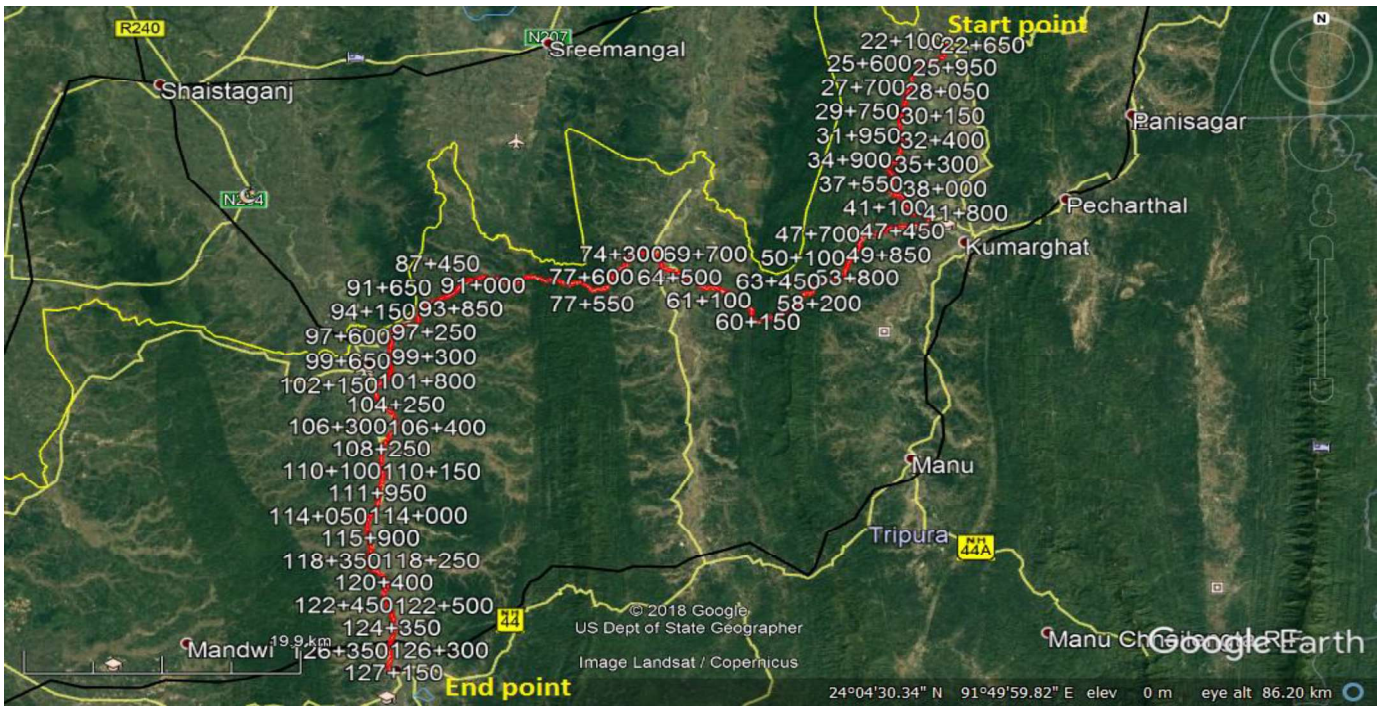
1344562/2019/Technical

Summary

Supplemental Environmental Impact Assessment (SEIA)

FOR

Improvement/Widening to two lane with paved shoulder of Kailashahar to Teliamura via Khowai section of newly declared NH – 208 from CH 21.100 km to 127.319 km.



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Summary

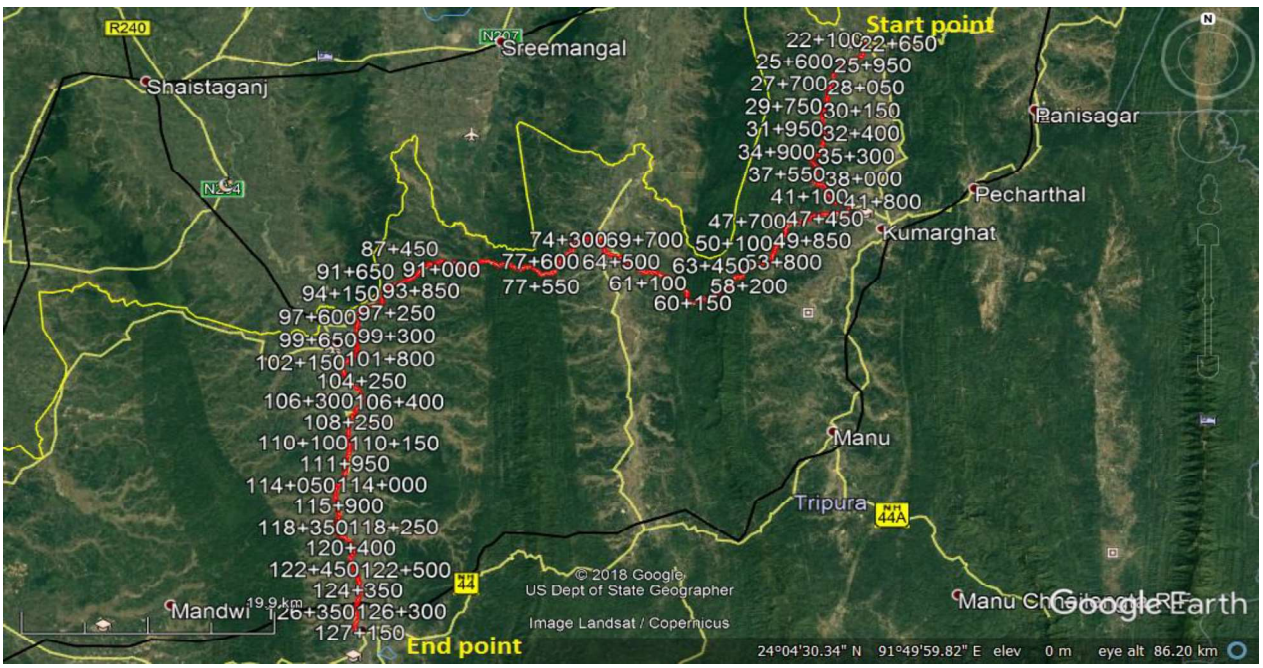
Supplemental Environmental Impact Assessment (SEIA)

