)	0.05 (1.5)
	Total Hardness	mg/l	200 (600)	200 (600)
	Calcium	mg/l	75 (200)	75 (200)
	Zinc	mg/l	5 (15)	5 (15)
	Mercury	mg/l	0.001	0.001
	Aluminum	mg/l	0.1 (0.3)	0.1 (0.3)
	Residual Chlorine	mg/l	0.2	0.2
Micro Germs	E-coli	MPN/100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample
	Total Coliform	MPN/100ml		

[a] Bureau of India Standard 10200: 2012.
[b] Health-based guideline values.
[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.
[d] Figures in parenthesis are maximum limits allowed in the absence of alternate source.

Appendix 5: Criteria for Water Classification by CPCB

Designated Best Use	Class of Water	Criteria
Drinking water source (with conventional treatment)	A	Total Coliforms MPN/100ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4 mg/1 or more Biochemical Oxygen Demand (BOD) 5 days 20°C 3 mg/L or less
Outdoor bathing (organized)	B	Total Coliforms MPN/100ml shall be 500 or less pH between 6.5 to 8.5 Dissolved Oxygen 5 mg/1 or more Biochemical Oxygen Demand (BOD) 5 days 20°C 3 mg/L or less
Drinking Water Source (without conventional treatment)	C	Total Coliforms MPN/100 ml shall be 50 or less pH between 6.5 to 8.5 Dissolved Oxygen 6 mg/l or more Biochemical Oxygen Demand (BOD) 5 days 20°C 2 mg/L or less
Propagation of Wildlife	D	pH between 6.5 to 8.5 for Fisheries Dissolved Oxygen 4 mg/L or more Free Ammonia (as N) 1.2 mg/L or less
Irrigation, Industrial Cooling, Controlled Waste	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C Max 2250µ mhos/cm Sodium absorption ratio Max. 26 Boron, Max. 2 mg/L

Appendix 6: Applicable Ambient Noise Level Standards for India Projects

Receptor/ Source	Applicable Standards Per ADB SPS[c] (dBA)	
	Day time	Night time
Industrial area	70[b]	70[b]
Commercial area	65[a]	55[a]
Residential Area	55[a]	45[a]
Silent Zone	50[a]	40[a]

[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 7: Applicable Standards for Discharge of Environmental Pollutants (Effluent)

Pollutants	Units	Applicable Standard per ADB SPS [a, b, c]
pH	pH	6 – 9 [b]
BOD	mg/l	20 [a]
COD	mg/l	125 [b]
Total nitrogen	mg/l	10 [b]
Total phosphorus	mg/l	2 [b]
Oil and grease	mg/l	10 [b]
Total suspended solids	mg/l	<50 [a]
Total coliform bacteria	MPN b / 100 ml	400a [b]

[a] Environment (Protection) Amendment Rules, 2017

[b] Health-based guideline values

[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 8: GO on GRM Government order no GO.RT. No. 163 dated 8 June 2018 for establishment of Grievance Redressal Mechanism

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

VCICDP - Establishment of Project Grievance Redress Mechanism (GRM) at three levels to cover both environmental and social issues - Orders - Issued.

==========

INDUSTRIES AND COMMERCE (INFRA) DEPARTMENT

G.O.RT.No. 163 Dated: 08-06-2018

Read the following:

1. Facility Administrative Manual (FAM) of VCICDP.
2. From the Commissioner of Industries, Vijayawada, 15/1/2014/11427/VCIC-GRM. Dated:31-05-2018

&&&

ORDER:

In the reference 2nd read above, the Commissioner of Industries has stated that at SI. No. 95, Page No. 42 of the Facility Administrative Manual of the VCICDP, the Project Grievance Redress Mechanism (GRM) is envisaged, wherein, it is directed to establish Project GRM at three levels to cover both Environmental and Social issues.

2. The Commissioner of Industries has proposed for establishment of Project Grievance Redress Mechanism at three levels with the following provisions and requested the Government to take a view on the establishment of Project GRM and issue orders:-

a. The GRM shall be established and disclosed to the project affected communities.
b. The Project Grievance Redress Committee, supported by the consultants of PMSC and Safeguard officers of both the PMU and PIUs, will be responsible for timely redress of grievances on Environmental and Social Safeguards issues.
c. The Grievance Redress Committee is also responsible for Registration of Grievances, Related Disclosure and Communication with the aggrieved parties.
d. A complaint register shall be maintained at the field unit, PIU and PMU levels with details of 1. Complaint lodged, 2. Date of Personal Hearing, 3. Action Taken and 4. Date of communication sent to the complainant.
e. Contact Details, Procedure and Complaint Mechanism shall be disclosed to the Project Affected Communities at accessible locations and through various Media (Leaflets, Newspapers etc.,)

3. Government after careful examination of the proposal, hereby establish the Project Grievance Redress Mechanism at three levels is as follows:-

1st Level Grievance:

The Contact Number of the PIU office should be made available at the construction site signboards. The contractor and field unit staff can immediately resolve onsite, seek the advice of the PIU Safeguard Manager as required, within seven (7) days of receipt of the complaint / grievance.

2nd Level Grievance:

All grievances that could not be redressed within seven (7) days at Field / Ward level shall be reviewed by the GRC at District Level headed by Joint Collector of the respective District. GRC shall attempt to resolve them within fifteen (15) Days. The Safeguard Manager of the PIU shall be responsible to see through the process of redressal of each grievance.

(P.T.O)

3rd Level Grievance:

All grievances that cannot be redressed within fifteen (15) days at District Level shall be reviewed by the Grievance Redressal Committee (GRC) at State Level headed by the Project Director, VCICDP PMU, with support from District GRC, PMU, Social Safeguards and Gender Officer (SSGO), Environmental Safeguard Officer of PMU. Environmental and Social Safeguard Specialists of PMSC shall coordinate the GRC to ensure that the grievances be resolved within fifteen (15) days. The SSGO of PMU shall be responsible to see through the process of redressal of each grievance pertaining to the Social Safeguards

4. Government hereby constitute the Grievance Redressal Committee (GRC) at District level with the following composition:

1.	Joint Collector of the Concerned District	Chairman
2.	Project Engineer of the concerned field unit	Member Secretary
3.	Revenue Divisional Officer (RDO) or sub-collector of the division	Member
4.	Project Director, DRDA	Member
5.	Chief Executive Officer, Zilla Parishad	Member
6.	District Panchayat Officer	Member
7.	District Education Officer	Member
8.	District Medical and Health Officer	Member
9.	District level representative of DISCOM	Member
10.	Superintendent Engineer, RWS Panchayat Raj Department	Member
11.	Three members from affected persons, with at least one of them a woman DP	Member
12.	Team Leader of the resettlement plan implementation support NGO or Agency	Member

5. The functions of the Grievance Redressal Committee (GRC) at District level are as follows:

a) GRC at District Level shall receive, evaluate and facilitate the resolutions of displaced person's concerns, complaints and grievances.
b) The GRC shall provide an opportunity to the affected persons to have their grievances redressed prior to approaching the State Level LARR Authority, constituted by the GoAP in accordance with Section 51 (1) of the RFCTLARR Act, 2013.
c) The GRC is aimed to provide a trusted way to voice and resolve concerns linked to the project, and to be an effective way to address displaced person's concerns without allowing it to escalate resulting in delays in project implementation.
d) The GRC shall meet once in every month and review and redress any grievances / complaints. Periodical monthly reports shall be submitted to the Project Director, VCICDP PMU in the prescribed proforma.

//Countd.p.3//

e) The GRC will continue to function, for the benefit of the displaced persons, during the entire life of the project including the defects liability period. The entire resettlement component of the project has to be completed before the construction starts, and pending grievances resolved. Other than disputes relating to ownership rights and apportionment issues on which the LARR Authority has jurisdiction.
f) GRC will review grievances involving all resettlement benefits, relocation and payment of assistances.
g) The GRCs will function out of each district where the subprojects are being implemented. The existing setup for coordination, monitoring and grievance redress at district level which meets once a month, will be used for VCICDP.
h) An annual fund of Rs.1.00 Lakhs shall be allocated to each GRC for their operations like convening monthly review meetings, preparing and distributing broachers, leaflets etc.

6. The Project Director, PMU, VCICDP shall be the Appellate Authority and shall be supported by the Safeguards Officer of PMU, VCICDP and the Team Leader of PMSC. This shall be the highest Grievance Redressal Mechanism at the project level.

7. The Project Monitoring Unit (PMU), Project Implementing Units (PIUs) and Grievance Redressal Committees (GRCs) shall update the status of complaints / grievances in the VCIC Web-Site.

5. The Project Director, PMU, VCICDP shall take further necessary action in the matter, accordingly.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

S.SOLOMON AROKIARAJ
SECRETARY TO GOVERNMENT & CIP

To
The Project Director, Project Monitoring Unit, VCICDP, Vijayawada.
The Chairman and all the members through PD, PMU, Vijayawada.
Copy to:
The District Collectors, Visakhapatnam, East Godavari, Krishna and SPS Nellore.
P.S. to Minister for Industries
P.S. to Prl. Secretary to CM (GSP)
Sc/Sf

//FORWARDED BY: ORDER//

SECTION OFFICER

Appendix 9: Public Consultation

ENVIRONMENTAL SURVEY

Practical View of the Community about Environmental Scenario
Km from: Kagitha to Patimeda Village
Consultation Questionnaire with general community response (Translated in English)

Q.1. What do you think about the quality of water from ponds, wells, rivers or Canal in your area?
Good/Satisfactory/Polluted -Satisfactory

Q.2. if the quality of water is polluted /poor then in your opinion what are its reasons?
Ingress of industrial effluent in the source Sewage leakage/discharge in the source Animal waterholes -Yes
Rainwater storage-Yes Others, please specify

Q.3. Is the noise level in your area disturbing/irritating?
Yes/No - No

Q.4. If the Noise level is disturbing/irritating then in your opinion, it is due to Vicinity of industry
Vehicular Traffic Construction work -Yes
Workshop/ scooter repair shop - Aviation zone
Others, please specify

Q.5. How, in your opinion, the noise level can be brought to satisfactory level in your area?
Using the Machinery equipment, which causes less noise as well as the good condition certificate from the authorities concerned.

Is the quality of air, which you breathe, is healthy and clean?
Yes/No Yes

are there any places of Archaeological/historical importance in your vicinity? If yes, please give details: Furnished in the Report
Is there any previous history of natural disaster viz. Floods, Drought, earthquake etc., in your area? If so, give details with year of occurrence and damage.

Flood Yes – Cyclone in 2016
Drought No
Earthquake No

Location: Year:

Are any rare species of Birds, Animals etc., visiting your area during winter? If so,
Please give details and locations
Name of the Species: Location:

Do you have any marketplace etc., in your area sand it is likely to be affected by proposed expansion of road? If yes, then which site do you suggest for relocation of the markets. Not much

Do you have any suggestion to improve the Environment W.R.T. Air, Water and Noise in your area?

Follow and implement the pre-cautions mentioned in their port during the work execution.

Particular	**Name**	**Sign/Date**

Public Consultation held at Neelapalli and Pallamala

SUMMARY OF STAKEHOLDER ENVIRONMENTAL SURVEY

Practical view of the community about environmental scenario

Consultation Questionnaire with general community response (Translated in English)

Q.1. What do you think about the quality of water from ponds, wells, rivers or canal in your area?

Good/Satisfactory/Polluted - **Satisfactory**

Q.2. if the quality of water is polluted /poor then in your opinion what are its reasons?
(a) Ingress of industrial effluent in the source
(b) Sewage leakage/discharge in the source
(c) Animal waterholes -**Yes**
(d) Rainwater storage -**Yes**

Others, please specify

Q.3. Is the noise level in your area disturbing/irritating?

