FINAL ENVIRONMENT ASSESSMENT REPORT (FEAR)
FOR
T & D NETWORK IN BISHNUPUR, IMPHAL EAST, IMPHAL WEST, KANGPOKPI & SENAPATI DISTRICTS UNDER NERPSIP TRANCHE-1, MANIPUR

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Prepared for:

Power Grid Corporation of India Limited

Prepared by:

R S Envirolink Technologies Pvt. Ltd.

402, BESTECH CHAMBER,

B-BLOCK, SUSHANT LOK-I, GURGAON

Phone: +91-124-4295383: www.rstechnologies.co.in

ABBREVIATIONS

ADC	-	Assistant Deputy Collector
AP	-	Affected Persons
CA	-	Compensatory Afforestation
CEA	-	Central Electricity Authority
CFC	-	Chlorofluorocarbon
CPIU	-	Central Project Implementation Unit
CPR	-	Common Property Resources
CPTD	-	Compensation Plan for Temporary Damage
CRM	-	Contractor's Review Meeting
DC	-	Deputy Collector
DPR	-	Detailed Project Report
EMF	-	Electro Magnetic Field
EMP	-	Environment Management Plan
EN	-	Endangered
EPA	-	Environment Protection Act
ESMU	-	Environment and Social Management Unit
ESPPF	-	Environment and Social Policy & Procedures Framework
FEAR	-	Final Environment Assessment Report
FSI	-	Forest Survey of India
GA	-	Geographical Area
GCC	-	General Conditions of Contract
GHG	-	Green House Gas
GIS	-	Geographical Information System
GoI	-	Government of India
GoMan	-	Government of Manipur
GPS	-	Global Positioning System
GRC	-	Grievance Redress Committee
GRM	-	Grievance Redressal Mechanism
GW	-	Green Wash
HFL	-	High Flood Level
HQ	-	Head Quarter
IA	-	Implementing Agency
ICNIRP	-	International Commission on Non-Ionizing Radiation Protection
IEAR	-	Initial Environment Assessment Report
ISFR	-	India State of Forest Report
IUCN	-	International Union for Conservation of Nature
Km	-	Kilometer
kV	-	KiloVolt
LC	-	Least Concerned
LILO	-	Line-In Line-Out

MDF	-	Moderately Dense Forest
MoEF&CC	-	Ministry of Environment Forest & Climate Change
MVA	-	Mega Volt Ampere
MW	-	MegaWatt
NA	-	Not Assessed
NBSS&LUP	-	National Bureau of Soil Survey & Land Use Planning
NER	-	North East Region
NERPSIP	-	North Eastern Region Power System Improvement Project
NH	-	National Highway
NOC	-	No Objection Certificate
NPV	-	Net Present Value
NT	-	Near Threatened
NTFP	-	Non Timber Forest Product
OF	-	Open Forest
PCB	-	Poly Chlorinated Biphenyl
PF	-	Protected Forest
PGCIL	-	Powergrid Corporation of India Limited
PIU	-	Project Implementation Unit
PRA	-	Participatory Rural Appraisal
PWD	-	Public Works Department
RF	-	Reserved Forest
RFA	-	Recorded Forest Area
RFCTLARRA	-	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act
ROW	-	Right of Way
RSET	-	R S Envirolink Technologies Pvt. Ltd.
S/s	-	Substation
SH	-	State Highway
SIA	-	Social Impact Assessment
SMF	-	Social Management Framework
SPCU	-	State Project Coordination Unit
Sq km	-	Square Kilometer
ST	-	Scheduled Tribes
T&D	-	Transmission and Distribution
TOF	-	Tree Outside Forest
TRC	-	Terrace Rice Cultivation
VDF	-	Very Dense Forest
VU	-	Vulnerable
WB	-	World Bank
ZSI	-	Zoological Survey of India

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EXECUTIVE SUMMARY

North Eastern Region Power Supply Improvement Project (NERPSIP) is a World Bank funded project aimed at improving the impoverished power transmission and distribution system in the North Eastern states of India with Power Grid Corporation of India Ltd. (POWERGRID), the single transmission utility of the country as the implementing agency (IA). The present Final Environmental Assessment Report (FEAR) is for the transmission and distribution system in Bishnupur, Imphal East, Imphal West, Kangpokpi and Senapati district and has been undertaken to verify the actual locational details of the project elements, to report any impacts on the biodiversity and protected area and the project affected people, and to assess the compliance of the Initial Environmental Assessment Report (IEAR) /Environment Management Plan (EMP) prepared and submitted by the IA for the instant project. The elements of the present project include two 132 kV transmission lines of 33.995 km, construction of one new transmission sub-stations, bay extension of three transmission sub-stations, five 33 kV distribution lines of 24.593 km, construction of five new distribution sub-stations and augmentation/ bay extension of eleven distribution sub-stations.

The topography of the districts is mainly plain, part of Senapati and Kangpokpi district is hilly also. Both the 132 kV transmission lines and new transmission lines are in hilly region, while the existing transmission sub-stations are in plains. Similarly, all the distribution lines are in plain region. About 50% of the landscape has a forest cover mostly in the hilly terrain, and the rest 50% is constituted by jhum land, agricultural fields, settlements etc. Most of the land is privately owned and some are under the jurisdiction of the Village Council.

The final layout of transmission lines has been carefully selected from three given options. The alignment has successfully avoided all reserve forests, protected areas, all ecological and social sensitive areas such as protected areas, sacred groves, community conserved areas, important bird areas, wetlands, settlements, common property resources, etc. The land use along the RoW (27 m for 132 kV) of lines comprises of agricultural land, private plantation and govt. land. The original length of the line has been increased to 33.995 km from earlier 32.40 km due to further optimization during ground truthing survey. However, there is no change in the environmental footprints and impacts as envisaged in IEAR. A total of 121 towers are being/to be erected for the proposed transmission lines.

Similarly, the distribution lines too have been aligned mostly along the existing roads and by avoiding dense forest areas. Here, the RoW corridor being narrower (15m) will further reduce the necessity of tree felling. Much of the line would only need lopping of branches for unhindered passage. The land use along the RoW of lines comprises of agricultural land, private plantation and govt. land. The original length of the line has been decreased to 24.593 km from earlier 37.31 km due to change in routes and further optimization during ground truthing survey. Considering that length has decreased and distribution line has minimum environmental footprints and without any change in land use and other base line data, no additional impacts of any kind apart from earlier identified impacts in IEAR/EMP are anticipated. A total of around 459 poles are being/to be erected for the proposed finalized distribution lines.

Sub-station locations are based on environment and social aspects and technical requirement. Various site-specific parameters that include availability of infrastructure facilities such as access roads, water, distance from railheads, type of land (Government/ revenue/private land); social impacts such as number of families getting affected; CPR including feasibility of acquisition were considered for analysis. The social aspects are provided due weightage after technical requirement in decision making for selection/finalization of land for substation. In the instant case land for all the proposed substations are either in possession of MSPCL or identified for purchase on willing seller–willing buyer basis.

Impacts due to project have been analyzed for all the phases of project i.e. during design, construction and operation. Since, no involuntary acquisition was involved and fresh lands were secured only through private purchase there is no R & R and resettlement issues. Due to electricity supply, land value is expected to increase, therefore, possibility of land value depreciation is not envisaged. Final routes of lines and sites for construction of new sub-stations don't involve any monuments of historical or cultural significance. Since forest area covered under Forest (Conservation) Act, 1980 has been completely avoided with careful selection of route alignment, therefore, provisions of the Forest (Conservation) Act, 1980 shall not prevail. However, in case of felling of trees in non-designated forest areas MSPCL/IA shall provide fund for compensation. As per existing law, land for tower/pole & right of way is not acquired and ownership of land remains with the owner and agricultural activities are allowed to continue after construction activity. However, as per existing laws compensation for all damages (tree/crop) are paid to the individual land owner. GoMan adopted the MoP guidelines dated 15th October 2015 for land compensation for tower footing and RoW Corridor on

28th March 2018 which provide payment of @ 85% and @ 15% of land value towards compensation for land coming under tower base and line corridor respectively. Further, as per said guidelines land compensation provisions is only applicable to new or ongoing transmission lines and shall not be applicable in case of existing line, stringing of 2nd circuit, reconductoring/re stringing, repairing, construction of existing towers etc. Execution of the projects covered in this report has not resulted in any steep rise in traffic volume. The project does not require availing clearances from Department of Railways, Department of Telecommunications, and the Ministry of Aviation. Further, the present project requires very less vehicular movement and that too restricted to construction period only. Hence, neither any interference with other utility nor steep rise in traffic volume is anticipated/ observed. The lines proposed under this scheme don't involve any tower/ pole to be placed in river bed which could interfere with existing drainage patterns. In sub-stations, all drainage channels along or inside substations are being trained and connected to main or existing drainage to avoid any erosion due to uncontrolled flow of water.

Detailed specification with respect to equipment design and substation drainage and sewage design has been included in tender document to avoid any incidence of land and water contamination. Adequate safety measures are in place to avoid any potential fire/ explosion hazard. All the soil excavated for tower/pole footings and substations construction are optimally utilized for backfilling and the remaining soil being spread evenly and compacted. Top soil disturbed during the development of sites are used to restore the surface of the platform. Infertile and rocky material are dumped at carefully selected dumping areas and used as fill for substation/ and tower/pole foundations. Hence, possibility of erosion of exposed area due to construction activity is negligible. To contain the noise level within the permissible limits, measures like providing sound and vibration dampers and rectification of equipment are undertaken. In addition, plantations of sound absorbing species like Casuarinas, Tamarind, and Neem are raised at the substations that reduce the sound level appreciably. The proposed lines are not passing through any forest area, wildlife area. Since there is no protected area or demarcated/ documented migration path of wildlife like elephant corridor existing near to subproject locations, hence, possibility of any disturbance to wildlife is not imminent. No bird migration/fly path found in project area.

Almost all the tower/ pole are in plain area, therefore, there was no impact due to the silt runoff. In case of distribution lines all the excavated soil is backfilled and compacted immediately after erection of tubular poles. In case

of sub-station, existing one are located on flat land and adjacent to existing road and new ones are also being constructed on flat land after site clearing and leveling. So far there are no instances with potential of erosion during construction of above said lines. Any adverse impact arising during the construction is limited to the boundaries of proposed substation only and neither impacts nearby habitat/property nor health & safety of neighboring community. Tower/pole foundations involve excavations on small scale basis and the excavated soil is utilized for back filling. In case of substations, generally the sites are selected in such a manner that the volume of cutting is equal to volume of filling so as to avoid borrowing of the area. Issues relating to operational health and safety has been adequately addressed. The labourers are provided with safety gear and provisions for first aid and arrangement for shifting of affected persons to nearby hospitals are also in place. Compensation for injury and death has been ensured through provisions in Safety Plan & Contract condition. Proper sanitation facilities and safe drinking water are being provided in the project locations. The site managers have been advised to ensure that there are no instances of open defecation.

The IA has a continuous monitoring mechanism of the project w.r.t. compliance of the mandatory requirements as stipulated in the IEAR. Thus, the adherences to the clauses by the contractors are regularly monitored especially in respect of EMP implementation, OHS compliance. The project has thus far had zero fatality which is indicative of the strict vigil of the IA.

The Capacity building and Institutional Strengthening program of the IA is held intermittently to enhance the skills of the project officials. Further, meetings between IA and MSPCL are held on a monthly/ bimonthly basis to assess the work progress and difficulties encountered in respect of land acquisition, RoW and compensation if any.

Public is informed about the project at every stage of execution. Public consultation using different technique like Public Meeting, Small Group Meeting, informal meetings have been carried out during different activities of project cycle. For the Participatory Rural Appraisal (PRA), informal meetings were held with various stakeholders such as IA, contractors, labours, villagers etc. to capture their view about the project. It emerged from the survey that the PAPs were appreciative of the project and hoped that the power scenario would improve after commissioning of the project. Local people are also getting benefited through project related employment that was being generated.

Overall, the planning and layout of the project elements have been undertaken in a judicious manner so as to ensure minimum environmental impact. However, during the implementation phase, especially in respect of the construction, strict monitoring by the IA should be undertaken so as to ensure proper compliance by the contractors with reference to the IEAR and especially with regard to compliance of the health and safety measures.

Chapter 1 INTRODUCTION & PROJECT DESCRIPTION

1.1 PROJECT BACKGROUND

India's North East Region (NER) stretches across the eastern foothills of the Himalayan mountain range and is comprised of seven states including Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura.

Recognizing that intrastate Transmission & Distribution (T&D) systems in the NER states have remained very weak and that there is a critical need to improve the performance of these networks, the Central Electricity Authority (CEA) developed a comprehensive scheme for the NER in consultation with Power Grid Corporation of India Limited (PGCIL/ POWERGRID) and the concerned state governments. This scheme is intended to (a) augment the existing T&D infrastructure to improve the reliability of service delivery across all the NER states and (b) build institutional capacity of the power utilities and departments in the NER. This scheme is part of the Government of India's (GoI) wider efforts to develop energy resources in the NER for electricity supply within the region, to strengthen transmission networks, expand and strengthen sub-transmission systems, and extend last mile electricity connectivity to household.

GoI requested for World Bank's (WB) support in implementing a set of priority investments in six NER States In 2016, the WB has approved a loan (IBRD 470 USD Million) to the GoI for **North Eastern Region Power System Improvement Project (NERPSIP)** which aims to create a robust intrastate transmission and distribution network in all the six (6) North Eastern States. The project being funded on 50:50 (WB loan: GoI) basis except the component of capacity building for Rs. 89 crore, which GoI will bear entirely. The scheme is to be taken up under a new Central Sector Plan Scheme of Ministry of Power (MoP).

MoP, GoI has appointed POWERGRID as Implementing Agency (IA) to six North Eastern States for the said project under Tranche-1 in close coordination with the respective State Governments/Utilities. However, the ownership of the assets shall be with the respective State Utilities/State Government which upon progressive commissioning shall be handed over to them for taking care of Operation and Maintenance of assets. POWERGRID is also facilitating in building the institutional capacity of the state departments and utilities to continue managing the rehabilitated networks in an efficient

manner. The state wise scope of works proposed under Tranche-1 is given below in **Table 1.1**.

Table 1.1: State Wise Scope of Work Proposed Under Tranche-1

State	Transmission/ Sub-transmission (132kV & above)			Distribution (33kV)		
	Line (km)	New S/s (No.)	Total MVA (New & Aug.)	Line (km)	New S/s (No.)	Total MVA (New & Aug.)
Assam	217	11	1668	389	16	240
Manipur	223	2	139	99	13	274.85
Meghalaya	207	4	940	199	11	150
Mizoram	116	3	100	4	1	6.3
Nagaland	193	5	245	76	10	200
Tripura	236	9	1389	950	34	510
Total	**1192**	**34**	**4481**	**1717**	**85**	**1381.15**

Source: https://cea.nic.in/wp-content/uploads/transmission/2020/09/mpr_cfs.pdf and updated based upon Monthly Progress Report of Manipur PSIP, May 2021

The project has two components namely, Component A: Priority Investments for Strengthening Intrastate Transmission, Sub-transmission, and Distribution Systems, and Component B: Technical Assistance for Capacity Building and Institutional Strengthening (CBIS) of Power Utilities and Departments of Participating States. The total project cost is **Rs. 5111.33 Crore** with financing from both GoI and Bank on 50:50 basis. The Bank is providing financial support to the tune of US$ 470 million (**Rs. 2511.165 Crore**) under the Loan No.-8631-IN which was signed on 28th November, 2016 and became effective from 20th February, 2017. The loan closing date is 31st March, 2023. The remaining financing including capacity building will be met through GoI funding. Details of State wise funding is placed below in **Table 1.2.**

Table 1.2: Details of State Wise Funding

State	World Bank	Government of India		Total (Rs. in Cr.)
	Project Cost (Rs. in Cr.)	Project Cost (Rs. in Cr.)	Capacity Building (Rs. in Cr.)	
Assam	729.485	729.485	14.83	**1473.803**
Manipur	213.690	213.690	14.83	**442.213**
Meghalaya	381.050	381.050	14.83	**776.933**
Mizoram	150.965	150.965	14.83	**316.763**
Nagaland	357.290	357.290	14.83	**729.413**
Tripura	678.685	678.685	14.83	**1372.203**
Total	**2511.165**	**2511.165**	**89.00**	**5111.33**

Source:https://www.powergridindia.com/sites/default/files/Our_Business/Domestic_Consultancy/NER_Agreements_and_MoUs/sanctions/NERPSIP%20SANCTION%20ORDER.pdf

1.2 PROJECT JUSTIFICATION

The state of Manipur is spread over an area of about 22,327 sq. km with a population of more than 25 Lakh. The present per capita energy consumption is of the order of 240 units (kWh) against the regional per capita consumption of about 258 units and national per capita consumption of about 779 units. The state meets its power requirement through about 43 MW of self-generation and about 123 MW of power allocation from various central sector generation projects of NHPC Ltd. and North Eastern Electric Power Corporation Limited (NEEPCO). The present demand is of the order of 125 MW. As most of the generation projects in the north eastern region are hydro in nature, the state faces shortage of power during low-hydro generation condition.

Presently, the state draws its share of power from central sector generating stations through following inter-state transmission system:

- 132kV S/C Dimapur (POWERGRID, Nagaland) – Imphal (POWERGRID)
- 132kV S/C Badarpur (POWERGRID, Assam) – Jiribam (POWERGRID)
- 132kV S/C Aizwal (POWERGRID, Mizoram) – Jiribam (POWERGRID)
- 132kV S/C Haflong (POWERGRID Assam) – Jiribam (POWERGRID)
- 132kV S/C Pailapool (POWERGRID, Assam) – Jiribam (POWERGRID)
- 132kV S/C Imphal (POWERGRID) – Loktak (NHPC)
- 132kV S/C Imphal (POWERGRID) – Imphal (Manipur)
- 132kV D/C Loktak (NHPC) – Jiribam (POWERGRID) (one of 132kV D/C line is owned by POWERGRID and the other by Manipur)
- 132kV S/C Imphal (POWERGRID) – Kohima (Nagaland)

As per the 18th Electric Power Survey of CEA, the future demand of the state is expected to grow to about 346 MW by year 2016-17 and 497 MW by year 2021-22. This shall be met through various hydro and thermal projects coming up in the north-eastern region in near future, which are as follows:

- Pallatana GBPP: 726 MW
- Bongaigaon TPS: 750 MW
- Kameng HEP: 600 MW
- Lower Subansiri HEP: 2000 MW

The state has a share of about 146 MW from these future generation schemes. With this, the total share of the state from central sector generating stations shall be about 269 MW. Various 400 kV interconnections (initially operated at 132 kV level) have been planned to transfer power from these future generation schemes to the state of Manipur, which are as below:

- 400 kV D/C (charged at 132kV) New Kohima (POWERGRID, Nagaland) – Imphal (POWERGRID)
- 400 kV D/C (charged at 132kV) Silchar (POWERGRID, Assam) – Imphal (POWERGRID)

Besides this, the present Intra-State transmission system of the State is quite old & weak and is unable to cater to the growing power requirements of the State. Although the present transmission and distribution (T&D) system covers many areas of the State, it is inadequate in its reach and due to non-availability of redundant T&D system, outage of any transmission system element results in long term power shortages making the system highly unreliable. Besides, some of the network elements have undergone long term outage due to break-down. Therefore, it has become essential to address the above situation through remedial measures in the T&D system. Accordingly, phase wise strengthening of transmission & sub-transmission system has been proposed.

The transmission schemes proposed under Tranche-1 of Manipur State include construction of 222.738 km of 132 kV Transmission Lines (TL) & associated 2 new substations and 98.519 km of 33 kV Distribution Lines (DL) & associated 13 new substations along with augmentation & strengthening of transmission and distribution spread across the State.

The Power Map of Manipur indicating the existing and proposed T&D network is placed in **Figure 1.1**. Summary of subprojects to be implemented in the State in Tranche-1 under NERPSIP along with capacity addition and cost is shown in **Table 1.3** below.

Table 1.3: Summary of Subprojects in Tranche- I Under NERPSIP

S. No.	Name of the subproject	Quantity (Nos.)	Capacity Addition (km/MVA)	Estimated Cost (Rs. in Cr.)
1	132 kV Transmission lines	6	222.738 km	442.213
2	132/33kV substations (New/Augmentation)	10	139.18 MVA	
3	33 kV Distribution lines	13	98.519 km	
4	33/11kV substations (New/Extension/ Augmentation)	38	274.85 MVA	

Source: Monthly Progress Report of Manipur PSIP, May 2021

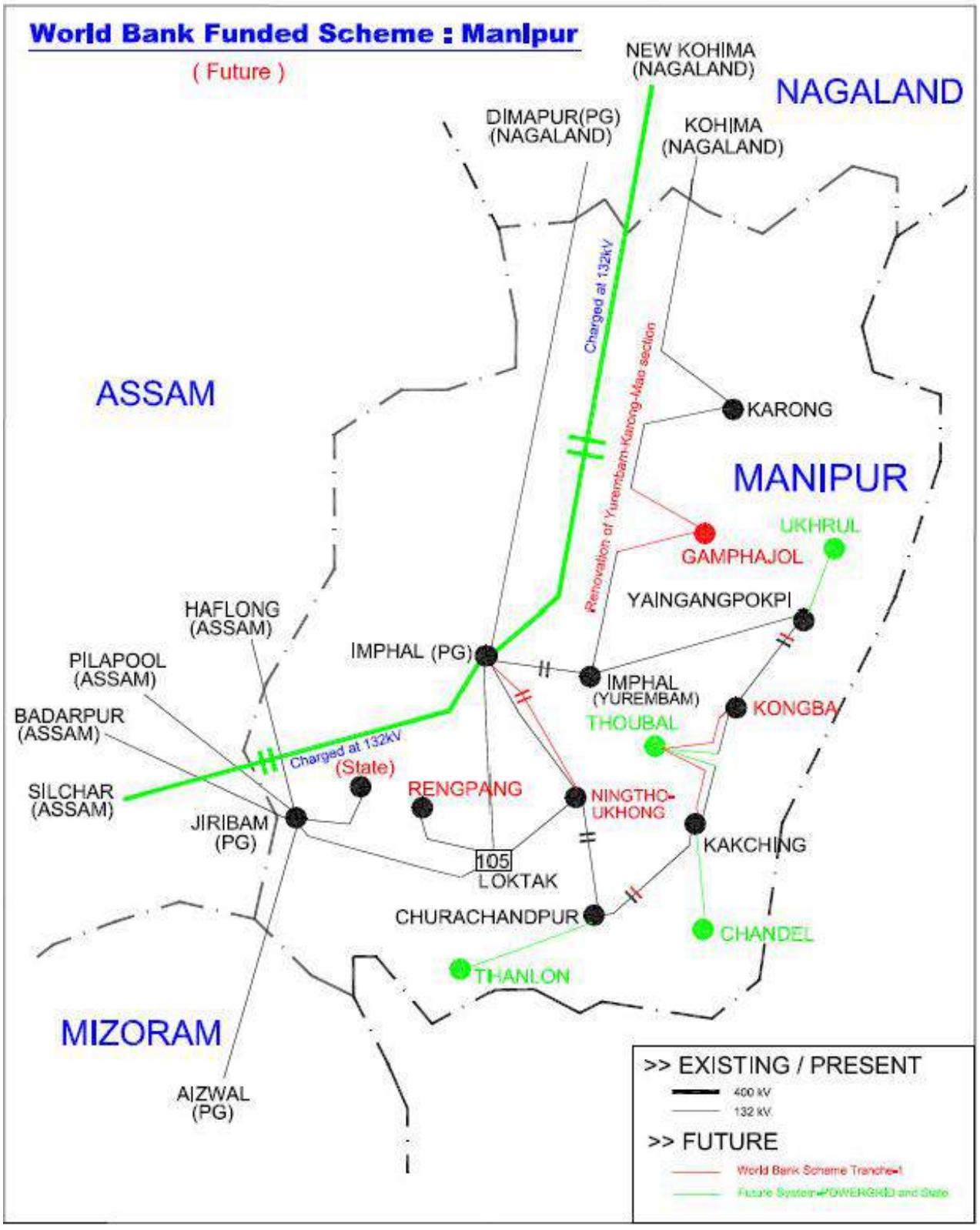


Figure 1.1: Power Map of Manipur

1.3 PROJECT BENEFIT

The proposed transmission and distribution schemes will not only improve overall power supply situation but will also improve reliability, quality, security and enhancement of power supply in the North Eastern Region.