Project Background

National Highways infrastructure Development Corporation Limited (NHIDCL) has decided to take up the development of various NH stretches/Corridors in the country where intensity if traffic increased significantly and there is a requirement of augmentation of capacity for safe and efficient movement of traffic. In pursue of the above, the present section of NH-208 has been considered for upgradation. The project aims to improve transport efficiency of the state road network, which will contribute to expansion of economic opportunities and poverty reduction. This will be realized by (i) improving the state highway network, (ii) facilitating safe and appropriate road usage, (iii) increasing efficiency of transport services and (iv) enhancing Tripura State's PWD (NH) capacity for road asset development and management. Project immediate outcome will be improved accessibility to social services and markets, increased fuel efficiency, reduced travel time, accidents, vehicle emissions, better employment opportunities outside agriculture and improved access to economic Centers and increased industrial activities in the project area. Horizontal geometry is found to be very poor with very sharp turns and reverse "S" curves are found at many locations causing discomfort to the drivers in most of the stretch of thealignment.

The proposed project transverses from 24°18'30.39"N92° 1'0.87"Eat Kirtantali (near kailasahar town) to 23°50'21.83"N91°37'36.26"E at NH-44 at Teliamura with elevation varies from 30 m to 243 m.The project road has designed length of 106.219km having started CH 21+100 and end CH 127+319.This section is a part of the NH-208. The project road runs through Unakoti, Dhalai and Khowai districts of Tripura. The project road passes through village / localities namely Kirtantali, Rajnagar, Durgachowmuhani, Manikbhander, Khowai, Kalyanpur & ends at Teliamura. A project location Map of the present section is enclosed in below.

Project Location Map



The Extent and Objective of the EIA Study

This EIA report has been prepared on the basis of Detailed Engineering Design, Field Investigations including baseline environmental data collection and stakeholder consultations to meet the requirements for environmental assessment process, and JICA guidelines. EIA extent has been decided considering all likely impacts and risks analyzed in the context of the project's area of influence encompassing (i) the primary project site(s) and related facilities like site clearance, utility shifting etc. (ii) associated facilities project viz. Borrowing, quarrying, disposal of debris, construction camp etc. (iii) areas and communities potentially affected by cumulative impacts and (iv) potential impact from unplanned but predictable developments caused by the project that may occur at later stage or at a different location.

National Legal Frame Works &its Applicability to the Project and Gap Analysis against JICA Environmental Guidelines

Within the framework of environmental laws of India, the Environmental (Protection) Act of 1986 and its enforcement rights has been given to Ministry of Environment, Forest & Climate Change (MOEFCC). It has overall authority for the administration and implementation of the EIA related policies, laws and regulations, sustainable development and pollution control in India. MOEFCC identifies the need to enact new laws and to issue amendment to the existing environmental legislations when required, in order to continue to conserve and protect the environment in India. Central Pollution Control Board (CPCB) and respective State Pollution Control Board (SPCB) implement the acts. At the state level, the Department of Environment and Forest of Tripura perform a role similar to MOEFCC.

JICA GUIDELINES

Applicability of JICA's Guidelines for Environment and Social Considerations**(here in after, ESC)** is required if a project is funded by JICA. If a significantly adverse impact on the environment or society has been identified in JICA-assisted project, the following has to be thoroughly considered and studied.

1) ESC are pre-requisite

a. JICA will take necessary measures to ensure that the appropriate ESC is given;

b. When JICA reviews a project proposal and finds that the project could cause negative impacts on the environment or society, JICA advises the project proponents to provide appropriate ESC;

c. If the negative impact of the project cannot be avoided or mitigated to an acceptable level, JICA will not support its implementation.

2) Respect human rights

a. Development project should aim for fair distribution of its benefits and must not burden or exclude certain stakeholders for the sake of others;

b. The project proponents must respect the rights of all people concerned, and pay special attention to vulnerable social groups such as women, elderly, the poor, people with disabilities, indigenous peoples, ethnic minorities, and other minority groups to ensure that they are involved in decision-making processes and that they

benefit from the project;

c. JICA's ESC Guidelines defines 'stakeholders' as local residents including non-titleholders who are affected by the project as well as local NGOs. By involving local stakeholders from the early stage of the project, the project proponents can receive their inputs and plan appropriate measures to address their concerns, avoid conflict, and achieve higher results with their support. For this reason, the project proponents should conduct a series of consultations with local stakeholders in an interactive and meaningful manner. During this process, appropriate consideration must be given to socially vulnerable or different people such as women, children, the elderly and ethnic minorities.

