STATE PROJECT IMPLEMENTATION UNIT, NCRMP II, RELIEF AND REHABILITATION DEPARTMENT, GOVERNMENT OF MAHARASHTRA

Conversion of High Tension & Low Tension Over Head Distribution Network into HT& LT Underground Cable System in Alibag Town Area & Nearby Villages of coastal belt in District Raigad Under NCRMP-II Project, Maharashtra

Executive Summary - Environmental Impact Assessment

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

The National Cyclone Risk Mitigation Project (NCRMP) is initiated by Ministry of Home Affairs, Government of India with the World Bank assistance for creating suitable infrastructure to mitigate the effects of cyclones in the coastal states of India. NCRMP focus is on ex-ante disaster risk mitigation in cyclone prone coastal states and union territories. Project is being implemented by the National Disaster Management Authority (NDMA) with support from the Ministry of Home Affairs Government of India.

The main objectives of the NCRMP project are:

a. To minimize risk and vulnerabilities of coastal to cyclones
b. To strengthen the structural and non-structural cyclone mitigation efforts through creation of appropriate infrastructure which can help to mitigate the adverse impacts of cyclones
c. To strengthen the cyclone warning systems enabling quick and effective dissemination of warning and advisories at all levels
d. To build capabilities and capacities of people for cyclone risk mitigation in harmony with the conservation of coastal ecosystems.

The project has identified 13 cyclone prone States and Union Territories ('UTs'), with varying levels of vulnerability. Maharashtra is one of the 13 states covered in two Phases. Government of India has approved NCRMP Phase-II in July,2015 for five years up to March, 2020 covering States of Goa, Gujarat, Karnataka, Kerela, Maharashtra and West Bengal at an outlay of Rs 2361.35Cr with the World Bank funding amounting to Rs1881.20Cr.

NCRMP Maharashtra Project Components:

The project components in Maharashtra include conversion of overhead electrical cable network to underground system in Alibagh, Ratnagiri, and Satpathi towns and rehabilitation of select embankments and construction of Multipurpose Cyclone Shelters.

This EIA report relates to"conversion of the overhead cable network to underground cable network for Alibag town.

An SPIU has been formed under the Relief and Rehabilitation Department, Government of Maharashtra for implementing the NCRMP- II project in Maharashtra state which will implement the project in coordination with various government agencies like MSEDCL, Harbour Division of PWD, Kharland Development Authority, and State Disaster Management Authority.

2.0 BRIEF DESCRIPTION OF THE PROJECT

Project Components

Under the project overhead cable system in Alibag and adjoining villages (Alibag town and Chendhare) will be converted into underground system along with the upgradation of

relevant infrastructure. Salient features of the project are given in the table below and the project area is represented in the **Figure 1.1.**

- Laying of armoured underground cable (HT & LT) through trenching and through trenchless methods (HDD method).
- Development of overhead cable network across River Khadtal and in Custom Bunder & Medpada Area (3.008 km long)
- Construction of new switching station, control room and CFC & SCADA room within premises of existing Alibag switching station
- Installation of 84 Ring Main Units in the Electrical network (Incoming & Outgoing Feeders).
- Construction of 4 nos of new pole mounted distribution transformers (1 no-315 kVA & 3 no-200 kVA)
- Augmentation of existing pole mounted distribution transformer (25 nos)
- Construction of new DP structures for existing DTs (37 with fuse & 68 without fuse)
- Provision of other components of electrical network like LT distribution boxes, LT Feeder Pillars, LT Mini Pillar Box etc
- Shifting of existing 1 Ph consumer meter outside premises and connecting cable to multi-consumer buildings
- Construction of steel tubular street light poles
- Dismantling of overhead electrical network & transportation to nearest collection area

Salient Features of Project

S. No.	Features	Description
1	Sub-station Feeding the Area	Thal (6 km, North from Switching Station, Alibag)-22/22 kV
2	Project Area	Alibag (Alibag town &Chendhare village)
3	Switching Station	Within Alibag Town along Alibag Pen Road near Maruti Naka
4	Type of Cable System	Underground with some sections overhead[1]
5	Incoming HT Feeder Length	27.46 km
6	Outgoing HT Feeder Length	21.72 km
7	LT Feeder Length	67.339 km
8	Nos. of Distribution Transformer	118
9	Nos. of feeder	Outgoing:8 nos. Incoming: 2 nos.
10	HDD & HDD-HDPE cabling	166.999 km and 160.029 km
11	Overhead cabling	3.008 km

[1]Cable remains overhead across Khadtal River and Custom Bander &Metpada Area

12	Trench and prefabricated RCC trench	17.552 km & 1.425 km
13	Cable laying methodology	Trenching and Trenchless (Horizontal Directional Drilling)
14	Depth of trench	0.8-1.2 m below ground level
15	Width of trench	800 mm-1000 mm
16	Height of pole mounted transformer	1.5 m above ground level
17	Land Acquired and R & R	Nil. Project components will be within the government's land (mostly in RoW of roads)