1.4 PROJECT SCOPE & PRESENT STUDY

In line with Manipur State Power Company Limited's (MSPCL), Electricity Department, Government of Manipur (GoMan), Environment and Social Policy & Procedures Framework (ESPPF), POWERGRID carried out comprehensive environment and social assessment of each subprojects and prepared Initial Environment Assessment Report (IEAR). These reports were subsequently disclosed for public information both on the State Utility, POWERGRID and Bank website after obtaining clearance from The World Bank.

As mandated in the ESPPF, a Final Environment Assessment Report (FEAR) for each subproject need to be prepared with an objective to assess the compliance of mitigation measures identified in IEAR including implementation of EMP provisions by IA/ Contractor. However, as per Project Agreement signed between POWERGRID and Bank such study is required to be undertaken by Independent Agencies as per Term of Reference agreed with Bank. As a part of this development, POWERGRID appointed **R S Envirolink Technologies Pvt. Ltd. (RSET)** as Independent consultant vide Letter of Award (LOA) Ref No.: **NEGW/C&M/2020-21/NERPSIP/300-19/LOA-6/155** dated **26/08/2020** to carry out FEAR study.

The present FEAR is a document developed as a consultancy assignment to validate the work undertaken and to critically examine any deviation, if any with respect to management measures as outlined in the IEAR which is based on MSPCL's ESPPF, World Bank's Operational Policies and Bank's Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution.

The scope of the present study includes 132 kV transmission line and associated 132/33 kV substations, 33 kV distribution lines and associated 33/11 kV substations which are being implemented in Bishnupur, Imphal East, Imphal West, Kangpokpi and Senapati Districts of Manipur. Detail of T&D network are given below and shown in **Figure 1.2.**

1.4.1 Transmission Components

The present study includes two 132 kV transmission lines and associated four 132/33 kV substations being implemented in Bishnupur, Imphal East and Imphal West Districts of Manipur. Details of Transmission network are given below in **Table 1.4.**

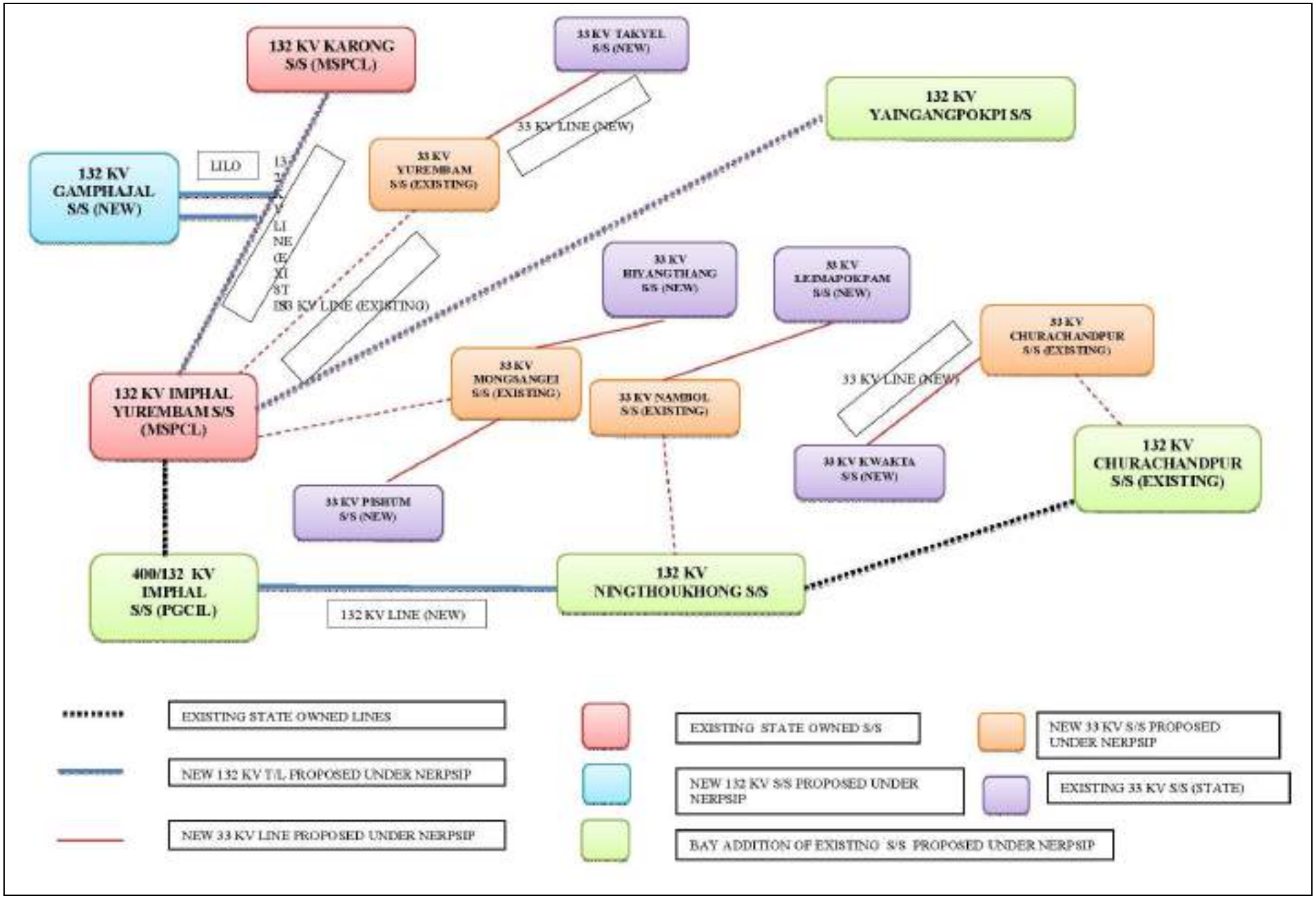


Figure 1.2: Proposed T&D Network in Bishnupur, Imphal East, Imphal West, Kangpokpi and Senapati Districts under NERPSIP

Table 1.4: Details of Transmission Network

S. No.	Name of the Line	Name of New/ Existing Sub-station	Project District/s
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line – **32.525 km**	Extension of existing 132/33 kV Imphal (PG) substation	Bishnupur, Imphal West
		Extension of existing 132/33 kV substation at Ningthoukhong	
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol – **1.47 km**	Establishment of new 132/33 kV substation at Gamphajol	Imphal West
3		Extension of existing 132/33 kV substation at Yaingangpokpi	Imphal East

1.4.2 Distribution Components

The present study includes five 33 kV distribution lines and associated sixteen 33 kV substations being implemented in Bishnupur, Imphal East, Imphal West, Kangpokpi and Senapati Districts of Manipur. Details of Distribution network are given below in **Table 1.5.**

Table 1.5: Details of Distribution Network

S. No.	Name of the Line	Name of New/ Existing Sub-station	Project District/s
1	LILO from Mongsangei to Kakwa at Pishum – **0.157 km**	Establishment of 33/11kV substation at Pishum (GIS)	Imphal East
2	33 kV line from Mongsangei to Hiyanthang substation – **4.82 km**	Establishment of 33/11kV substation at Hiyanthang	Imphal West
3	33 kV line from Iroisemba to Takyel substation – **7.0 km**	Establishment of 33/11kV substation at Takyel	Imphal West
4	33 kV line from Moirang to Kwatka substation – **6.33 km**	Establishment of 33/11kV substation at Kwatka	Bishnupur
		Extension of existing 33/11 kV substation at Moirang	
5	33 kV line from Nambol to Leimapokpam substation – **6.286 km**	Establishment of 33/11kV substation at Leimapokpam	Bishnupur
		Augmentation of existing 33/11 kV substation at Nambol	
6		Augmentation of existing 33/11 kV substation at Kangpokpi	Senapati
7		Augmentation of existing 33/11 kV substation at Ningthoukhong	Bishnupur
8		Augmentation of existing 33/11 kV substation at Khwairakpam	Bishnupur
9		Augmentation of existing 33/11 kV substation at Moirangkhunou	Bishnupur
10		Augmentation of existing 33/11 kV substation at Yaingangpokpi	Kangpokpi
11		Augmentation of existing 33/11 kV substation at Saikul	Kangpokpi
12		Augmentation of existing 33/11 kV substation at Tadubi	Senapati

S. No.	Name of the Line	Name of New/ Existing Sub-station	Project District/s
13		Augmentation of existing 33/11 kV substation at Karong	Senapati
14		Augmentation of existing 33/11 kV substation at Maram	Senapati

1.5 OVERALL PROJECT PROGRESS

A brief status on project implementation progress of various transmission & distribution components till May, 2021 is given below in **Table 1.6**.

Table 1.6: Brief Status on Project Implementation Progress

S. No.	Name of the T & D Components	Progress as on May, 2021
A	**Transmission and Distribution Line**	
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line	➢ Tower foundation work, erection work and earthing completed. ➢ 32.305 km out of 32.525 km stringing of conductor work completed. ➢ Testing and commissioning is yet to start
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	➢ Charged on 16/09/2019
3	LILO from Mongsangei to Kakwa at Pishum	➢ All works completed by 28/02/2021
4	33 kV line from Mongsangei to Hiyanthang substation	➢ Commissioned on 31/12/2019
5	33 kV line from Iroisemba to Takyel substation	➢ Report on earth resistivity is awaited
6	33 kV line from Moirang to Kwatka substation	➢ Commissioned on 27/12/2019
7	33 kV line from Nambol to Leimapokpam substation	➢ Commissioned on 09/01/2020
B	**Transmission and Distribution Sub-stations**	
1	Bay Extension of existing 132/33 kV Imphal (PG) substation Bay Extension x 2	➢ Completed on 31/10/2020
2	Bay Extension of existing 132/33 kV substation at Ningthoukhong Bay Extension x 2 + (1x20 MVA)	➢ 68 out of 68 nos. of 132 kV equipment foundation completed ➢ 33 kV equipment foundation yet to start ➢ 70 out of 128 RM excavation completed ➢ Erection, testing and commissioning work yet to commence
3	Establishment of new 132/33 kV substation at Gamphajol (2x20 MVA)	➢ 2.96 acre of land has been purchased on willing buyer willing seller basis. ➢ 140 out of 376 rmt. of boundary wall constructed. ➢ Civil work in progress & equipment

S. No.	Name of the T & D Components	Progress as on May, 2021
		erection work yet to commence
4	Bay Extension of existing 132/33 kV substation at Yaingangpokpi Bay Extension x 1	➢ Commissioned on 01/11/2019
5	Establishment of 33/11kV substation at Pishum (GIS) (2x10 MVA)	➢ All works completed by 31/03/2021
6	Establishment of 33/11kV substation at Hiyanthang (2x3.15 MVA)	➢ Commissioned on 31/12/2019
7	Establishment of 33/11kV substation at Takyel (2x5 MVA)	➢ Alternate land handed over to POWERGRID ➢ Geo-Technical and Soil investigations work completed and reports are awaited
8	Establishment of 33/11kV substation at Kwatka (2x3.15 MVA)	➢ Commissioned on 27/12/2019
9	Extension of existing 33/11 kV substation at Moirang	➢ Commissioned on 02/07/2019
10	Establishment of 33/11kV substation at Leimapokpam (2x5 MVA)	➢ Commissioned on 11/01/2019
11	Augmentation of existing 33/11 kV substation at Nambol (1x5 MVA)	➢ Commissioned on 27/05/2019
12	Augmentation of existing 33/11 kV substation at Kangpokpi (1x3.15 MVA)	➢ Commissioned on 24/09/2019
13	Augmentation of existing 33/11 kV substation at Ningthoukhong (2x5 MVA)	➢ Commissioned on 13/06/2019
14	Augmentation of existing 33/11 kV substation at Khwairakpam (1x3.15 MVA)	➢ Commissioned on 31/05/2019
15	Augmentation of existing 33/11 kV substation at Moirangkhunou (2x5 MVA)	➢ Commissioned on 01/09/2019 (1st Xmer) ➢ Commissioned on 06/09/2019 (2nd Xmer)
16	Augmentation of existing 33/11 kV substation at Yaingangpokpi (2x5 MVA)	➢ Commissioned on 22/09/2019 (1st Xmer) ➢ Commissioned on 23/09/2019 (2nd Xmer)
17	Augmentation of existing 33/11 kV substation at Saikul (1x3.15 MVA)	➢ Commissioned on 05/12/2018
18	Augmentation of existing 33/11 kV substation at Tadubi (1x3.15 MVA)	➢ Commissioned on 22/12/2018
19	Augmentation of existing 33/11 kV substation at Karong (1x5 MVA)	➢ Commissioned on 02/12/2018
20	Augmentation of existing 33/11 kV substation at Maram (1x3.15 MVA)	➢ Commissioned on 06/02/2019

1.6 OBJECTIVE & METHODOLOGY ADOPTED FOR FEAR STUDY

The main objectives of the FEAR study are to assess the mitigative measures as suggested in IEAR and/or EMP are effectively implemented/ addressed at the ground during pre-construction & construction stages of project cycles. The study also helps in establishing the status of compliance of various mitigation/management measures provided in the IEAR/EMP and suggests gaps or weaknesses, if any.

To achieve this, RSET undertook a comprehensive biophysical, environmental, socioeconomic data gathering exercise along the transmission/ distribution line routes and substations location to assess/verify the actual site-specific measures implemented/ being implemented by IA/ Contractor in respect of measure/ actions listed in IEAR/EMP. The methodologies adopted for instant FEAR are as follows:

Defining Study Area: Environmental impacts of Transmission & Distribution (T&D) projects are not far reaching and are mostly localized to RoW (refer **Table 1.7**). However, T & D projects have some effects on natural and socio-culture resources. Study area has been defined as RoW of transmission line i.e. 27 m corridor for 132 KV transmission line and 15 m corridor for 33 KV transmission line. Also, area in immediate vicinity of substations has been included in the study area.

Table 1.7: RoW Width

Transmission Voltage	Max. RoW (m)
132 kV	27
33 kV	15

Review of existing reports: Review of existing reports and data prepared and generated by POWERGRID such as Initial Environment Assessment Report (IEAR), Environment and Social Policy & Procedures Framework (ESPPF), Compensatory Plan for Temporary Damage (CPTD) etc. was undertaken and suitably incorporated in the present report.

Literature review: Review of existing literature was undertaken for collection of secondary baseline data related to physiography, climatic conditions, demography, natural resources including forests/wildlife, protected area and socio-economic features of the study area. Sources and data so collected have been mentioned below:

- 'A Revised Survey of the Forest Types of India' by Champion and Seth (1968) was used for forest type classification of forests in the study area.

- Data collected from published literature of Zoological Survey of India, Forest Survey of India, Botanical Survey of India, Website of Directorate of Environment, Govt. of Manipur and other research and government publications for floral and faunal diversity of the study area.

- Soil map of the study area was prepared using 'Soils of Manipur for Optimising Land Use, NBSS Publ. 56-C, 1996' published by National Bureau of Soil Survey & Land Use Planning (NBSS&LUP), Nagpur.

- Conservation status of flora and fauna of the study area as per Indian Wildlife (Protection) Act (1972), threatened status according to IUCN Red List 2020.1, Red Data Book of Indian Plants by Botanical Survey of India, Kolkata.

- Census of India 2011 for demography of the study area.

Collection of primary data and Physical verification of construction elements: To gather primary data/ physical verification, a field visit/ survey of the project area along with IA and Contractor staff was made in January 2021. The data which has been collected from field visit are implementation status of proposed environmental management plan and mitigation measures as suggested in IEAR.

Ground truthing/ physical verification was made with photographic evidence and verification of record maintained by IA and Contracts for various activities for monitoring the compliance of mitigation measures like Health and Safety measures, Solid waste and sanitation, construction of protection wall/ retaining walls, status of labour camps location of proposed substations, towers, and Transmission & Distribution Lines alignments. Findings of field survey were consolidated along with secondary data for interpretation and finding the gaps for immediate necessary action.

Surveys for flora and fauna: Being a transmission line project, ecological surveys for assessment of vegetation structure/ profile in the proximity of the proposed transmission lines, corridors of transmission line routes, sub-stations, etc. were conducted wherein line transact methodology has been followed.

The terrestrial ecological surveys were undertaken to prepare a comprehensive checklist of flora (angiosperm, gymnosperm, pteridophyte, and bryophytes) and fauna (mammals, birds, herpetofauna and butterflies) of the study area. The study area was divided into different strata based on

topography and vegetation pattern covering different land use/ land cover categories like scrubland near agricultural fields, forest, fallow/abandoned land, and vegetation growing along the project components (RoW of transmission line, near towers and sub-stations).

As the topography along the routes varied from foothills to top of the hills. In the valley region, most of the transmission line route passes through the bunds of paddy fields. The coverage of the study area was hampered by inaccessibility of certain areas due to inhospitable terrain. It was therefore, not feasible to chart the entire routes of proposed/completed transmission line as large part of the routes has steep slopes and due to issues of accessibility at present. However, during the field surveys at least 10% of the route was covered for the collection of baseline data, which in some cases constituted a continuous stretch and, in some cases, could be covered in parts.

A series of transects were identified along the routes of transmission line covering the corridors between the ROW of transmission line and substations. Area covered under different sub-components (ROW of transmission line and substations) of project is given below in table. Faunal surveys also were conducted along the same transects.

Transmission Lines and Transects Locations for sampling

S. No.	Name of Transmission Line	Status of Project	Distance Covered
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line – **32.525 km**	Foundation, erection, earthing and stringing work completed. Testing and commissioning is yet to start	Approx. 5 km
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol – **1.47 km**	Work completed	Entire Stretch
3	LILO from Mongsangei to Kakwa at Pishum – **0.157 km**	Work completed	Entire Stretch
4	33 kV line from Mongsangei to Hiyanthang substation – **4.82 km**	Work completed	Approx. 3 km
5	33 kV line from Iroisemba to Takyel substation – **7.0 km**	Ongoing	Route is yet to be finalized
6	33 kV line from Moirang to Kwatka substation – **6.33 km**	Work completed	Approx. 1 km
7	33 kV line from Nambol to Leimapokpam substation – **6.286 km**	Work completed	Approx. 1 km

The results of the primary field surveys were supplemented with secondary data to fill the gaps and further with the information generated through PRA. In addition, at all the sites bird walks were also undertaken, particularly areas

under private plantations nearby the routes to locate nesting sites and for bird sightings.

Consultation: Consultation was carried out with stakeholders like POWERGRID officials, MSPCL officials, Contractor, migratory labours, local labours, Village head and public representatives to collect data with respect to compliance of suggested Environmental Management Plan and implementation of mitigation measures.

Development of Maps: Geo-referenced and Google maps with superimposed coordinates of project elements were generated to verify locational details and details of physical features of terrain of the project locations.

Chapter 2 POLICY, LEGAL AND REGULATORY FRAMEWORK

2.1 INTRODUCTION

Power transmission and distribution project activities by their inherent nature and flexibility have negligible impacts on environmental and social attributes. Indian laws relating to environmental and social issues have strengthened in the last decade both due to local needs and international commitments. MSPCL, IA and contractors are undertaking its activities within the purview of Indian and State specific laws keeping in mind appropriate international obligations and directives and guidelines with respect to environmental and social considerations of World Bank's Operational Policies.

2.2 CONSTITUTIONAL PROVISIONS

Subsequent to the first United Nations Conference on Human Environment at Stockholm in June, 1972, which emphasized the need to preserve and protect the natural environment, the Constitution of India was amended through the historical 42nd Amendment Act, 1976 by inserting Article 48-A and 51-A (g) for protection and promotion of the environment under the Directive Principles of State Policy and the Fundamental Duties respectively. The amendment, *inter alia* provides:

"The State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country". (New Article 48A)

"It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures". [New Article 51 A(g)]

Article 21 of the constitution provides, "no person shall be deprived of his life or personal liberty except according to procedure established by law".

Article 21 is the heart of the fundamental rights and has received expanded meaning from time to time after the decision of the Supreme Court in 1978. The Article 21 guarantees fundamental right to life – a life of dignity to be lived in a proper environment, free of danger or disease or infection. Recently, Supreme Court has broadly and liberally interpreted the Article 21, transgressing into the area of protection of environment, and held that the citizen's right to live in an eco-friendly atmosphere is to be interpreted as the basic right guaranteed under Article 21.

Thus, the Indian Constitution now has a two folds provision:

(a) On the one hand, it gives directive to the State for the protection and improvement of environment.

(b) On the other hand, the citizens owe a constitutional duty to protect and improve the natural environment.

Article 371 C provides special provision to the State of Manipur for the Constitution and functions of a committee of the Legislative Assembly of the State consisting of members of that Assembly elected from the Hill Areas of the State. Under this Manipur (Hill Areas) District Council Act was enacted in 1971 which has provisions similar to those contained in the Sixth Schedule and has established six Autonomous Hill District Councils, covering 5 hill districts of the State. These Autonomous Hill District Councils (AHDC) are empowered to maintain and manage the property: movable and immovable, and institutions under their jurisdiction (e.g. in the field of agriculture, animal husbandry, community development, social and tribal welfare, village planning, management of any forest except RF, regulation of the Jhum /shifting cultivation or any other matter.) Under this act, the administrations of the Tribal areas are vested in village/district council under supervision of concerned DC at local/district level and Hill area Committee at State level. All activities sited in AHDC area needs their consent.

Constitutional provisions in regard to social safeguards are well enshrined in the preamble such as **JUSTICE**, social, economic and political; **LIBERTY** of thought, expression, belief, faith and worship; **EQUALITY** of status and of opportunity; **FRATERNITY** assuring the dignity of the individual and the unity and integrity of the Nation. Fundamental Rights and Directive Principles guarantee the right to life and liberty. Health, safety and livelihood have been interpreted as part of this larger right. Social safeguards provisions are dealt in detail in different Article such as Article-14, 15 17, 23, 24, 25, 46, 330, 332 etc.

2.3 ENVIRONMENTAL PROVISIONS

Environmental issues of T&D projects are manageable given the inherently small 'foot print' of towers and flexibility in siting facilities within a relatively large host area and are mostly localized to RoW. However, transmission line project may have some adverse effects on natural resources. These impacts can be minimized by careful route selection and siting of substations. The applicable acts, rules, and relevant policies in the context of the project and its status of compliance are presented in **Table 2.1**.