3) Avoid adverse impacts

a. Priority should be given to the avoidance of adverse impacts on the environment or society when a project is planned;

b. Minimization or mitigation of impacts should be considered only if avoidance is not feasible and if the benefit of the project outweighs the cost of mitigation measures;

c. The project proponents must assess the environmental and social impacts at the earliest possible stage of planning, and implement ESC measures in accordance with the ESC Guidelines.

4) Information on ESC must be disclosed to the public

a. Information disclosure is key in ESC. Project proponents must proactively release relevant information to the public;

b. Sharing information with a wide range of stakeholders from the early stage, the project proponents can utilize their feedback to improve the plan/project. In addition, the project proponents can ensure that unnecessary concerns and misunderstandings among the stakeholders are ameliorated.

5) Host country's laws, standards, policies and plans

a. JICA-funded project must comply with the laws, standards, policies, and plans of the host country;

b. If the standard set by the host country differs from the international standard, the project proponents are advised to adopt international standard that better serves the purpose of attaining a higher level of ESC.

6) The World Bank's Safeguard Policies

ESC in a JICA project must be in line with the World Bank's Safeguard Policies including:

a. Operational Policy on Environmental Assessment (OP 4.01);

b. Natural Habitats (OP 4.04);

c. Involuntary Resettlement (OP 4.12);

d. Indigenous Peoples (OP 4.10), and other relevant policies.

The National and State Regulations relevant to the project and its applicability to the project are described below:

National and State Regulations and its applicability for the Project

Law	Description	Applicability in the project
EIA Notification	The EIA Notification of 2006 set out the requirement for environmental assessment in India. Environmental Clearance is required for certain defined activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence.	Not Applicable as project activity does not attract provisions of EIA notification 2006 and its amendment till date.
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments(1987)	Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Pollution Control Boards and for conferring on and assigning to CPCB/SPCBs powers and functions relating to water pollution control. Such projects have to obtain Consent to Establish (CTE) under Section 25 of the Act from State Pollution Control Board (SPCB) before starting implementation and Consent to Operate (CTO) before commissioning.	Consent to Establish (CTE) before start of construction works and Consent to Operate (CTO) before start of operation will be required for (if any)- • Batching Plant • Hot mix plants; and • Sand mining
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	This Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. The Act also establishes ambient air quality standards.	Following will require CTE and CTO from SPCB: Establishment of DG sets more than 10 KVA. • Batching Plant • Hot mix plants; and • Sand mining, if any
Environment (Protection) Act, 1986 and CPCB Environmental Standards. (National Ambient Air Quality Standards 2009)	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards.	Ensure applicable standards for ambient air quality. Ensure Emission Limits standards for New DG Sets Ensure Stake Height standards Requirement for DG Sets.
Noise Pollution (Regulation and Control) Rules, 2000 amended up to 2010.	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones.	Ensure applicable noise standards and noise limits for DG sets.
Central Motor Vehicle Act Central Motor Vehicle Rules and (Amendment) Rules (1988 and amendment thereafter)	Objective of this Act is to check vehicular air and noise pollution. Vehicles to be used for construction and other purposes need to meet the standards and certificates prescribed as per the Rules, 1989 to control noise, pollution, etc.	Ensure vehicle exhaust emission standards.
Ancient Monuments and Archaeological	The Act designates areas within 100 meters (m) of the "protected	Not applicable as no such monuments within the project

Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010	monument/area" as "prohibited area" and beyond that up to 200 m as "regulated area" respectively. No "construction" is permitted in the "prohibited area" and any construction activity in the "regulated area" requires prior permission of the Archaeological Survey of India (ASI).	corridors.
The Right to fair compensation and transparency in land acquisition, rehabilitation and resettlement Act, 2013	Private land acquisition is guided by the provisions and procedures of this Act.	Applicable to this project as there is private land acquisition and resettlement.
Seventy Third Constitution Amendment Act 1992	This act guides Governments to establish rules for Panchayat involvement in project preparation and implementation. The Act stipulates involvement of the institutions especially, the Gram Sabha/ Panchayat during project preparation and implementation. The Panchayats at the village level will be involved for preparation and implementation of the project.	Ensure involvements of Gram Sabha/Gram Panhayat in the project design.
Labor Laws	The contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The contractor shall base the employment relationship upon equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline. The contractor shall provide equal wages and benefits to men and women for work of equal value or type.	Applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.
The Sexual Harassment of Women at workplace (Prevention, Prohibition and Redressal) Act, 2013	Whereas sexual harassment results in violation of the fundamental rights of a women to equality under article 14 and 15 of the Constitution of India and her right to life and to live with dignity under article 21 of the Constitution and right to practice any profession or to carry on any occupation, trade or business which includes a right to safe environment free from sexual harassment.	Applicable
The schedule caste and schedule tribe amendment act 2015 and rules 2016	The acts and rules are to provide the protection to tribal people.	Applicable
Biodiversity Act of 2002	The Biodiversity Act 2002 primarily addresses access to genetic resources	Not applicable