Yes/No - **No**

Q.4. If the Noise level is disturbing/irritating then in your opinion it is due to Vicinity of industry

Vehicular Traffic Construction work -**Yes**
Workshop/ scooter repair shop –
Aviation zone

Others, please specify

Q.5. How, in your opinion the noise level can be brought to satisfactory level in your area?

Using the Machinery equipment, which causes less noise as well as the Good condition certificate from the authorities concerned - **Yes**

Is the quality of air which you breathe is healthy and clean?

Yes/No **Yes**

Q 6. Are there any places of Archaeological / historical importance in your vicinity? If yes, please give details: **Furnished in the Report**

Q 7. Is there any previous history of natural disaster viz. Floods, Drought, earthquake etc., in your area? If so, give details with year of occurrence and damage.

Flood **Yes**
Cyclone in 2016
Drought No

Earthquake No

Q 8. Are any rare species of Birds, Animals etc., visiting your area during winter? If so, Please give details and locations -**No**

Q 9. Do you have any marketplace etc., in your areas and it is likely to be affected by proposed expansion of road? If yes, then which site do you suggest for relocation of the markets. **Not much impact on market activity**

Q 10. Do you have any suggestion to improve the Environment W.R.T. Air, Water and Noise in your area? **– Follow and implement the pre-cautions mentioned in their port during the work execution.**

Appendix 10: Public Consultation Details and Photos

List Of Participants attended for Public Consultation (Routhusuramala Road)
VCIC APRDC Variation Roads

District Name: Chittoor. Mandal Name: Thottam Bedu

Village Name : Dommarammitta(vil) Lingamanaidu Kandriga Panch Date : 01 June 2018

Sl.No	Name	Occupation	Contact No	Signature /LTI
1.	S. SubbaRao	farmer	9949932645	సుబ్బా రావు
2.	S. Uma maheswari	House wife	"	S.ఉమామహేశ్వరి
3.	S. Padma	"	9642777958	S.Padma
4.	S. Nirmala	"	7330747990	S.నిర్మల
5	S. Sujatha	"	8179071870	S.సుజాత
6	S. Subhasini	"	9951770553	S. సుభాషిణి
7	S. Durga	Agriculture worker		S.దుర్గ
8	S. Lakshmi	House wife	9177012138	S. లక్ష్మి
9	S. Chinnaiah	Agriculture labor	9951770558	[illegible]
10	S. Sumathi	Agriculture worker	7702297634	S.సుమతి
11	S. Ratnamma	House wife		S.రత్నమ్మ
12	S. Muni Ratnam	Cultivation	9505113126	S మునిరత్నం
13	S. Venkatesh	Student	8008639045	S.VENkatesh
14	S. Balaji	Student	9963257161	S. Balaji
15	S. Anil	Student	9533407195	S-Anil
16	S. Dharmaiah	farmer	8330968929	S Dharmaiah
17	S. Saritha	House wife	9963715478	S.సరిత
18	S. Lakshmamma	Agriculture worker	9959869865	S.లక్ష్మమ్మ

19. S Venkateswarulu వెంకటేశ్వర్లు 9842355039 [illegible]
20. S. Venkatesh farmer → 9963257101 S.Venkatesh
21. S. Chandrasekhar " → 9951770553 S.Chakradhar
S. Hari " → 9963719473 S.hari
S.Abhilash

PUBLIC. This information is being disclosed to the public in accordance with ADB's Access to Information Policy.

Consultancy Services for Project Management Phase-I including preparation of Detailed Project Report for up gradation of Allahabad-Jaunpur-Gorakhpur Road(excluding common portion with existing National Highways)(NH declaration approved "In Principle")in the State of Uttar Pradesh to two / four lane with paved shoulder configuration (Package no- NHIIAHE/48) (i) Allahabad to Mungrabadshah ii) Jaunpur to Azamgarh iii) Azamgarh to Dhorighat)

SATRA

INTERVIEW SCHEDULE FOR FGDS

Section No : 1

Questionnaire No : 1

Name of village/ Township : Dommara mitta Chainage 1+400 kms Date 01 June 2018 Time 05:30 PM

Hours: 1 hr

Sr. No.	Name	Profession	Address	Sex	Age	Caste	Category of PAP(R/S)	Status (O/W)
1.	S. Subba Rao	Farmer	Dommaramitta	Male	49	Bc		with in the row
2.	S. Muni Ratnam	cultivation	"	"	50	Bc		O
3.	S. Venkateswarulu	Tiles work	"	"	39	Sc		O
4.	S. Uma maheswari	Housewife	"	Female	35	Bc		O
5.	S. Subhasini	"	"	"	29	Bc		O

R/S : Resident Shop owner O/W : Outside or Within ROW

Activity	Name of Personnel	Signature
Data Collector	D.GOVARDHAN	D Govardhan
Supervisor	DR. S.Babu Praveen Kumar	S.Babupraveen
Approval Authority		

Consultancy Services for Project Management Phase-I including preparation of Detailed Project Report for up gradation of Allahabad-Jaunpur-Gorakhpur Road(excluding common portion with existing National Highways)(NH declaration approved "In Principle")in the State of Uttar Pradesh to two / four lane with paved shoulder configuration (Package no- NHIIAHE/48) (i) Allahabad to Mungrabadshah ii) Jaunpur to Azamgarh iii) Azamgarh to Dhorighat)

QUESTIONNAIRE FOR FGDs

Questionnaire for Focus Group Discussion

Q.1 Do you have any problem due to existing road?

రోడ్డు వెడల్పు చేయడం వలన ఎటువంటి ఇబ్బంది లేదని, అయితే మా తీసుకున్న భూములకు నష్టపరిహారం చెల్లించాలని, ఉపాధి అవకాశాలు కల్పించాలని కోరుతున్నారు

Q.2 Have you heard about the project? If yes, what do you know about it?

ఈ ప్రాజెక్టు గురించి ఎటువంటి సమాచారము లేదు. ఈ విషయం మొదటి సారిగా వింటున్నాము.

Q.3 If the road has to be expanded, which side should be expansion take place and why?

మా గ్రామం దగ్గర కుడి వైపు రోడ్డు వెడల్పు చేయాలి. కుడి వైపు చేస్తే (ప్రభుత్వ) గుడి పోయే ప్రమాదం వుంది కావున.

Q.4 Bypass, via duct or raised roads – which is a better alternative? Why?

ఇక్కడ అలాంటి అవకాశము లేదు.

Q.5 Why not the other two choices? Give reasons.

ఇక్కడ జన సాంద్రత బాగా తక్కువ, companies నిర్మాణం కొరకు రోడ్డు విస్తరణ అవసరం వుంది.

Q.6 which option is likely to cause minimum risk of accidents to the human beings?

రోడ్డు భద్రతా నియమాలు సక్రమంగా పాటించే విధంగా చర్యలు తీసుకోవాలి.

Q.7 If bypass, which side?

Right side, ఎందుకంటే Left side గ్రామం వుంది కావున.

Q.8 If the widening of the road necessitates dislocation, where would you like to be relocated?

మా గ్రామానికి widening వలన ఎటువంటి సమస్య లేదు. ఎందుకంటే గ్రామం కొంచెం దూరంలో వుంది.

Q.9 What form of compensation would you prefer?

న్యాయబద్ధమైన నష్టపరిహారము మరియు ఉపాధి అవకాశాలు.

Q.10 What kind or problems do you foresee in the process of relocation?

1 మా గ్రామానికి పునరావాసం అవసరం లేదు.

2

3

4

Consultancy Services for Project Management Phase-I including preparation of Detailed Project Report for up gradation of Allahabad-Jaunpur-Gorakhpur Road(excluding common portion with existing National Highways)(NH declaration approved "In Principle")in the State of Uttar Pradesh to two / four lane with paved shoulder configuration (Package no- NHIIAHE/48) (i) Allahabad to Mungrabadshah ii) Jaunpur to Azamgarh iii) Azamgarh to Dhorighat)

Q.11 what are the possible solutions for problems in relocation?

1 మా గ్రామానికి పునరావాస అవసరము లేదు.

2

3

4

Q.12 What would be the suitable location for the construction of lay-bye? What kind of services should be provided at these lay-byes?(explain the concept of lay-bye)

— Not suitable.

Q.13 what is the possibility of shifting the temple(s) and where to relocate?

గ్రామము మొదలులో ఉన్న అమ్మవారి గుడిని ఆచారాలతో, నియమాలతో ఎంతో శ్రమ పడి నిర్మించడం వలన మా గుడిని మార్చుటకు ఎట్టి పరిస్థితుల ఒప్పుకోము.

Q.14 Any other issue that you would like to discuss?

According Govt. Land cost 1 ఎకరం = 8 లక్షలు

Market cost 1 ఎకరం = 13 లక్షలు.

Activity	Name of Personnel	Signature
Data Collector	D. Govardhan	D Govardhan
Supervisor		
Approval Authority		

మా గ్రామానికి సమీపంలో పరిశ్రమలు స్థాపించినపుడు మా గ్రామంలో చాలా మంది యువకులు చదువుకొని వారి భవిష్యత్తును వ్యవసాయంగాని అంకితం చేస్తున్నారు. కావున రహదారి వలన వారి స్థాయికి తగ్గ ఉద్యోగాలు ఇప్పించ వలసినదిగా వేడుకుంటున్నాము.

Consultancy Services for Project Management Phase-I including preparation of Detailed Project Report for up gradation of Allahabad-Jaunpur-Gorakhpur Road(excluding common portion with existing National Highways)(NH declaration approved "In Principle")In the State of Uttar Pradesh to two / four lane with paved shoulder configuration (Package no- NHIIAHE/48) (i) Allahabad to Mungrabadshah ii) Jaunpur to Azamgarh iii) Azamgarh to Dhorighat)

SATRA

INTERVIEW SCHEDULE FOR FGDS

Section No : 3

Questionnaire No : 3

Name of village/ Township : Routu Suramala **Chainage** 3+500 **kms** **Date** 02.06.2018 **Time** 11:15 AM

Hours: 1 hr 15 min

Sr. No.	Name	Profession	Address	Sex	Age	Caste	Category of PAP(R/S)	Status (O/W)
1	K. Yohan	Agri. Worker	Routu Suramala	M	35	SC		O
2	K. Ramanamma	House wife	"	F	29	SC		O
3	K. Paramdamaiah	farmer	"	M	42	SC		O
4	K. Meghana	Agri. Worker	"	F	28	SC		O

R/S : Resident Shop owner O/W : Outside or Within ROW

Activity	Name of Personnel	Signature
Data Collector	D. Govardhan	D. Govardhan
Supervisor	DY. S. Babu Praveen Kumar	S. Babupraveen
Approval Authority		

Consultancy Services for Project Management Phase-I including preparation of Detailed Project Report for up gradation of Allahabad-Jaunpur-Gorakhpur Road(excluding common portion with existing National Highways)(NH declaration approved "In Principle")in the State of Uttar Pradesh to two / four lane with paved shoulder configuration (Package no- NHIIAHE/48) (i) Allahabad to Mungrabadshah ii) Jaunpur to Azamgarh iii) Azamgarh to Dhorighat)

QUESTIONNAIRE FOR FGDs

Questionnaire for Focus Group Discussion

Q.1 Do you have any problem due to existing road?

ఈ గ్రామ ప్రజలకు రోడ్డు వెడల్పు వలన ఎటువంటి ఇబ్బంది లేదని చెబుతున్నారు.

Q.2 Have you heard about the project? If yes, what do you know about it?

ఈ project గురించి ఎటువంటి సమాచారం లేదని చెబుతున్నారు.

Q.3 If the road has to be expanded, which side should be expansion take place and why?

మా గ్రామం వద్ద కుడి వైపు రోడ్డు వెడల్పు చేయాలని అని కోరుతున్నారు

Q.4 Bypass, via duct or raised roads – which is a better alternative? Why?