Table 2.1: Environmental Provisions

S. No.	Acts, Notifications and Policies	Relevance	Applicability to the project	Status of Compliance
1.	Electricity Act, 2003	To consolidate the laws relating to generation, transmission, distribution, trading and use of electricity. Under the provisions of Section 68(1):- Prior approval of the GoMan is a mandatory requirement to undertake any new transmission and distribution project in the State.	Applicable - Transmission line projects are constructed under the ambit of Electricity Act, 2003 following the provisions of Section 67 & 68 of act.	Complied with: MoP, GoI approved the NERPSIP comprehensive scheme for six North Eastern States including Nagaland under vide its Office Memorandum dated 1st December 2014.
2.	Forest (Conservation) Act, 1980	To protect and conserve Forest Areas and Tree Cover. Any transmission/ distribution line traverses forest land, prior clearance is mandatorily required from Ministry of Environment, Forest & Climate Change (MoEF&CC), GoI under the Forest (Conservation) Act, 1980.	Not Applicable - No notified forest area is involved in any of the line routes or substations location.	Not Required
3.	Environment (Protection) Act, 1986	To protect and improve the overall environment. It is umbrella legislation for the protection and improvement of environment.	Applicable – Though some limited compliance measures notified under this EPA, 1986 are to be adhered to relevant rules and regulations under the EPA, 1986 applicable to the operations of MSPCL.	Complied with: Though applicable as it is umbrella legislation, however, as such statutory permission/ license is not required.
i)	Ozone Depleting Substances (Regulation and Control) Rules, 2000	Regulate and control manufacturing, import, export and use of Ozone Depleting Substances under Montreal Protocol adopted on 16th September 1987	Applicable - As per the notification, certain control and regulation has been imposed on manufacturing, import, export, and use of these compounds.	Complied with: Only CFC free equipments are being procured/ specified in tender document
ii)	Batteries (Management and	Provides certain restriction on disposal of used batteries and its handling and to file half yearly	Applicable during operation phase only – Used batteries to be disposed to dealers,	Batteries are used during operation

S. No.	Acts, Notifications and Policies	Relevance	Applicability to the project	Status of Compliance
	Handling) Rules, 2001	return in prescribed form to the concerned State Pollution Control Board.	manufacturer, registered recycler, reconditioners or at the designated collection centers only. A half-yearly return to be filed as per Form-8 to the Manipur State Pollution Control Board	phase. Hence, the issue of proper handling and disposal of batteries as per rules not an issue during construction stage.
iii)	Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008	To ensure that the hazardous wastes are managed in a manner which shall protect the health and the environment against the adverse effects that may result from such waste. The used transformer oil has been declared as a hazardous waste vide this notification.	Applicable – Requires proper handling, storage and disposed only to authorized disposal facility (registered recyclers/ reprocessors). In case it is decided to outsource the process of recycle of used oil to registered recycler as per the provisions of notification then MSPCL shall submit the desired return in prescribed form to concerned State Pollution Control Board at the time of disposal of used oil.	Generally Used oil is generated after 10-15 years of operation of transformers and hence the issues of handling and disposals of hazardous transformer oil is not an issue at this stage.
iv)	E-waste (Management and Handling) Rules, 2011	To ensure that e-waste is managed in a manner which shall protect health and the environment against the adverse effects that may result from hazardous substance contained in such wastes. It is the responsibility of the bulk consumer to ensure that e-waste generated is channelized to authorized collection centre(s) or registered dismantler(s) or recycler(s) or is returned to the pick-up of take back services provided by the producer.	Applicable – To dispose e-waste generated in environmentally sound manner by channelizing to authorized collection centres/ registered dismantler/ recyclers/ return to producers. MSPCL, being a bulk consumer of electrical and electronics equipment's shall maintain record as per Form-2 for scrutiny by State Pollution Control Board.	E-waste disposal is not an issue during construction phase.
4.	The Biological Diversity Act, 2002	To provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources,	Not Applicable - The present project does not involve any biosphere reserves.	Not Required

S. No.	Acts, Notifications and Policies	Relevance	Applicability to the project	Status of Compliance
		knowledge and for matters connected therewith. All restrictions applicable to protected areas like National Park & Sanctuaries are also applicable to these reserves.		
5.	The Scheduled Tribes & Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	When transmission projects pass through forest land, NOC from DC has to be obtained before Stage-II approval in compliance to FRA Act as per MoEF&CC circular dated 5th February 2013	Not Applicable - No forest clearance is involved.	Not Required
6.	The Manipur Loktak Lake (Protection) Act, 2006	This act provides for administration, control, protection, improvement, conservation and development of the natural environment of the Loktak Lake and for matters connected with as incidental thereto. It demarcates an area of 70.30 sq. km as No-Development Zone or Totally Protected Zone and an area of 120.91 sq km as buffer zone where developmental activities are prohibited.	Not Applicable – Loktak lake, its no-development zone and buffer zone has been completely avoided.	Not Required
7.	The Manipur Conservation of Paddy Land and Wetland Act, 2014	The purpose of the Act is to conserve the paddy land and wetland of the state of Manipur. The act restricts the conversion or reclamation of paddy land and wetlands of the state of Manipur, in order to, promote growth in agricultural sector.	Not Applicable – Conversion or reclamation of paddy land and wetlands has been completely avoided.	Not Required
8.	Ancient Monuments & Archaeological Sites and Remains Act, 1958	To prevent damage to archaeological sites and its maintenance. It also places restriction on activities which can cause harm to the monument /property. The law is however applicable only in monuments identified by the Archaeological Survey of India.	Not Applicable - All such areas have been completely avoided.	Not Required

2.4 SOCIAL PROVISIONS

The applicable acts, rules, and relevant policies in the context of the project and its status of compliance are presented in **Table 2.2**.

Table 2.2: Social Provisions

S. No.	Acts, Notifications and Policies	Relevance	Applicability to the project	Status of Compliance
1.	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	Act ensures appropriate identification of the affected families/ households, fair compensation and rehabilitation of titleholders and non-titleholders. The Act authorizes State Govt. (i.e. GoMan) or its authorized Government agency to complete the whole process of acquisition of private land including Social Impact Assessment (SIA), Action Plan for R&R (i.e. Rehabilitation and Resettlement) & its implementation and the MSPCL responsibility is limited to identification and selection of suitable land based on technical requirement and ensuring budget allocation.	Not Applicable – Land has been purchased on willing buyer and willing seller basis.	Not Required
2.	The Manipur (Hill Areas) District Council Act, 1971	Through this act, Autonomous Hill District Councils (AHDC) of Manipur are empowered to maintain and manage the property: movable and immovable, and institutions under their jurisdiction. Under this act, the administrations of the Tribal areas is vested in village/district council under supervision of concerned DC at	Applicable – Since the project is being implemented in the districts which are part of The Manipur (Hill Areas) District Council Act, 1971, therefore, consent of AHDC is required.	Complied with: IA is obtaining NOCs from AHDC before initating the work in these districts.

S. No.	Acts, Notifications and Policies	Relevance	Applicability to the project	Status of Compliance
		local/district level and Hill area Committee at State level.		
3.	Rights of Way (RoW) and Compensation	The Electricity Act, 2003 has a provision for notifying transmission company under section 164 (B) to avail benefits of eminent domain provided under the Indian Telegraph Act, 1885.	Applicable - MSPCL may seek for GoMan authorization to exercise all the powers that the Telegraph authority possesses and can spot, construct and erect towers without acquiring the land. Moreover, all damages due to its activity shall be compensated at market rate. In case of agricultural or private land the provisions of section- 67 and or section-68 (5 & 6) of the Electricity Act, 2003 and section-10 of the Indian Telegraph Act, 1885 are followed for assessment and payment of compensation towards such damages.	Complied with: Implementing Agency has already been vested with powers of telegraph authority by GoI vide Gazette Notification dated Dec.24, 2003. However, compensation for all damages are being paid to the individual land owner as per the provision of Section-10 (d) of Indian Telegraph Act, 1885
4.	The Right to Information Act, 2005	To provide for setting out the practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, the constitution of a Central Information Commission and State Information Commissions and for matters connected therewith or incidental thereto.	Applicable - Designated authorities to be in place.	Complied with: Designated authorities are already in place in MSPCL.
5.	Indian Treasure Trove Act, 1878 as amended in 1949	To provide for procedures to be followed in case of finding of any treasure, archaeological artifacts etc. during excavation.	Not Applicable - No such instances reported.	Not Required
6.	Workmen's	This act provides for compensation in case of	Applicable during construction,	Complied with: No such

S. No.	Acts, Notifications and Policies	Relevance	Applicability to the project	Status of Compliance
	Compensation Act, 1923	injury by accidents arising out of and during the course of employment.	operation and decommissioning phases – Since labours will be engaged during different phases.	instances of violation of act was reported.
7.	Minimum Wages Act, 1948	As per this act, the employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government.	Applicable during construction, operation and decommissioning phases – Since labours will be engaged during different phases.	Complied with: No such instances of violation of act was reported.
8.	The Child Labour (Prohibition and Regulation) Act, 1986	This Act prohibits employment of children below 14 years of age in Building and Construction Industry covering Railway.	Applicable during construction, operation and decommissioning phases – Since labours will be engaged during different phases.	Complied with: No such instances of violation of act was reported.
9.	The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013	To provide protection against sexual harassment of women at workplace and for the prevention and redressal of complaints of sexual harassment and for matters connected therewith or incidental thereto.	Applicable during construction, operation and decommissioning phases – Since labours will be engaged during different phases.	Complied with: No such instances of violation of act was reported.

2.5 WORLD BANK OPERATIONAL POLICY

When World Bank provide governments with financing to invest in projects such as building a road, connecting people to electricity, or treating waste water, World Bank we aim to ensure that the people and the environment are protected from potential adverse impacts. World Bank do this through policies that identify, avoid, and minimize harm to people and the environment. These policies require the borrowing governments to address certain environmental and social risks in order to receive World Bank support for investment projects. The mandatory environment and social requirements with respect to World Bank Operational Policies are presented in **Table 2.3**.

2.6 STATUTORY PERMISSION/LICENSES/NOC OBTAINED

The applicability of acts, notifications and policies have already been described in above paragraphs and table. As per the applicability, necessary permission/ licenses/ NOC so far obtained by IA or contractor are:

- Under the provisions of Section 68(1) of Electricity Act, 2003, prior approval GoN is a mandatory requirement to undertake any new transmission project 66kV upward and for distribution project of 33kV system in the State. As a part of permission/ approval, GoI approved the NERPSIP comprehensive scheme for six North Eastern States including Manipur under vide its Office Memorandum dated 1st December 2014. In addition, Implementation/ Participation agreement between MSPCL and PGCIL has been signed on 26th March, 2015.

- All the contractors are operating with valid labor license as per provision under section – 12(1) of the Contract Labour (Regulation & Abolition) Act, 1970 and also certified under Section- 7(3) of the Building and Other Construction Workers (Regulation of Employment and Condition of Service) Act, 1996 from Ministry of Labour & Employment.

- All the contractors have obtained requisite insurance policy as per provisions of Employee Compensation Act, 1923 for its employed workforce.

- Since the locations of stringing of 2nd circuits are coming under various villages of districts, No Objection Certificates (NoC) from concerned land owner/ Headman /Village Council are being obtained as per the progress of work.

Table 2.3: World Bank Operational Policy

S. No.	Acts, Notifications and Policies	Relevance	Applicability to the project	Status of Compliance
1.	OP- 4.01: Environmental Assessment	To ensure the environmental and social and sustainability of investment projects. Support integration of environmental and social aspects of projects in the decision-making process.	Applicable - E & S aspects of the project have already been integrated into management procedures based on comprehensive environment assessment undertaken by IA.	Complied with: E & S aspects of the project have already been integrated into management procedures based on comprehensive environment assessment undertaken by IA during 2015.
2.	OP- 4.04: Natural Habitats	To promote and supports natural habitat conservation and improved land use to integrate into national and regional development the conservation of natural habitats and the maintenance of ecological functions. Furthermore, to promote the rehabilitation of degraded natural habitats.	Not Applicable - The present project does not involve any natural habitats such as biodiversity area, protected area, sacred groves etc. However, NoC from ADFC, village councils and land owners are being obtained in this regard.	Not Required
3.	OP-4.11: Physical Cultural Resources (PCR)	To preserve PCR and in avoiding their destruction or damage. PCR includes resources of archaeological, paleontological, historical, architectural, and religious (including graveyards and burial sites), aesthetic, or other cultural significance.	Not Applicable - The Present project does not encroach upon any such resources.	Not Required
4.	OP-4.36: Forests	To harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests	Applicable – Though all line routes and substation locations successfully avoided encroachment into any Protected and Reserve forests. However, line routes pass through community and private forests. To minimise adverse impact on forests, management measure already provided in MSPCL's ESPPF	Complied with: To minimise adverse impact on forests, management measure already provided in MSPCL's ESPPF of June, 2015
5.	WB EHS Guidelines for Electric Power Transmission and Distribution	The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice. The EHS	Applicable - EHS guidelines are being followed during project implementation.	Complied with: EHS guidelines are being followed during project implementation.

S. No.	Acts, Notifications and Policies	Relevance	Applicability to the project	Status of Compliance
		Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs.		
6.	OP 4.12 – Involuntary Resettlement	Covers direct economic and social impacts both resulting from Bank-assisted investment projects and are caused by the involuntary taking of land. To avoid or minimize involuntary resettlement and, where this is not feasible, assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.	Not Applicable - As no involuntary acquisition invoked for securing land for proposed substations. However, fresh land required for construction of new substations were secured through direct Purchase on Willing Buyer Willing Seller basis on negotiated rate	Not Required.
7.	OP 4.10 – Indigenous Peoples	This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. The objective is to design and implement projects in a way that fosters full respect for indigenous peoples so that they receive culturally compatible social and economic benefits, and do not suffer adverse effects during the development process. The project shall ascertain broad community support for the project based on social assessment and free prior and informed consultation with the affected Tribal community, if any.	Not Applicable - Explicit consent from AHDC and the Village Councils is required in the case of acquisition of lands which is not applicable in instant project. However, NoC from AHDC, village councils and land owners obtained for community forest land/AHDC area wherever applicable.	Complied with: NoC of from AHDC, village councils and land owners being obtained for community forest land/ADC area wherever applicable.

Chapter 3

BASELINE DATA

3.1 INTRODUCTION

This chapter deals with the baseline status of physical, biological, socio-economic environment in the study area as well as districts belonging to study area. The baseline data presented in this chapter has been prepared from primary data collected during field studies as well as data/information gathered from available literature and reports published by various institutions and organizations.

3.2 DEFINING STUDY AREA

Environmental impacts of T&D) projects are not far reaching and are mostly localized to RoW (refer **Table 3.1**). However, T&D projects have some effects on natural and socio-culture resources.

Study area has been defined as RoW of transmission line i.e., 27m corridor for 132 KV transmission line and 15 m corridor for 33 KV transmission line. Also, area in immediate vicinity of substations has been included in the study area.

Table 3.1: RoW Width

Transmission Voltage	Max. RoW (m)
132 kV	27
33 kV	15

3.3 DISTRICTS BELONGING TO STUDY AREA

The project is an intra-state power sector project located in the State of Manipur and study area covers Bishnupur, Imphal East, Imphal West, Kangpokpi and Senapati districts of Manipur.

Bishnupur district lies between 93.43°E and 93.53°E Longitudes and 24.18°N and 24.44°N Latitudes the total geographical area of the district is 496 km^2. It is bounded on the north by Imphal West district, on the south by Churachandpur district, on the east by Imphal West and Kakching districts and on the west by Noney and Churachandpur districts.

Imphal East district occupies the northeastern corner of the Manipur (Imphal) Valley. The district lies between latitudes 24°39’49.09"N and 25°4’5.45"N and longitudes 93°55’30"E and 94°8’42"E approximately. The Kangpokpi district

bounds on the north and east, Thoubal district on the south and Imphal West district on the west. The total geographical area of the district is 497 km^2.

Imphal West falls in the category of Manipur valley region with total geographical area of 519 km^2. It is a tiny plain at the centre of Manipur surrounded by plains of other districts. Imphal city, the state capital is the nodal functional centre of this district. It is surrounded by Kangpokpi district on the north, on the east by Imphal East, Thoubal and Kakching districts, on the south by Kakching and Bishnupur districts, and on the west by Senapati district.

Kangpokpi district lies in the northern part of Manipur state. The district is bounded on the south by Tengnoupal, Thoubal and Imphal East districts, on the east by Ukhrul and Kamjong districts, on the west by Imphal West and Senapati districts and on the north by Senapati district. The total geographical area of the district is 1698 km^2.

Senapati district is located between 93.29° and 94.15° East Longitude and 24.37° and 25.37° North Latitude and lies in the northern part of Manipur state. The district is bounded on the south by Kangpokpi, Imphal West, Bishnupur and Churachandpur districts, on the east by Ukhrul district, on the west by Tamenglong and Noney districts and on the north by Kohima and Phek districts of Nagaland State. The district lies at an altitude between 1061 meters to 1788 meters above sea level. The total geographical area of the district is 1573 km^2.

3.4 PHYSICAL ENVIRONMENT OF DISTRICTS BELONGING TO STUDY AREA

3.4.1 Physiography

Bishnupur district wholly belongs to the valley region. The surface of the district gradually slopes towards east and south-east. Several hillocks, like Ishok (947 m above the mean sea level), Maibam Lokpaching (892 m), Laithouching (838 m), etc.are found spotted in the northern portion of the district. The Loktak Lake, which is the biggest freshwater lake in the NorthEastern India, occupies the heartland of this district. The Keibul Lamjao National Sanctuary, a home of the Brow Antlered Deer (Sangai in local name), one of the rarest animals in the world is situated in the southeastern corner of this Lake. Islets like Thanga village (903 m), Ithing village (882 m), Karang village (811 m) and Sendra (about 800 m) are the important settlements, which dot in this Lake near the National Sanctuary. Some hillocks as high as

879 m above the mean sea level lie behind the western side of this sanctuary. The boundary of the district extends upto the foothills of the Laimaton range and the Thangjing range on the west.

The geological formation of the **Imphal East** district belongs to the part of Indo-Myanmar (Burma) Ranges, which was made up at Tertiary, and Cretaceous sediments under which the Dissang Group of rocks was deposited probably during the Lower and Middle Eocene period. Some hills like Khundrakpam and other small hillocks such as Angom Leikai (820 m), Chingaren (804 m) and Chingmeirong (802 m) dotted in the district, however, partly belong to the Barail Group that was formed during the Oligocene and appear Eocene periods. The Mount Nungsikom located in the Khundrakpam hill as high as 1,168 m above the mean sea level (msl) is the highest relief in the district. Generally, the district slopes southwards. The Nongmaijing hill administratively under the Senapati district stretches north - south from the Kameng village to the end of the district boundary as high as 1,565 m near Nongmaijing Chiru village disturbs the physical feature of the district.

Imphal West slopes towards the east and south-east and the rivers and the streams flow eastwards and mainly towards the south. The district is mainly valley and there are no major hills and peaks in it. However, in the valley one comes across hillocks and small ranges of hills here and there of which mention may be made of the Langol, Pheidinga, Tendongyan, Chingmeiraong, Langthabal, Heibok and Chinga, the elevations differing from 813 m at Chinga to 961 m at Tendongyan. The geological nature of the district is composed of Barail Series and Simang formation (Garo Hills) and according to some geologists the soil which is alluvium in nature is comparatively of young geological formation. Although adequate research has not yet been carried out to ascertain the origin of the valley some research scholars and geologists are of the opinion that the valley was once a place full of water much bigger than Loktak and swamps and marshy lands occupied most parts of the district, and the valley was formed slowly by a gradual process of silting by soils carried down by the rivers and streams from the adjoining hills. Till recently there were many areas in the district consisting of swamps and marshy lands of which Lamphelpat, Takyelpat and Kakwapat (pat in local language meaning lake) are important ones. In recent years these marshy areas have been reclaimed for residential areas and agricultural purposes by improving the natural drainage system and constructing new ones.

Senapati (including Kangpokpi) district slopes towards the south and the rivers and the streams flow mainly towards the south. As per the Regional Divisions of India - a Cartographic Analysis Series, Manipur published by the

Registrar General, India in 1980 the district is divided into three hilly regions, viz., i) Northern Hilly Region, ii) Eastern Hilly Region and iii) Western Hilly Region. The Northern Hilly Region spreads over the district on the northern side and covers about half of the Mao-Maram sub-division. Its geology is related to Barail Series and Simsang formation and Jaintia Series and Disang Series with faults and thrusts. Soils are Udalfs-Ochrepts in general. The Eastern Hilly Region extends over the southeastern part of the district occupying whole of the Sadar Hills East sub-division and some parts of Mao-Maram sub-division and a small portion of Sadar hills West sub-division. The soil is of UdalfsOchrept and Orthents-Udalfs and is formed over Barail Series and Disang Series with transported alluvium. The Western Hilly Region extends over the southwestern part of the district occupying more than half of the Sadar Hills and Saitu Gamphazol sub-divisions and some portions of Mao-Maram subdivision. The soil is of Udalfs-Ochrept, UdalfsOrthents and Orthents-Udalfs and the region is spread over Barail Series and Disang Series. Mount Tenipu which is 2,995 m above the MSL is the highest peak in Manipur and is in the Northern Hilly Region on the northern side near Mao, a town bordering the state of Nagaland. During the winter months frozen snow could be seen at the peak at the morning hours. The other important peaks of the district are Laikot (2,832 m), Shoyangjang (2,249 m) and Laishan (2,261 m).

3.4.2 Ground Water

Manipur is rich in water resources. The annual replenishable ground water resources of the state amount to 0.44 BCM, while net annual ground water availability stands at 0.40 BCM. As per Central Ground Water Board, stage of ground water development has been calculated as 1.02%. The state does not have any Over Exploited, Critical or Semi critical region as far as ground water is concerned. Barring certain pockets, quality of ground water has been found satisfactory.

3.4.3 River System

Manipur receives heavy rainfall from Southwest and Northeast Monsoons. The main rivers of the state include the Imphal, Iril, Thoubal, Sekmai, Heirok, Khuga, Manipur, Barak, Chapki, Tuining river etc. The Barak River basin draining the western part of the state and the Manipur River basin draining the Eastern part of the state are the two major river basins of Manipur. The Barak River originates from the hills of northern hills of Manipur in Senapati district. It flows through the southwestern hill ranges by passing the valley towards Cachar district in Assam. The main tributaries of the river are Jiri, Maku, Irang, Gwai rivers etc. The Manipur River basin is the main river system of Manipur valley, and it originates from Sadar hills in Senapati district. The

major tributaries of this basin that are flowing in the district are Imphal, Iril, and Thoubal rivers. Manipur River is the main drainage of Manipur valley, which ultimately flows to the south towards Myanmar and falls into Chindwin River. Manipur river basin accounts for 0.5192 M hectare meter of annual run off against a total catchment area of 6332 km^2, while the Barak river basin has a discharge capacity of 1.3295 M hectare meter against a catchment of 9042 km^2. The main rivers flowing in the subproject area districts are Barak (Ahu), Manipur, Thoubal, Irang, Makhru (Makhu), Iring, Ijei (Aga), Wangjing, the Arong and the Sekmai, Leimatak, Leinganpokpi, Khuga, Tuitha and Apah rivers etc. Among these are Manipur & Barak (Ahu) are the biggest rivers and are perennial in nature. The main rivers flowing through districts belonging to study area are given below in **Table 3.2** and shown in **Figure 3.1** to **Figure 3.4**. The T&D network superimposed over the topographical sheets to highlight the drainage pattern and other features have been shown in **Map 1** to **Map 3**.