	and associated knowledge by foreign individuals, institutions or companies, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people.	
Wildlife Protection Act, 1972 amendment 1991	This overarching Act provides protection to wild animals, birds, plants and matters connected with habitat protection, processes to declare protected areas, regulation of wildlife trade, constitution of state and national board for wildlife, zoo authority, tiger conservation authority, penalty clauses and other important regulations.	The GumtiWildlife Sanctuary is located within 10 km from the end point of the road. The draft ESZ notification no. 1985 dated 31.05.2018 of the sanctuary has been published. The project does not required Environmental Clearance and the applicability of wildlife clearance need to be further clarified from MoEFCC as the forest clearance letter no. 3814-15 dated 20.02.2019 for the project has not specifically asked for wildlife clearance.
Forest (Conservation) Act, 1980	The Forest (Conservation) Act prohibits the use of forest land for non-forest purposes without the approval of Ministry of Environment and Forests and Climate Change (MoEFCC), Government of India	Applicableas 79.756196 ha of forest land is required for project. The stage-1 clearance has already been obtained.
Solid Waste Management Rules 2016	Responsibility of Solid Waste Generator (i) segregate and store the waste generated in three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes in suitable bins and handover segregated wastes to authorized waste pickers or waste collectors as per the direction or notification by the local authorities from time to time.	Contractor to follow all the rules during construction works.
Construction and Demolition Waste Management Rules 2016	(i) Every waste generator shall segregate construction and demolition waste and deposit at collection centre or handover it to the authorized processing facilities (ii) Shall ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains. (iii) Large generators (who generate more than 20 tons or more in one day or 300 tons per project in a month) shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or re-modeling work, (iv) Large generators shall have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process and disposal /	Contractor to follow all the rules during construction works.

	reuse of C & D Waste. (v) Large generators shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar, Large generators shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities;	
Hazardous Waste Rules 2016	Responsibilities of the occupier for management of hazardous and other wastes.- (1) For the management of hazardous and other wastes, an occupier shall follow the following steps, namely:- (a) prevention; (b) minimization; (c) reuse, (d) recycling; (e) recovery.	Contractor to comply all the requirements of this Act during construction works.
International conventions and treaties		
Ramsar Convention, 1971	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. India is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory countries to include wetland conservation in their national land use plans.	Not applicable to this project as not site within the vicinity of the project.
Wetlands (Conservation and Management) Rules, 2017	The Rules specify activities which are harmful and prohibited in the wetlands such as industrialization, construction, dumping of untreated waste and effluents, and reclamation. The Central Government may permit any of the prohibited activities on the recommendation of Central Wetlands Regulatory Authority.	Not applicable as subprojects components are not located in designated wetland area.
Montreal Protocol 1992	India is a signatory of this convention which aims to reduction in the consumption and production of ozone-depleting substances (ODS), while recognizing differences in a nation's responsibilities. Ozone depleting substances are divided in two groups Chlorofluorocarbons (CFCs) and Hydro chlorofluorocarbons (HCFCs).	Not applicable in this project as no ODS are involved in construction works.
Basel Convention on Trans-boundary Movement of Hazardous Wastes, 1989	India is a signatory of this convention which aims to reduce trans-boundary movement and creation of hazardous wastes.	Contractor to follow the provisions of Hazardous Waste Rules 2016 for storage, handling, transport and disposal of hazardous waste emerged during construction works.
Convention on Migratory Species of Wild Animals	CMS, also known as Bonn convention was adopted in 1979 and entered into force on 1 November 1983, which	Not applicable to this project as no migratory species of wild animals are reported in

(CMS), 1979 (Bonn convention)	recognizes that states must be the protectors of migratory species that live within or pass through their national jurisdictions, and aims to conserve terrestrial, marine and avian migratory species throughout their ranges. CMS Parties strive towards strictly protecting these species, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them.	the project areas.

Study of Alternative Options

A comparative analysis of various alternatives considered to avoid, prevent or minimize impacts that would be inevitable if technically (based on design speed and geometrics) best-fit alignment is followed. The consideration of alternatives to a proposal is a requirement of the EIA report. During the scoping process, alternatives to a proposal can be generated or refined, either directly or by reference to the key issues identified. A comparative analysis of the alternatives will help to determine the best method of achieving project objectives while minimizing environmental and social impacts.Three options have been selected to decide the final alignment, these three options are:-

1. Zero option: No project intervention is implemented i.e. transportation by present roads is continued to be used.
2. The selected option: The option is used for this EIA impact study
3. Others options (widening options): The option is to widen the existing road to the level of the planned road.

Zero option has been ruled out as present road is not able to withstand increased traffic. The widening option of existing road was also not feasible due to its geometric design, R&R issues, socioeconomic viability, environmental & road safety aspects. The initial site visit and detailed ground reconnaissance by the consultants revealed that by and large this selected alignment having less/minor effect on environmental and social components is acceptable.The proposed alignment was selected after finalization of various options such as realignments, bypasses, keeping in view objectives of the project, traffic condition, obligatory points, geometric designs, congestions and socioeconomic viability, environmental & road safety aspects.