–

Q.5 Why not the other two choices? Give reasons.

ఇంతకు ముందు సర్వే చేశారు. company వారు వచ్చి రోడ్డు విస్తరణ అవసరమైతే మా భూమి నుండి తీస్తే అభ్యంతరం [illegible] ఇబ్బంది లేదు

Q.6 which option is likely to cause minimum risk of accidents to the human beings?

మా గ్రామ వద్ద ఉన్న Assigned భూములు రోడ్డు పక్క ఉన్నాయి [illegible] చెబుతున్నారు మాకు ఉన్న నష్టం లేదు. [illegible]

Q.7 If bypass, which side?

Right side – Assigned భూముల ప్రక్కన కలదు.

Q.8 If the widening of the road necessitates dislocation, where would you like to be relocated?

మా గ్రామంలో widening వలన నష్టం లేదు.

Q.9 What form of compensation would you prefer?

నష్టాలు [illegible] ప్రభుత్వం [illegible] ఇవ్వాలి.
DKT భూములు ఉంటే తగిన నష్టపరిహారం చెల్లించాలి.

Q.10 What kind or problems do you foresee in the process of relocation?

1 మా గ్రామంలో పునరావాసం అవసరం లేదు.

2

3

4

Consultancy Services for Project Management Phase-I including preparation of Detailed Project Report for up gradation of Allahabad-Jaunpur-Gorakhpur Road(excluding common portion with existing National Highways)(NH declaration approved "In Principle")in the State of Uttar Pradesh to two / four lane with paved shoulder configuration (Package no- NHIIAHE/48) (i) Allahabad to Mungrabadshah ii) Jaunpur to Azamgarh iii) Azamgarh to Dhorighat)

Q.11 what are the possible solutions for problems in relocation?

1 ——

2

3

4

Q.12 What would be the suitable location for the construction of lay-bye? What kind of services should be provided at these lay-byes?(explain the concept of lay-bye)

——

Q.13 what is the possibility of shifting the temple(s) and where to relocate?

No Temples

Q.14 Any other issue that you would like to discuss?

Land cost (According to govt) - 8 Lacks
Market cost — 13 Lacks

Activity	*Name of Personnel*	*Signature*
Data Collector	D Govardhan	D Govardhan
Supervisor		
Approval Authority		

Signature Sheet of Public consultations

ప్రజాభిప్రాయసేకరణ

రాతుసూరమల క్లస్టర్ (నేలబల్లి to పల్లమల) – 4.5 Km

గ్రామపంచాయితీపేరు: మండలంపేరు: [illegible]

మున్సిపాలిటీ / వార్డు: జిల్లా: [illegible]

ప్రజాభిప్రాయసేకరణ వివరాలు:-

క్రమ సంఖ్య	సభ్యుల పేర్లు	గ్రామం పేరు	సంప్రదించాల్సిన నెం.	సంతకాలు
1	G. Chandra Sekhar Reddy	MRO	9491077047	
2	K Haranath	Mandal Surveyor	9440138833	
3	V. Muralidhar	ARI	9701694803	
4	M. Murali Mohan	S. A	9989584056	
5.	D. A. [illegible]	RL-PMIC VCICDP	950260331	
6	K. Surya Rao	SDC APRDC	9705502808	
7	M. Udaya Sankar	LA and R&R Assistant	9866862299	
8.	L. Sreekanth	investigator	9848474929	
9.	P. KISHORE	investigator	9700644721	P. Kishore
10	P. [illegible]	Pallamala	9640934709	VRO
11.	K. Gopi	V.RO Farmer	9989123591	
12.	A. Mahalakshmi	Kothapalem	9702468850	
13	J. Subba Reddy	pallamala	8106021783	
14	SK. GHOUSE BHASHA	Pallamala	9700833320	
15.	C. Siva Sankar Reddy	pallamala.	9989559918	
16.	T. Venkata Ramanaiah	Kotha palem		
17.	K. Srinivasulu	AEE (R&B) B.N.Kandriga	9440818955	

SATRA

→ B.N. కండ్రిగ.

క్రమ సంఖ్య	సభ్యుల పేర్లు	గ్రామం పేరు	సంప్రదించాల్సిన నెం.	సంతకాలు
18.	D. Venkataratnam Naidu	pallamala	9502615007	D. వెంకటరత్నం నాయుడు
19.	D. Muniswamy	Kothapalem	8790555978	D మునిస్వామి
20.	G. Lakshmamma	Kothapalem	9177234482	లక్ష్మమ్మ

SATRA

11:10 AM

ప్రజాభిప్రాయసేకరణ

రాతుసూరమల క్లస్టర్ (నేలబల్లి to పల్లమల) – 4.5 Km

గ్రామపంచాయితీపేరు: మండలంపేరు: వి.ఆర్. పురం

మున్సిపాలిటీ / వార్డు: జిల్లా: [illegible] జిల్లా

ప్రజాభిప్రాయసేకరణ వివరాలు:-

క్రమ సంఖ్య	సభ్యుల పేర్లు	గ్రామం పేరు	సంప్రదించాల్సిన నెం.	సంతకాలు
1	G. Chandra Sekhar Reddy	MRO	9491077047	
2	K. Haranath	Mandal Surveyor	9440738833	
3	V. Muralidhar	ARI	9701694803	
4	M. Murali Mohan	S. A	9989584056	
5.	D. A. Saniththa	PL-PMLL VLICDP	9502603314	
6	K. Surya Rao	SDC APRDC	9705502808	
7	H. Udaya Sankar	LA and R&R Assistant	9866862299	
8.	L. Sreekanth	Investigator	9848474929	
9.	P. KISHORE	interviewer	9700444721	

SATRA

2:45 pm

ప్రజాభిప్రాయసేకరణ

రొతుసూరమల క్లస్టర్ (నేలటల్లి to పల్లమల) – 4.5 Km

గ్రామపంచాయితీపేరు: మండలంపేరు: అనంతసాగరం

మున్సిపాలిటీ / వార్డు: జిల్లా: నెల్లూరు

ప్రజాభిప్రాయసేకరణ వివరాలు:-

క్రమ సంఖ్య	సభ్యుల పేర్లు	గ్రామం పేరు	సంప్రదించాల్సిన నెం.	సంతకాలు
1	T. Ugandhar	Taharildar	94910770A6	[signature]
		thollambedu		
2.	D.A. SANTHOSH	PC-PHSC VCICDP	9502603311	[signature]
3	K. Surya Rao	SDC APRDC	9705502808	
4	H. udayasankar	LA and R&R Assistant	9866862299	[signature]
5	T. Rajesh	CS	9963476112	T. Rajesh
6.	B. Jagadeesh	Surveyor	8686862867	[signature]
7.	D.V. Ramanaiah	V.R.O. Payya	9963150380	[signature]
8	P. Rajani Kumar	V.R.O RS Mala	9885820891	[signature]
9.	P. KISHORE.	Investigator	9700444791	P. kishore
10.	L. Sreekanth	investigator	9848474929	[signature]

SATRA

[illegible]

క్రమ సంఖ్య	సభ్యుల పేర్లు	గ్రామం పేరు	సంప్రదించాల్సిన నెం.	సంతకాలు
11.	K. Siva Sankar	[illegible]	9989720076	[illegible]
12.	S. Kumar	poyya (Dhamalupeta)	8297753868	S.Kumar
13.	K. Hemalyaya	Poyya	9492716388	[illegible]
14.	G. Bhasker Naidu	[illegible]	6309485275	[illegible]
15.	M. Mallikarjuna	Poyya	8712274176	M. Rangera
16.	K. [illegible]	Poyya	9949932645	[illegible]
17.	K. [illegible]	Poyya	9849924007	[illegible]
18	G. Ravichandra	Poyya	9866828750	[illegible]
19.	P. Radha Krishna Reddy	Poyya	9505933611	P. R[illegible]
20.	S. Thirupalaiah	([illegible]) poyya	9989305273	[illegible]
21	A. Ravi	Poya	9985339810	A Ravi
22	R. Lavanya Madhu	Poya	9885187167	R. Lavanya Madhu
23.	B. Jagadeesh	Surveyor	8686862867	[illegible]
24	G. Subramanyam Naidu	poyya (Gummadi gunta)	9949113954.	G. Subramanyam
25.	K. Manohar	Poyya	9652964426	[illegible]
26.	K Bhasker	POYYA	9032942958	K Bhaskar
27.	G Ramesh naidu	Poyya.	6309697721	G Ramesh naidu
28.	P. Lokesh	Poyya	9951303149	P. Lokesh

SATRA

Appendix 11: Sample Semi-Annual Environmental Monitoring Report Template

Sample Semi-Annual Environmental Monitoring Report Template

INTRODUCTION

Overall project description and objectives

Environmental category as per ADB Safeguard Policy Statement, 2009

PROJECT SAFEGUARDS TEAM

Identify the role/s of Safeguards Team including schedule of on-site verification of reports submitted by consultants and contractors.

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

OVERALL PROJECT AND SUBPROJECT/PACKAGE PROGRESS AND STATUS

Indicate (i) status of design – preliminary design or final design, (ii) status of implementation - under bidding, contract awarded but no works yet, contract awarded with works, civil works completed, or O&M

Package Number	Components/List of Works	Type of Contract *(specify if DBO, DB or civil works)*	Status of Implementation *(specify if Preliminary Design, Detailed Design, On-going Construction, Completed Works, or O&M phase)*[18]	Contract Status *(specify if under bidding or contract awarded)*	If On-going Construction	
					%Physical Progress	Expected Completion Date

For package with awarded contract, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.

Package-wise Contractor/s' Nodal Persons for Environmental Safeguards

Package Name	IEE Cleared by ADB	Contractor	HSE Nodal Person	Email Address	Contact Number

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

	(provide date)				

STATUS OF IEE PER SUBPROJECT/PACKAGE

Provide status of updated/final IEE[19] per package.

Package-wise Implementation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director?[20] *(Yes/No)*	Remarks
	Not yet due *(detailed design not yet completed)*	**Submitted to ADB** *(provide date of submission)*	**Disclosed on project website** *(provide link)*	**Final IEE provided to Contractor/s** *(Yes/No)*		

COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS[21]

Package No.	Statutory Environmental Requirements[22]	Status of Compliance *(Specify if obtained, submitted and awaiting approval, application not yet submitted)*	Validity Date(s) *(if already obtained)*	Action Required	Specific Conditions that will require environmental monitoring[23]

COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

Schedule No. and Item *(see Project Loan Agreement and list provisions relevant to environmental safeguards, core labor standards and occupational health and safety)*	Covenant	Status of Compliance	Action Required

[19] IEE prepared based on preliminary design and cleared by ADB with condition that updated/Final IEE based on detailed design will be submitted.

[20] Works will not be allowed until SEMP/CEMP is approved by project implementation unit or project management unit.

[21] 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.

[22] Specify statutory requirements: environmental clearance? Permit/consent to establish? Forest clearance? Workers/Labor permit, etc.

[23] *Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.*

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

Confirm in IEE/s if contractors are required to submit site-specific EMP (SEMP)/construction EMPs (CEMP). If not, describe the methodology of monitoring each package under implementation.

Provide over-all compliance of the contractors with SEMP/CEMP. This should be supported by contractors' monthly monitoring reports to PIU(s) and/or verification reports of PIU(s) or project consultants. Include as appendix supporting documents such as **signed** monthly environmental site inspection reports prepared by consultants and/or contractors.