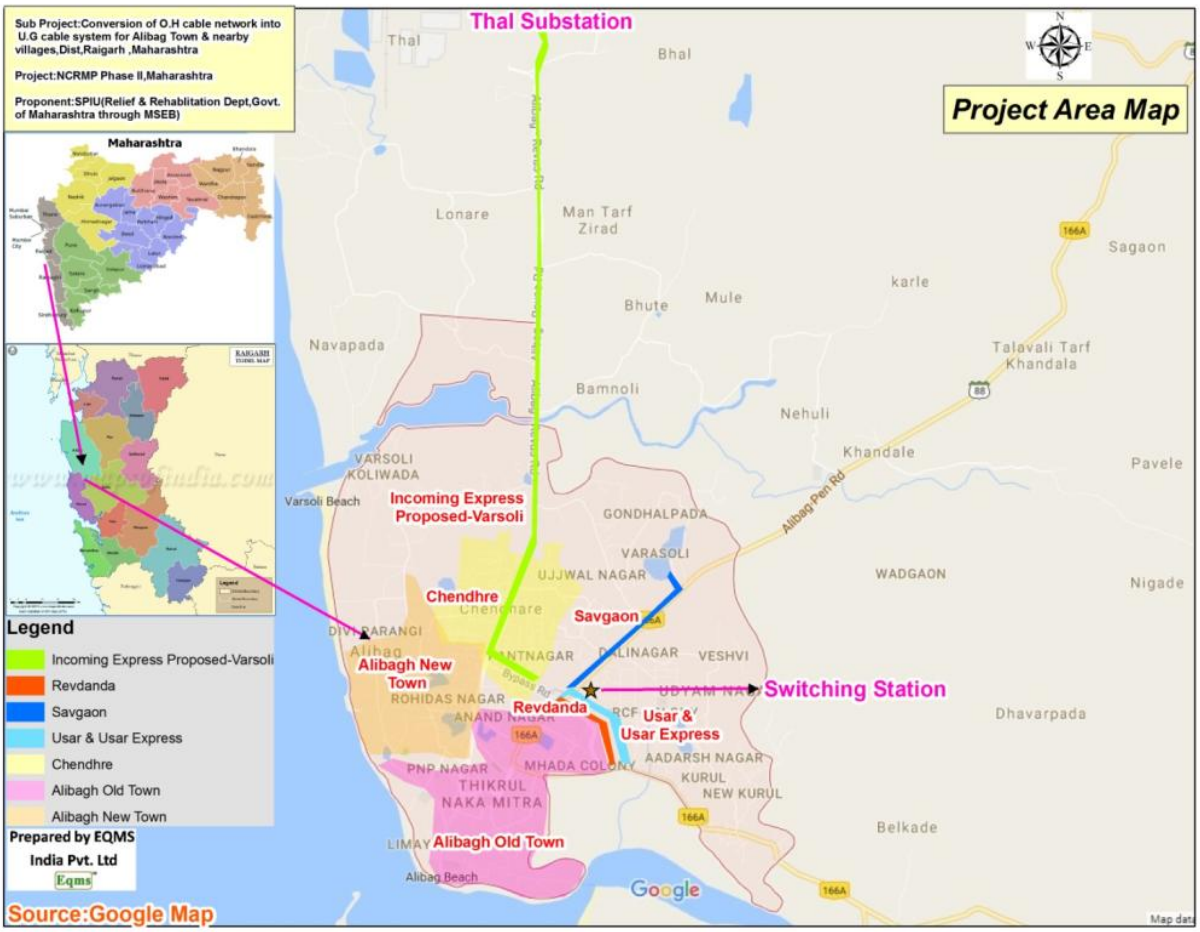


Figure 1.1 : Map of Project Area (Feeders, Switching Station and Sub-station)

Alibag, is a coastal town and a municipal council and headquater of Raigad District in the Konkan region of Maharashtra. Alibag is located about 100 km south of Mumbai at 18°38′29″N & 72°52′20″E. The ground elevation of Alibag town varies from 0-18 metresabove mean sea level (amsl) . The District Government offices are located along the sea coast road. Alibag is the centre place of Raigad District. Town is well connected by roads to nearby cities. Alibag Pen Road, Alibag Revas Road and Alibag Revdanda Road connect Alibag to other cities. Location map of sub project area is given in **Figure 1.2.**

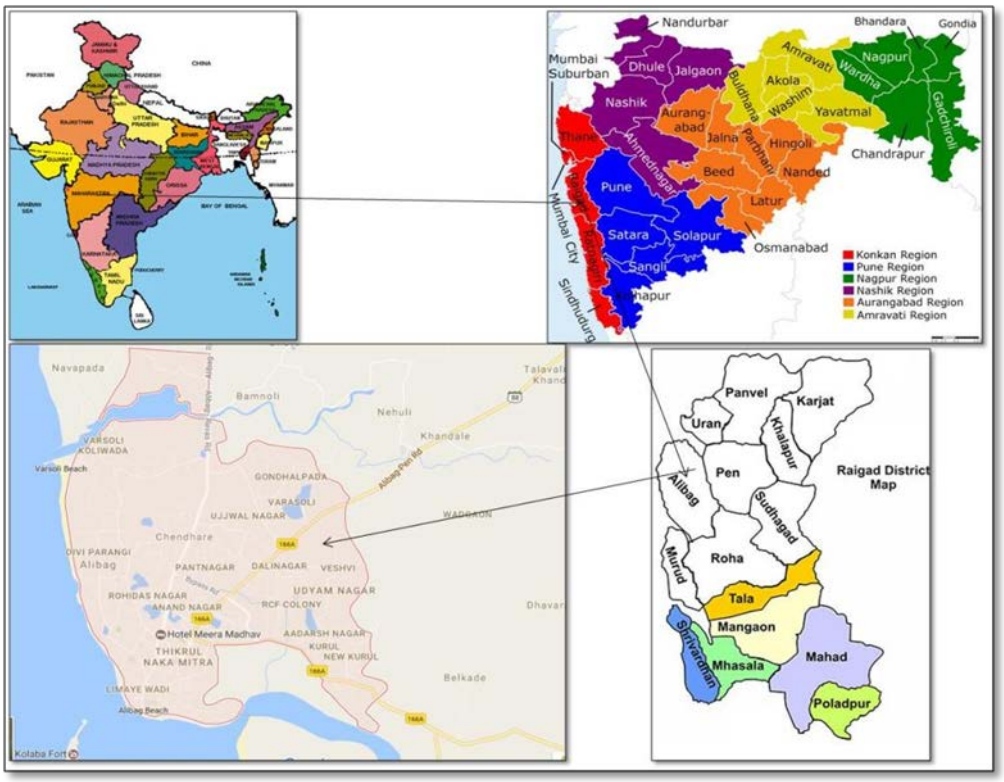


Figure 1.2 : Location map of the Project Area

Profile of Project Area

Topographically area is almost flat with elevation ranging from 0-18 m amsl. The area is low-lying and is prone to inundation during floods and cyclones. Area gets water logged during rains in monsoon. There are no rivers in the project except Khadtal River which touches the boundary of Alibag town in North. This river carries water from the hills of Sahyadrin Range located in Eastern direction to the project site and this river drains into Arabian Sea. Alibag creek abuts the Alibag town boundary on the South. Slope of the area is towards SW. As per 2011 India census, project area is urban area and have total population of 31782.