Table 3.2: Rivers Flowing Through Districts Belonging to Study Area

S. No.	Name of District	Name of River
1	Bishnupur	Nambul, Yangiomacha, Thongjaorok, Khuga, Manipur
2	Imphal East	Iril, Imphal, Thoubal, Kongba, Naga
3	Imphal West	Imphal, Nambul, Naga, Yangoi Macha, Manipur, Khordak
4	Kangpokpi	Iril, Ithoi Lok, Ichai Lok, Thoubal, Khangban Tangkhul Lok
5	Senapati	Dzuako, Barak, Iril, Sedzu, Knobari, Laini Lok, Akhong Lok, Ithoi Lok, Rodaki, Irang, Imphal

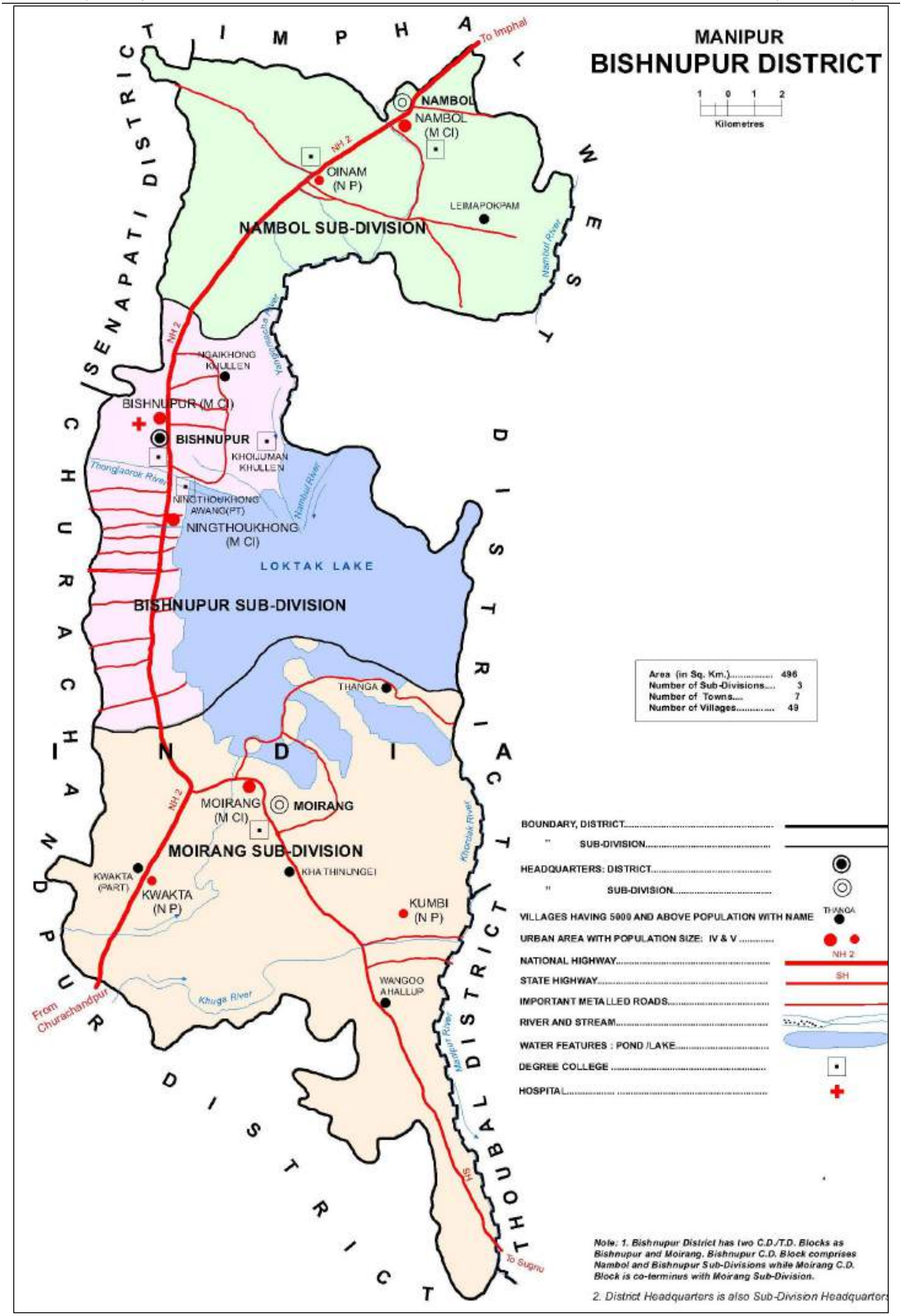


Figure 3.1: Map Showing Rivers Flowing Through Bishnupur District

Source: District Census Handbook, Bishnupur

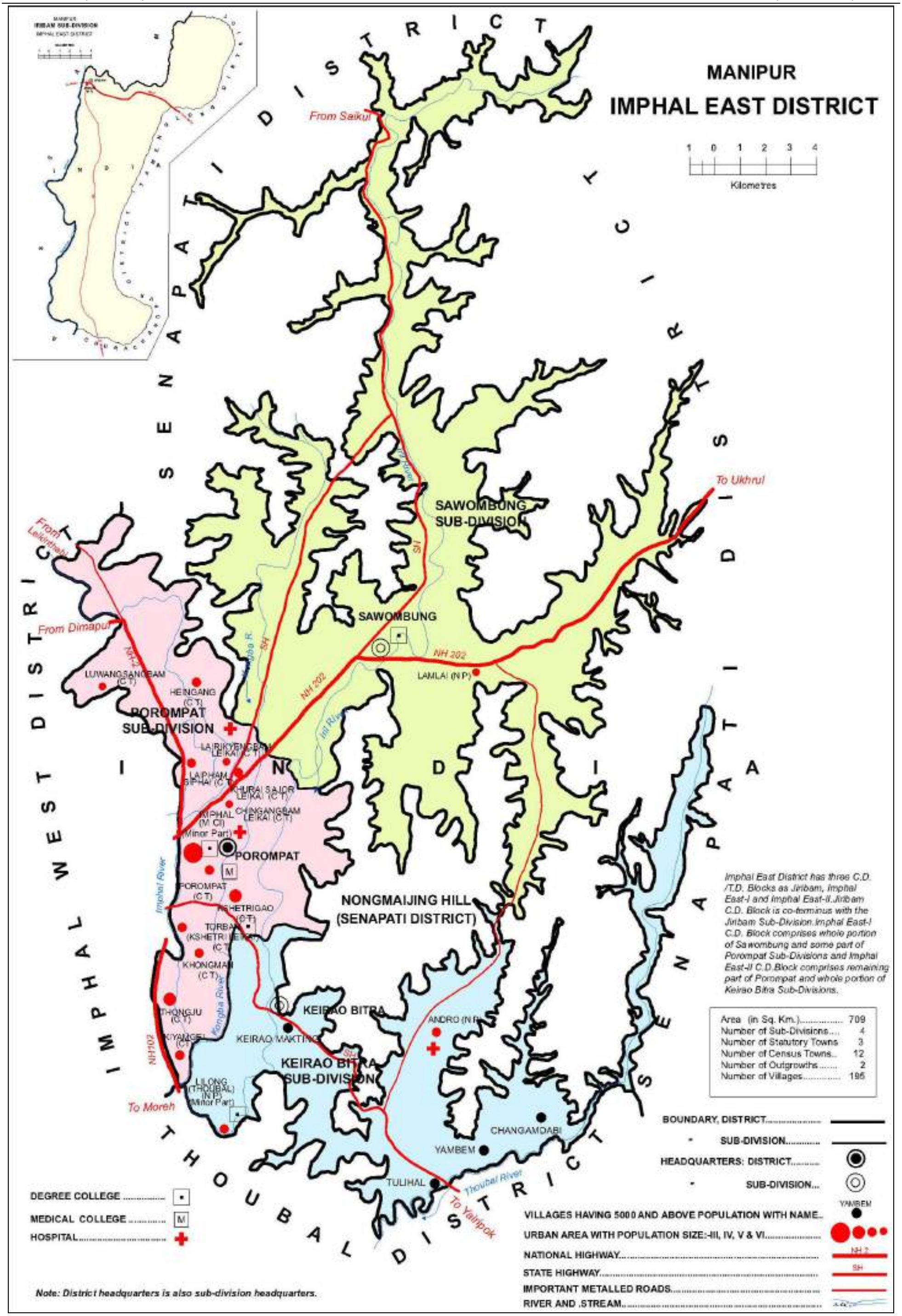


Figure 3.2: Map Showing Rivers Flowing through Imphal East District

Source: District Census Handbook, Imphal East

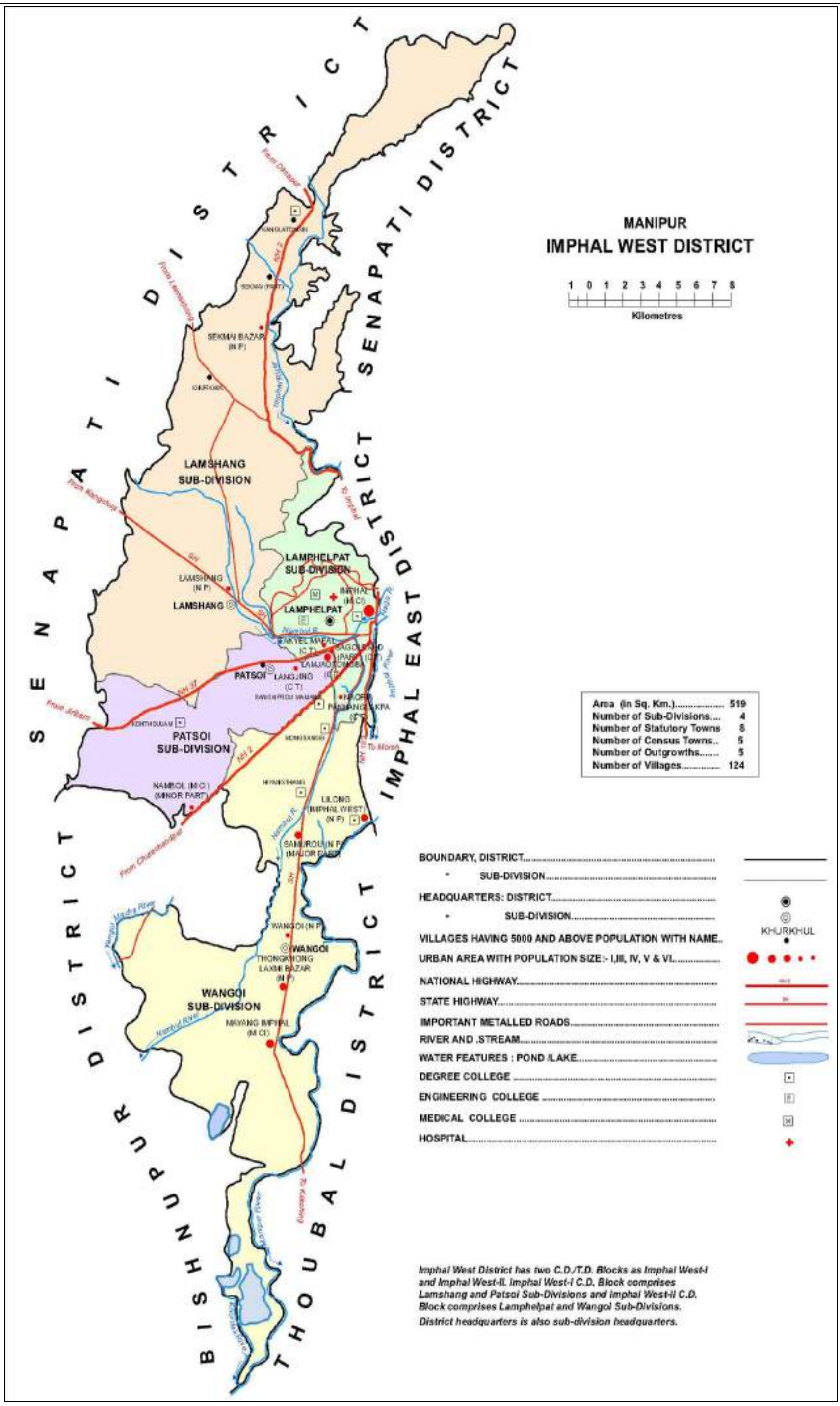


Figure 3.3: Map Showing Rivers Flowing through Imphal West District

Source: District Census Handbook, Imphal West

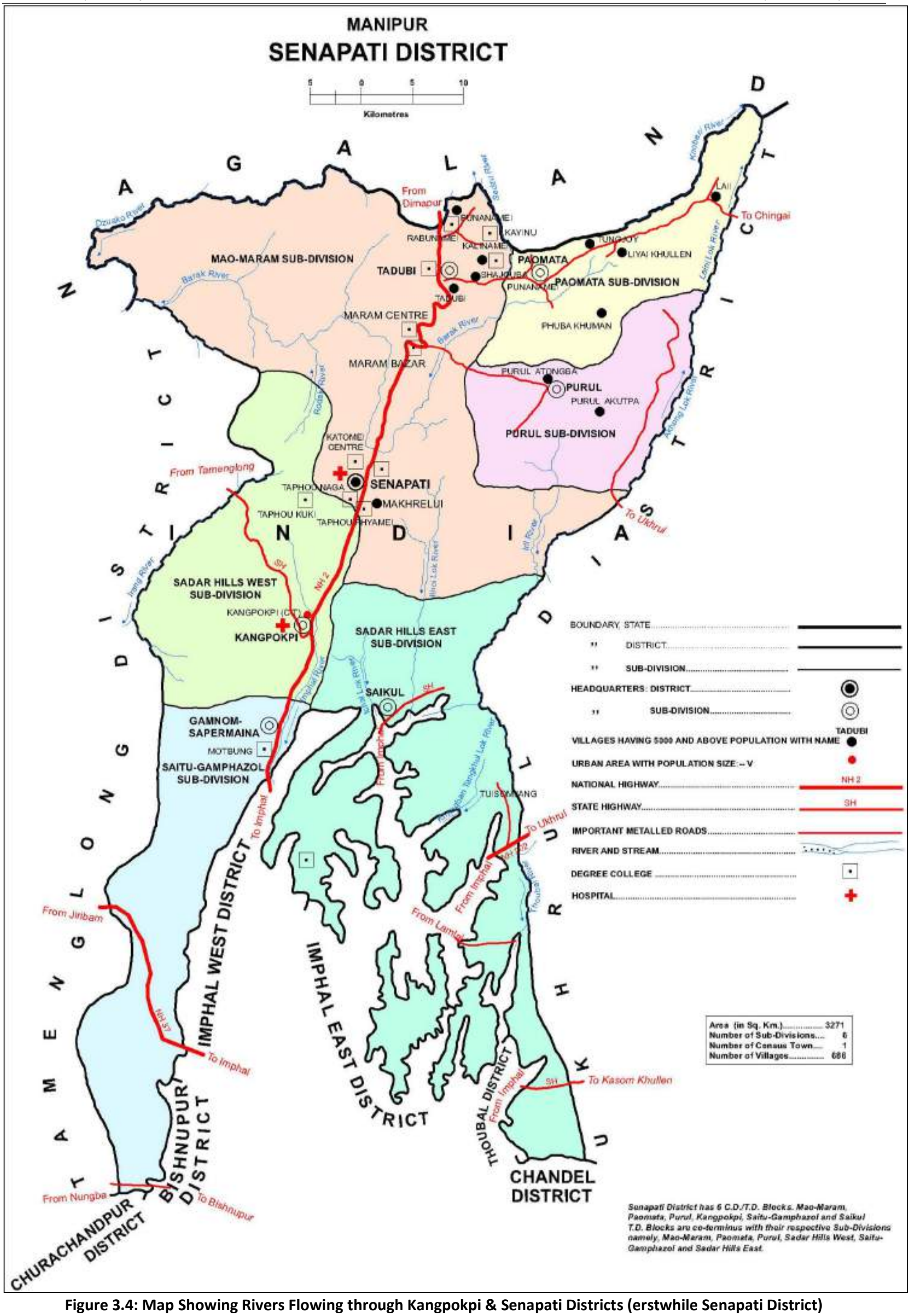


Figure 3.4: Map Showing Rivers Flowing through Kangpokpi & Senapati Districts (erstwhile Senapati District)

Source: District Census Handbook, Senapati

3.4.4 Meteorology

The climate of Manipur is mostly tropical with alpine climate. The northeastern region has an amiable climate and is very cold in the winters. The climate varies according to the elevations of the landforms in the state. The weather in the plains is, however, similar to that of the other states in the country. But the hilly regions are different and enjoy a pleasant climate with dry and low temperature. The weather in the state is highly influenced by the winds blowing from the Bay of Bengal and is conducive for heavy rainfall in the rainy season. The state experiences three main seasons like summer, winter, and the rainy season. Manipur does not experience extreme climatic conditions with temperature in summers rising upto 32°C, although the winter temperature may go below zero degree. The weather is bright and sunny, and the hills experience a dry and warm climate, while the plains are hot and dry like any other part of the country. As the Himalayan region is close by and the hills are an extension of the Himalaya, the climate here is similar to the Himalayan region, but not extreme. Winters begin from November and stay on till February. The coldest month is January, as cold winds freeze the atmosphere. The monsoon season begins in May and continues till the mid of October. Average rainfall ranges from 1250 mm to 2700 mm. November to February are the dry months.

Bishnupur district have a pleasant climate throughout the year. May-June is the hottest period while December-January is the coldest period in the year. The Loktak Lake influences the climatic conditions in the district in winter and summer. The maximum summer temperature recorded in the neighbouring district varies between 31^0C to 38^0C during 2001-2009 while the minimum is found ranging from 2^0C to 5^0C. The rainy season begins from the month of April-May and continues upto August September. Average rainfall in the district is 1204.2 mm

The climate of the **Imphal East** and **Imphal West** District is salubrious and Monsoon is tropical. The temperature varies from 0.6°C in winter to 41°C in summer. Average rainfall varies in the range of 1240 mm – 1470 mm.

Climate of **Senapati** (including Kangpokpi) district can be describe as humid subtropical climate. The temperature ranges from a minimum of 3.4°C to a maximum of 34.1°C. The annual rainfall ranges from 670 to 1450 mm (26.4 to 57.1 in).

3.4.5 Soils

The soil taxonomic (family) classification map of districts belonging to study area was prepared as per the data by National Bureau of Soil Survey & Land Use Planning (NBSS&LUP). Soil map prepared from this data is given at **Figure 3.5**.

According to **Figure 3.5** and **Table 3.3,** Soil Unit 12 is the most dominant Group (12.15%) which is characterized by deep, excessively drained, clayey skeletal soils on gently to moderately sloping side slopes of hills having clayey surface with moderate to severe erosion and moderate stoniness. Closely followed by Soil Unit 10, Soil Unit 7 and Soil Unit 17 covering 11.35%, 11.33% and 11.27% of the area, respectively. Soil Unit 5 covers 10.51% of the area. Rest all the soil units covers less than 10% of the area of the districts belonging to study area.

Table 3.3: Soils in Districts Belonging to Study Area

Unit	Description	Taxonomic Classification	Area (km^2)	Area (%)
5	Deep, excessively drained, fine soils on moderately steep side slopes of hills having clayey surface with moderate erosion; associated with: Deep, well drained, fine soils on moderately sloping side slopes of hills with moderate erosion and slight stoniness.	• Fine, Umbric Dystrochrepts • Fine, Typic Haplohumults	502.69	10.51
6	Deep, well drained, fine soils on gently sloping side slopes of hills having loamy surface with moderate erosion; associated with: Deep, well drained, fine soils on moderately sloping side slopes of hills with slight erosion and slight stoniness.	• Fine, Typic Kanhapludults • Fine, Ultic Hapludalfs	186.77	3.90
7	Deep, well drained, fine soils on moderately sloping side slopes of hills having loamy surface with moderate erosion; associated with: Moderately deep, excessively drained, fine loamy soils on moderately steep side slopes of hills with moderate erosion and slight stoniness.	• Fine, Typic Haplohumults • Fine loamy, Umbric Dystrochrepts	542.12	11.33
8	Deep, excessively drained, fine soils on strongly sloping side slopes of hills having loamy surface with moderate erosion and slight stoniness; associated with: Deep, well drained, fine soils on strongly sloping side slopes of hills with moderate erosion.	• Fine, Typic Hapludults • Fine, Typic Haplumbrepts	269.21	5.63
9	Deep, excessively drained, fine loamy soils on strongly sloping to moderately steep side slopes of hills having loamy surface with severe erosion; associated with: Deep, excessively drained, clayey skeletal soils on moderately steep side slopes of hills with moderate erosion and slight stoniness.	• Fine loamy, Typic Dystrochrepts • Clayey-skeletal, Typic Haplohumults	334.58	7.00
10	Deep, well drained, fine soils on gently to moderately sloping side slopes of hills having clayey surface with moderate erosion; associated with: Moderately deep, excessively drained, clayey skeletal soils on moderately steep side slopes of hill with severe erosion and slight stoniness.	• Fine, Typic Paleudults, • Clayey-skeletal, Typic Udorthents	542.81	11.35
11	Deep, somewhat excessively drained, fine soils on moderately steep side slopes of hills having loamy surface with moderate erosion; associated with: Deep, excessively drained, clayey skeletal soils on	• Fine, Typic Palehumults, • Clayey-skeletal, Typic	288.66	6.04

Unit	Description	Taxonomic Classification	Area (km^2)	Area (%)
	steeply sloping side slopes of hills with severe erosion and slight stoniness.	Udorthents		
12	Deep, excessively drained, clayey skeletal soils on gently to moderately sloping side slopes of hills having clayey surface with moderate to severe erosion and moderate stoniness; associated with: Deep, excessively drained, fine loamy soils on moderately steep side slopes of hills with moderate erosion.	• Clayey-skeletal, Typic Udorthents • Fine loamy, Typic Hapludults	581.24	12.15
13	Deep, well drained, fine silty soils on moderately steep side slopes of hills having loamy surface with severe erosion and slight stoniness; associated with: Deep, well drained, clayey-skeletal soils on moderately sloping side of hills with moderate erosion and slight stoniness.	• Fine silty, Typic Udorthents • Clayey-skeletal, Fluventic Umbric Dystrochrepts	195.58	4.09
14	Deep, poorly drained, fine silty soils on nearly level to gently sloping valleys having clayey surface with slight erosion, ground water table below one meter of the surface and slight flooding; associated with: Deep, well drained, fine soils on gently sloping side slopes of hills with slight erosion.	• Fine silty, Typic Haplaquepts • Fine, Aquic Dystrochrepts	118.16	2.47
15	Deep, poorly drained, fine soils on level to nearly level valleys having clayey surface with very slight erosion, ground water table between one to two meters of the surface and slight flooding; associated with: Deep, well drained, fine soils on gently sloping side slopes of hills with slight erosion.	• Fine, Typic Haplaquepts • Fine, Ruptic Ultic Dystrochrepts	162.00	3.39
16	Deep, very poorly drained, fine soils on valleys having clayey surface with no erosion, ground water table below one meter of the surface and moderate to severe flooding; associated with: Shallow, well drained, clayey skeletal soils on gently to moderately sloping side slopes of hills with severe erosion and strong stoniness.	• Fine, Typic Humaquepts • Clayey-skeletal, • Umbric Dystrochrepts	101.07	2.11
17	Deep, very poorly drained, very fine soils on nearly level valleys having clayey surface with very slight erosion, ground water level below one meter of the surface and severe flooding; associated with: Deep, poorly drained, fine soils on very gently sloping valleys with slight erosion, ground water level below one to two meters of the surface and slight flooding.	• Very fine, Mollic Haplaquepts • Fine, Typic Haplaquepts	539.05	11.27
18	Deep, extremely poorly drained, very fine soils on valleys having loamy surface with no erosion, ground water table within one meter of the surface and moderate flooding; associated with: Deep, very poorly drained, fine soils on valleys with no erosion, ground water table within one meter of the surface	• Very fine, Mollic Haplaquepts • Fine, Fluvaquentic Humaquepts	153.41	3.21