Overall Compliance with SEMP/CEMP

Package No.	Status of SEMP/CEMP Implementation *(Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)*	Action Proposed and Additional Measures Required

Provide description based on site observations and records:
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 in each work site (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 workers labor camp(s). Provide photographs.
Provide information on work-related accidents and incidents. Describe actions implemented.
Provide information on if there are any activities being undertaken out of working hours and how that is being managed.
Provide list of trainings on environmental safeguards, core labor standards, and OSH conducted during the reporting period. Include ADB-organized workshop, trainings, seminars, etc)

Trainings, Workshops and Seminars Conducted

Date	Topic	Conducted by	No. of Participants (Total)	No. of Participants (Female)	Remarks

Provide the monitoring results as per the parameters outlined in the approved EMP (or site-specific EMP/construction EMP when applicable).

Summary of Environmental Monitoring Activities (for the Reporting Period)[24]

Impacts *(List from SEMP/CEMP)*	**Mitigation Measures** *(List from SEMP/CEMP)*	**Parameters Monitored** *(As identified in the SEMP/CEMP)*	**Method of Monitoring** *(Visual, Actual Sampling, etc)*	**Location of Monitoring** *(Provide GPS Coordinates)*[25]	**Date of Monitoring Conducted**	**Person Who Conducted the Monitoring**
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS

Confirm records of pre-work condition of roads, agricultural land or other infrastructure prior to starting to transport materials and construction.

Package No.	**Status of Pre-Work Conditions** *(Recorded / Not Recorded)*	**Baseline Environmental Conditions (air, water, noise) Documented** *(Yes / No)*	**Action Proposed and Additional Measures Required**

Provide information on monitoring activities conducted during reporting period. If not conducted, provide justification. Compare results with baseline and internationally recognized standards.[26]

Air Quality Monitoring Results

Site No.	**Date of Testing**	**Site Location** *(Provide GPS Coordinates)*[27]	**Parameters** *(as required by statutory clearances or as mentioned in the IEE)*			**Remarks**
			PM10 µg/m³	**SO2 µg/m³**	**NO2 µg/m³**	

[24] Attach Laboratory Results and Sampling Map/Locations

[25] If GPS coordinate is not available, provide landmark(s) and/or chainage.

[26] ADB Safeguard Policy Statement (SPS) Appendix 1, para 33: 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 such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from these levels and measures, the borrower/client will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the borrower/client will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in the SPS.

[27] If GPS coordinate is not available, provide landmark(s) and/or chainage.

Water Quality Monitoring Results

Site No.	Date of Sampling	Site Location	Parameters *(as required by statutory clearances or as mentioned in the IEE)*						Remarks
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L	

Noise Quality Monitoring Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) *(as required by statutory clearances or as mentioned in the IEE)*		Remarks
			Day Time	Night Time	

INFORMATION DISCLOSURE AND CONSULTATIONS

Confirm PMU/PIU/contractors provide project-related information to stakeholders, communities and/or affected people before and during construction works.[28]
Provide information on consultations conducted during reporting period such dates, topics discussed, type of consultation, issues/concerns raised, safeguards team member present. Attach minutes of meetings (ensure English translation is provided), attendance sheet, and photos.

Date of Consultation	Location	Number of Participants *(specify total, male and female)*	Issues/Concerns Raised	Response to issues/concerns

GRIEVANCE REDRESS MECHANISM

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 (package-wise if applicable).

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).

[28] Check EMP requirement on information disclosure. At a minimum, PIU thru the contractor should notify communities/affected persons/sensitive receptors 7 days and again 1 day before start of works.

SUMMARY OF KEY ISSUES/CONCERNS IDENTIFIED DURING THE REPORTING PERIOD AND REMEDIAL ACTIONS

Provide corrective action plan which should include all issues/concerns, actions required to be implemented, responsible entities, and target dates.

STATUS OF CORRECTIVE ACTIONS FROM PREVIOUS SEMR(S)

Provide information on corrective actions to be implemented as reported in the previous SEMR(s). Include status of implementation of feedbacks/comments/suggestions as provided by ADB, if any.

Corrective Action Plan Status

Issues/Concerns	Corrective Action	Status	Remarks

APPENDIXES

Photos
Records of consultations
Copies of environmental clearances and permits (if not provided in the previous SEMR)
Environmental site inspection report (if not provided in the previous SEMR)
Other

Appendix 12: Integrated Biodiversity Assessment Tool
PROXIMITY REPORT APRDC 05

Country: India

Location: [13.8, 79.8]

Date of analysis: 15 February 2022 (GMT)

Buffers applied: 10 km

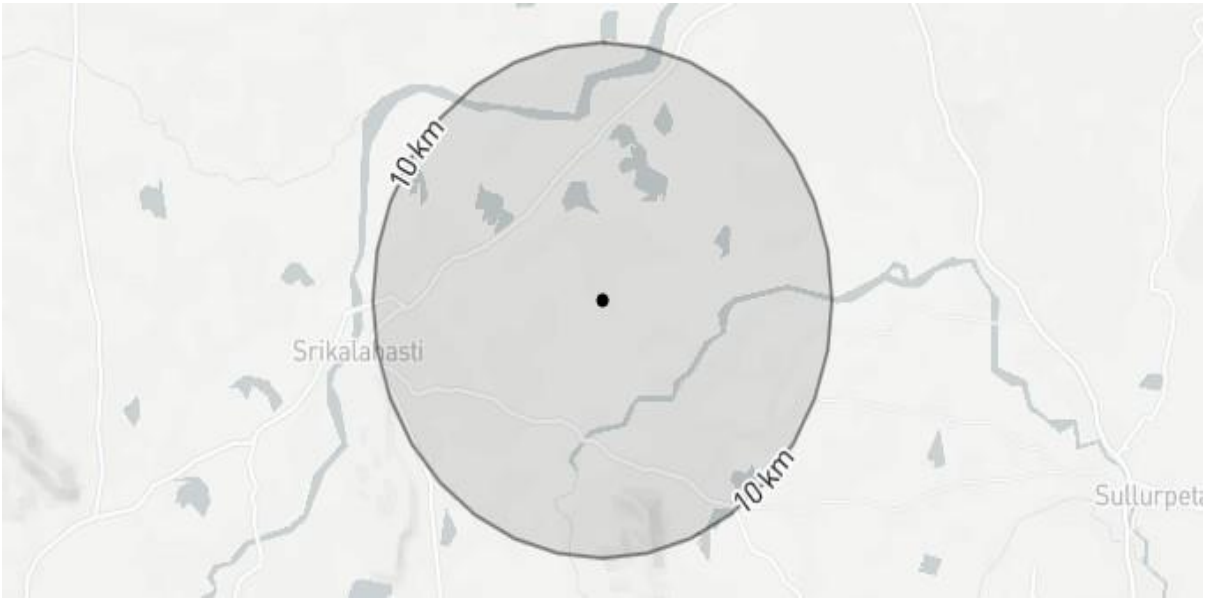
IUCN Red List Biomes: Freshwater, Terrestrial

Generated by: Anik Ajmera

Organization: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	0
IUCN Red List	38



Displaying project location and buffers: 10 km

About this report

This report presents the results of [158-27130] proximity analysis to identify the biodiversity features and species with are located within the following buffers: 10 km.

This report is one part of a package generated by IBAT on 15 February 2022 (GMT) 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.

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Please note, sensitive species data are currently not included in IBAT reports in line with the Sensitive Data Access Restrictions Policy for the IUCN Red List. This relates to sensitive Threatened species and KBAs triggered by sensitive species.

Data used to generate this report

- UNEP-WCMC and IUCN, 2022. Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net - February 2022.
- BirdLife International (on behalf of the KBA Partnership), 2021. Key Biodiversity Areas -
- September 2021IUCN, 2021. IUCN Red List of Threatened Species - December 2021.
- IUCN. The IUCN Red List of Threatened Species. Version 2019-3. (2019).
- https://www.iucnredlist.orgIUCN. Threats Classification Scheme (Version 3.2).

  (2019)
- Strassburg, B.B.N., Iribarrem, A., Beyer, H.L. et al. Global priority areas for ecosystem restoration. Nature 586, 724–729(2020). https://doi.org/10.1038/s41586-020-2784-9

Protected Areas

The following protected areas are found within 10 km 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 10 km 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

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Pristis pristis	Largetooth Sawfish	CHONDRICHTHYES	CR	Decreasing	Marine, Freshwater
Eretmochelys imbricata	Hawksbill Turtle	REPTILIA	CR	Decreasing	Terrestrial, Marine
Sypheotides indicus	Lesser Florican	AVES	CR	Decreasing	Terrestrial
Gyps bengalensis	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
Sarcogyps calvus	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
Gyps indicus	Indian Vulture	AVES	CR	Decreasing	Terrestrial

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Sterna acuticauda	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
Neophron percnopterus	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
Cuon alpinus	Dhole	MAMMALIA	EN	Decreasing	Terrestrial
Manis crassicaudata	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
Calidris tenuirostris	Great Knot	AVES	EN	Decreasing	Terrestrial, Marine
Aquila nipalensis	Steppe Eagle	AVES	EN	Decreasing	Terrestrial
Cyrtodactylus rishivalleyensis	Rishi Valley Geckoella	REPTILIA	EN	Unknown	Terrestrial
Crocodylus palustris	Mugger	REPTILIA	VU	Stable	Terrestrial, Freshwater
Lutrogale perspicillata	Smooth-coated Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater
Carcharhinus leucas	Bull Shark	CHONDRICHTHYES	VU	Decreasing	Marine, Freshwater
Wallago attu		ACTINOPTERYGII	VU	Decreasing	Freshwater
Bagarius yarrelli		ACTINOPTERYGII	VU	Decreasing	Freshwater
Sterna aurantia	River Tern	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater

Clanga clanga	Greater Spotted Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Aquila rapax	Tawny Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
Leptoptilos javanicus	Lesser Adjutant	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Schoenicola striatus	Bristled Grassbird	AVES	VU	Decreasing	Terrestrial, Freshwater
Sousa chinensis	Indo-Pacific Humpback Dolphin	MAMMALIA	VU	Decreasing	Marine, Freshwater
Lissemys punctata	Indian Flapshell Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
Caretta caretta	Loggerhead Turtle	REPTILIA	VU	Decreasing	Terrestrial, Marine
Dermochelys coriacea	Leatherback	REPTILIA	VU	Decreasing	Terrestrial, Marine
Lepidochelys olivacea	Olive Ridley	REPTILIA	VU	Decreasing	Terrestrial, Marine
Macaca radiata	Bonnet Macaque	MAMMALIA	VU	Decreasing	Terrestrial
Melursus ursinus	Sloth Bear	MAMMALIA	VU	Decreasing	Terrestrial
Panthera pardus	Leopard	MAMMALIA	VU	Decreasing	Terrestrial

Dalbergia latifolia	Indonesian Rosewood	MAGNOLIOPSIDA	VU	Decreasing	Terrestrial
Geochelone elegans	Indian Star Tortoise	REPTILIA	VU	Decreasing	Terrestrial

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Macaca radiata ssp. radiata	Dark-bellied Bonnet Macaque	MAMMALIA	VU	Decreasing	Terrestrial
Rusa unicolor	Sambar	MAMMALIA	VU	Decreasing	Terrestrial
Machlolophus nuchalis	White-naped Tit	AVES	VU	Decreasing	Terrestrial
Pycnonotus xantholaemus	Yellow-throated Bulbul	AVES	VU	Decreasing	Terrestrial
Oryza malampuzhaensis		LILIOPSIDA	VU	Decreasing	Terrestrial

Recommended citation

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How to use this report

This report provides an indication of the potential biodiversity-related features - protected areas, key biodiversity areas and species - close to the specified location. It provides an early indication of potential biodiversity concerns and can provide valuable guidance in making decisions. For example, this information can be helpful when assessing the potential environmental risk and impact of a site, categorizing investments/projects, preparing the terms of reference for an impact assessment, focusing attention on key species of conservation concern and sites of known conservation value, and reviewing the results of an impact assessment.