Existing Utilities

No major private or public property will be affected due to the project. If any property is damaged accidentally during cable laying, provision of cost for restoration of steps/compound wall/underground utilities has been made in DPR as per recommendation of SIA studies.

Underground utilities in town include drainage system, water supply pipeline and BSNL telecom cable. Data on alignment of the underground utilities is not available thus the impact on these utilities due to the cable laying cannot be predicted at this stage. As per DPR, there is no interface of the proposed cable alignment with any of the underground utilities. But since the alignment of existing UG utilities is not available, there could be interception of proposed UG alignment with the existing utilities and the contractor should be responsible

for restoration of the disrupted facilities. Provision has also been made in DPR for restoration of the underground utilities as per recommendation of EIA/SIA studies. Provision with an emergency repair crew by the Contractors is also proposed as part of the project planning

Roads will be affected due to proposed trenching, different types of roads which will be affected includes: bitumen roads (15240.36 sq m), paver block (1541.16 sq m) and RCC road (342.48 sq m). Cost of restoration of roads is also included in the DPR.

Above ground utilities which may get affected are drains, manholes, roads and street lights. No drains or manholes are likely to be disrupted as per current planning but there are chances of accidental damage to these above ground utilities. Provision has been kept in DPR for restoration of these structure as per recommendation of EIA/SIA studies. Street light and transmission lines are provided on common poles in project area thus there is requirement of installation of new street lights if the existing poles will be dismantled. Provision is kept for new 1190 street lights in the DPR.

3.0 NEED AND BENEFITS OF THE PROJECT

The project is planned with a view of protecting the electrical infrastructure from the cyclone risks. Failure of the electrical infrastructure leads to disturbances to essential services in cyclone induced emergency situations. The direct beneficiaries are the habitats of the Alibag town and Chendhare villages with a total population of 31782 as per 2011 census records. The technical and other benefits expected from the project are:

- Easy transmission of power across densely populated urban areas
- High life of the UG cable system, Reduced Transmission Loses and Better Monitoring System
- The system becomes Aesthetic with high public acceptance
- Protection against Electro Magnetic Radiations, fewer interruption and lower maintenance cost
- High level of personal and public safety, less seasonal impacts on the system, minimum land use

4.0 NEED FOR ENVIRONMENTAL IMPACT ASSESSMENT STUDY

As project involves excavation, construction, dismantling works will have some impacts on overall environment of the area. EIA will support in identifying the potential environment and social impacts of the projects within influenced area and to recommends the mitigation and monitoring measures for eliminating or minimising these impacts in a systematic manner. EIA is conducted based on NDMA's Environment and Social Management Framework (ESMF) of the project. As per ESMF, the Alibag underground cabling project requires preparation of Environment Impact Assessment Study. The World Bank Safeguard requirements as per OP 4.01 also requires preparation of Environmental Impact Assessment Study for all "Category A" project like the proposed Alibag underground cabling project. Based on the mitigation and monitoring measures provided in EIA actions are planned during implementation and operation of the project

5.0 APPLICABILITY OF LEGAL AND REGULATORY FRAMEWORK ON PROJECT

The project has been evaluated for applicability ofall National and State Laws, Rules and Regulations as well as Operational policies and guidelines of World Bank. The Acts, rules and guidelines applicable for the project are critically analysed to list out the statutory and regulatory requirements including permits/NOC to be obtained by MSEDCL/ SPIU during Planning phase and by Contractor during implementation phase. The detailed requirements under each rule/regulations are mentioned in subsequent sections. Some of the key important legislations and requirements applicable for the project are listed below.

i. *Environment Protection Act-1986*

ii. *Coastal Regulation Zone Notification -2011.*

Certain sections of proposed underground cabling project falls in CRZ requiring permission under this notification. Maharashtra Coastal Zone Management Authority (MCZMA) has already recommended for grant of CRZ clearance for the project activities.

iii. *The Forest (Conservation) Act, 1980 and amendments and Rules 1981 & Maharashtra Felling of Tree (Regulation) Act 1964*

Forest clearance is required for installation of DP tower, pole in forest area. Concurrence is also required from forest department for dismantling the existing towers within Mangrove forests (for 0.38 km of OH HT and 0.03 km OH LT) and within 50 M buffer area (for 1.19 km OH HT and 0.96 km OH LT) as well as for 30 m of LT line and HT/LT in buffer area of mangroves. Apart from this permission is required from forests department (tree officer) for cutting of trees listed under Maharashtra Felling of Tree Act 1964 for two listed species present at Switching station. (Forest Clearance application for diversion of 0.03 ha forest land already submitted to concerned authorities)

iv. *Air (Prevention and Control of Pollution) Act, 1981, 1987*

Many project activities involves air pollution generation and management for installation and operation of construction camp involving DG Set, Hot Mix Plants, etc. for road restoration and switching station construction. Under this consent is required from state pollution control board.

v. *Water (Prevention and Control of Pollution) Act, 1974, 1988*

Domestic sewage may generate from labour camps and also run-off from construction camp which may pollute the surface water bodies. Consent to Establish and Consent to operate for sewage and run-off generation from labour camp site and construction camp site required from state pollution control board

vi. *Noise Pollution (Regulation and Control Act) 2000 and amendment till date (Noise Rules 2010)*

Noise level monitoring is required to be done at baseline level and as per the standards Noise levels to be maintained at each activity.

vii. *Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016*

Many activities on site required oil/lubricants e.g. DG sets & machinery Transformer oil from old transformer from which used oil will be generated as waste. Authorization from state pollution control board is required for the same.

viii. Manufacture Storage, & Imports of Hazardous Chemicals (Amendment) Rules, 2000

Many a time's construction work may require storage of the hazardous substance like fuel for project activities or operation of DG sets. Permit for storage of hazardous material is required if the quantity of hazardous material exceeds the threshold limits defined in the Rules and applicable as and when required.

ix. *The Batteries (Management and Handling) Rules 2001*

Existing batteries may be discarded after development of upgraded switching station. In future, also there may be generation of battery waste. Registration for disposal is required with department for the same.