Unit	Description	Taxonomic Classification	Area (km^2)	Area (%)
	and moderate to severe flooding.			
19	Deep, somewhat excessively drained, fine soils on steeply sloping side slopes of hillocks having clayey surface with moderate to severe erosion; associated with: Deep, well drained, fine silty soils on moderately sloping side slopes of hillocks with moderate erosion.	• Fine, Typic Hapludalfs • Fine silty, Typic Haplumbrepts	18.73	0.39
20	Marshy land		246.91	5.16
TOTAL			**4783.00**	**100**

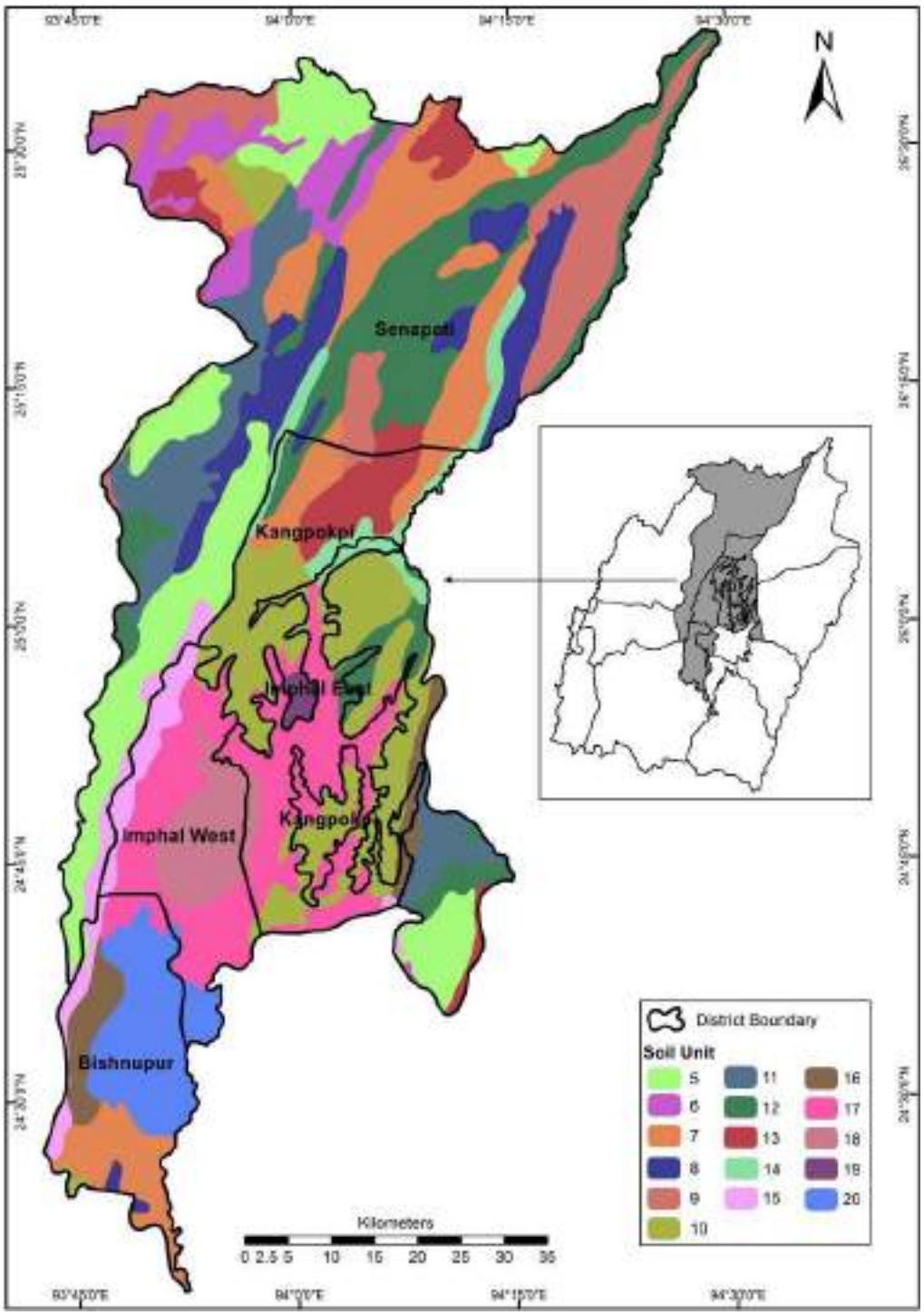


Figure 3.5: Soil Map of Districts Belonging to Study Area
(For Legend Refer Table 3.3)

3.4.6 Landuse Pattern of the Study Area

The study area pass through mixed land uses which are generally agricultural land, private plantation, government land etc. The calculations are based on detailed survey/ investigation carried out along the route of transmission/distribution lines and considering the total length of the line and its right of way. The total line length is 51.588 km which will impact an estimated of 292 acre of land. These include 46.155 km of line passing through agricultural land (271.87 acre of agricultural land), 3.667 km of private plantation (13.59 acre of private plantation land), 0.359 km of riverine (1.33 acre of riverine area) and 1.407 km of government land (5.21 acre of government land). A brief description about the type and use of land in the study area is given in **Table 3.4**.

Table 3.4: Landuse Pattern of the Study Area

S. No.	Name of Line	RoW Width (m)	Agricultural Land		Private Plantation		Riverine		Govt. Land		Total	
			Length (km)	Area (acre)	Length (km)	Area (acre)	Length (km)	Area (acre)	Length (km)	Area (acre)	Length (km)	Area (acre)
A	**Transmission Lines**											
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line	27	32.525	217	Nil	Nil	Nil	Nil	Nil	Nil	**32.525**	**217**
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	27	1.47	9.80	Nil	Nil	Nil	Nil	Nil	Nil	**1.47**	**9.80**
	Sub Total		**33.995**	**226.80**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**33.995**	**226.80**
B	**Distribution Lines**											
3	LILO from Mongsangei to Kwatka at Pishum	15	Nil	Nil	Nil	Nil	Nil	Nil	0.157	0.58	**0.157**	**0.58**
4	33 kV line from Mongsangei to Hiyanthang substation	15	2.3	8.52	1.27	4.71	Nil	Nil	1.25	4.63	**4.82**	**17.86**
5	33 kV line from Moirang to Kwatka substation	15	4.91	18.20	1.42	5.26	Nil	Nil	Nil	Nil	**6.33**	**23.46**
6	33 kV line from Nambol to Leimapokpam substation	15	4.95	18.35	0.977	3.62	0.359	1.33	Nil	Nil	**6.286**	**23.30**
	Sub Total		**12.16**	**45.07**	**3.667**	**13.59**	**0.359**	**1.33**	**1.407**	**5.21**	**17.593**	**65.20**
	TOTAL		**46.155**	**271.87**	**3.667**	**13.59**	**0.359**	**1.33**	**1.407**	**5.21**	**51.588**	**292.00**

Source: Detailed Survey of POWERGRID/ Contractor

3.5 BIOLOGICAL ENVIRONMENT OF DISTRICTS BELONGING TO STUDY AREA

It is pertinent to mention that, in the present project, forest area/land covered under Forest (Conservation) Act, 1980 has been completely avoided with careful selection of route alignment. Therefore, diversion of forest land is not involved in the project.

To analyze the impacts and plan mitigation measures, it is imperative to study baseline information broadly for districts belonging to study area and specifically for transmission line and surrounding or proximity area as well (study area), which includes forest areas under the control of individual/community/village councils. The same has been described in ensuing paragraphs.

3.5.1 Forest Types

As per the 'A Revised Survey of the Forest Types of India' by Champion and Seth (1968) forests in the districts belonging to study area can be classified five Forest Type Groups which are further divided into 7 Forest Types and Plantation/Tree Outside Forest (TOF) (**Table 3.5**).

Table 3.5: Forest types found in the Study Area

Group	Sub-Group	Forest Type
2-Tropical Semi-evergreen Forest	2B-Northern Tropical Semi-Evergreen Forests	2B/C2 Cachar Semi-Evergreen Forest
		2/2S1 Secondary Moist Bamboo Brakes
3-Tropical Moist Deciduous Forest	3C-North India Moist Deciduous Forest	3C/C3b East Himalayan Moist Mixed Deciduous Forest
4-Littoral and Swamp Forest	4D-Tropical Seasonal Swamp Forest	4D/2S2 Eastern Wet Alluvial Grassland
8-Subtropical Broad-Leaved Hill Forest	8B- Northern Subtropical Broad Leaved Wet Hill Forest	8B/C1 East Himalayan Sub-Tropical Wet Hill Forest
9- Subtropical Pine Forest	--	9/C2 Assam Sub-Tropical Pine Forest
		9/C2/DS1 Assam Subtropical Pine Savannah
		Plantation/Tree Outside Forest (TOF)

3.5.2 Forest Cover

Total forest cover in the districts belonging to study area is 2484.09 km^2, which is 49.73% of the geographical area of the districts belonging to study area. In terms of forest canopy density classes, the districts belonging to study area have 270.75 km^2 under Very Dense Forest, 822.01 km^2 under Moderately Dense Forest and 1391.33 km^2 under Open Forest. The details of forest cover of districts belonging to study area are given below in **Table 3.6**.

Table 3.6: Forest Cover in Districts Belonging to Study Area

S. No.	Name of District	Geographical Area (GA) (km^2)	2019 Assessment (Area in km^2)				% of GA
			Very Dense Forest	Moderately Dense Forest	Open Forest	Total Area	
1	Bishnupur	496	0.00	0.99	20.51	**21.50**	**4.33**
2	Imphal East & Jiribam	709	0.00	60.90	213.36	**274.26**	**38.68**
3	Imphal West	519	0.00	15.66	36.09	**51.75**	**9.97**
4	Senapati & Kangpokpi	3271	270.75	744.46	1121.37	**2136.58**	**65.32**
	TOTAL	**4995**	**270.75**	**822.01**	**1391.33**	**2484.09**	**49.73**

Source: India State of Forest Report 2019, Manipur

3.6 BIOLOGICAL ENVIRONMENT OF THE STUDY AREA (RoWs & SUB-STATIONS' VICINITY)

3.6.1 Floristics Elements

The study area for the floristic surveys has already been defined in the Chapter 1 which is defined as area in the proximity of the proposed transmission lines on both left and right sides, corridors of transmission line routes and substations. The description of the vegetation is based upon these observations and data collected around each site collected through transects' survey.

In general, the vegetation in and areas around sampling sites is characterized with two landforms valley and hills. Vegetation in valley region is comprised of Tropical moist and deciduous forest, while East Himalayan sub-tropical wet hill forests, and Secondary Moist Bamboo Brakes are prevalent in the hills.

A series of transects were identified along the routes of transmission line covering the corridors between the RoW of transmission line and substations. Details of transmission line and locations (transects) selected for ecological survey are as given in **Table 3.7.**

Table 3.7: Transmission Lines and Transects Locations for Vegetation Sampling

S. No.	Name of Transmission Line	Status of Project	Distance Covered
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line – **32.525 km**	Foundation, erection, earthing, and stringing work completed. Testing and commissioning is yet to start	Approx. 5 km (From Tower-1 to 8, Tower-85 to 91 and Tower-106 to 117)
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol – **1.47 km**	Work completed	Entire stretch
3	LILO from Mongsangei to Kakwa at Pishum – **0.157 km**	Work completed	Entire stretch

S. No.	Name of Transmission Line	Status of Project	Distance Covered
4	33 kV line from Mongsangei to Hiyanthang substation – **4.82 km**	Work completed	Approx. 3 km (From FP-1 to DP-10)
5	33 kV line from Iroisemba to Takyel substation – **7.0 km**	Ongoing	Route is yet to be finalized
6	33 kV line from Moirang to Kwatka substation – **6.33 km**	Work completed	Approx. 1 km (From SP-58 to DP-16 and SP-92 to FP-3)
7	33 kV line from Nambol to Leimapokpam substation – **6.286 km**	Work completed	Approx. 1 km (From FP-1 to DP-1 and DP-12 to DP-14)

3.6.1.1 Floral Diversity

As per field surveys and based upon secondary data an inventory of 197 plant species in the study area has been prepared**.** Group-wise breakup of families, genera and species is given below.

Group	Angiosperms	Gymnosperms	Pteridophytes	Bryophytes	Total
Families	66	3	7	7	**83**
Genera	155	3	8	7	**190**
Species	177	3	9	8	**197**

A brief description of number of plant species recorded in various taxonomic groups is given in the following paragraphs.

a) Angiosperms

During the field surveys conducted in the study area 177 plant species of angiosperms belonging to 66 families were recorded (For detailed list see **Annexure I**). These include trees, shrubs, herbs, and climbers. Herbaceous component comprises of 71 species, shrubs are 45 and trees are comprised of 61 species. Most common families recorded from the study area are Poaceae, Fabaceae, Malvaceae, Asteraceae, Orchidaceae, Moraceae and Acanthaceae.

b) Gymnosperms

Three species of gymnosperms recorded from the study area are:

S. No.	Family	Botanical name
1	Cupressaceae	*Platycladus orientalis* (Syn. *Thuja orientalis*)
2	Gnetaceae	*Gnetum montanum*
3	Pinaceae	*Pinus kesiya*

c) Pteridophytes:

During field survey 9 species belonging to 6 families of Pteridophytes were recorded from the area:

S. No.	Family	Botanical Name
1	Dennstaedtiaceae	*Pteridium aquilinum*
2	Equisetaceae	*Equisetum diffusum*
3	Lygodiaceae	*Lygodium flexuosum*
4	Polypodiaceae	*Drymoglossum piloselloides*
5	Pteridaceae	*Adiantum caudatum*
6	Pteridaceae	*Onychium siliculosum*
7	Pteridaceae	*Pteris vittata*
8	Pteridaceae	*Adiantum edgeworthii*
9	Selaginellaceae	*Selaginella gracilis*

d) Bryophytes

Eight species belonging to 7 families of Bryophytes were recorded from the study area as follows.

S. No.	Family	Botanical Name
1	Andreaeaceae	*Andreaea rupestris*
2	Bryaceae	*Bryum mildeanum*
3	Marchantiaceae	*Marchantia papiliata*
4	Marchantiaceae	*Marchantia polymorpha*
5	Meteoriaceae	*Papillaria crocea*
6	Polytrichaceae	*Polytrichum abbreviatum*
7	Ricciaceae	*Ricciocarpos natans*
8	Targioniaceae	*Targionia hypophylla*

3.6.1.2 Rare Threatened and Endangered Species

Conservation status of plant species found in the **'Study Area'** was assessed using IUCN Red list of Threatened Species Version 2020.3 (accessed in February 2021) and Botanical Survey of India Red Data Book. Out of 197 species reported from the study area only 70 species have been assessed by IUCN Red list of Threatened Species Version 2020.3. All the plant species assessed by IUCN Red list of Threatened Species Version 2020.3 are listed under "Least Concern' category (**Table 3.8**).

Table 3.8: RET Plant Species Reported from Study Area

S. No.	Family	Name of Species	Conservation Status IUCN 2020.3
1	Acanthaceae	*Barleria cristata*	LC
2	Acanthaceae	*Justicia adhatoda*	LC
3	Acanthaceae	*Strobilanthes auriculatus*	LC
4	Acanthaceae	*Thunbergia coccinea*	LC
5	Acanthaceae	*Strobilanthes hamiltoniana*	LC
6	Altingiaceae	*Altingia excelsa*	LC
7	Amaranthaceae	*Achyranthes aspera*	LC
8	Amaranthaceae	*Amaranthus viridis*	LC
9	Amaranthaceae	*Chenopodium album*	LC
10	Anacardiaceae	*Rhus chinensis*	LC

S. No.	Family	Name of Species	Conservation Status IUCN 2020.3
11	Anacradiaceae	*Mangifera sylvatica*	LC
12	Apiaceae	*Centella asiatica*	LC
13	Araceae	*Alocasia fornicata*	LC
14	Araliaceae	*Brassaiopsis glomerulata*	LC
15	Araliaceae	*Trevesia palmata*	LC
16	Araliaceae	*Brassaiopsis hainla*	LC
17	Arecaceae	*Calamus tenuis*	LC
18	Asteraceae	*Artemisia capillaris*	LC
19	Asteraceae	*Chromolaena odorata*	LC
20	Cannabaceae	*Trema orientalis*	LC
21	Cannabaceae	*Celtis australis*	LC
22	Combretaceae	*Combretum decandrum*	LC
23	Commelinaceae	*Commelina benghalensis*	LC
24	Cyperaceae	*Carex longipes*	LC
25	Cyperaceae	*Cyperus exaltatus*	LC
26	Cyperaceae	*Cyperus rotundus*	LC
27	Dilleniaceae	*Dillenia indica*	LC
28	Dipterocarpaceae	*Shorea assamica*	LC
29	Euphorbiaceae	*Macaranga denticulata*	LC
30	Euphorbiaceae	*Ostodes paniculata*	LC
31	Euphorbiaceae	*Mallotus paniculatus*	LC
32	Fabacaea	*Acacia farnesiana*	LC
33	Fabaceae	*Albizia procera*	LC
34	Fabaceae	*Bauhinia variegata*	LC
35	Fabaceae	*Dalbergia pinnata*	LC
36	Fabaceae	*Erythrina variegata*	LC
37	Fabaceae	*Hardwickia binata*	LC
38	Fabaceae	*Mimosa pudica*	LC
39	Fagaceae	*Castanopsis indica*	LC
40	Juglandaceae	*Engelhardtia spicata*	LC
41	Lamiaceae	*Callicarpa arborea*	LC
42	Lamiaceae	*Gmelina arborea*	LC
43	Lamiaceae	*Elsholtzia blanda*	LC
44	Lauraceae	*Litsea monopetala*	LC
45	Lythraceae	*Duabanga grandiflora*	LC
46	Magnoliaceae	*Magnolia champaca*	LC
47	Magnoliaceae	*Magnolia liliifera*	LC
48	Malvaceae	*Bombax ceiba*	LC
49	Malvaceae	*Kydia calycina*	LC
50	Malvaceae	*Pterospermum acerifolium*	LC
51	Meliaceae	*Chukrasia tabularis*	LC
52	Meliaceae	*Toona ciliata*	LC
53	Moraceae	*Ficus semicordata*	LC
54	Moringaceae	*Moringa oleifera*	LC
55	Orchidaceae	*Bulbophyllum roxburghii*	LC
56	Orchidaceae	*Bulbophyllum wallichii*	LC
57	Orchidaceae	*Ceratostylis teres*	LC
58	Orchidaceae	*Dendrobium hookerianum*	LC
59	Orchidaceae	*Eria acervata*	LC
60	Pandanaceae	*Pandanus odorifer*	LC

S. No.	Family	Name of Species	Conservation Status IUCN 2020.3
61	Phyllanthaceae	*Bischofia javanica*	LC
62	Phyllanthaceae	*Phyllanthus emblica*	LC
63	Plantaginaceae	*Plantago major*	LC
64	Poaceae	*Phragmites karka*	LC
65	Poaceae	*Poa annua*	LC
66	Poaceae	*Saccharum spontaneum*	LC
67	Simaroubaceae	*Ailanthus integrifolia*	LC
68	Theaceae	*Schima wallichii*	LC
69	Urticaceae	*Urtica dioica*	LC
70	Zingiberaceae	*Alpinia nigra*	LC

3.6.1.3 Vegetation Profile of the Sampling Area

During the field surveys vegetation profile of the study area i.e., areas along the transmission and distribution lines were studied. Based upon these observations the information of vegetation along these transmission transmission and distribution lines is given in the table below. It can be seen that all the lines are passing through paddy fields and only LILO of Yurembam (Imphal-State) – Karong at Gamphajol passes through scrub vegetation comprised mainly of shrubby species and few scaterred trees in between.

S. No.	Name of Transmission & Distribution Line	Vegetation Profile
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line	The line passes through paddy fields
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	The area along the transmission is characterized as scrub land surrounded by habitation and agriculture fields. Vegetation along the line is mainly comprised of shrub and herb species like *Ageratum conyzoides, Arisaema concinnum, Asparagus racemosus, Centella asiatica, Urena lobata, Cocculus orbiculatus, Datura metel, Debregeasia longifolia, Ricinus communis*. Tree species recorded in the surroundings of the area are *Albizzia lebbek*, *Alnus nepalensis, Anthocephalus cadamba, Bauhinia purpurea*, *Callicarpa arborea*, *Castanopsis hystrix*, *Gmelina arborea*, *Lannea grandis*, *Azadirachta indica* and *Sapium baccatum*
3	LILO from Mongsangei to Kakwa at Pishum	The line passes through paddy fields and the poles are erected on the bunds.
4	33 kV line from Mongsangei to Hiyanthang substation	The line passes through paddy fields and along the roads. Poles are erected on the bunds and roadside.
5	33 kV line from Iroisemba to Takyel substation	Route is yet to be finalized.
6	33 kV line from Moirang to Kwatka substation	The line passes through paddy fields and the poles are erected on the bunds.
7	33 kV line from Nambol to Leimapokpam substation	The line passes through paddy fields and along the roads. Poles are erected on the bunds and roadside.
8	33 kV line from Sanjenbam to	The line passes through paddy fields and along the

S. No.	Name of Transmission & Distribution Line	Vegetation Profile
	Napetpalli substation	roads. Poles are erected on the bunds and roadside.

3.6.1.4 Economically Important Plant Species

The people of the area use wild plants in their daily life as food, medicine, fiber, fodder, fuel wood, timber, vegetables, fruits, and various minor forest products. Agriculture is the major occupation in the project area and jhum cultivation is prevalent. Jhum paddy, WRC paddy, maize, soybean, and rapeseed/mustard are main crops cultivated. Among horticultural crops are pineapple, banana, orange, passion fruit and litchi. Among vegetable chili, colocasia, leafy vegetables, tapioca, pumpkin, and ginger are common. During finalization of route of transmission lines, it has been ensured that they do not pass-through areas with good vegetation and avoiding any disturbance to the vegetation. Wherever it was unavoidable, it has been ensured that the damage to vegetation is minimal. Distribution lines also do not traverse through vegetated patches in the area as it runs along the bunds of agricultural field or road. Therefore, these lines are not expected to disturb good vegetation areas harbouring economically important plant species and thereby their impact on any income from the economically important plant species due to implementation of the instant project is not envisaged.