The report does not provide details of potential indirect, downstream or cumulative impacts. Furthermore, the report should be regarded as a “first-step”, providing a set of conservation values sourced from global data sets, and is not a substitute for further investigation and due diligence, especially concerning national and/or local conservation priorities.

Appendix 13: Trees Data and Land Use Pattern along the Subproject Road

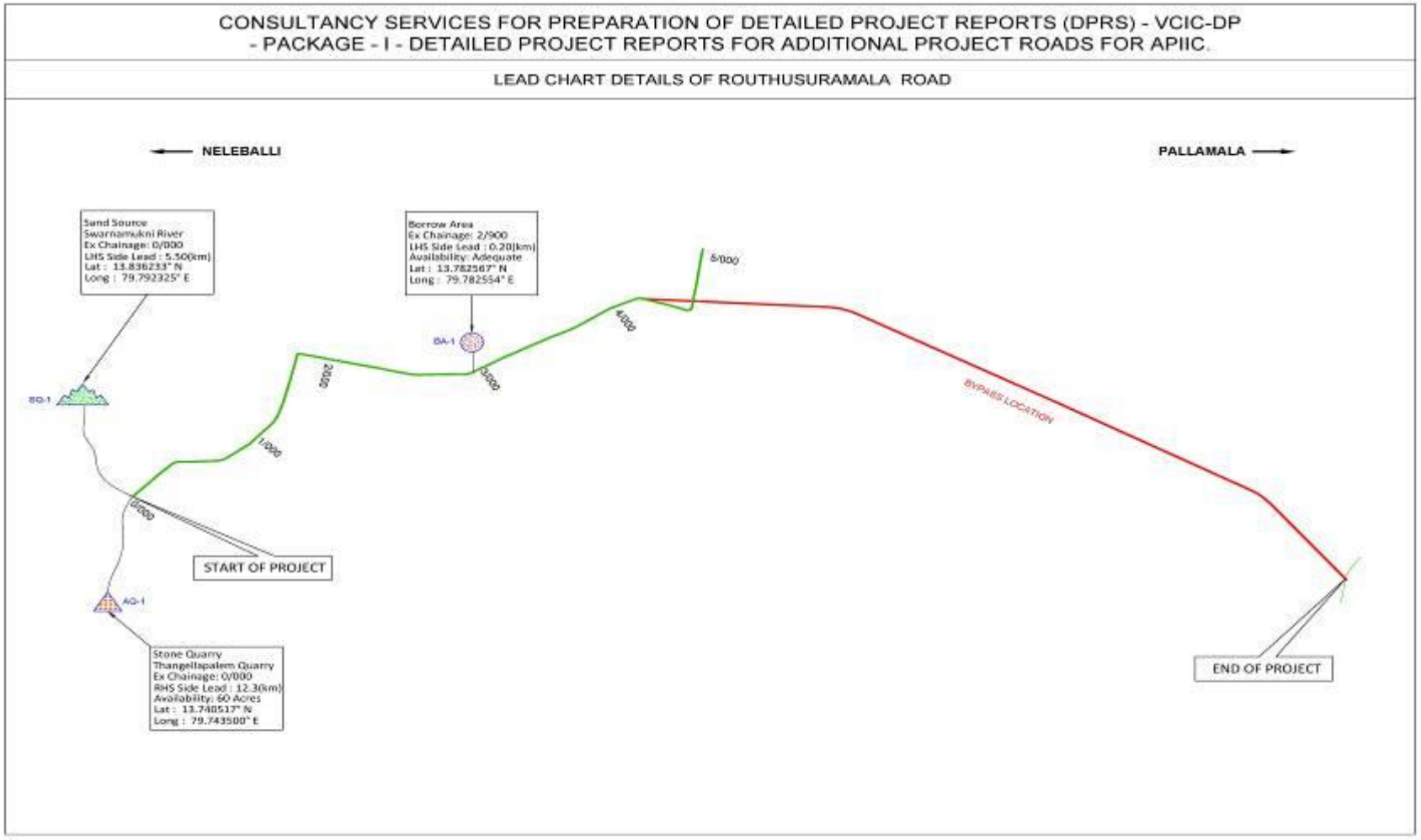
Trees along the Project Road

Trees in PROW			
Tree	**LHS**	**RHS**	**Total**
Tree palm	15	6	21
Neem	2	1	3
Tree Other	32	51	83
Tree Coconut	2	0	2
Total	**51**	**58**	**109**

List of Common Property Resources

Common Property Resources in PROW			
Details	**LHS**	**RHS**	**Total**
Transformer	1	1	**2**
Hand pump	1	0	**1**
Temple	1	0	**1**
Bore-well	1	1	**2**
Bus stop	1	0	**1**
Total	**5**	**2**	**7**

Appendix 14: Details of Existing Borrow Areas



Appendix 15: Sample Site Inspection Checklist
SAMPLE SITE INSPECTION CHECKLIST

Project: _____ Date: _____
Subproject / Location: _____

MONITORING/INSPECTION QUESTIONS		FINDINGS			COMMENTS / CLARIFICATIONS
1.	Supervision and Management On-Site	Yes	No	NA	
	a. Is an EHS supervisor available?				
	b. Is a copy of the SEMP available?				
	c. Are daily toolbox talks conducted on site?				
2.	The Facilities	Yes	No	NA	
	a. Are there a medical and first aid kits on site?				
	b. Are emergency contact details available on-site?				
	c. Are there PPEs available? What are they?				
	d. Are the PPEs in good condition?				
	e. Are there firefighting equipment on site?				
	f. Are there separate sanitary facilities for male and female workers?				
	g. Is drinking water supply available for workers?				
	h. Is there a rest area for workers?				
	i. Are storage areas for chemicals available and with protection? in safe locations?				
3.	Occupational Health and Safety	Yes	No	NA	
	a. Are the PPEs being used by workers?				
	b. Are excavation trenches provided with shores or protection from landslide?				
	c. Is breaktime for workers provided?				
	d. How many for each type of collection vehicle is in current use?				
4.	Community Safety	Yes	No	NA	
	a) Are excavation areas provided with barricades around them?				
	b) Are safety signages posted around the sites?				
	c) Are temporary and safe walkways for pedestrians available near work sites?				
	d) Is there a record of treated wastewater quality testing/measurement?				
5.	Solid Waste Management	Yes	No	NA	
	a. Are excavated materials placed sufficiently away from water courses?				
	b. Is solid waste segregation and management in place?				
	c. Is there a regular collection fo solid wastes from work sites?				
6.	Wastewater Management	Yes	No	NA	

MONITORING/INSPECTION QUESTIONS		FINDINGS			COMMENTS / CLARIFICATIONS
	a) Are there separate sanitary facilities for various types of use (septic tanks, urination, washing, etc.)?				
	b) Is any wastewater discharged to storm drains?				
	c) Is any wastewater being treated prior to discharge?				
	d) Are measures in place to avoid siltation of nearby drainage or receiving bodies of water?				
	e) Are silt traps or sedimentation ponds installed for surface runoff regularly cleaned and freed of silts or sediments?				
7.	Dust Control	Yes	No	NA	
	a. Is the construction site watered to minimize generation of dust?				
	b. Are roads within and around the construction sites sprayed with water on regular intervals?				
	c. Is there a speed control for vehicles at construction sites?				
	d. Are stockpiles of sand, cement and other construction materials covered to avoid being airborne?				
	e. Are construction vehicles carrying soils and other spoils covered?				
	f. Are generators provided with air pollution control devices?				
	g. Are all vehicles regularly maintained to minimize emission of black smoke? Do they have valid permits?				
8.	Noise Control	Yes	No	NA	
	a) Is the work only taking place between 7 am and 7 pm, week days?				
	b) Do generators operate with doors closed or provided with sound barrier around them?				
	c) Is idle equipment turned off or throttled down?				
	d) Are there noise mitigation measures adopted at construction sites?				
	e) Are neighboring residents notified in advance of any noisy activities expected at construction sites?				
9.	Traffic Management	Yes	No	NA	
	a) Are traffic signages available around the construction sites and nearby roads?				
	b) Are re-routing signages sufficient to guide motorists?				
	c) Are the excavation sites along roads provided with barricades with reflectors?				

MONITORING/INSPECTION QUESTIONS		FINDINGS			COMMENTS / CLARIFICATIONS
	d) Are the excavation sites provided with sufficient lighting at night?				
10.	Recording System	Yes	No	NA	
	a) Do the contractors have recording system for SEMP implementation?				
	b) Are the daily monitoring sheets accomplished by the contractor EHS supervisor (or equivalent) properly compiled?				
	c) Are laboratory results of environmental sampling conducted since the commencement of construction activities properly compiled?				
	d) Are these records readily available at the site and to the inspection team?				

Other Issues: _____

_____

_____

_____

Prepared by: _____

Name, Designation and Signature

Appendix 16: COVID-19 Health and Safety Plan and Precautions

1 INTRODUCTION

- This document is intended to supplement formal H&S policies, procedures and plans that the contractor has in place for its employees and staff working on VCICDP projects under loan 3430-IND and Grant 0495 and Visakhapatnam-Chennai Industrial Corridor Development Program Tranche 2. Hence, this document is not intended to replace any formalized procedures currently in place for the Contractor. Where this guideline does not meet or exceed the standards put forth by the Contractor, the Contractor shall abide by the most stringent procedure available.
- This approved project specific Health and Safety Plan (H&SP) shall be modified to require that the COVID-19 Officer (supervised by the contractor's environmental and health and safety officer) at the Contractor's worksite (appointed by Contractor and agreed by PIU) submit a written daily report to the Client's Representative (PIU Head). The COVID-19 Officer shall certify that the Contractor and all subcontractors are in full compliance with these guidelines.
- The COVID-19 officer should be present on site at all times.
- Any issue of non-compliance with these guidelines shall be a basis for the suspension of work. The Contractor will be required to submit a corrective action plan (on the next day or immediately as per the nature of issue) detailing each issue of non-conformance and a plan to rectify the issue(s). The Contractor will not be allowed to resume work until the plan is approved by the Client (PIU). Any additional issues of non-conformance may be subject to action against the Contractor's as health & safety/safeguard clauses of the contract.
- Construction sites operating during the Covid-19 pandemic need to ensure they are protecting their WORKFORCE and minimising the risk of spread of infection.
- This guidance is intended to introduce consistent measures on sites of all sizes in line with the Government's recommendations on social distancing.
- These are exceptional circumstances and the industry must remain abreast of and comply with the latest Government advice on COVID-19at all times.
- The health and safety requirements of any construction activity must also not be compromised at this time. If an activity cannot be undertaken safely due to a lack of suitably qualified personnel being available or social distancing being implemented, it should not take place.
- It is to be noted that emergency services are also under great pressure and may not be in a position to respond as quickly as usual.
- Sites should remind the workforce at every opportunity of the Worksite Procedures which are aimed at protecting them, their colleagues, their families and the Andhra Pradesh population.
- If a worksite is not consistently implementing the measures in this document, it may be required to shut down.

2 PRINCIPLES OF WORKER PROTECTION

- Consistently practice social distancing
- Cover coughs and sneezes
- Maintain hand hygiene
- Clean surfaces frequently

3 MAXIMUM PRECAUTION FOR PERSONS/LABOURERS REPORTING TO WORK

- IF SICK, STAY HOME!
- IF SICK, GO HOME!
- IF SOMEONE SICK, SEND THEM HOME!

Contractor to provide face masks (of the type approved by Government for use to protect persons from COVID-19) to all persons working in or visiting the worksite. This along with procedures set out in this document is for maximum precaution to protect all persons/labourers at all times.

4 COVID-19 TYPICAL SYMPTOMS

- Fever
- Cough
- Shortness of Breath
- Sore Throat

All persons at the worksite should have their temperature screened by COVID-19 officer with Infrared Thermometer (handheld non-contact).