x. *Construction and Demolition Waste Management Rules , 2016*

No specific permit is required. Just comply with the handling and disposal requirements of the rules

xi. *Central Motor Vehicle Act 1988 and amendment, Central Motor Vehicle Rules, 1989 and amendments till date Applicable, The Maharashtra Motor Vehicle Rules 1989*

For all the vehicles at site during construction & operation phase. PUC is required for all vehicles at site.

xii. *Maharashtra Minor, Mineral Extraction (Development and Regulation) Rules 2013*

Project need minor minerals (like sand, aggregate, murram, etc). Authorizations and permissions required for excavation, use of sand etc. is required from district magistrate office.

xiii. *The Gas Cylinder Rules 2016*

Applicable if contractor store more than the exempted quantity of gas cylinder. Gas cylinders will be required for the welding activity. Permission required from Chief Controller of explosives.

xiv. *Ancient Monuments and Archaeological Sites and Remains Act, 1958*

Applicable, Hirakot fort is at 25 m from the edge of the road where underground cabling works are to be taken up. Thus, permission or NOC from ASI should be taken prior undertaking any excavation or other activity

xv. *Building and Other Construction Workers (Regulation Of Employment And Conditions Of Service) Act, 1996*

Mandatory for contractors to provide safety health and welfare measures.

The details of administrative authority for each above applicable legislation is given in chapter 2 of EIA.

Assessment is made wrt to the applicability of the World Bank Operational Policies on Project. It is found that OP 4.01, OP 4.36 and OP 4.11 are triggered for the project. Also, IFC EHS general guidelines, IFC EHS guidelines for Electric Power Transmission and Distribution and IFC & EBRD guideline for Workers accommodation: processes and standards are applicable for the project. As per World Bank policy 4.01, project is

categorized as “Category A” as the project is spread over large spatial extent and has impact of low to high significance. However, the anticipated impacts can be mitigated by taking appropriate mitigation measures. Environmental standards to be maintained during project implementation and operation stage includes the following:

1. National Ambient Air Quality Standards, 2009
2. Noise Standards, CPCB
3. OSHAS Noise Exposure Limits for the Work Zone
4. Drinking water Quality Standards-IS:10500:2012

6.0 ANALYSIS OF ALTERNATIVE

Analysis of alternatives is carried out for analytical comparison of the operational effectiveness, costs and environmental and social risks of the proposed developmental options. It has been carried out for following three:

1. “With” and “Without Project” scenario considering the four major aspects, i.e. cyclone & earthquake resilient electrical cable network, uninterrupted power supply and reduced power loses
2. Planning of cable route and
3. Type of cable, poles and excavation methodology.

The selected alternatives were assessed in in tandem with preparation of DPR and are included in the project design. It is found that the proposed underground cable system is cyclone and earthquake resilient and due to design improvement, power loses and power failure will be significantly reduced. Thus, the proposed UG cable system is found to be a better than the existing overhead cable system. The proposed UG cable system involve excavation or laying the cable through HDD may disturb the physical, biological and social environment. Such locations are bypassed in new proposed alignment. Thus, new proposed alignment is recommended for development of project due to minimal impact on sensitive receptors. RSJ poles are strongest among the options available and are adopted to be used for this project. Cable laying will be combination of both trenching & HDD method. HDD is preferred in the narrow and busy stretches to minimize the socio-economic impact

7.0 PROJECT IMPACT AREA

Project activities majorly involves excavation of trenches, installation of new DTs, installation of poles for AB/overhead cable across Khadtal river, digging of pilot holes for laying cable through HDD, and dismantling of existing electrical system. All these activities may have direct and indirect impact on the physical, biological and social environmental components.

As per the ESMF, direct project influence area due to cable laying operation can be considered equal to double the width of the cable laying trench.

Direct impact zones area considered are

a. The maximum width of the trench is 1.2 m therefore an area of 2.4 m or say 2.5 m is considered as corridor of direct impact
b. Pilot holes locations for HDD cabling,

c. Switching station construction area,
d. RMU installation locations and temporary usage areas viz construction/labour camps areas and material storage areas

Indirect impact zone is considered are

a. The road width where trenching is proposed in case of single lane road or up to median in case of double lane road,
b. The area likely to be impacted due to traffic diversions, traffic congestion in nearby habitats due to construction in whole of the town

8.0 ENVIRONMENTAL SCREENING OF PROJECT AREA

Environmental screening for project area has been carried out as per the guidelines provided in ESMF of NCRMP- II project and based on the primary field data collected secondary data.Following are the outcomes of the screening of the project area:: .

a. **No national park, wildlife sanctuary, biosphere reserve, notified wetland or IBA** exists within 10 km radius area of Alibag Town.
b. Forest Area:
    - There are 3 forest areas within the Alibag and Chendhare town but none of the alignment is crossing through these forest areas 1) forest patch near RCF colony, 2) forest area near police line and 3) forest area near municipal corporation office.
    - In addition to the above three patches, three forests areas exists within 10 km of the project area 1) Alibag Mangrove Forest: South to NH-91/Alibag town; 2) Kankeshwar Forest: 8 km from Alibag town boundary in NE direction; 3) Sahaydra Range Forest (Forest near Siddheshwar temple at 4.0 km, E & Ramdhaneshwar temple at 2.5 km in NE).
    - All these three forest areas mentioned are outside the project area but within 10 km radius of the project area.
c. **Tree Cutting**: Few trees also exists (about 12 nos) in the Switching Stations area which may required to be cut. Some trees exists along the proposed alignment. DPR consultant has accepted the recommendation of not to cut any trees. The alignment has been planned accordingly. According to DPR consultant and recommendations, the alignment will be suitably adjusted to prevent cutting of the trees.
d. **Rivers**: Khadtal River abuts the Alibag town and bank of Khadtal River is near to protected forest area. Incoming HT line crosses the khadtal river. (It is proposed to keep cable overhead in this section to minimize excavation in forest land).
e. **Existing overhead cable** : Existing overhead cables need to be dismantled lies in the CRZ area. Total 6.0 km of HT cable lies in CRZ area. Out of this 6 Km HT cable 0.45 km lies in CRZ I, 5.08 km able lies in CRZ II and 0.47 km lies in CRZ III. Similarly, total 16.21 km of LT line lies in CRZ area. Out of this LT cable 0.73 km lies in CRZ I, 13.90 km lies in CRZ II and 1.59 km lies in CRZ III. Also, Existing overhead