Wild Edible Plants

List of wild edible plants used by villagers in the study area was prepared from http://manenvis.nic.in/Database/WildEdiblePlants_2940.aspx; Gangte *et. al* (2013); https://ethnobiomed.biomedcentral.com/articles/10.1186/s13002-016-0080-4 and the same is given at **Table 3.9**.

Table 3.9: Wild Edible Plant Species Used by Tribes in the Study Area

S. No.	Family	Name of species	Common Name	Mode of Use
1	Vitaceae	*Cissus adnata*	Kongouyen	The leaves are used as vegetable.
2	Alismataceae	*Alisama plantago*	Kaothum	Cooked or fresh rhizome is eaten
3	Alismataceae	*Sagittaria sagittifolia*	Koukha	The petioles are cooked and eaten. The tubers are also eaten as cooked or raw.
4	Amaranthaceae	*Asternanthera sessilis*	Phakchet	The leaves with tender stems are used specially in chagempomba curry
5	Amaryllidaceae	*Allium hookeri*	Maroinapakpi	The whole plant used as vegetable and spices.
6	Amaryllidaceae	*Allium ramosum*	Maroi Nakuppi	The leaves are used as vegetable and as spices
7	Apiaceae	*Centella asiatica*	Peruk	The whole plant is cooked and used as curry
8	Apiaceae	*Oenanthe*	Comprek	The plant is used in salad and

S. No.	Family	Name of species	Common Name	Mode of Use
		javanica		cooked as curry.
9	Araceae	*Alocasia cucullata*	Pallukabi	The tuber is used as raw in salad and cooked petiole is used as vegetable.
10	Araceae	*Alocasia macrorrhizos*	Pan	Whole plant is used for curry.
11	Araceae	*Colocasia gigantea*	Yendem	The whole plant is generally used for vegetable.
12	Caryophylliaceae	*Stellaria media*	Yerum Keirum	The young leaves and shoots are used as vegetable.
13	Convolulaceae	*Ipomoea aquatica*	Kolamani	The whole plant is used in salads and cooked in curry.
14	Cycadaceae	*Cycas pectinata*	Yendang	The young tender leaves and male cone are used as vegetable.
15	Dioscoreaceae	*Dioscorea glabra*	Ha	The cooked or roasted root tubers are eaten.
16	Fabaceae	*Crolalaria Juncea*	U-Hawai matol	The stem with young tender leaves are used in salad.
17	Fabaceae	*Leucaena leucocephala*	Chigonglei angouba	Tender leaves, young fruits and seeds are used as raw or fry as vegetable.
18	Fabaceae	*Neptunia oleracea*	Ishing Ikaithabi	The young stems and leaves are eaten raw in salad and cooked.
19	Fabaceae	*Parkia javanica*	Yongchak	The flower is used in salad. The fruits are also used as vegetable as raw or cooked.
20	Fabaceae	*Sesbania cannabinuss*	Chuchurangmei	The young leaves and fruits are used as vegetable.
21	Fabaceae	*Vicia sativus*	Pikongjai	The young tender stems with leaves are used in salad by the people in rural areas.
22	Lamiaceae	*Ocimum barilieum*	Mayangba	The leaves and whole inflorescence are used as spices for salad and curry.
23	Malvaceae	*Hibiscus cannabinus*	Saugri	The boiled leaves are used as curry.
24	Musaceae	*Musa paradisiaca*	Laphu	The stem, inflorescence and fruits are used as vegetable.
25	Nymphaeaceae	*Euryale ferox*	Thangjing	The young thorny leaves and petioles are used as fresh or cooked. Seeds with pulp are used as raw or cooked
26	Poaceae	*Bambasa tuida*		
27	Poaceae	*Bambusa nutans*	Sanebi	Young shoots from fresh plant are cooked or fermented shoots are used.
28	Poaceae	*Dendrocalamus gigantanus*	Meiribob	Yong shoots & fermented young shoots are used as vegetable.
29	Poaceae	*Zizania latifolia*	Eshing Kambong	The young stem with tender leaves are used as a vegetable
30	Polygonaceae	*Polygonum flaccidum*	Yelang	The young shoot and tender leaves are used as vegetable.
31	Polygonaceae	*Rumex maritimus*	Palang shak	The leaves are used as a vegetable.
32	Primulaceae	*Lysimachia ovata*	Kangoi	The plant is used as vegetable by

S. No.	Family	Name of species	Common Name	Mode of Use
				the local people.
33	Saururaceae	*Houttuynia cordata*	Toningkhok	The fresh whole plant is used as spices for curry and salad
34	Zingiberaceae	*Alpinia nigra*	Pulei	The shoots with tender leaves are cooked.

Medicinal Plants

Plant species are used for various medicinal purposes for treating various ailments by local tribals. The list of plant species used for various medicinal purposes by locals and found in the study area was prepared from Khumbongmayum *et. al*. (2005), Lokendrajit *et. al*. (2012), Leishangthem and Sharma (2014), Yuhlung and Bhattacharyya (2016), and the same is given in **Table 3.10.**

Table 3.10: Plant Species Used for Medicinal Purposes in the Study Area

S. No	Family	Scientific Name	Parts use	Medicinal values
1	Araceae	*Acorus calamus*	Rhizome	Cough, fever, itching
2	Asteraceae	*Adenostem malavenia*	Leaves	Fresh injuries & skin disease
3	Acanthaceae	*Adhatoda vasica*	Leaves & flower	Cough, fever, dysentery
4	Fabaceae	*Albizia myriophylla*	Root	Dog Bite
5	Araceae	*Alocasia cucullata*	Rhizome	Purify blood
6	Zingiberaceae	*Alpinia allughas*	Rhizome/ Root	Gas Formation (Flatulence)
7	Zingiberaceae	*Alpinia galanga*	Rhizome	Piles and Regulate blood circulation
8	Acanthaceae	*Andrographis paniculata*	Leaves	Chronic fever
9	Asteraceae	*Artemisia nilagirica*	Shoot & leaves	Mouth ulcer & dizziness
10	Liliaceae	*Asparagus filicinus*	Root	Dysentery & epilepsy
11	Meliaceae	*Azadiracta indica*	Leaf	Malaria
12	Asteraceae	*Blumea balsamifera*	Leaf	Burning Sensation of Stomach
13	Papilionaceae	*Butea monosperma*	Leaves, bark,	Diarrhea and dysentery,
14	Asclepiadaceae	*Calotropis gigantea*	Shoot	Ring worm & leprosy
15	Brassicaceae	*Cardamine hirsute*	Whole plant except root	Diuretic, better urination
16	Caesalpiniaceae	*Cassia alata*	Leaves	Diabetes, skin diseases
17	Meliaceae	*Toona ciliata*	Leaves	Skin diseases & poxes
18	Apiaceae	*Centilla asiatica*	Whole plant	Sore Throat/Hypertension
19	Lauraceae	*Cinnamomum tamala*	Leaves	Dizziness, headache
20	Verbenaceae	*Clerodendrum colebrookianum*	Leaves	Skin diseases, dysentery
21	Verbenaceae	*Clerodendrum serratum*	Leaves, stem	Fever, dysentery, asthma, bronchitis
22	Zingiberaceae	*Costus speciosus*	Rhizome	Urinary stone case
23	Zingiberaceae	*Curcuma caesia*	Rhizome	Cough, dysentery
24	Gramineae	*Cymbopogon citrates*	Leaves	Cut & injuries, Digestion & Sinusitis
25	Lamiaceae	*Elsholtzia blanda*	Leaves	Boil

S. No	Family	Scientific Name	Parts use	Medicinal values
26	Apiaceae	*Eryngium foetidum*	Whole plant	Arthritis
27	Asteraceae	*Eupatorium* sp.	Leaves	Epilepsy
28	Euphorbiaceae	*Euphorbia hirta*	Young stem &	Diarrhoea, dysentery &
29	Moraceae	*Ficus glomerata*	Leaf	Body Swelling
30	Cucurbitaceae	*Melothria maderaspatana*	Whole plant	Jaundice
31	Musaceae	*Musa paradisiaca*	Fruit & Flower	Dysentery
32	Bignoniaceae	*Oroxylum indicum*	Bark, leaf	Tonsilitis/ Sore Throat/ Sinus
33	Oxalidaceae	*Oxalis corniculata*	Leaf	Arthritis/ Rheumatism (Joint's pain)
34	Phyllanthaceae	*Phyllanthus emblica*	Fruit	Dry Cough and Asthma, Headache, Hypertension
35	Solanaceae	*Saccharum officinarum*	Stem/ fruit	Jaundice (Thongngak)
36	Solanaceae	*Solamum virginuanum*	Fruit	Headache/ Toothache
37	Myrtaceae	*Syzigium fruticosum*	Leaf	Fever (especially for children)
38	Verbenaceae	*Vitex negundo*	Leaf	Piles
39	Flacourtiaceae	*Xylosma longifolia*	Leaf	Piles
40	Rutaceae	*Zanthoxylum acanthopodium*	Seed	Gas Formation

Source: Khumbongmayum et. al. (2005), Lokendrajit et. al. (2012), Leishangthem and Sharma (2014), Yuhlung and Bhattacharyya (2016).

Timber yielding Tree species

Some of the timber yielding trees found in the study area are *Phoebe hainesiana, Gmelina arborea, Michelia champaca, Pinus kesiya, Tectona grandis, Terminalia myriocarpa*, *Dipterocarpus tuberculatus* and *Toona ciliata*.

3.6.2 Faunal Elements

The fauna of the state has been compiled with the help of secondary sources. Data was compiled from published literature Viz; The Environmental Information System (ENVIS) Centre, Manipur (http://manenvis.nic.in/Database/Biodiversityof_Manipur_3142.aspx) and Zoological Survey of India (ZSI). Manipur harbours a variety of wildlife distributed throughout the state. For management and preservation of wildlife in the State, the Department of Forests, Environment & Ecology and Wildlife has a full-fledged wildlife Wing under the Chief Wildlife Warden.

3.6.2.1 Mammals

As per the data compiled, 31 species of mammals belonging 18 families of 7 orders are reported from the districts belonging to study area. As per the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, 2020-3, 7 species are in Endangered (EN) category, 4 species are in Near Threatened (NT) category, 7 species are in Vulnerable (VU) category and 13 species are in Least Concerned (LC) category. List of important mammals

found in the districts belonging to study area alongwith their conservation status is given in **Table 3.11.** The classification and nomenclature of mammals is as per https://www. iucnredlist.org/.

Table 3.11: List of Mammals

S. No.	Family	Scientific Name	Common Name	Conservation Status (IUCN 2020-3)
	ORDER: CARNIVORA			
1	Canidae	*Canis aureus*	Jackal	LC
2	Canidae	*Vulpes bengalensis*	Indian Fox	LC
3	Felidae	*Catopuma temminckii*	Asiatic Golden Cat	NT
4	Felidae	*Panthera pardus*	Leopard Cat	VU
5	Felidae	*Panthera tigris*	Tiger	EN
6	Felidae	*Pardofelis bengalensis*	Leopard Cat	LC
7	Herpestidae	*Herpestes edwadsi*	Mongoose	LC
8	Mustelidae	*Arctonyx collaris*	Hog Badger	VU
9	Mustelidae	*Lutra lutra*	Common Otter	NT
10	Mustelidae	*Martes flavigula*	Yellow-throated Marten	LC
11	Prionodontidae	*Prionodon pardicolor*	Spotted Linsang	LC
12	Ursidae	*Ursus thibetanus*	Asiatic Black Bear	VU
13	Viverridae	*Viverricula indica*	Small Indian civet	LC
	ORDER: CETARTIODACTYLA			
14	Bovidae	*Bos gaurus*	Gaur	VU
15	Bovidae	*Capricornis sumatraensis*	Serow	VU
16	Cervidae	*Axis porcinus*	Hog Deer	EN
17	Cervidae	*Muntiacus muntjak*	Barking Deer	LC
18	Cervidae	*Rucervus eldii*	Eld's Deer	EN
19	Cervidae	*Rusa unicolor*	Sambar	VU
20	Suidae	*Sus scrofa*	Wild Boar	LC
	ORDER: LAGOMORPHA			
21	Leporidae	*Lepus nigricollis*	Common Hare	LC
	ORDER: PHOLIDOTA			
22	Manidae	*Manis pentadactyla*	Pangolin	EN
	ORDER: PRIMATE			
23	Cercopithecidae	*Macaca assamensis*	Assam Macaque	NT
24	Cercopithecidae	*Trachypithecus pileatus*	Capped Langur	VU
25	Hylobatidae	*Hoolock hoolock*	Hoolock Gibbon	EN
26	Lorisidae	*Nycticebus coucang*	Slow Loris	EN
	ORDER: PROBOSCIDEA			
27	Elephantidae	*Elaphus maximus*	Elephant	EN
	ORDER: RODENTIA			
28	Hystricidae	*Hystrix indica*	Porcupine	LC
29	Sciuridae	*Petuarista petuarista*	Giant Flying Squirrel	LC
30	Sciuridae	*Ratufa bicolor*	Black Giant Squirrel	NT
31	Sciuridae	*Ratufa indica*	Indian Giant Squirrel	LC

Source: *http://manenvis.nic.in/ Database/Biodiversityof Manipur 3142.aspx*

3.6.2.2 Avifauna

As per the data compiled, 114 species of avifauna belonging to 45 families of 20 orders are reported from the districts falling within study area. As per the IUCN Red List of Threatened species, 2020-3, 1 species is in Endangered (CR)

category, 4 species are in the Vulnerable (VU) category, 5 species are in Near Threatened (NT) category and 104 species are in the Least Concern (LC) category. List of important avifauna found in the districts belonging to study area alongwith their conservation status is given in **Table 3.12.**

Table 3.12: List of Avifauna

S. No.	Family	Scientific Name	Common Name	Conservation Status IUCN 2020-3
	ORDER: ACCIPITRIFORMES			
1	Accipitridae	*Accipiter nisus*	Eurasian Sparrowhawk	LC
2	Accipitridae	*Circus aeruginosus*	Western Marsh-harrier	LC
3	Accipitridae	*Circus macrourus*	Pallid Harrier	NT
4	Accipitridae	*Circus melanoleucos*	Pied Harrier	LC
5	Accipitridae	*Elanus caeruleus*	Black-winged Kite	LC
6	Accipitridae	*Gyps himalayensis*	Himalayan Griffon	NT
7	Accipitridae	*Milvus migrans*	Black Kite	LC
8	Pandionidae	*Pandion haliaetus*	Osprey	LC
	ORDER: ANSERIFORMES			
9	Anatidae	*Anas acuta*	Northern Pintail	LC
10	Anatidae	*Anas crecca*	Common Teal	LC
11	Anatidae	*Anas poecilorhyncha*	Spot-billed Duck	LC
12	Anatidae	*Anas querquedula*	Garganey	LC
13	Anatidae	*Anas strepera*	Gadwall	LC
14	Anatidae	*Aythya fuligula*	Tufted Duck	LC
15	Anatidae	*Aythya nyroca*	Ferruginous Duck	NT
16	Anatidae	*Dendrocygna bicolor*	Fulvous Whistling-duck	LC
17	Anatidae	*Dendrocygna javanica*	Lesser Whistling-duck	LC
18	Anatidae	*Netta rufina*	Red-crested Pochard	LC
19	Anatidae	*Nettapus coromandelianus*	Cotton Pygmy-goose	LC
20	Anatidae	*Tadorna ferruginea*	Ruddy Shelduck	LC
	ORDER: APODIFORMES			
21	Apodidae	*Apus nipalensis*	House Swift	LC
22	Apodinae	*Aerodramus brevirostris*	Himalayan Swiftlet	LC
	ORDER: BUCEROTIFORMES			
23	Bucerotidae	*Aceros nipalensis*	Rufous-necked hornbill	VU
24	Bucerotidae	*Anthracoceros albirostris*	Oriental Pied Hornbill	LC
25	Bucerotidae	*Buceros bicornis*	Great Hornbill	VU
26	Bucerotidae	*Rhyticeros undulatus*	Wreathed Hornbill	VU
27	Upupidae	*Upupa epops*	Eurasian hoopoe	LC
	ORDER: CAPRIMULGIFORMES			
28	Caprimulgidae	*Caprimulgus asiaticus*	Indian nightjar	LC
	ORDER: CHARADRIIFORMES			
29	Charadriidae	*Vanellus indicus*	Red-wattled Lapwing	LC
30	Jacanidae	*Hydrophasianus chirurgus*	Pheasant-tailed Jacana	LC

S. No.	Family	Scientific Name	Common Name	Conservation Status IUCN 2020-3
31	Jacanidae	*Metopidius indicus*	Bronze-winged Jacana	LC
32	Laridae	*Larus ridibundas*	Black headed Gull	LC
33	Scolopacidae	*Gallinago gallinago*	Common Snipe	LC
34	Scolopacidae	*Gallinago stenura*	Pin-tailed Snipe	LC
35	Scolopacidae	*Numenius phaeopus*	Whimbrel	LC
	ORDER: CICONIIFORMES			
36	Ciconiidae	*Anastomus oscitans*	Asain Openbill	LC
	ORDER: COLUMBIFORMES			
37	Columbidae	*Columba livia*	Rock Pigeon	LC
38	Columbidae	*Ducula badia*	Mountain Imperial-Pigeon	LC
39	Columbidae	*Streptopelia chinensis*	Spotted Dove	LC
40	Columbidae	*Streptopelia orientalis*	Oriental Turtle Dove	LC
41	Columbidae	*Treron phoenicoptera*	Yellow-footed green Pigeon	LC
	ORDER: CORACIIFORMES			
42	Alcedinidae	*Alcedo atthis*	Common kingfisher	LC
43	Coraciidae	*Coracias benghalensis*	Indian Roller	LC
44	Meropidae	*Merops orientalis*	Green Bee-eater	LC
	ORDER: CUCULIFORMES			
45	Cuculidae	*Centropus sinensis*	Great Coucal	LC
46	Cuculidae	*Eudynamys scolopaceus*	Common Koel	LC
47	Phasianidae	*Arborophila torqueola*	Hill Partridge	LC
	ORDER: FALCONIFORMES			
48	Falconidae	*Falco tinnunculus*	Common Kestrel	LC
	ORDER: GALLIFORMES			
49	Ardeidae	*Ardea Cinerea*	Grey Heron	LC
50	Ardeidae	*Ardea intermedia*	Intermediate Egret	LC
51	Ardeidae	*Ardea purpurea*	Purple Heron	LC
52	Ardeidae	*Ardeola grayii*	Indian Pond-heron	LC
53	Ardeidae	*Bubulcus Ibis*	Cattle Egret	LC
54	Ardeidae	*Ixobrychus cinnamomeus*	Cinnamon Bittern	LC
55	Ardeidae	*Nycticorax nycticorax*	Black-crowned Night-heron	LC
56	Corvidae	*Corvus macrorhynchos*	Large-billed Crow	LC
57	Corvidae	*Corvus splendens*	House crow	LC
58	Phasianidae	*Coturnix coturnix*	Common Quail	LC
59	Phasianidae	*Gallus gallus*	Red Jungle Fowl	LC
60	Phasianidae	*Lophura leucomelanos*	Kalij Pheasant	LC
61	Phasianidae	*Perdicula manipurensis*	Manipur Bush Quail	EN

S. No.	Family	Scientific Name	Common Name	Conservation Status IUCN 2020-3
62	Phasianidae	*Polyplectron bicalcaratum*	Grey Peacock-pheasant	LC
63	Phasianidae	*Syrmaticus humiae*	Mrs Hume's Pheasant	NT
	ORDER: GRUIFORMES			
64	Rallidae	*Amaurornis phoenicurus*	White-breasted Waterhen	LC
65	Rallidae	*Fulica atra*	Common Coot	LC
66	Rallidae	*Gallinula chloropus*	Common Moorhen	LC
67	Rallidae	*Porphyrio porphyrio*	Purple Swamphen	LC
68	Rallidae	*Rallus aquaticus*	Western Water Rail	LC
	ORDER: PASSERIFORMES			
69	Campephagidae	*Pericrocotus speciosus*	Scarlet Minivet	LC
70	Corvidae	*Dendrocitta formosae*	Gray Treepie	LC
71	Corvidae	*Dendrocitta vagabunda*	Rufous Treepie	LC
72	Corvidae	*Urocissa erythroryncha*	Yellow-billed Blue Magpie	LC
73	Emberizidae	*Emberiza fucata*	Chestnut-eared Bunting	LC
74	Emberizidae	*Melophus lathami*	Crested Bunting	LC
75	Leiothrichidae	*Heterophasia capistrata*	Rufous sibia	LC
76	Leiothrichidae	*Turdoides caudatus*	Common Babbler	LC
77	Monarchidae	*Terpsiphone paradisi*	Indian Paradise-flycatcher	LC
78	Motacillidae	*Motacilla alba*	White wagtail	LC
79	Muscicapidae	*Chaimarrornis leucocephalus*	White-capped Water Redstart	LC
80	Muscicapidae	*Copsychus malabaricus*	White-rumped Shama	LC
81	Muscicapidae	*Copsychus saularis*	Oriental Magpie Robin	LC
82	Muscicapidae	*Enicurus maculatus*	Spotted Forktail	LC
83	Muscicapidae	*Myophonus caeruleus*	Blue Whistling Thrush	LC
84	Muscicapidae	*Rhyacornis fuliginosus*	Plumbeous Water Redstart	LC
85	Nectariniidae	*Aethopyga siparaja*	Crimson Sunbird	LC
86	Paridae	*Parus major*	Great Tit	LC
87	Passeridae	*Motacilla cinerea*	Grey Wagtail	LC
88	Passeridae	*Motacilla flava*	Yellow Wagtail	LC
89	Passeridae	*Motacilla maderaspatensis*	White-browed Wagtail	LC
90	Passeridae	*Passer domesticus*	House Sparrow	LC
91	Phasianidae	*Tragopan blythii*	Blyth's Tragopan	VU
92	Phylloscopidae	*Phylloscopus fuscatus*	Dusky Warbler	LC
93	Picidae	*Dinopium*	Black-rumped	LC

S. No.	Family	Scientific Name	Common Name	Conservation Status IUCN 2020-3
		benghalense	Woodpecker	
94	Pnoepygidae	*Pnoepyga albiventer*	Scaly-breasted Wren Babbler	LC
95	Pnoepygidae	*Pnoepyga pusilla*	Pygmy Wren Babbler	LC
96	Pycnonotidae	*Hypsipetes leucocephalus*	Black Bulbul	LC
97	Pycnonotidae	*Pycnonotus cafer*	Red-vented Bulbul	LC
98	Pycnonotidae	*Pycnonotus jocosus*	Red-whiskered bulbul	LC
99	Pycnonotidae	*Pycnonotus melanicterus*	Black-crested Bulbul	LC
100	Pycnonotidae	*Pycnonotus striatus*	Striated Bulbul	LC
101	Stenostiridae	*Culicicapa ceylonensis*	Grey-headed Canary-flycatcher	LC
102	Sturnidae	*Acridotheres tristis*	Common Myna	LC
103	Sturnidae	*Gracula religiosa*	Hill Myna	LC
	ORDER: PELECANIFORMES			
104	Dicruridae	*Dicrurus macrocercus*	Black Drongo	LC
105	Dicruridae	*Dicrurus remifer*	Lesser Racket-tailed Drongo	LC
	ORDER: PICIFORMES			
106	Megalaimidae	*Psilopogon asiaticus*	Blue Throated Barbet	LC
	ORDER: PODICIPEDIFORMES			
107	Podicipedidae	*Podiceps cristatus*	Great Crested Grebe	LC
108	Podicipedidae	*Tachybaptus ruficollis*	Little Grebe	LC
	ORDER: PSITTACIFROMES			
109	Psittacidae	*Psittacula roseata*	Blossom-headed Parakeet	NT
110	Psittaciormes	*Psittacula Krameri*	Rose-ringed Parakeet	LC
	ORDER: STRIGIFORMES			
111	Strigidae	*Otus lettia*	Collared Scops Owl	LC
112	Strigidae	*Otus spilocephalus*	Mountain Scops Owl	LC
	ORDER: SULIFORMES			
113	Phalacrocoracidae	*Microcarbo niger*	Little Cormorant	LC
114	Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant	LC

Source: http://manenvis.nic.in/Database/BiodiversityofManipur_3142.aspx; https://avibase.bsc-eoc.org/; https://ebird.org/region/IN-MN

Falco amurensis (Amur falcons), locally known as '*Akhuaipuina*' the world's longest travelling raptors is also reported from the state as passage migrant. These raptors travel one of the longest migration routes of all birds, up to 22,000 km in a year. They arrive in north-east India from Siberia *en route* their destination at Somalia, Kenya, and South Africa.