5 SELF-ATTESTATION BY PERSONS/LABOUR PRIOR TO WORK

Prior to starting a work (on daily basis), each labour /worker will self-attest to the supervisor:

- no signs of COVID-19 symptoms within the past 24 hours.
- No contact with an individual diagnosed with COVID-19. (contact means living with a positive person, being within 6 ft of positive person OR sharing things of positive person)
- Not undergone quarantine or isolation (in case of any labourer /worker who has been quarantined or isolated previously, the engagement shall be only after obtaining the requisite clearance)

The engagement of workers falling in the high-risk category such as workers over the age of 55 years, with underlying medical conditions or health issues, etc. should be done only after obtaining the requisite clearance from trained and registered medical practitioners.

The self-attestation would be verified in collaboration with trained and registered medical practitioners deployed at site through discussions with laborers /workers and/or preliminary checks such as temperature checks, etc. prior to their engagement at site.

In addition, the Contractor shall mandatorily follow all medical test requirements for the workers prior to their engagement and/or mobilization at site as per the guidelines issued by the Central and State government agencies and WHO from time to time.

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.

6 GENERAL DIRECTION

- No handshake, Only Namaste

- Non-essential physical work that requires close contact between workers should not be carried out
- Work requiring physical contact should not be carried out
- Plan all other work to minimise contact between workers
- Wash hands often (every 1-2 hrs or frequently as possible) with soap for at least 20 seconds
- Use hand sanitizer
- No person should enter the work site other than the authorized persons mentioned by supervisor during start of work
- All must implement social distancing by maintaining a minimum distance of 6-feet from others at all times to eliminate the potential of cross contamination.
- Avoid face to face meetings – critical situations requiring in-person discussion must follow social distancing i.e., 6 ft from others.
- Conduct all meetings via conference calls, if possible. Do not convene meetings of more than 10 people. Recommend use of cell phones, texting, web meeting sites and conference calls for project discussion
- All individual work group meetings/ talks should follow social distancing
- At each job briefing/toolbox talk, employees are asked if they are experiencing any symptoms, and are sent home if they are
- Each worksite should have laminated COVID-19 safety guidelines and handwashing instructions
- All restroom/toilet facilities should be cleaned (min twice a day), and handwashing facility must be provided with soap, hand sanitizer and paper towels
- All surfaces should be regularly cleaned, including mobiles, tabletops /surfaces, door handles, laptops, records, etc.
- All common areas and meeting areas are to be regularly cleaned (min twice a day) and disinfected at least twice a day
- All persons to maintain their own water bottle, and should not be shared.
- To avoid external contamination, it is recommended everyone bring food from home
- Please maintain Social Distancing separation during breaks and lunch.
- Cover coughing or sneezing with a tissue, then throw the tissue in the trash and wash hands, if no tissue is available then cough /sneeze into your upper sleeves or elbow. Do not cough or sneeze into your hands.
- Clean your hands after coughing or sneezing thoroughly by using soap and water (minimum for 20 seconds). If soap and water are not available, please use a hand sanitizer. The Contractor shall ensure adequate quantities of sanitizer and soap are made available at all locations including site offices, meeting rooms, corridors, washrooms /toilets, etc. as appropriate.
- Avoid touching eyes, nose, and mouth with your hands
- To avoid sharing germs, please clean up after Yourself. DO NOT make others responsible for moving, unpacking and packing up your personal belongings
- If you or a family member is feeling ill, stay home!
- Work schedules are adjusted to provide time for proper cleaning and disinfecting as required.

7 WORK-SITE PREVENTION PRACTICES

- At the start of each shift, confirm with all employees that they are healthy and inform all workers of reusable and disposable PPE.
- Outside person(s) should be strictly prohibited at worksite

- All construction workers will be required to wear cut-resistant gloves or the equivalent.
- Use of eye protection (reusable safety goggles/face shields) is recommended. The supply of eye protection equipment to the workers is considered as a standard part of PPE during construction works.
- In work conditions where required social distancing is impossible to achieve, such employees shall be supplied with standard face mask, gloves, and eye protection.
- All employees shall drive to work site as per the prevailing guidelines of the Government in a single occupant vehicle. Staff shall not ride together in the same vehicle
- When entering a machine or vehicle which you are not sure you were the last person to enter, make sure that you wipe down the interior and door handles with disinfectant (with 1% sodium hypochlorite solution daily) prior to entry. Adequate quantity of the disinfectant shall be provided by the Contractor at all such site-specific locations.
- Workers should maintain separation of 6' from each other.
- Multi person activities will be limited where feasible (two persons lifting activities)
- Gathering places on the site such as sheds and/or break areas will be eliminated, and instead small break areas will be used with seating limited to ensure social distancing.
- Contact the cleaning person of the worksite and ensure proper COVID-19 sanitation processes. Increase cleaning/disinfection visits to at least 2 times a day. Cleaning person(s) to be provided with gloves, gown and face mask for each cycle of cleaning. The Contractor shall make available adequate supply of PPE and chemicals while the threat of COVID-19 continues.
- Clean all high contact surfaces a minimum of twice a day in order to minimize the spread of germs in areas that people touch frequently. This includes but is not limited to desks, laptops and vehicles
- All employees to maintaining good health by getting adequate sleep; eating a balanced, healthy diet, avoid alcohol; and consume plenty of fluids.
- Continuation of works in construction project with workers available on site and no workers to be brought in from outside
- The site offices shall have adequate ventilation. The air conditioning or ventilation systems installed at the site offices would have high-efficiency air filters to reduce the risk of infection. The frequency of air changes may be increased for areas where close personal proximity cannot be fully prevented such as control rooms, elevators, waiting rooms, etc.
- The Contractor shall carry out contactless temperature checks for the workers prior to site entrance, during working hours and after site works to identify persons showing signs of being unwell with the COVID-19 symptoms

8 WASHING FACILITY

- All worksites should have access to toilet and hand washing facility.
- Providing hand cleaning facilities at entrances and exits. This should be soap and water wherever possible or hand sanitiser if water is not available
- Washing facility with hot water, and soap at fire hydrants or other water sources to be used for frequent handwashing for all onsite employees
- All onsite workers must help to maintain and keep stations clean

- If a worker notices soap or towels are running low or out, immediately notify supervisors. Proactively supervisor should make sure shortage situation never occurs.
- Garbage bins will be placed next to the hand wash facility for discarding of used tissues/towels with regular removal and disposal facility (end of each day)

9 CLEANING PROCEDURES

Increase cleaning/disinfection visits to at least 2 times a day. Cleaning person(s) to be provided with gloves, gown and face mask for each cycle of cleaning.

Each worksite should have enhanced cleaning and disinfection procedures that are posted and shared including sheds, gates, equipment, vehicles, etc. and shall be posted at all entry points to the sites, and throughout the project site. These include common areas and high touch points like

- Taps and washing facilities
- Toilet flush and seats
- Door handles and push plates
- Handrails on staircases and corridors
- Lift and hoist controls
- Machinery and equipment controls
- Food preparation and eating surfaces
- Telephone equipment / mobiles
- Keyboards, photocopiers and other office equipment

Re-usable PPE should be thoroughly cleaned after use and not shared between workers

10 LABOUR CAMP

Contractor shall follow a zero-tolerance policy on wearing of masks.

Masks (homemade 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.

10.1 Toilet Facility

- Restrict the number of people using toilet facility at any one time e.g. appoint one welfare attendant among the labours.
- Wash hands before and after using the facilities
- Enhance the cleaning regimes for toilet facilities particularly door handles, locks and the toilet flush
- Portable toilets should be avoided wherever possible, but where in use these should be cleaned and emptied more frequently
- Provide suitable and sufficient rubbish bins for hand towels with regular removal and disposal.

10.2 Eating/snacks Arrangements

- With eateries having been closed (restricted) across Andhra Pradesh, providing permanent (till society is safe from COVID-19) on-camp/off-camp cook/helpers can be implemented. Make sure that the "Guidelines for food handling, preparation and distribution during COVID-19" and it regular updates are being followed.
- Whilst there is a requirement for construction camps to provide a means of heating food and making hot water, these are exceptional circumstances and where it is not possible to introduce a means of keeping equipment clean between use, etc. must be removed from use.
- Contractor to arrange all daily need items and grocery at site itself and no worker is allowed to go to shops for daily need items.
- Dedicated eating areas should be identified on camp to reduce food waste and contamination
- Break times should be staggered to reduce congestion and contact at all times
- Hand cleaning facilities or hand sanitiser should be available at the entrance of any room where people eat and should be used by workers when entering and leaving the area
- Workers should sit 2 metres "6 feet" apart from each other whilst eating and avoid all contact
- Where catering is provided on camp, it should provide pre-prepared and wrapped food only
    - Payments should be taken by contactless options wherever possible
    - Crockery, eating utensils, cups etc. should be avoided wherever possible
- Drinking water should be provided with enhanced cleaning measures of the tap mechanism introduced
- Tables should be cleaned between each use
- All rubbish should be put straight in the bin and not left for someone else to clear up; only covered pedal operated bins should be used and the bins should be cleared and cleaned regularly, with strict adherence to safety protocols for disposal and hygiene maintenance (including proper PPE's such as gloves, mask and apron worn by the waste handler/cleaner and disposal at a designated place);
- All areas used for eating must be thoroughly cleaned at the end of each break and shift, including chairs, door handles, etc.

10.3 Changing Facilities, Showers and Drying Areas

- Introduce staggered start and finish times to reduce congestion and contact at all times
- Introduce enhanced cleaning of all facilities throughout the day and at the end of each day
- Consider increasing the number or size of facilities available on camp if possible
- Based on the size of each facility, determine how many people can use it at any one time to maintain a distance of two metres
- Provide suitable and sufficient garbage bins in these areas with regular removal and disposal.
- Visitor log should be strictly maintained that the labour camp.

COVID-19 officer will ensure compliance with prevention issues at the labour camp(s).

11 UPDATES ON COVID-19

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:

- Strictly follow the guidelines issues by Ministry of health and OSHA
- Other workers, vendors, inspectors, or visitors to the worksite with close contact to the individual
- Labour Camps / Work areas such as designated workstations or rooms/sheds
- Work tools and equipment
- Common areas such as break rooms, tables and sanitary facilities

Also refer the following websites from time to time for regular updates.

https://www.mohfw.gov.in/

http://hmfw.ap.gov.in/

This document can be updated from time to time based on the advisories or directions of the Government.

12 TRAINING

- RPMU/PIU to ensure all workers get training on above requirements before start of any construction activity
- 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

13 EMERGENCY CONTACT

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

Ensure all staff and personal use the AarogyaSetu App, recommended by GOI for tracking COVID-19 patients.

Appendix 17: Site Pictures of Around Proposed Subproject Site

	
Starting point (busstop)	End point meeting on Tada-Srikalahasti Road
	
Quarry Area	Tar plant near project road
	
A Bridge	Project road

	
Quarry	Plantation along the road

Appendix 18: Sample Outline Traffic Management Plan

A. Principles for TMP around the Water Pipes/Sewer Construction Sites

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; and
    (v) Addressing issues that may delay the project.