cable also runs through mangrove area and through 50 m buffer mangrove area. 1.19 km of HT line runs within mangrove area, 0.38 km of HT line runs in 50 m buffer area of mangrove, 0.96 km of LT line runs within mangrove area and 0.03 km of LT line runs within 50 m buffer area of mangroves. All these lines are required to be dismantled

f. **Proposed UG Cable**: Total, of 4.81 km of HT cable is proposed to be laid in CRZ area. Out of this HT cable, 0.19 km will be laid in CRZ I, 4.5 km will be laid in CRZ II and 0.12 km will be laid in CRZ III. Total of LT line to be laid in CRZ is 1.59 km. Out of this LT cable, 0.78 km will be laid in CRZ I, 14.21 km will be laid in CRZ II, 1.32 km will be laid in CRZ III. However, no wetland area will be affected for cable laying. 30 m of the proposed LT UG cable run from the mangrove area. Also 1.15 km of LT line and 0.91 km of HT line and 2 RMUs are planned within 50 m buffer area of mangroves. As confirmed by MSEDCL, cable will be laid beyond mangroves (for 30 m LT line) ensuring no damage to mangrove is caused.
g. Hirakot fort is only an archaeological site which lies within the project area. This fort lies enroute of new town feeder.
h. Cable is traversing through the roads having sensitive receptors like religious locations, educational institutes, health institutes, public buildings, trees, forest, mangroves, wetlands, ponds, lakes, rivers, private properties, archaeological structures and congested areas. However, none of these sensitive receptors are getting affected due to cable laying works. Access of these receptors and the other buildings will get affected so alternative access arrangements shall be made forthese receptors and all the other buildings by the contractor. No structure (steps, boundary wall etc) is getting affected in UG cable laying process however if any incidental or accidental damages occurs during execution, they shallbe repaired and restored by the Contractor immediately. (At road crossing points, cable will be laid through HDD only. No trenching will be undertaken at crossings).

9.0 DESCRIPTION OFTHE ENVIRONMENT: ENVIRONMENT SENSITIVE FEATURES

Project activity area is majorly Alibag Town and Chendhare. Land use along the cable route varies and is mix of residential, commercial, industrial, agricultural and open land. Various environment and socially sensitive features were observed along the alignment. Sensitive features are found along the New town, old town, Chendhare and Incoming Express/Varasoli Feeder. No sensitive features were recorded along the Usar, Usar express road, Revdanda and Sagaon feeders. Sensitive features along the alignment are presented in Table below:

Environmental Sensitivity of Study Area

S. No.	Environmental Features	Within the project area (Alibag Town &Chendhare)	Within 10 km area from the Project Area (Alibag town and Chendhare)[2]
1	**Ecological Environment**		

[2] 10 km area is selected to identify the notified eco-sensitive zone within the 10 km of the project area

A	Presence of Wildlife Sanctuary/ National Park/Biosphere Reserves (within 10 km radius of the Project area)	None	None
B	Reserve & Protected Forests	Three RFs within the town (Near Police line, Mangrove patch near Municipal Corporation Office & Near RCF Colony at Adarsh Nagar, Forest area near Khadtal River. No cable laying proposed in RCF colony area)	• Alibag Mangrove Forest (South to NH-91/Alibag town) • Kankeshwar Forest at 8 km from Alibag town • Sahaydra Range Forest (Forest near Siddheshwar temple at 4.0 km, E & Ramdhaneshwar temple at 2.5 km in NE) • Forest area near Khadtal River
C	Wetland Area	Mangrove patches	Coastal wetlands-Alibag creek, Mangroves, Mudflats & beaches
D	Migratory route for wild animals	None	None
E	Migratory routes for birds	None	None
F	Presence of Schedule-I Terrestrial Fauna in the project area	None	None
G	Waterbody	Hirakotlake, pond in Taikarnagar, Khadtal River &Alibag creek	Hirakotlake, pond in Taikarnagar, Varasoli pond, Khadtal River &Alibag creek
H	Archaeological Place (within 300 m)	• Hirakotfort in police line along cable alignment • Alibag Fort at 800 m in Arabian Sea in West direction from Alibag town	
I	Seismicity	Zone IV	
J	Physical Sensitive Receptors	Yes beaches, Temples, mosque, Schools, College and Hospital.	
K	Pollution Sources in Area	No industries within the town, major source of pollution is vehicular pollution	
L	Populated Area	The project area is majorly Alibag town and Chendhare. The proposed alignment of the cable network is distributed along the settlements, roads and streets of the Alibag town. As per Census India 2011 the total population of Alibag town & Chendhare is 31782.	
M	CRZ Area	Some of the stretches of the HT line of old town feeder, Revdanda and new town feeder are falling within the CRZ zone. CRZ clearance taken by MSEDCL themselves for implementation of project	

N	Mangroves	Some of the stretches of the old town feeder, new town feeder and Revdanda HT line are falling within mangroves and 50 m buffer area from mangroves.

10.0 BASELINE DESCRIPTION

The environmental conditions of area to be affected due to the proposed project were established through extensive literature review, field monitoring, laboratory analysis, stakeholder consultation and data interpretation.