Description of the Project Components

Project road improvement will broadly follow IRC: SP: 73-2007 and Ministry of Road Transport and Highways (MoRTH) Guidelines. It will be of 7m width carriageway with paved shoulder of 1.5m in rural/hilly and 2.5m in built-up section on both the side. In some places, there are provisions of earthen shoulders of 2m width on both side of the road. 39.3% of the total road length proposed to be realigned. The length of realignment stretch is 41.750km. Besides, a stretch of 4.990km length is proposed at Khowai bypassing the main town form design chainage 96120m to 101110m. Footpath with cover drain has been proposed in built up area & Brick Masonry drain has been proposed on hill side for proper drainagepurpose.The salient features of the project have been presented below.

Salient Features of the Project

1.	Project	Improvement/Widening to two lane with paved shoulder of Kailashahar to Teliamura via Khowai section of newly declared NH – 208 from CH 21.100 km to 127.319 km.
2.	Location of the proposed project	The proposed project transverses from 24°18'30.39"N 92° 1'0.87"E at Kirtantali (near Kailasahar town) to 23°50'21.83"N 91°37'36.26"E at NH-44 at Teliamura.
3.	Total Length of the proposed project	106.219 km
4.	Terrain	Plain,rolling and hilly
5.	Seismic Zone	Zone V
6.	Geographical Location	Start Location24°18'30.39"N 92° 1'0.87"E End Location23°50'21.83"N 91°37'36.26"E
7.	Proposed Bridges and ROB	53 nos. minor bridges& 08 nos.major bridges 01 no. of ROB
8.	Bus Bay/ Truck Lay Bye	13 nos. of bus bay and 01 no. of truck lay bye
9.	Design Speed	
	a) Plain Terrain (in general)	Ruling: 100 kmph Minimum: 80 kmph
	b) Rolling Terrain	Ruling: 80 kmph Minimum: 65 kmph
	C) Hilly Terrain	Ruling: 60 kmph Minimum: 40 kmph For Hair Pin Bend: min 20kmph
10.	Carriage way Width	7.0 m
11.	Width of Shoulder	In Rural/Built-up section:
	a) Paved	2 x 1.5m (in Rural); 2x 2.5m (in Built-up); In hill section: 1.5m (on hill side) and 1.5m (on valley side)
	b) Earthen	2 x 2.0m
12.	Footpath width at built-up areas	2 x 2.0m
13.	Number of affected persons and household	Affected persons 4286 and Affected Household - 2464
14.	Nos. of private structures affected	2464
15.	Total number of CPRs affected Community and Religious)	38
16.	Total Area of Land Acquisition	121.419 Ha. Plus 54.233 Ha. Govt. Land will be given by the Govt. of India at free of cost
17.	Forest Land Diversion	79.756196 ha
18.	Total R&R budget for the proposed project RP	Rs. 256.46 Crs.

The typical cross sections (TCS) as per the following details area enclosed as **Annexure -1.**

(a). TCS of 2 lane carriageway with paved shoulder in rural area applicable for plain/rolling terrain (reconstruction),

(b). TCS of 2 lane carriageway with paved shoulder in bypass and realignment stretch

applicable for plain/rolling terrain (new construction),

(c). TCS of 2 lane carriageway with paved shoulder in bypass and realignment stretch applicable for plain/rolling terrain in cutting section (new construction) and

(d). TCS of 2 lane carriageway with paved shoulder and both side RCC cover drain in built up area applicable for plain/rolling terrain(reconstruction).

(e). Typical cross section of 2-lane carriageway with paved shoulder and both side rectangular brick masonary drain applicable for mountainous terrain (reconstruction).

Baseline Environment

The project state, Tripura falls under the sub-tropical to temperate climatic region. The climate of the project districts Unakoti, Dhalai & Khowai is characterized by moderate temperature and high humid nature. There are three prominent seasons summer, rainy and winter. The State of Tripura comes under the very high risk seismic zone in the country, namely, Zone V of seismic Zoning Map of India. The major geomorphic element observed in Tripura is north-south running parallel hill regions and intervening valleys.

Ambient air and noise quality conformed the prescribed limit. Air & Noise level is comparatively high in Teliamura (End point), Durgachowmuhani, Kalyanpur & Khowai being populated area with comparatively higher vehicular movement. Ground water samples collected from the hand-pumps of various locations as well as surface water quality along with soil quality also confirm the prescribed limit. Dominant land use in the 10km radius of the project road is vegetation /forest land with an area covering 75.57% which is higher than the Tripura's over all forest cover. It is followed by agriculture land which covers an area of 9.34% in 10km radius of the project road.

The recorded forest area of the state is 6,294 km^2, which constitutes 60.02% of its geographical area. The Reserved Forest (RF) constitute 66.33%, Protected Forest (PF) 0.03% and Unclassified Forest constitute 33.64%. The forest cover in the state, based on interpretation of satellite imagery of January 2009 is 7,977 km^2 which is 76.04% of the total geographical area. Important flora in the project road are *Schimawallichi*, *Syziguimcuminii*, *Albizia procerra*, *Artocarpaschaplasa*,*Lagerstromiaparviflora*, *Alstoniascholaris*, *Dilleniapentagyna*, *careyaarborea*, *Lannea grandis*, *Amoorawallichii*, *Cedrellatoona*, *Sapiumbaccatum*, *Trewianudiflora*, *Grewia microcos*, *Odinawodier*, *Garugapinnata*, etc. Bamboo plays a very vital role in the economy of the State along with rubber plantation as it serves the artisan & non-artisan users of the state.