B. 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 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.

3. **Figure A2 to Figure A12** illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

C. Analyze the impact due to street closure

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

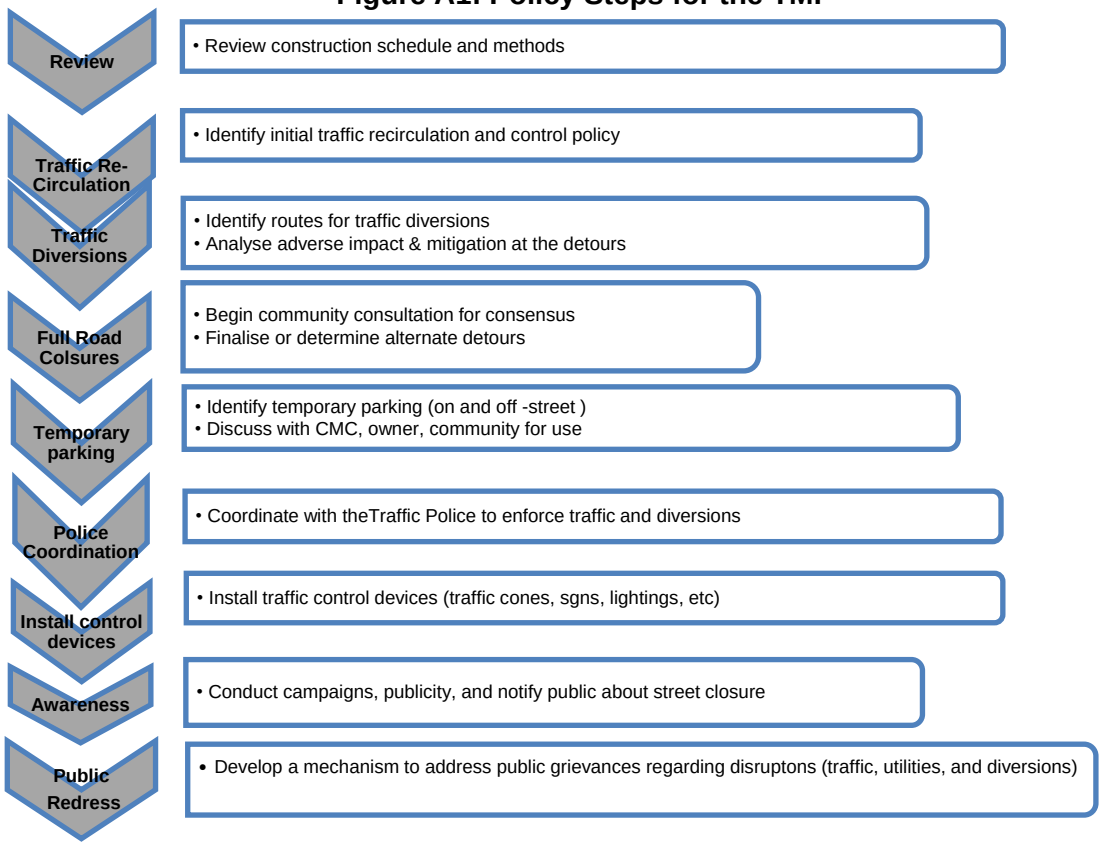
    (i) approval from the ULB/Public Works Department (PWD) to use the local streets as detours;
    (ii) consultation with businesses, community members, traffic police, PWD, etc., regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
    (iii) determining 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.

5. 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.

Figure A1: Policy Steps for the TMP



D. Public awareness and notifications

6. 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.

7. 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.

8. The 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.

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

10. 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.

E. 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:

    - Signs
    - Pavement Markings
    - Channelizing Devices
    - Arrow Panels
    - 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. **Figure A2 to Figure A12** illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:
    - Work on shoulder or parking lane
    - Shoulder or parking lane closed on divided road
    - Work in Travel lane
    - Lane closure on road with low volume
    - Lane closure on a two-line road with low volume (with yield sign)
    - Lane closure on a two-line road with low volume (one flagger operation)
    - Lane closure on a two lane road (two flagger operation)
    - Lane closure on a four lane undivided Road
    - Lane closure on divided roadway
    - Half road closure on multi-lane roadway
    - Street closure with detour

14. 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.

15. 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 be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

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

Figure A2 & A3: Work on shoulder or parking lane & Shoulder or parking lane closed on divided road

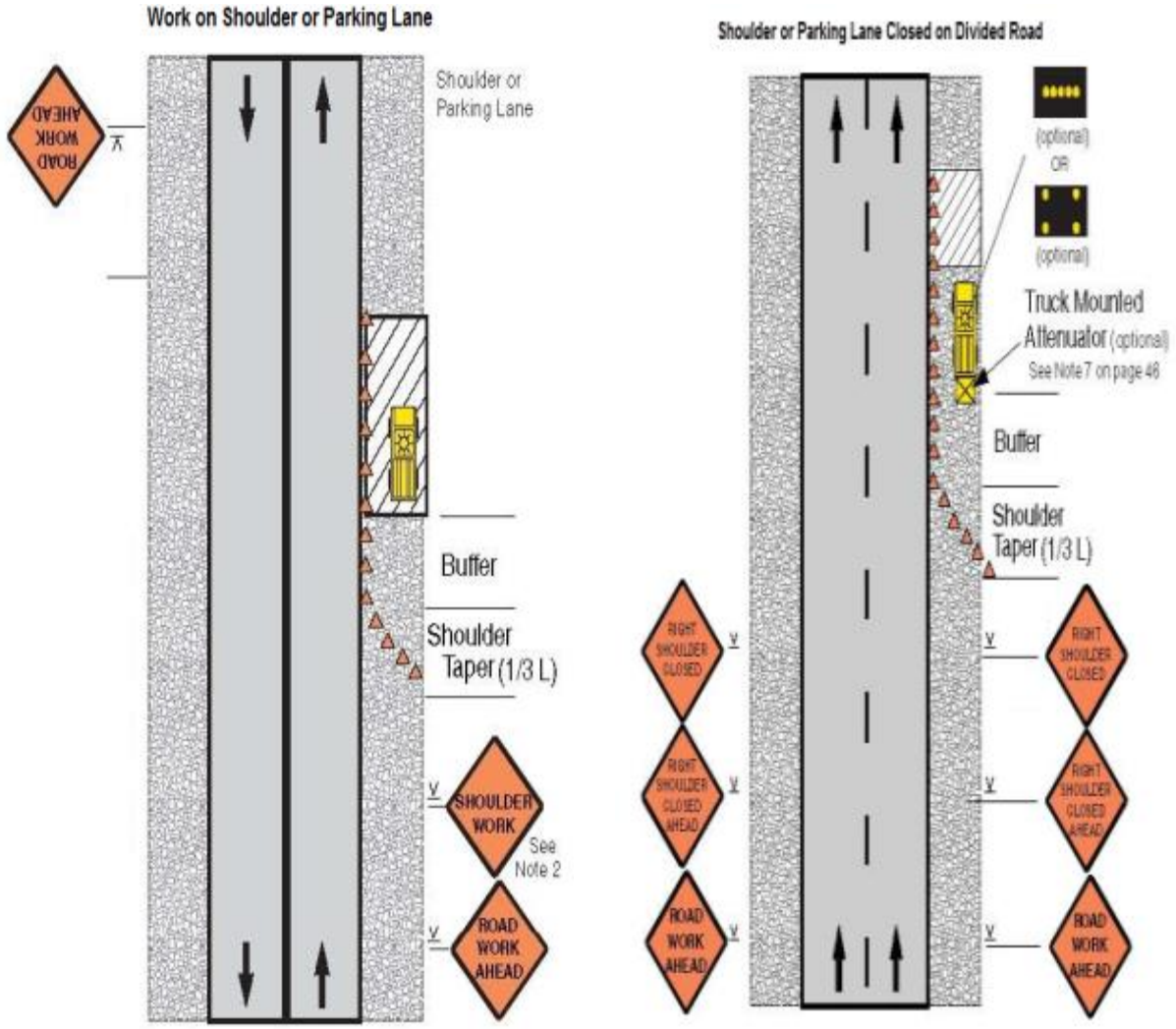


Figure A4 & A5: Work in Travel Lane & Lane closure on road with low volume

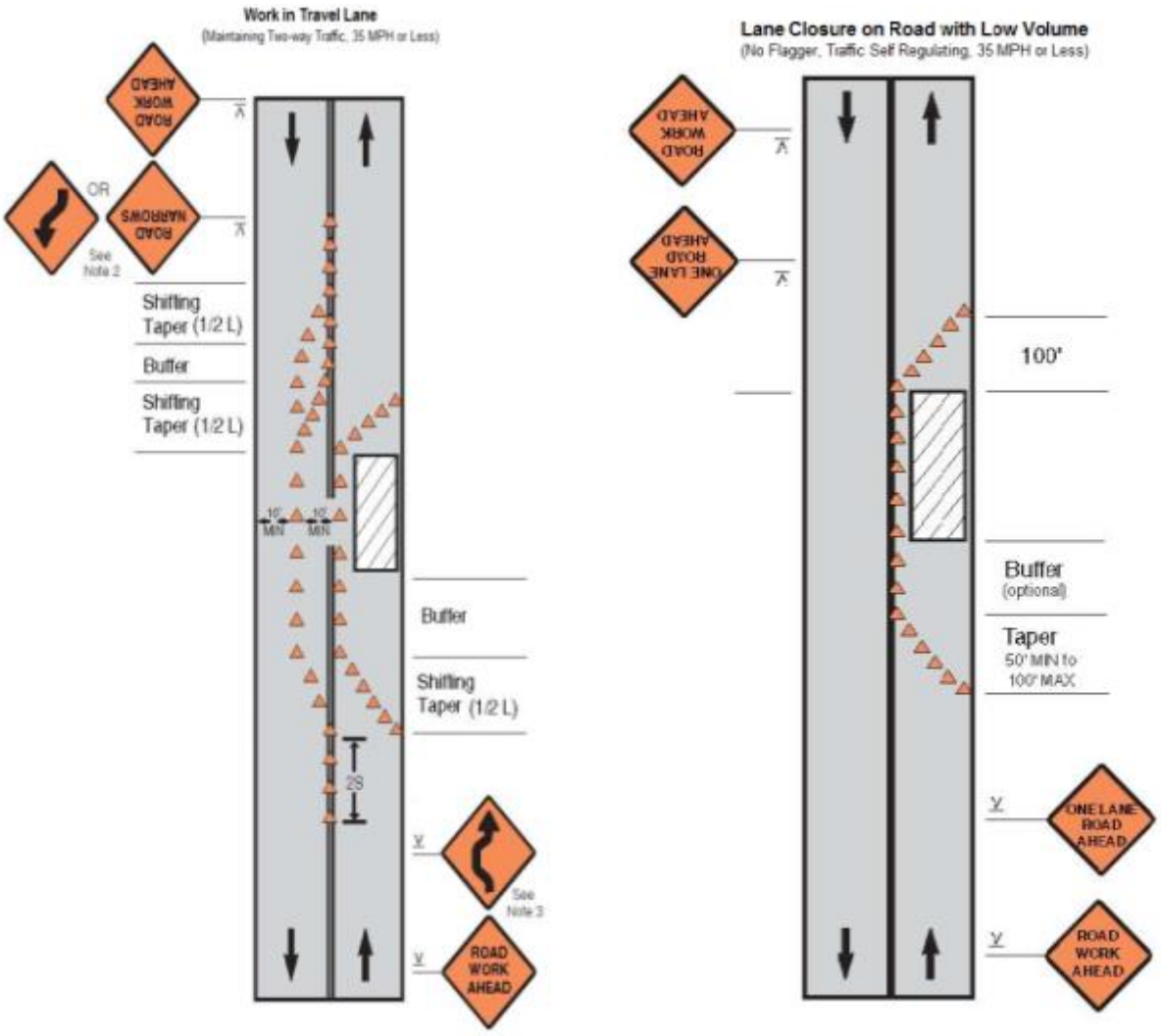
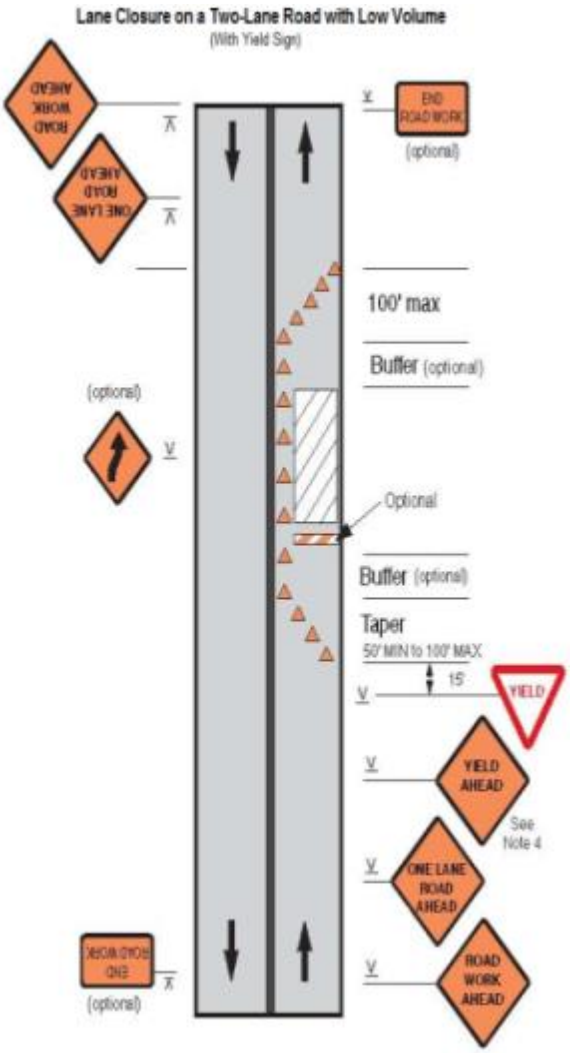