In Manipur state, Puching village in Tamenglong district, is known as a roosting site for the Amur falcons during their annual migration from their breeding grounds to warmer South Africa.

Amur falcons are the listed under the 'Least Concern' category of IUCN and is Schedule-IV species under Indian Wildlife (Protection) Act, 1972, and the Convention on Migratory Species, to which India is a signatory (which means it is mandatory to protect the birds).

Earlier these migratory raptors were reportedly killed in Manipur when they arrived in Tamenglong district to roost every winter. The efforts of the Manipur Forest department and villagers of Tamenglong district ensured that not a single falcon was killed last year while on their way to South Africa from Siberia.

The migratory path of Amur falcons is tracked by different agencies like Wildlife Institute of India through tagging and traced though satellites (https://satellitetracking.eu/inds/showtable) and their migratory path in NE India is mainly through Wokha and Longleng districts of Nagaland and Tamenglong district of Manipur. During field survey and interaction with locals it was noted that neither the location of any sub station nor any route of transmission or distribution line falls within migratory path of Amur falcons.

3.6.2.3 Herpetofauna

As per the data compiled, 24 species of reptiles and 10 species of amphibians are reported from the districts belonging to study area. List of important herpetofauna found in the districts belonging to study area is given in **Table 3.13.**

Table 3.13: List of Herpetofauna

S. No	Family	Scientific Name	Common Name
REPTILES			
	ORDER-SQUAMATA		
1	Agamidae	*Calotis emma*	Forest crested lizard
2	Agamidae	*Calotis versicolor*	Common garden lizard
3	Agamidae	*Draco spilonotus*	Flying Lizard
4	Colubridae	*Ahaetulla prasina*	Short-nosed Vine Snake
5	Colubroidea	*Amphiesma stolatum*	Striped keelback
6	Colubroidea	*Boiga trigonata*	Common Cat Snake
7	Colubroidea	*Blythia reticulata*	Blyth's Reticulate Snake
8	Colubroidea	*Naja kaouathia*	Monocled Cobra
9	Colubroidea	*Oligodon arnensis*	Banded Kukri Snake
10	Colubroidea	*Ptyas korros*	Indo-Chinese Rat Snake
11	Colubroidea	*Rhabdophis subminiatus*	Red-necked Keelback

S. No	Family	Scientific Name	Common Name
12	Colubroidea	*Sibynophis collaris*	Collared Black-headed Snake
13	Colubroidea	*Fowlea piscator*	Asiatic Water Snake
14	Colubroidea	*Ptyas nigromarginata*	Green Rat Snake
15	Elapidae	*Bungarus caeruleus*	Common Krait
16	Elapidae	*Ophiophagus hannah*	King Cobra
17	Gekkonidae	*Hemidactylus garnotii*	Gecko
18	Pythonidae	*Python molurus*	Rock Python
19	Scincidae	*Eutropis carinata*	Skink
20	Varanidae	*Varanus bengalensis*	Monitor Lizard
21	Viperidae	*Ovophis monticola*	Mountain Pit Viper
22	Viperidae	*Trimeresurus gramineus*	Indian green pit viper
23	Viperidae	*Daboia russelii*	Russell's Viper
	ORDER-TESTUDINES		
24	Testudinidae	*Testudo graeca*	Tortoise
AMPHIBIANS			
	ORDER-ANURA		
25	Bufonidae	*Bufo melanostictus*	Asian Common Toad
26	Dicroglossidae	*Hoplobatrachus tigerinus*	Indian Bullfrog
27	Hylidae	*Hyla annectans*	Tree Frog
28	Megophryidae	*Megophrys glandulosa*	The Glandular Horned Toad
29	Ranidae	*Amolops gerbillus*	Stream frog
30	Ranidae	*Pterorana khare*	Indian Flying Frog
31	Ranidae	*Rana humeralis*	Bhamo Frog
32	Ranidae	*Rana tytleri*	Yellow-striped Leaf Frog
33	Rhacophoridae	*Rhacophorus bipunctatus*	The twin-spotted Flying Frog
34	Rhacophoridae	*Rhacophorus maximus*	Giant Gliding Frog

Source: http://manenvis.nic.in/Database/BiodiversityofManipur_3142.aspx; https://www.indianreptiles.org/ ; https://www.indianamphibians.org/

3.6.2.4 Butterflies

As per the data compiled, 75 species of butterflies belonging 6 families are reported from the districts belonging to study area. Of which, 38 species belong to Nymphalidae family, followed by 13 species belonging to Lycaenidae family. List of butterflies found in the districts belonging to study area is given in **Table 3.14.**

Table 3.14: List of Butterflies

S. No.	Family	*Scientific name*	Common Name
1	Hesperiidae	*Choaspes benjaminii*	Indian Awlking
2	Hesperiidae	*Gerosis bhagava*	Common Yellow Breasted Flat
3	Hesperiidae	*Hasora chromus*	Common Banded Awl
4	Hesperiidae	*Oriens goloides*	Common Dartlet
5	Hesperiidae	*Spialia galba*	Indian Skipper
6	Hesperiidae	*Tagiades japetus*	Common Snow Flat
7	Lycaenidae	*Abisara fyllla*	Dark Judy
8	Lycaenidae	*Acytolepis puspa*	Common Hedge Blue
9	Lycaenidae	*Castalius rosimon*	Common Pierrot
10	Lycaenidae	*Chilades lajus*	Lime Blue

S. No.	Family	*Scientific name*	Common Name
11	Lycaenidae	*Heliophorus epicles*	Purple Sapphire
12	Lycaenidae	*Jamides bochus*	Dark Cerulean
13	Lycaenidae	*Jamides celeno*	Common Cerulean
14	Lycaenidae	*Leptotes plinius*	Zebra blue
15	Lycaenidae	*Neopithecops zalmora*	Quaker
16	Lycaenidae	*Talicada nyseus*	Red Pierrot
17	Lycaenidae	*Taraka hamada*	Forest Pierrot
18	Lycaenidae	*Spialia galba*	Indian Skipper
19	Lycaenidae	*Surendra quercetorum*	Common Acacia Blue
20	Nymphalidae	*Aglais cashmiriensis*	Indian Tortoise Shell
21	Nymphalidae	*Apatura ambica*	Indian Purple Emperor
22	Nymphalidae	*Argyreus hyperbius*	Indian Fritillary
23	Nymphalidae	*Ariadne merione*	Common Castor
24	Nymphalidae	*Athyma perius*	Common Sergeant
25	Nymphalidae	*Cethosia cyane*	Leopard Lacewing
26	Nymphalidae	*Charaxes bernardus*	Tawny Rajah
27	Nymphalidae	*Childrena childreni*	Large Silverstripe
28	Nymphalidae	*Cirrochroa tyche*	Common Yeoman
29	Nymphalidae	*Cyrestis thyodamas*	Common Map
30	Nymphalidae	*Danaus chrysippus*	Plain Tiger
31	Nymphalidae	*Elymnias hypermnestra*	Common Palmfly
32	Nymphalidae	*Elymnias patna*	Blue-Striped Palmfly
33	Nymphalidae	*Euploea core*	Common Crow
34	Nymphalidae	*Euripus nyctelius*	Courtesan
35	Nymphalidae	*Fabriciana kamala*	Common Silverstripe
36	Nymphalidae	*Junonia lemonias*	Lemon Pansy
37	Nymphalidae	*Kallima inachus*	Orange Oakleaf
38	Nymphalidae	*Kaniska canace*	Blue Admiral
39	Nymphalidae	*Lethe bhairava*	Rusty Forester
40	Nymphalidae	*Lethe insane*	Common Forester
41	Nymphalidae	*Moduza procris*	Commander
42	Nymphalidae	*Mycalesis perseus*	Common Bushbrown
43	Nymphalidae	*Parantica aglea*	Glassy Tiger
44	Nymphalidae	*Phalanta phalantha*	Common Leopard
45	Nymphalidae	*Polyura athamas*	Common Nawab
46	Nymphalidae	*Sumalia daraxa*	Green Commodore
47	Nymphalidae	*Symbrenthia hippoclus*	Common Jester
48	Nymphalidae	*Symbrenthia hypselis*	Himalayan Jester
49	Nymphalidae	*Vagrans egista*	Vagrant
50	Nymphalidae	*Vanessa cardui*	Painted Lady
51	Nymphalidae	*Vanessa indica*	Indian Red Admiral
52	Nymphalidae	*Ypthima asterope*	Common Threering
53	Nymphalidae	*Ypthima baldus*	Common Fivering
54	Nymphalidae	*Junonia orithya*	Blue Pansy
55	Nymphalidae	*Melanitis leda*	Common Evening Brown
56	Nymphalidae	*Junonia lemonias*	Lemon Pansy
57	Nymphalidae	*Junonia hierta*	Yellow Pansy
58	Papilionidae	*Graphium cloanthus*	Glassy Bluebottle
59	Papilionidae	*Papilio alcmenor*	Red Breast
60	Papilionidae	*Papilio polyctor*	Common Peacock
61	Papilionidae	*Graphium cloanthus*	Glassy Bluebottle

S. No.	Family	*Scientific name*	Common Name
62	Papilionidae	*Graphium sarpedon*	Common Bluebottle
63	Papilionidae	*Papilio memnon*	Great Mormon Swallowtail
64	Papilionidae	*Callerebia suroia*	Manipur Argus
65	Papilionidae	*Araschnia dohertyi*	Manipur Map
66	Papilionidae	*Lamproptera meges*	Green Dragon Tail
67	Pieridae	*Catopsilia pomona*	Common Emigrant
68	Pieridae	*Colias fieldii*	Dark Clouded Yellow
69	Pieridae	*Delias pasithoe*	Red-Base Jezebel
70	Pieridae	*Eurema hecabe*	Common Grass Yellow
71	Pieridae	*Ixias pyrene*	Yellow Orange Tip
72	Pieridae	*Pareronia valeria*	Common Wanderer
73	Pieridae	*Pieris brassicae*	Large Cabbage White
74	Pieridae	*Pieris canidia*	Indian Cabbage White
75	Riodinidae	*Abisara echerius*	Plum Judy

Source: https://nlc.manipurforest.gov.in/ ; Irungbam et.al. (2020); (*https://doi.org/10.11646/zootaxa .4882.1.1)*

3.6.3 Protected Areas

The protected area network in Manipur occupies 847.512 km^2 area, which constitute about 3.79% of the state's geographical area. The Protected Area Network includes 2 National Park (NP) and 6 Wildlife Sanctuaries (WLS). Out of these, 2 protected areas, Keibul Lamjao National Park and Kailam wildlife sanctuary falls in districts belonging to study area. However, the proposed transmission and distribution lines do not pass through any protected area. In the instant scheme, all such areas are completely avoided through careful route selection. Details of the protected areas are presented below in **Table 3.15**. Map showing location of all the protected areas in Manipur is given at **Figure 3.6**.

Table 3.15: Protected Area Network in Districts Belonging to Study Area

S. No.	Protected Areas	District	Area (km^2)	Year of Notification	ESZ Area (km^2)	Year of ESZ Notification
National Park						
1	Keibul Lamjao National Park	Bishnupur	40.00	1977	176.00	2017
Wildlife Sanctuary						
1	Khongjaingamba Wildlife Sanctuary	Bishnupur	0.412	2016	NA	NA

Source: http://moef.gov.in/rules-and-regulations/esz-notifications-2/ and https://forest.manipurforest.gov.in/sites/default/files/2020-03/Annual%20Report%202018-19.pdf

The nearest subproject from Keibul Lamjao NP is 33 kV Moirang to Kwatka DL. The nearest component of the DL from the NP is Moirang Gantry, which is at approx. 5.19 km (refer to **Figure 3.7**). The nearest new sub-station from the NP is 33/11 kV sub-station at Kwatka which is at approx. 8.26 km (refer **Figure 3.7**).

The nearest subproject from Khongjaingamba WLS is 33 kV Moirang to Kwatka DL. The nearest component of the DL from the WLS is Moirang Gantry, which is at a distance of approx. 4.22 km (refer to **Figure 3.7**). The nearest new sub-station from the WLS is 33/11 kV sub-station at Kwatka which is at a distance of approx. 8.10 km (refer to **Figure 3.7**).

Therefore, impact of any subproject is not envisaged on any of the nearby Protected Areas as the proposed lines are located far away from any PA.

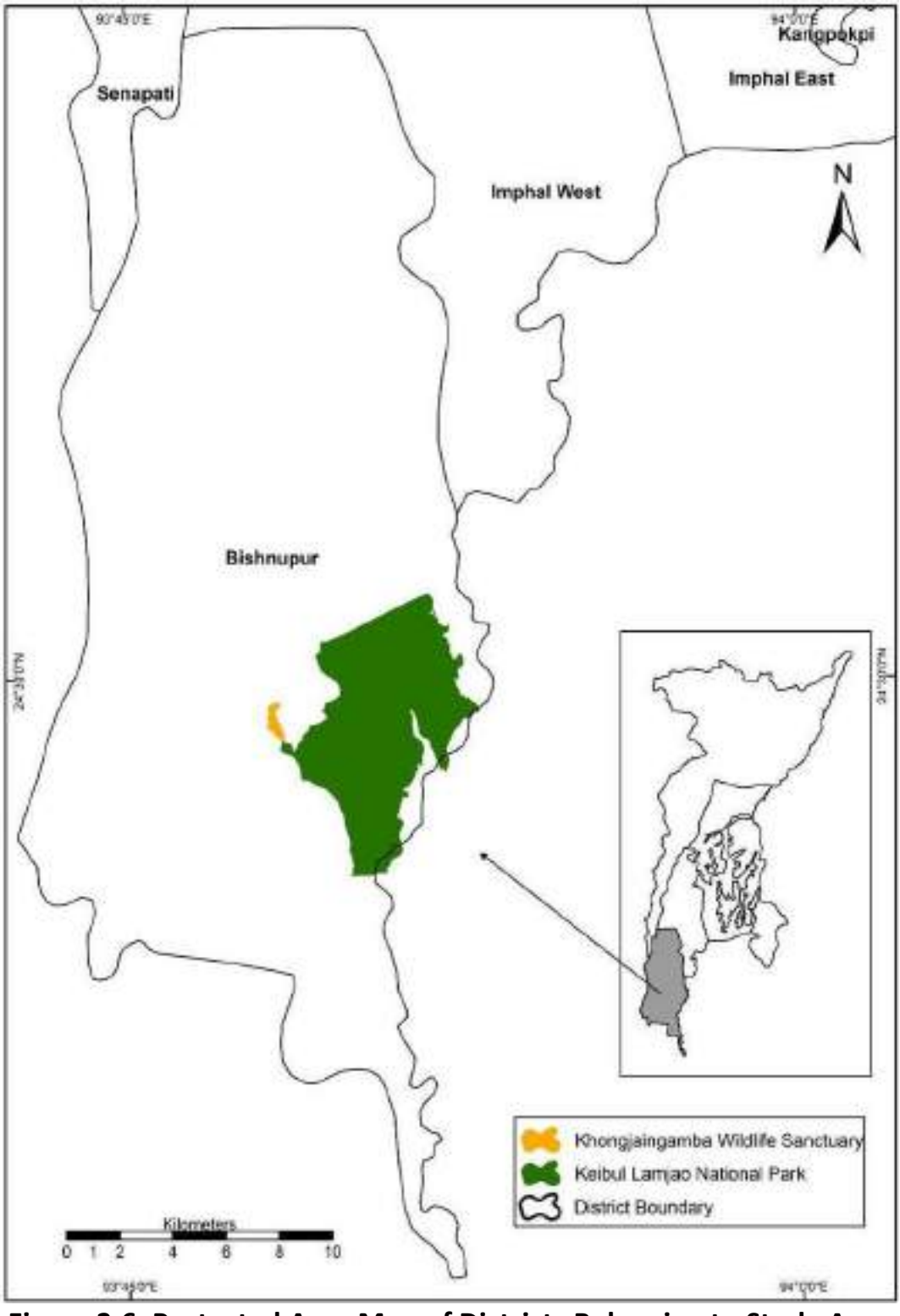


Figure 3.6: Protected Area Map of Districts Belonging to Study Area

Figure 3.7: Distance of Sub-Projects from Keibul Lamjao NP and Khongjaingamba WLS

3.6.4 Community Reserves

Community Reserves are the biodiversity abundant lands that are privately or community-owned and are managed by the individual(s)/communities in possession of the area. These reserves allow for extraction of natural resources, the levels of which are governed by a multi-stakeholder Reserve Management Committee. Community Reserve Management Committee is to consist of five representatives nominated by the local Village Panchayat or the Gram Sabha, and one representative each from the State Department of Forest and Wildlife.

As per information available from State forest department and ENVIS Centre on Wildlife & Protected Areas, the State Government of Manipur had Notified 10 Community Reserves under section 36C(1) of the Wildlife (Protection) Act, 1972. Out of these 10 community reserves, 8 community reserves fall within the one district belonging to study area i.e. Senapati (refer **Table 3.16**).

Table 3.16: List of Community Reserves in District belonging to Study Area

S. No.	Name of Community Reserve	Name of District	Year of Notification	Area (km^2)
1	Chipeivao	Senapati	2018	5.85
2	Houphai	Senapati	2018	3.23
3	Shangneme	Senapati	2018	3.00
4	Mekrimei Ru Kakramai Bu	Senapati	2018	72.46
5	Pfunemai	Senapati	2016	2.10
6	Chiibvii & Veimairii	Senapati	2017	3.39
7	Baneevehdea Oinam Village	Senapati	2017	2.10
8	SofiiKhro Kodom Village	Senapati	2017	2.04

Source: https://forest.manipurforest.gov.in/sites/default/files/2020-03/Annual%20Report%202018-19.pdf & http://www.wiienvis.nic.in/database/community%20reserves_8228.aspx

The landuse pattern of study area given at **Table 3.4** shows that any kind of forest is not involved in the study area. Moreover, the only component of the project falling within the Senapati district is Augmentation of 4 existing 33/11 kV substations. Since augmentation of existing substations only require replacement especially of the main transformers and associated equipment with minimum or no disturbance to the existing power supply system therefore there will not be any impact of any magnitude on the community reserves due to instant project.

3.6.5 Sacred Groves and Community Conserved Areas (CCA)

India is well known for nature's worship, which plays an integral role in the live of many communities. Every aspect of religious and cultural practices is deeply rooted with the forest that helps in nature conservation. These types of forest bring the concept of "sacred groves". Generally, sacred groves are a tract of virgin forest, harbouring rich biodiversity and protected traditionally

by the local communities as a whole. The area of scared groves ranges from few square meters to several hectares.

In ancient Manipuri culture, people worshipped the natural phenomena like the sun, the moon, the sky, the water, and the fire. Although Hinduism invaded in the early Manipuri culture, the religious and cultural practice performed by the ancient meities were not change at all. The worshipping and protection of forest in the name of "Umanglai" because of their associated deities are still practice by the modern Manipuries preserving the ancient tradition till date. In Manipur, some of the forest patches are owned by some deity and conserved by the local people largely on the basis of religious beliefs and cultural practices. Such forests are known as "Umanglai". The beliefs and taboos associated with the Umanglais in the forest patches are restricted to any sort of disturbance of flora and fauna.

In Manipur, various ethnic groups have preserved and protected several forest patches and even individual trees or animals with the belief in nature's worship. As per available data, there are 158 sacred groves and community conserved areas in the districts belonging to study area (refer **Table 3.17**). In the instant scheme, all such areas are completely avoided through careful route selection.