Anticipated Environmental Impacts and Proposed Mitigation Measures

The road will benefit the residents and other stakeholders in the settlement areas of important nearby towns of Fatikroy, Kumarghat,Komolpur and Ambasa and villages/ localities i.e. Kirtantali, Jarultali, Rajnagar (near Fatikroy), Gokulnagar, Ganganagar, Rajkandi, Saidacherra, Demdung, Durgachowmuhani, Bamancherra, Eararpar, Manikbhander, lambucherra, Srirampur, Sukhiabari, Lengtibari, Laxmicherra, Behalabari, Khowai, Mahadevtila, Sonatala, Chebri, Gourangatila, Baganbazar, Dwarikapur, Kalyanpur, Totabari, Kamalnagar, Moharchara and Trishabari by providing improved connectivity to state capital and other important destination of nearby states of Assam, Meghalaya & Mizoram. About 38.6% of the project road is proposed for either realignment or bypass. This process involves diversion of both agriculture and forest land along with eviction of some existing structures including shops, school boundary wall and temples. More than 75% of the land use in 10km radius of the project road is forest cover. A total of 7743 numbers of trees

likely to be felt down during the widening process. The widening of the project road along with realignment and bypass development shall cause loss of vegetation/tree felling, other ecological imbalance and habitat destruction. Another significant impact identified during site visit is water quality deterioration of ponds abutting the project road. However, with effective environmental management plan, all these aspects can be mitigated.

Public Consultation and Information Disclosure

Consultation held with various government officials and local people from the fringe area of the project road. Divisional Forest Officers of all the three project districts were consulted during the field study along with higher officials from the Tripura State Pollution Control Board. Informal public consultations were held at seven important locations of the project road including both starting point (Kirtantali) and end point (Teliamura, near NH-44). All of them welcome the road development and improvement project. Suggestion received mainly on improved drainage system, adequate compensation, protection measures for water bodies (mainly ponds) and petty contracts for the local contractors during the construction phase of the projectroad. The second stage Public/stake holder consultation will be proposed in six locations covering all the three benefits districts as per JICA guidelines.

Environmental Management Plan

The Environmental Management Plan is prepared for avoidance, mitigation and management of the negative impacts of the project. It also covers remedial measures require to be taken EMP includes the list of all the project related activities, their impacts at different stages of project during pre-construction phase / design phase, construction phase and operational phase on environment and remedial measures to be undertaken to mitigate these impacts. Environmental Management Plan (EMP) is intended to set out clearly and unambiguously the likely negative impacts of construction and/or operation of the project, the action that is required to avoid or mitigate each impact and the responsibility for taking each action. Responsibility is made legally binding when actions are subsequently specified in contracts. A comprehensive environmental management plan has been designed for the project road;

1) to ensure compliance and regulatory requirements of Tripura and the Government of India,

2) To formulate avoidance, mitigation and compensation measures for anticipated adverse environmental impacts during construction and maintenance and ensure that environmentally sound, sustainable and good practices are adopted and to stipulate monitoring and institutional requirements for ensuring safeguard compliance. A strict environmental monitoring program also formulated for implementation during both construction and operation stage of the project road. A total budget amount of Rs. 5,06,87,588.00 has been allocated for implementation of environment safeguards under the project.

Findings and Conclusion

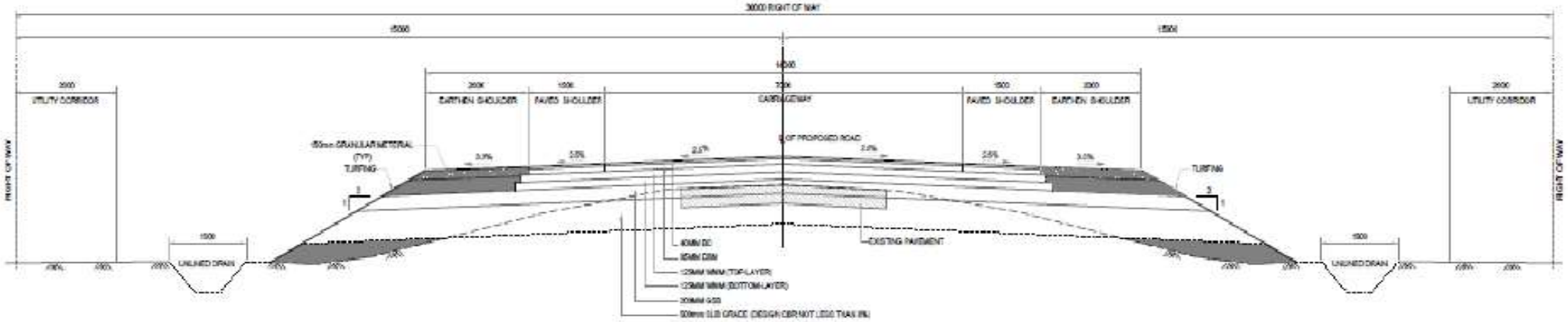
The significant environmental impacts attributable to the upgrading of the road sections pertains to tree cutting, construction of bridges, temporary deterioration of environmental attributes/ambient during construction phase from land clearing, silt run off, borrowing of earth, camp operations and community and occupational health and safety. These impacts can be mitigated 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. Retaining walls have been proposed on embankment slopes where ponds are abutting to avoid seepage into sub grade and erosion of road embankment.