Figure A6 & A7: Lane closure on a two-line road with low volume (with yield sign) & Lane closure on a two-line road with low volume (one flagger operation)



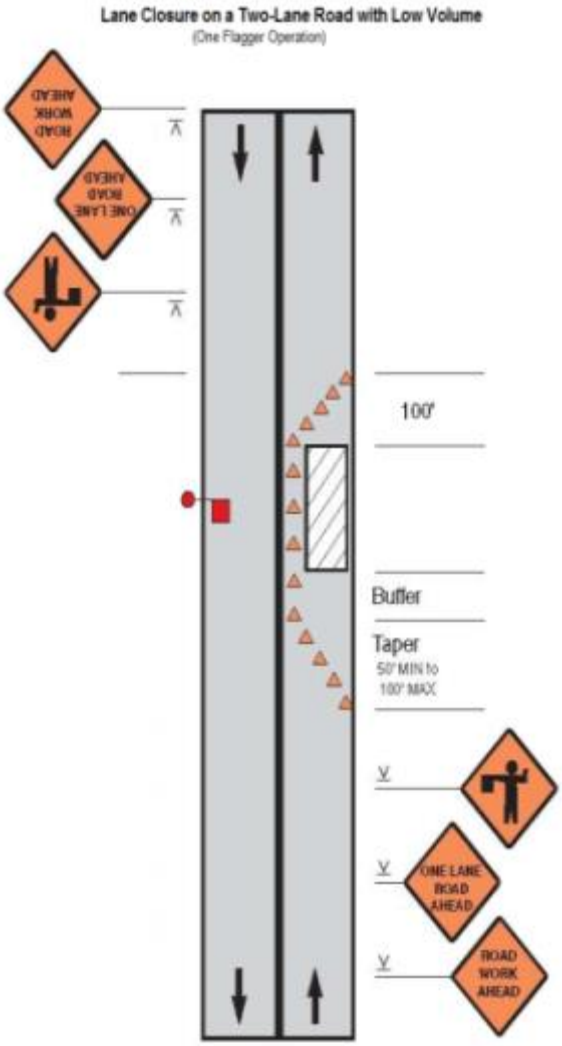


Figure A8 & A9: Lane Closure on a Two-Lane Road (Two Flagger Operation) & Lane Closure on a Four-Lane Undivided Road

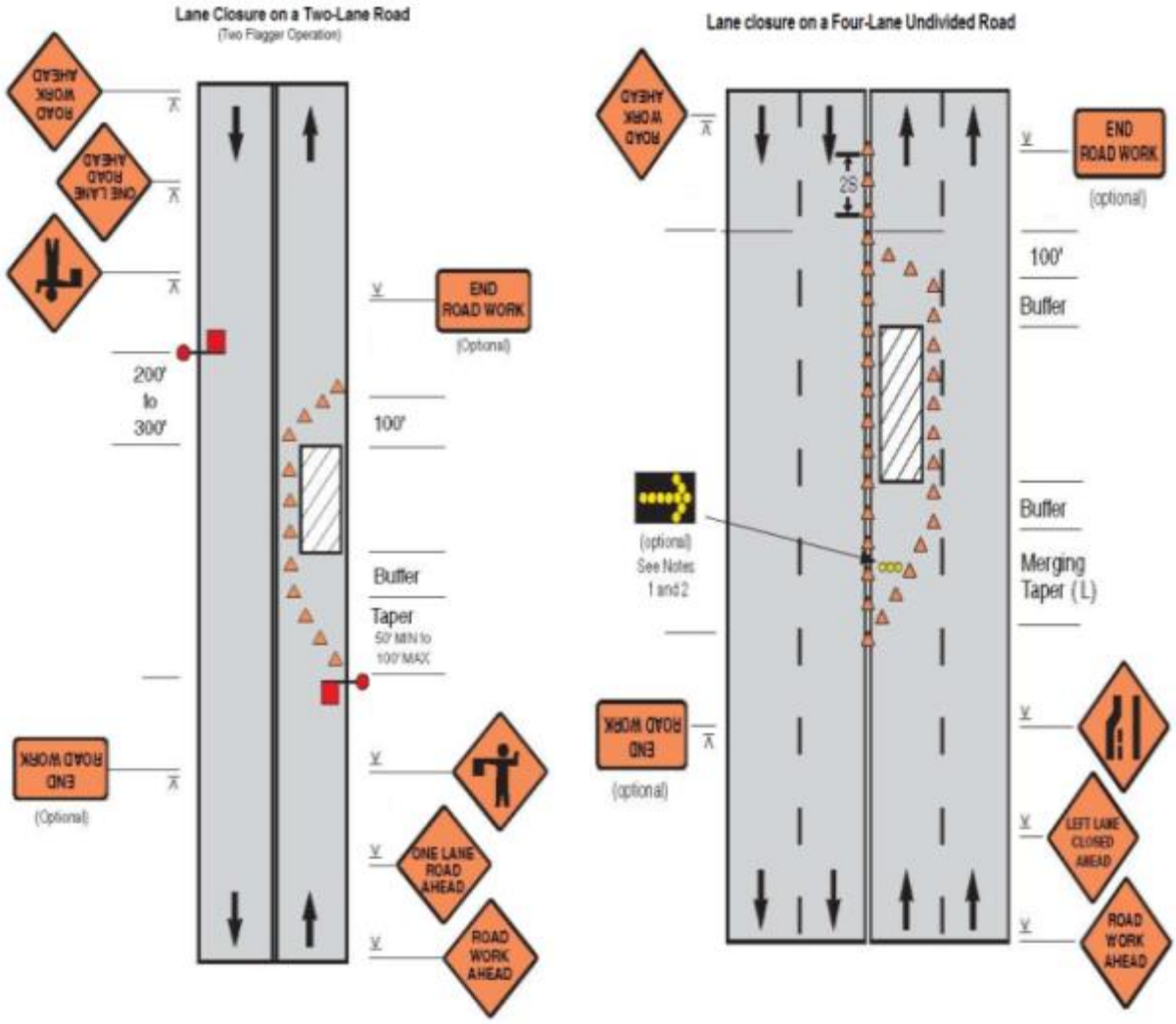
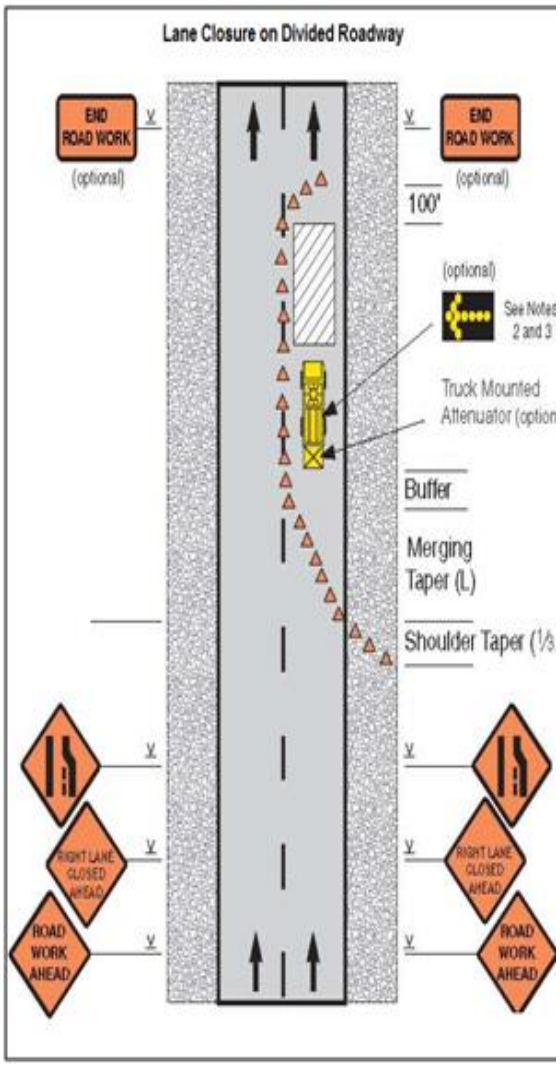


Figure A10 & A11: Lane Closure on Divided Roadway & Half Road Closure on Multi-Lane Roadway



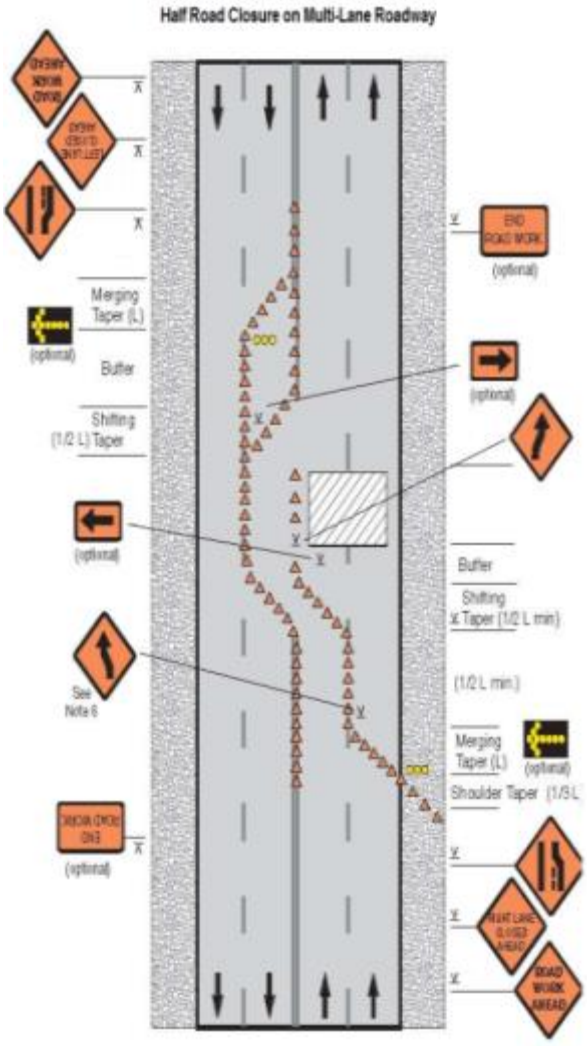


Figure A12: Street closure with detour