Secondary data from literature search were obtained from the Govt. sources i.e. Indian Meteorological Department, CPCB publications and other Govt. Sources. The primary baseline environmental data generation has been done during October 2018 in various locations within Alibag town and Chendhare village. Other than this, study area was extended upto 10km radius of activity area for identification of protected areas and other sensitive locations. Summary of baseline data along with pre-assessment of impacts of the project area is given below:

Environmental baseline Status

S. No.	Environmental Component	Baseline Scenario	Sensitivity Level of baseline scenario	Environmental Impact Probability due to Project Activities
1.	Connectivity & Traffic Pattern	Good road connectivity. Moderate Traffic Volume. Congestion on Rewas Road during morning and evening hours.	More congestion/blockage of routes due to excavation activities	Moderate
2.	Air quality	**October 2018:** PM_{10}:58-126 µg/m^3, $PM_{2.5}$:26 - 66 µg/m^3, SO_2:6.1-11.6 µg/m^3, NO_2:8.6 – 20.6 µg/m^3 Arthemetic mean values ranges between PM_{10}:67-90 µg/m^3, $PM_{2.5}$ - 33 - 45 µg/m^3, SO_2:6.5-8.3 µg/m^3, NO_2:10.8 – 14.8 µg/m^3 which is well with in the NAAQ standards	**October 2018:** The overall air quality of the town is within the prescribed National ambient air quality standard of 2009 except at 2 locations where PM conc. is marginally higher than prescribed standard. However, arthemetic mean concentration of all the location is well with in the NAAQ standards	Moderate (project implementation phase only) (project is likely to generate dust during trenching which is likely to be site specific (trenching area only) and due to transportation and traffic diversions.
3.	Noise Level	**October 2018:** Day Time Min Leq 55.4 d(B)A to 66.7 dB(A) and Night Time Leq= 43.8 dB(A) to 55.4 dB(A)	Marginally high at certain residential area during day time as per prescribed Ambient Noise level standards	Moderate (project implementation phase only) (noise is likely to be generated only due to

			October 2018: Day time noise marginally high at 3 location (0.5 to 1.7 d(B)A above standard), night time noise level well within the prescribed Ambient Noise level standards	transportation and trenching activity confined to trenching area which is will be of maximum 500 m at a location.
4.	Flood/Inundation Hazard	Flooding/inundation during monsoon and during cyclones	High flood/inundation prone area	Low as construction is not proposed during monsoon.
5.	Seismicity	IV	High seismic risk zone	None (however design of Switching station will confirm to design proposed for high -Zone IV-seismic zone area)
6.	Topography	Flat (0-18 m amsl)	--	Nil as project unlikely to change any topography aspects of the area
7.	Drainage	Khadtal River, Alibag creek and ponds. Some areas are low lying and water logged. Storm water drainage system exists in the town	No activity proposed within the river. Only one DP poles will be installed on river bank	Low Drainage congestion may occur during construction stage temporarily if due measures are not taken
8.	Flora & Fauna	No major flora and fauna within project activity areas. Existing cable lines runs within and buffer areas of mangroves. No protected area (wild life sanctuaries or national parks) exists within 10 km of project activity areas. Certain forest areas exist. One DP towers will be constructed across Khadtal River on river bank which is forest land.12 trees exist in switching station site (Mango, Jamun, Gulmohar, coconut and Palm) and these may require to be cut for construction of the SCADA room and other proposed development at switching station	No significant bio-diversity. No endangered or threatened species. Native species of trees.	Low. (out of 12 trees some of them may be cut for the construction of switching stations. Dismantling activities in and around mangroves can impact mangroves areas if due caution not

				taken)
9.	Demography	Entire project area is urban and populated with total population of 31782	Urban and populated	Moderate (traffic diversions and excavations)
10.	SW quality	Khadtal river receives flow only during monsoon season. Alibag creek water is saline	Not Potable	Low
11.	GW Quality	GW is moderately saline and is not used for drinking purpose and other potable uses	Not potable	Low
12.	Soil Quality	Clayey loam to sandy clay and is moderately fertile	Not polluted	Low
13.	Geology	Beach Sand, Alluvium & Deccan Traps	--	None
14.	Land Use	Settlement (32.83%), open scrubs (27.15%), vegetation (26.26%), Agriculture land (8.96%), marshy land (3.16%) and water body (1.64%),	--	Low
15.	Climate (temperature, rainfall, wind speed, wind direction, humidity)	Temp: 17.5 to 33.4 ^{o}C Rainfall : 2321 mm (Annual avg.) Wind : 12.6 kmph (Avg) Predominant Wind Direction: from NW Humidity: Max-84% & Min-27%	--	None
16.	GW Levels	2-5 m bgl	--	None specifically

11.0 ENVIRONMENTAL IMPACT ASSESSMENT

The impacts anticipated vary from low to high significance but most of the impacts are associated with construction phase and are short term, site specific and temporary in nature. Major impacts are anticipated on traffic, socio-economy & aesthetics and Occupational health and safety, air quality and noise during construction stage. The impacts envisaged are manageable and mitigable, if the suggested mitigation measures and environment management plan are implemented. During operation phase impacts are anticipated majorly on the occupational health and safety of the workers. Analysis of significance of the impacts pre & post implementation of the mitigation measures is given below:

Impact Assessment and Evaluation

S. No.	VECs	Impact Significance -Pre-mitigation measures	Impact Significance – Post mitigation measures
Project Implementation Phase			
1.	Due to Setting up of Construction Camp, material storage and debris disposal areas	Temporary, short term and moderate significance	Temporary, short term and low significance
2.	Due to Setting up of	Temporary, short term and	Temporary, short term

	Labour camps	moderate significance	and low significance
3.	Due to Material Sourcing and Transportation	Temporary, short term and moderate significance	Temporary, short term and low significance
4.	Due to Utility Shifting	Temporary, short term and moderate-high significance	Temporary, short term and low significance
5.	Occupational Health and Safety	Short term temporary and high significance.	Short term temporary and low significance.
6.	Due to Site Clearance and Preparation for Excavation of Trenches	Temporary, short term and moderate significance	Temporary, short term and low significance
7.	Due to Execution of Trenching Work and Restoration of Affected Utilities	Temporary, short term and moderate-high significance	Temporary, short term and low significance
8.	Due to Cable Pulling, Laying and Jointing at Inspection Chambers	Temporary, short term and low significance	Temporary, short term and low significance
9.	Due to Backfilling of Trenches and Road Restoration, Clean-up Operation and Restoration	Temporary, short term and low significance	Temporary, short term and low significance
10.	Due to Cable Laying through HDD	Temporary, short term and low significance	Temporary, short term and low significance
11.	Due to Site Clearance, Demolition and Preparation for Construction of Switching Station	Temporary, short term and moderate significance	Temporary, short term and low significance
12.	Due to Construction of Switcing Station, Control Room and SCADA Room	Temporary, short term and moderate significance	Temporary, short term and low significance
13.	Due to Preparation for and Laying of Overhead Cable and Installation of New Street Lights	Temporary, short term and moderate significance	Temporary, short term and low significance
14.	Due to Dismantling of Existing Overhead electrical Set-up	Temporary, short term and low significance	Temporary, short term and low significance
15.	Due to Prevention of Damage and Blockage of Drainage System	Temporary, short term and moderate significance	Temporary, short term and low significance
16.	Due to Increased Traffic during Cable Laying and Dismantling Works	Temporary, short term and moderate significance	Temporary, short term and low significance
17.	Due to Waste Generation	Temporary, short term and	Temporary, short term