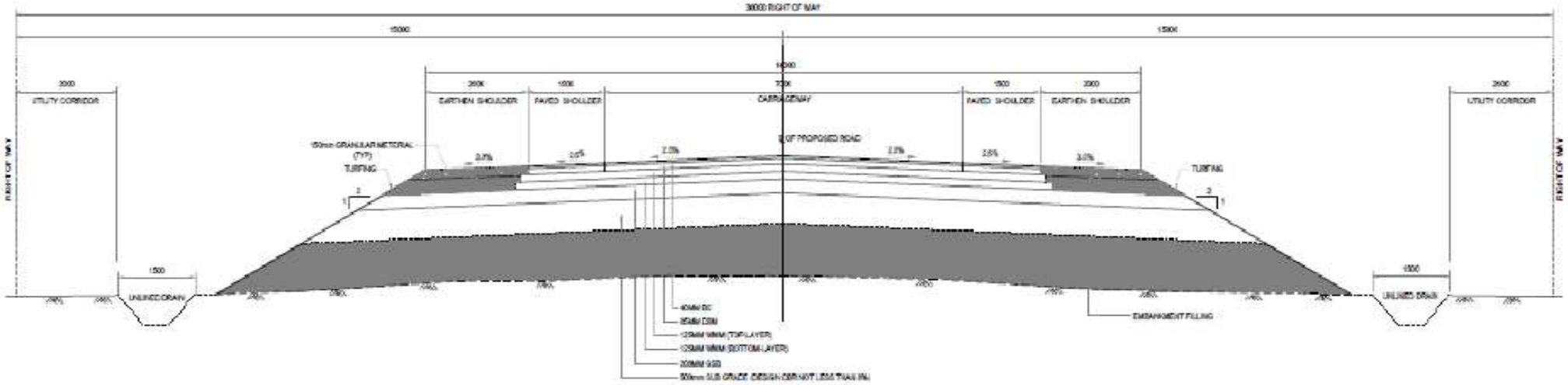
The EIA/EMP report was prepared after thorough interaction with the engineering section of the consultants so that the negative impacts on the environment and human population could be avoided as far as possible. Some of the important findings of the study are as follows: -

1. There will be insignificant loss of bio-diversity as no rare plant or animal species are going to be affected by the present project.
2. The alignment is not passing through any protected area, Gomati Wildlife Sanctuary or National Park and does not attracts Wildlife Clearance as no any Environmental Clearance required in this Project.
3. Precautionary measures such as underpass, pipe culverts and chain link fences etc. have been suggested to mitigate the likely impacts if any wild life present in Project area.
4. No monuments protected by the Archaeological Survey of India (ASI) are located within the ROW of project road.
5. The most important factors, which need continuous attention and assessment during the construction phase, are the ambient air quality, the water quality and the noise level. The ambient air quality of the study area is good and noise levels are within the standards.
6. The total land requirement for the project is 254.86 ha. out of which Pvt. Land 119.873 Ha, Govt. Land 55.779 Ha. and 79.756196 ha is forest land for which stage-1 forest clearance has already been obtained.
7. There are 2464 nos. of private structures and 38 nos. of CPRs recorded within the corridor of impact and need to be replaced. However, the proposed project will definitely have positive impacts on the socio-economic environment of the people of surrounding villages experiencing development in the area in specific and state and nation as a whole.

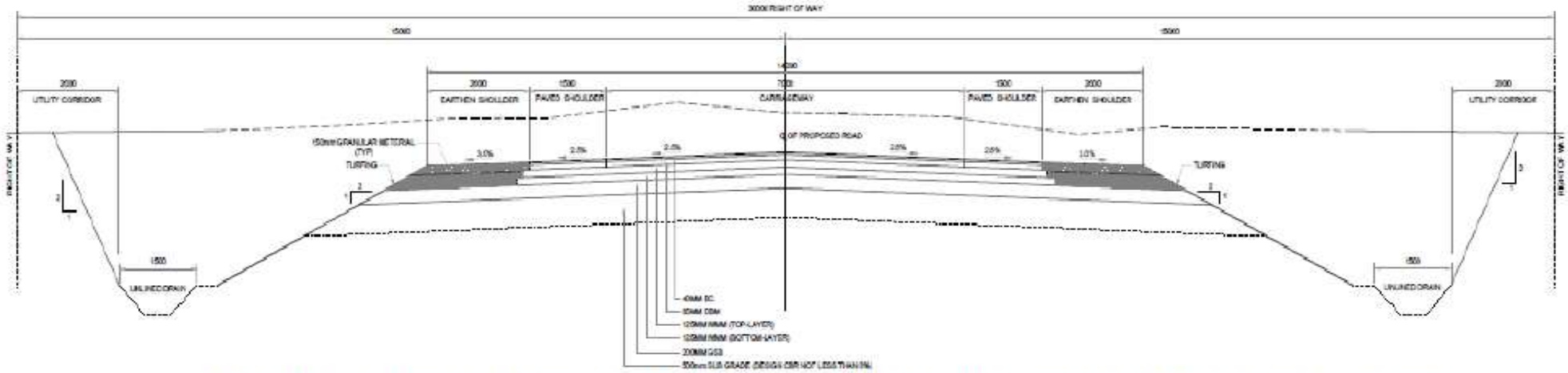
Typical cross sections for Road Annexure-1