	and Management	moderate significance	and low significance
18.	Impact on Archaeological monuments	Temporary, short term and low significance	Temporary, short term and low significance
19.	Impact on Air Environment	Temporary, short term and low to moderate significance	Temporary, short term and low significance
20.	Impact on Noise Environment	Temporary, short term and low to low to high significance	Temporary, short term and low to moderate significance
21.	Impact on Water Quality	Short term temporary and low significance.	Short term temporary and low significance.
22.	Impact on Water Resources	Short term temporary and low significance.	Short term temporary and low significance.
23.	Impact on Land Use	Short term temporary and low significance.	Short term temporary and low significance.
24.	Impact on Soil Quality	Short term temporary and low significance.	Short term temporary and low significance.
25.	Impact on Ecology	Long term, permanent and moderate significance	Long term, permanent and low significance
26.	Impact due to Natural Disaster on Project Components	Short term, temporary, irreversible and high significance	Short term, temporary, irreversible and low-moderate significance
Operation Phase (Operation, Maintenance & Repair)			
1.	Occupational Health and Safety	long term, irreversible and significant	Short term temporary and low significance.

12.0 PUBLIC CONSULTATION AND DISCLOSURE

The main stakeholders consulted includes general public, NGOs, local bodies and Government Departments. Stakeholder's view and perceptions were assessed through formal public consultation meetings in two stages. During stakeholder consultations public, Urban Local Body and NGO members voiced that the proposed project is overall beneficial for the area and not only resilience but the aesthetics of the town will improve significantly. The project is accepted to all the stakeholder with some suggestions from them which are also considered during preparation of environment management plan. This resulted in enhanced social acceptability of the project. Public consultation meeting were given wide publicity and time for preparation to ensure participation of all groups. EIA report will be disclosed at the SPIU (NCRMP) website. Executive summary will also be disclosed in local language as well at SPIU and NCRMP website.

13.0 ENVIRONMENT MANAGEMENT PLAN AND BUDGET

The Environmental Management Plan (EMP) is synthesis of all proposed mitigation and monitoring actions, set to a time frame with specific responsibility assigned and follow-up actions defined. Prepared EMP is a plan of actions for avoidance, mitigation and management of the negative impacts assessed due to project activities. A detailed set of

mitigation measures have been compiled in view of the likely impacts associated with the proposed project. EMP provides a management schedule of time and sequence of implementation of the proposed mitigation measures. It also includes plans for pollution prevention, environmental guidelines & standards, emergency management plan, institutional framework, grievance readdress mechanism, capacity building, environment monitoring plan and environment management budget.

Institutional Framework for EMP Implementation

Environmental and social management plan will be implemented by EHS cell of contractor (Comprising of Environment, Social and Safety Officers) under supervision of MSEDCL Alibag, TPQA and SPIU/PMC. MSEDCL already have functional safety cell which shall be named as EHS (Environment, Health and Safety) cell. Safety Cell officer will be given additional responsibility of environment and social management plan implementation. These officials shall also be given required training for discharging additional responsibility of environmental and social management.

Contractor will appoint Environment and Safety Officer (ESO) to ensure implementation of the EMP.