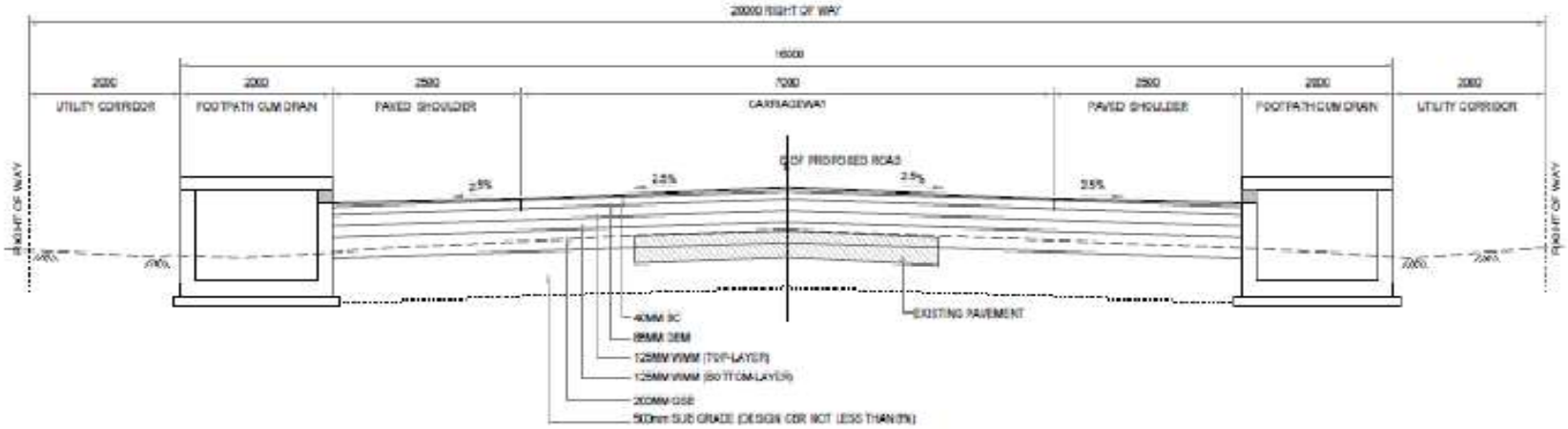
TCS-1 : TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA APPLICABLE FOR PLAIN/ROLLING TERRAIN (RECONSTRUCTION)



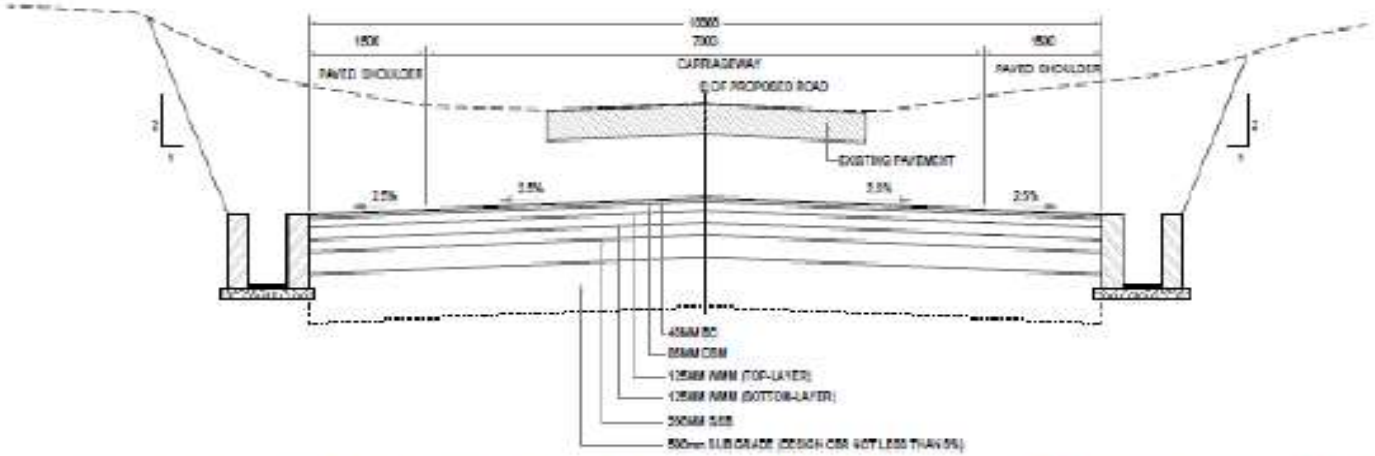
TCS-2 : TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH PAVED SHOULDER IN BYPASS AND REALIGNMENT STRETCH APPLICABLE FOR PLAIN/ROLLING TERRAIN (NEW CONSTRUCTION)



TCS-3 : TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH PAVED SHOULDER IN BYPASS AND REALIGNMENT STRETCH APPLICABLE FOR PLAIN/ROLLING TERRAIN IN CUTTING SECTION (NEWCONSTRUCTION)



TCS-4 : TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH PAVED SHOULDER AND BOTH SIDE RCC COVER DRAIN IN BUILTUP AREA APPLICABLE FOR PLAIN/ROLLING TERRAIN (RECONSTRUCTION)



TCS-5 : TYPICAL CROSS SECTION OF 2-LANE CARRIAGEWAY WITH PAVED SHOULDER AND BOTH SIDE RECTANGULAR BRICK MASONARY DRAIN APPLICABLE FOR MOUNTAINOUS TERRAIN (RECONSTRUCTION)