Environment Monitoring Plan

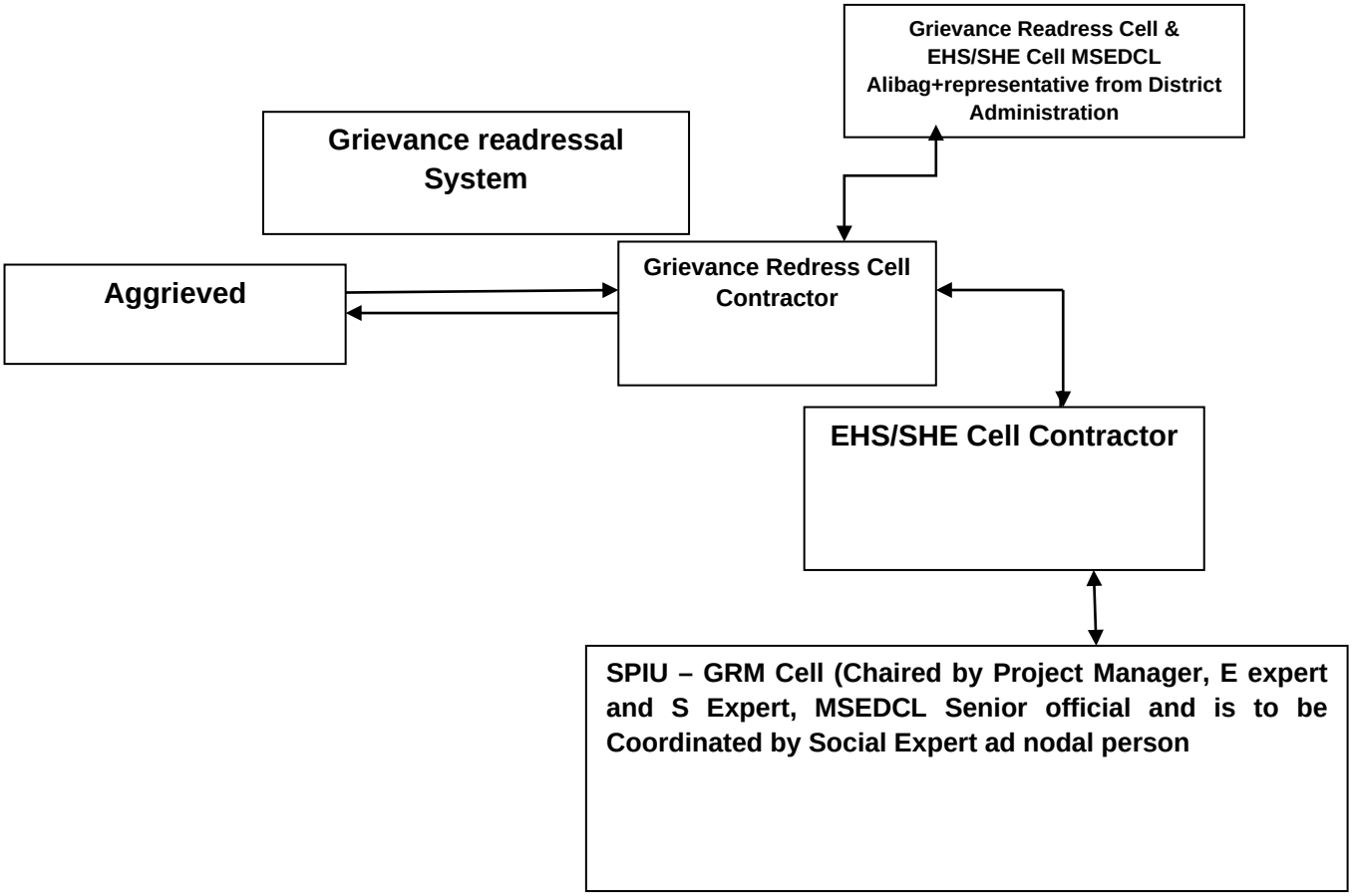
Key monitoring indicators are defined as the environmental parameters which may get impacted during different project stages and environment monitoring plan is prepared for these key indicators for e.g. drinking water quality, air quality, noise level, soil quality, occupational health & safety, community issues, solid waste disposal, sanitation, labour camps and construction camp

Environmental Management Budget

Budget for environmental management both during construction and operation phase is estimated and budgeted.

14.0 GRIEVANCE READRESS MECHANISM

The Grievance Redress Mechanism (GRM) will be established at each level with two tier structures. First tier will be MSDECL and second tier at SPIU level. The EHS cell of MSEDCL will be responsible to address the concerns of the aggrieved person at first stage. The EHS cell at MSEDCL shall have representative deputed by the District Collector who shall participate in the readdressal mechanism and facilitate early response of the grievance. EHS cell will designate a dedicated email, phone number for receipt of grievances. The response to the complaint with resolution will be communicated back to the aggrieved person within 15 days. In case, grievance cannot be resolved at MSDECL level, then it will be escalated to SPIU level for further resolution. SPIU will put up this to Grievance redress committee comprising of project Director, EHS officer SPIU, Chief Engineer (Infra) MSEDCL, representative deputed by the District Collector and EHS officer MSDECL. Any aggrieved person can send written communication to EHS cell of MSEDCL through email or using other modes of communication like phone call or drop his/her complain to drop box (to be installed at MSDCL office). The GRM will be displayed at each active site along with name of MSEDCL EHS officer, dedicated email and phone number. The GRM mechanism is shown at Figure below.



15.0 TRAINING AND CAPACITY BUILDING

The staff and workers at the site shall be given environmental trainings to enhance their understanding of EMP requirements and ensure effective implementation of EMP. Both Contractor/MSEDCL Alibag should organise such training for EHS cell members and workers as the case be. These trainings shall be organized by contractor through third party or can take help of PMC for organizing the trainings

- Training for usage of personal protective equipment
- Training for usage of firefighting equipment
- Training for working on heights
- First aid training
- Training for quality and environment management systems
- Training for implementation of EMP
- Training for implementation of Emergency Response Plan

16.0 Reporting

Following reporting schedule is recommended as given below:.

- The contractor shall submit the monthly compliance report including various aspects such as material sourcing, waste disposal, compliance to statutory conditions, incident and accident public grievances, work progress, traffic management etc. to MSEDCL and MSEDCL shall forward the reports to SPIU and SPIU with the support of PMC shall review the reports
- TPQA shall undertake periodical Audits and provide orientation including status of EMP and SMP implementation and submit periodical reports to SPIU and PMC shall verity its reports and submit a quarterly report to SPIU on EMP compliance status.
- SPIU supported by PMC will submit a quarterly progress report to PIU and World Bank.

17.0 Documentation, Updation and Record Keeping

The following reference documents shall be maintained and available with contractor and PIU for implementation at construction site

1. EMP
2. Environmental Standards
3. SoPs and Method Statements for each project activity (to be prepared by contractor)

The EMP shall be updated regularly based on change in regulatory requirements, WB /IFC EHS guideline and finding of annual independent audit findings. List of records to be maintained at site is provided in main report.

18.0 Mechanism for Feedback And Adjustments

As part of the feedback mechanism, MSEDCL Alibag and TPQA shall monitor project compliance based on monitoring reports, audit and inspection reports with respect EMP,

EMoP and applicable laws, rules and regulations. MSEDCL Alibag will report to SPIU/PMC on a quarterly basis. In case, any deviation from the contract requirements with respect to proposed EMP is observed, the same shall be corrected within a fortnight through contractor and TPQA and records maintained for the same. MSEDCL Alibag will also verify the facts reports through periodic site visits. If required SPIU/PMC shall verify the facts through site verification.

Public involvement shall be encouraged and ensured throughout the lifecycle of the project. The MSEDCL Alibag shall gather and maintain information on any damage or public concern that may be raised by the local people, NGOs and local authorities. While immediate solutions are to be worked out with the help of contractor, a detailed report will be submitted to the SPIU for information or detailed consideration. The MSEDCL Alibag and TPQA shall be responsible to bring it to the notice of the SPIU/PMC. Resulting decisions shall be communicated back to MSEDCL Alibag and TPQA and contractor for correction and future implementation.