Table 3.17: List of Sacred Groves & Community Conserved Areas in Districts Belonging to Study Area

S. No.	Sacred Grove Name	Sacred Grove Location	Area (ha)
	District - Bishnupur		
1	Sawongbung Lairenbi	Sawongbung	0.02
2	Salam Sorarel	Salam Mayai Leikai	0.092
3	Sayang Ningthou	Sayang Pukhri Mapan	0.019
4	Sekmai Koubru	Awang Sekmai	1.21
5	Sekmai Ningthou Kakching	Kakching Moiran-gthem Leikai	0.2
6	Sekmai Wangbarel	Awang Sekmai	0.25
7	Sorarel	Toubul bazaar	0.2
8	Soubam (Mawam) Lairembi	Thangmeiband Hijam Diwan Leikai	0.069
9	Sugunu Lokningthou	Sugunu	0.069
10	Sugunu Sanamahi	Sugunu	0.069
11	Sugunu Wangbarel	Sugunu	0.069
12	Tairel Pokpi Koubru	Tairel pokpi	1.5
13	Tamphaton Lairembi	Kwakeithel Lourembam Leikai	0.1
14	Thanagrel	Kha Khunou	0.25
15	Tharoijam Yumjao Lairenbi	Tharoijam	0.098
16	Thoidingjam Lairembi	Lamlong	0.034
17	Thonang Panganba Lai Manou, Mayamba	Kha Potsangbam Mamang Leikai	0.4
18	Thongmacha Macha Leihounu	Sagolband Thangjam Leirak	0.2

S. No.	Sacred Grove Name	Sacred Grove Location	Area (ha)
	Lairembi		
19	Thonju Rakpa	Thongju part-11	0.33
20	Tokpa Pung Lainingthou	Thangmeiband D.M. College	0.003
21	Tubileima	Tabungkhok Awang Leikai	0.1
22	Uchekon Moriba	Uchekon	0.5
	District - Imphal East		
23	Arai Leima	Lalabung	0.13
24	Chabugbam Lairembi Laishana	Kodompokpi Mayai leikai	0.002
25	Chakpa Panam Ningthou	Andro	0.012
26	Chingamathak Ema Lairembi	Singjamei Chingnga mathak	0.21
27	Chingol Ningthou	Chingmeiron Maning Leikai	0.5
28	Ebudhou Marjing	Laipham Khounou, Sanhakpham	0.25
29	Ebudhou Marjing	Khabam Awang Leikai, Kontha Khabam	0.1
30	Ebudhou Marjing (Heingang)	Heingang Mayai Leikai	0.1
31	Ebudhou Marjing	Kairang	0.2
32	Ebudhou Marjing	Achanbikei	0.45
33	Chothe Thayai Pakhangba	Bishempur chothe thawai pakhangba khuman, Ward no. 6	0.012
34	Chumthang Lairembi Mache	Bamdyar Awang Leikai	10
35	Chumthang Lairembi Manou	Bandyar Ahallup	30
36	Ebendhou Makubi Ching	Keithelmanbi	6.07
37	Ebudhou Khamlangba	Mayai Koibi	0.025
38	Ebudhou Khamlangba	Sapam Leirak	0.1
39	Ebudhou Khamlangba	Kakching Khullen Moirangthem Leikai	0.4
40	Ebudhou Koirouhanba	Moidampok	1.01
41	Ebudhou Marjing	Ahallup	0.07
42	Ebudhou Meitreng Pakhangba	Bishempur Joypur Khunou, Kha.	0.005
43	Ebudhou Nongda Lairen Pakhangba	Patsoi Part-II	0.09
44	Ebudhou Pakhangba	Wangoi	0.69
45	Ebudhou Pakhangba	Kwa Siphai, Wang Makhong	0.025
46	Ebudhou Pakhangba Puruk Shoubi	Uchekon	0.25
47	Ebudhou Sankardev	Wangoi	0.11
48	Ebudhou Moirang Kacha	Okram Leikai, Singjamei	0.043
49	Ebudhou Thangjing	Moirang Laisang-them Leikai	1
50	Ema Ebemma Leihoungou Thongak Lairembi	Eroisemba	0.25
51	Ema Konthokhanbi	Thangmeiband D.M.College	2.07
52	Ema Laikhulembi	Houbam Marak	0.1
53	Ema Nongaleima	Thangmeiban Hijam Diwan Leikai	0.2
54	Ema Panthoibi Lairembi	Patsoi Part-III	0.0003
55	Ema Wangdongbi Pung	Tera	0.018
56	Emoinu	Wangoi	0.097
57	Epa Sorarel, Khoiriphaba	Yurembam Awang Leikai	0.062
58	Eputhou Nongsaba	Kwakeithel Heinou Khonglembi, Guru	0.1

S. No.	Sacred Grove Name	Sacred Grove Location	Area (ha)
		Nongsaba Leikai	
59	Eputhou Nouthingkhong Pakhangba	Thangmeiband Lairenhanjaba Leikai	0.0007
	District - Imphal West		
60	Ereima Khanachouba	Oinam Thingngel Leikai	0.5
61	Erom Lairembi	Chingmakha Phuramakhong	0.036
62	Erom Laishram Lairenma	Chanam Phukhri Mapan, Erom Leikai	0.02
63	Erum Ningthou Kakching	Kakching	0.55
64	Heingang Marjing	Heingang	7.08
65	Heirang khonung Lairembi	Lamlongei, Sabal Leikai	0.02
66	Heisnam Panthoibi	Keisamthong Thangjam Leirak	0.6
67	Hodam Lairembi	Keisamthong Hodam Leirak	0.6
68	Huidompokpi Tarang Apanba	Yurembam Mayai Leikai	0.65
69	Huidrom Lairembi	Keisamthong	0.067
70	Kakching Wairi Khamlangba	Kakching Wairi Khamlangba	0.4
71	Kakwa Lairembi	Singjamei Waikhom leikai	1.5
72	Kakwa Lairembi Ema Ereima	Kakwa Asem Leikai	0.75
73	Kalika Lairembi/ Khonji Mahadeva	Khongji Loukon	5
74	Kangabam Yumjao Lairembi	Keisampat Kangabam Leikai	0.0007
75	Keisam Yumjao Lairembi	Keisampat	0.1
76	Khoimom Lairembi	Luker Mamang Leikai	1.2
77	Khuman Ningthou Pakhangba	Patsoi Part –I	0.2
78	Khunjao Lairembi	Malom Tulihal	0.2
79	Khurai Lai Awangba	Khurai	0.54
80	Khurai Lai Khurembi	Khurai Sajor Leikai	0.039
81	Khurai Ningthoubung Puri Puraba	Khurai Ningthoubung Leikai	0.06
82	Khurai Puthiba	Khurai Lamlong	0.43
83	Khurai Yumjao Lairenbi	Khurai	0.002
84	Kongpal Nongmai Leima	Kongpal	0.14
85	Kongpal Puri Puraba	Kongpal	0.059
86	Konjeng Lairembi	Konjeng Leikai	0.16
87	Konkham Loiyarakpa	Nambol konkham Leikai	0.3
88	Konthoujam Lairenbi	Konthoujam	1.41
89	Konung lairembi/ Ebudhu Laisana Yumjao Lairembi	C I college, Bishempur	0.5
90	Koubru	Phayeng	40
91	Koubru	Lairelkabi Mamang Leikai	0.2
92	Koubru	Heibongkokpi	0.003
93	Koubru	Lambal	1.5
94	Koubru	Tera Urak	0.03
95	Lai Eshing Chaibi Laisenba	Nagamapal Market	0.067
96	Lai Khurembi	Lamdeng Makha Leikai	0.2
97	Laijing Ningthou	Thangmeiband Lairenhanjaba Leikai	0.0004
98	Lainingthou Ahanba	Khurai	0.22
99	Lainingthou Amudon	Amudon	0.073
100	Lainingthou Khamlangba	Uripok	0.05
101	Lainingthou Khoiriphaba	Nambol	10
102	Lainingthou Khoubomba	Changangngei Mamang leikai	0.044
103	Lainingthou Liesing Chaibi	Lamsang Mayang Leikai	0.5

S. No.	Sacred Grove Name	Sacred Grove Location	Area (ha)
104	Lainingthou Nongpok Ning-thou Panthoibi	Sekta	0.15
105	Lainingthou Nouthingkhong Lairembi Petanga Tamphaton, (Lai Khurembi).	Uripok	0.14
106	Lainingthou Pureiromba	Lamlai	0.28
107	Lainingthou Puthiba	Awang Khunou	0.074
108	Lainingthou Sanamahi	Wangoi	0.76
109	Lainingthou Sorarel	Kodompokpi Mamang Leikai	0.001
110	Lairembi	Khabi Mayai leikai	0.2
111	Laisana Pakhangba	Toupokpi Mamang Leikai	0.076
112	Laishram Lairembi	Kwakeithel Laishram Leikai	0.044
113	Laishram Yumjao Lairembi	Wangkhi Laishram Leikai	0.2
114	Langol Lairembi	Langol Housing Complex	1
115	Langthabal Lainingthou Puthiba	Langthabal	0.032
116	Langol Thongak Lairembi	Langol	5.05
117	Langthabal Kamakhya Mandir	Langthabal	0.24
118	Leisangthem Lairembi	Leisangthem Leikai, Singjamei	0.5
119	Loiyarakpa (Lanjing Thouba) Ningthemleima	Tabungkhog Makha Leikai	0.001
120	Mahabali (Mongba Hanba)	Imphal	5.05
121	Maklang Nungthel Leima	Maklang	0.4
122	Mayang Ngamba/ Loiyarakpa	Bishnupur makha Leikai	0.2
123	Mayokpha	Keisamthong	0.025
124	Moirang Hanuba Epu	Takyel	0.016
125	Moirang pokpa Ebudhou	Thangmeiband Polem leikai	0.036
126	Moirangpokpa, Moirangpokpi Macha Ebungo, Manou Ebema	Yurembam Mayai Leikai	0.4
127	Mongba Hanba	Wangoi	0.003
128	Mongsangei Ebudhou Panganba	Mongsangei Ningthemjao Karong	0.07
129	Ngarangbam Loiyarakpa	Ngarangbam Makha Leikai	0.1
130	Ngarangbam Pakhangba	Ngarangbam Maning Leikai	0.4
131	Ningthoukhong Oknarel Macha Ebemma	Ningthourel Oknarel Leikai	0.27
132	Nongaren /Nongngaleima	Kha potsangbam, Mayai Leikai	0.062
133	Nongdon Lairembi Pakhangba	Utlou Mamang Leikai	0.2
134	Nongmailembi Leima	Top Awang Leikai	0.75
135	Nongpok Ningthou Panthoibi	Khumbong Awang Leikai	0.4
136	Nongpok Panthoibi	Nourem Leikai, Awang	0.069
137	Nongpok Panthoibi	Kongba Nongthongbam Leikai	0.25
138	Nongpok Panthoibi	Kongba Khunou Leikai	0.1
139	Nongshaba Yaiskul	Yaiskul	0.023
140	Nouhal Lai	Kakching	0.096
141	Nouthingkhong Pakhangba	Patsoi Awang Leikai	0.37
142	Nouthingkhong Pakhangba	Khongman Ketanapanung	0.14
143	Nouthingkhong Pakhangba	Patsoi Part –IV	1
144	Nungthel Leima	Tabungkhok Mayai Leikai	0.1
145	Oknarel Khubam Yaba	Ningthoukhong Mamang leikai	0.4
146	Panganba	Bamol kapu Maning Leikai	0.5
147	Panganba	Ningthoukhong Mayai leikai	0.1
148	Panthoibi	Kongba Khetri Leikai	0.038
149	Panthoibi, Nongpok Ningthou	Utlou Mayai Leikai	0.2
150	Pathabi Ema Lairembi	Khoijuman Ward no.3	0.25

S. No.	Sacred Grove Name	Sacred Grove Location	Area (ha)
151	Phoijing Changing Lairembi	Nambol, Phoijing	12.75
152	Phouoibi	Shorok khaiban Leikai, Singjamei	0.5
153	Pureiromba	Bamol kapu makha Leikai	0.4
154	Pureiromba	Bamol kapu Awang Leikai	0.1
155	Pureironlaba and Chingsomba	Andro	0.1
156	Puthiba	Touthong, Mamang Leikai	0.5
157	Sagoltongba Ningthempokpa	Sagoltongba	1.03
158	Sairelkhil Koubru	Shairelkhul	0.5

Source: http://www.cpreecenvis.nic.in/Database/Manipur_890.aspx

3.6.6 Important Bird & Biodiversity Areas (IBAs)

Bird Life International (www.birdlife.org) has identified 9 Important Bird & Biodiversity Areas (IBAs) in Manipur. These IBAs cover 1422.10 sq km area, which constitute about 6.37% of the state's geographical area. Out of these 9 IBAs, only 2 IBAs i.e. Dzuku Valley and Loktak Lake and Keibul Lamjao National Park falls in project districts. Details of the IBAs are presented below in **Table 3.18**.

Table 3.18: Important Bird & Biodiversity Areas in Manipur

S. No.	IBA Code	IBA Name	Criteria	Important Species	Area (sq km)	District
1	IN430	Ango or Anko Hills	A1, A2	*Pavo muticus, Tragopan blythii, Syrmaticus humiae, Aceros nipalensis, Heterophasia gracilis*	400.00	Ukhrul
2	IN431	Bunning Wildlife Sanctuary	A1, A2	*Aceros nipalensis, Heterophasia gracilis*	115.80	Tamenglong
3	IN432	Dzuku Valley	A1, A2	*Tragopan blythii, Syrmaticus humiae, Apus acuticauda, Yuhina bakeri, Stachyris roberti, Trochalopteron austeni, Trochalopteron virgatum, Heterophasia gracilis, Sibia waldeni*	25.00	Senapati
4	IN433	Jiri - Makru Wildlife Sanctuary	A1	*Pavo muticus, Asarcornis scutulata, Aceros nipalensis*	198.00	Tamenglong
5	IN434	Kailam Wildlife Sanctuary	A1, A2	*Syrmaticus humiae, Aceros nipalensis, Heterophasia gracilis*	187.50	Churachandpur
6	IN435	Loktak Lake and Keibul Lamjao National Park	A1, A4iii	*Dendrocygna javanica, Aythya baeri, Grus antigone, Leptoptilos javanicus, Clanga clanga, Haliaeetus leucoryphus, waterbirds*	240.00	Bishnupur, Imphal West, Kakching
7	IN436	Shiroi Community Forest	A1, A2	*Tragopan blythii, Syrmaticus humiae, Aceros nipalensis, Heterophasia gracilis*	50.00	Ukhrul

S. No.	IBA Code	IBA Name	Criteria	Important Species	Area (sq km)	District
8	IN437	Yangoupokpi - Lokchao Wildlife Sanctuary	A1	*Pavo muticus*	184.80	Tengnoupal
9	IN438	Zeilad Lake Sanctuary	A1	*Asarcornis scutulata*	21.00	Tamenglong

Source: http://www.birdlife.org/datazone/country/india

International Bird Areas are achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge of the sizes and trends of bird populations. The Global criteria are as follows:

A1. Globally threatened species

Criterion: The site is known or thought regularly to hold significant numbers of a globally threatened species, or other species of global conservation concern.

A2. Restricted-range species

Criterion: The site is known or thought to hold a significant component of a group of species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Area (SA).

A4iii. Biome-restricted species

Criterion: The site is known or thought to hold congregations of ≥1% of the global population of one or more species on a regular or predictable basis. The avifauna species found in the Dzuku Valley IBA are resident species, while Loktak Lake and Keibul Lamjao National Park IBA is home to migratory bird species. However, the proposed transmission and distribution lines do not pass through any of these IBAs. In the instant scheme, all such areas were completely avoided through careful route selection. Moreover, the incidence of avian hazards is rare due to the distance between the conductors, however, as an additional measure to prevent any avian hazard, bird guards/ anti perch devices are integral part of tower design.

The nearest component of the project from the Dzuku Valley IBA is the existing 33/11 kV Kangpokpi sub-station. The distance from the sub-station to the IBA is approx. 43.5 km (**Figure 3.8**). The nearest component of the Transmission system from Loktak Lake is the stretch of TL between tower nos. 87 and 88, which is at a distance of approx. 0.15 km (refer to **Figure 3.9**). The nearest component of the Distribution system from Loktak Lake is the Moirang Gantry in the existing Moirang sub-station, which is at a distance of approx. 0.75 km (refer to **Figure 3.10**).

Figure 3.8: Distance of Components of Project from Dzuku Valley IBA

Figure 3.9: Distance of Sub Components of Transmission System from Loktak Lake

Figure 3.10: Distance of Sub Components of Distribution System from Loktak Lake

3.6.7 Wetland

As per the National Wetland Atlas of Manipur, the estimated wetland area of the state is 63616 ha area, which is 2.85% of total geographic area of the state. It includes 541 small wetlands (<2.25 ha) also. Total number of wetlands present in the State is 708.

Loktak lake (including Keibul Lamjao, Sana pat, Laphu pat & Thaunamcha pat) is most important wetland area of Manipur state. Southern part of Loktak lake is declared as Keibul Lamjao National Park (KLNP). Due to its rich biodiversity & socio-economic importance the lake has been designated as one of the 25 Ramsar Site in India for the identifying wetlands of international importance under the Ramsar Convention in 1990. Geographical area of the lake is 24,672 ha (refer to **Figure 3.11**).

The lake falls in the district belonging to study area i.e. Bishnupur, however, the proposed transmission and distribution lines don't pass through it. In the instant scheme, Loktak Lake has been completely avoided through careful route selection. The nearest component of the Transmission system from Loktak Lake is the stretch of TL between tower nos. 87 and 88, which is at a distance of approx. 0.15 km (refer to **Figure 3.9**). The nearest component of the Distribution system from Loktak Lake is the Moirang Gantry in the existing Moirang sub-station, which is at a distance of approx. 0.75 km (refer **Figure 3.10**).

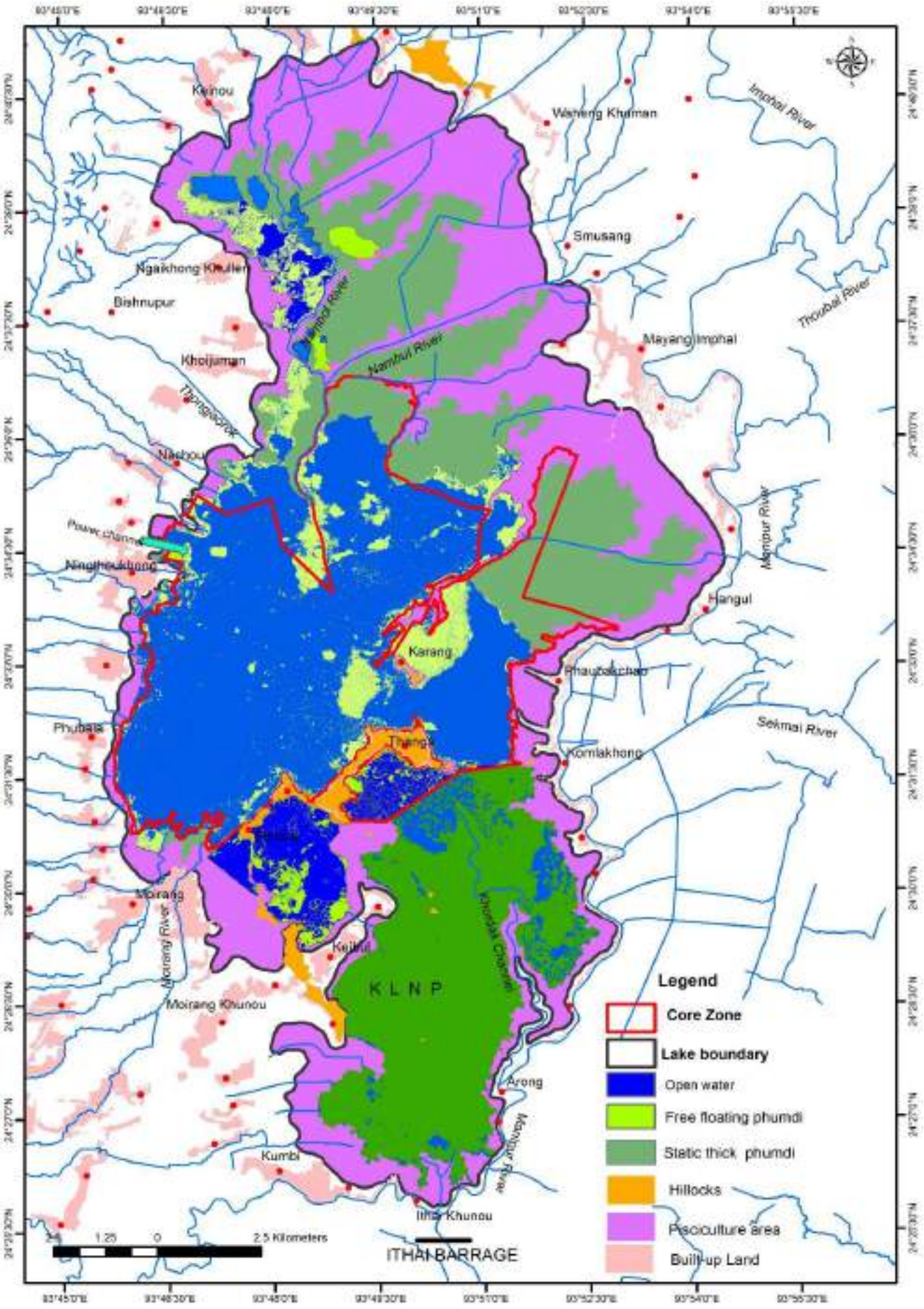


Figure 3.11: Map of Loktak Lake

3.7 SOCIO-ECONOMIC ENVIRONMENT

For sustainable development, it is important to understand social and economic conditions of the community in the region, impacts of development on the community, measures to mitigate negative impacts and enhance the positive impacts. For new development initiatives, socio economic assessment plays an important role to ensure community participation and their acceptance of the development activity. It also helps in planning the activities for local area development. The population of Manipur as per census 2011 was 28,55,794 out of which 14,38,586 were males and 14,17,208 were females.

Manipur is inhabited by three major ethnic group - the Meiteis including Meitei Muslim in the valley and the Nagas and the Kuki-Chin-Mizo tribes in the hills. Peoples are predominantly Mongoloid and speak Tibeto-Burmese languages. The Meiteis constitute the majority population in the state and are a fairly homogenous people. They are divided into seven clans (salais): Manganz, Luwang, Khuman, Angom, Moirang, Chenglai (Sarang-Leishangthem) and Khaba-Nganba. The Muslims, known locally as Meitei Pangans are an economically significant though small-sized community. There are no followers of Buddhism in the valley. Christianity, which was introduced by the British, was embraced only by the hill tribes. The Meiteis and other non-tribal groups constitute about 66 per cent of the total population of the state. These groups speak Manipuri.

33 tribal groups are recognised by the Government of India as Scheduled Tribes (STs), seven Scheduled Castes (SCs), and the Meiteis, the Pangans, and 'others' as separate population categories. The recognized Naga groups are the Anal, Chiru, Chothe, Kabui, Kacha Naga, Koireng, Kairao, Lamkang, Mao, Maram, Maring, Monsang, Mayon, Sema and Tangkhul who together form 18.7 per cent of the state's population. The Thangal, Liangmeiand Tharao, also recognized as Naga tribes, are yet to be listed as STs. In 2003, the Poumei were recognized as a separate tribe. The recognized tribes include Thadou, Zou, Vaiphei, Simte, Paite, Aimol, Gangte, and Ralte. Some groups like the Simte, Suhte and Ralte identify themselves as Zomi. Among the other prominent tribes are the Kom and the Hmar.

Area does not fall in Sixth Schedule of the constitution providing for the administration of tribal areas in Assam, Meghalaya, Tripura and Mizoram to safeguard the rights of the tribal population in these states nor it falls in Fifth Schedule of the constitution dealing with the administration and control of Scheduled Areas as well as of Scheduled Tribes residing in any State other these four States. Under Article 371 C of Constitution of India provides special provision to the State of Manipur for the Constitution and functions of a committee of the Legislative Assembly of the State consisting of members of

that Assembly elected from the Hill Areas of the State. Under this Manipur (Hill Areas) District Council Act was enacted in 1971 which has provisions similar to those contained in the Sixth Schedule and has established six Autonomous Hill District Councils, covering 5 hill districts of the State. These Autonomous Hill District Councils (AHDC) are empowered to maintain and manage the property: movable and immovable, and institutions under their jurisdiction (e.g. in the field of agriculture, animal husbandry, community development, social and tribal welfare, village planning, management of any forest except RF, regulation of the Jhum /shifting cultivation or any other matter.) Under this act, the administrations of the Tribal areas is vested in village/district council under supervision of concerned DC at local/district level and Hill area Committee at State level. All activities sited in AHDC area needs their consent.

Bishnupur district has a population of 2,37,399. The district has a sex ratio of 999 female per 1000 male, which is better than the corresponding National figures. The population of Schedule Caste and Schedule Tribes constitute 9.3% and 1.4% respectively of the total population **(Table 3.19)**. Aimol and Chothe are the tribes residing in the district. Aimol is listed under the Kuki tribes found living both in Assam and Manipur. They speak Aimol language, classified under Kuki-Chin-Mizo language. They are based around Loktak Lake. They practice slash and burn agriculture and are primarily Christians. Chothe tribes speak a Kuki-Chin dialect. Their main occupations are cultivation, livestock rearing, blacksmith and weaving. They are divided into seven clans. The literacy rate of the district stands at 75.85%. **(Table 3.20).** Work participation rate is about 46.3%, out of which 57.1% are male workers and 42.9% are female workers. Among the total work force, 69.5% are Main Workers and 30.5% are Marginal Workers **(Table 3.21)**. About 34.7% workers are cultivators and 6.2% are agricultural labourers. About 51.8% of work force is engaged in other than agricultural activities including 7.3% household industrial workers **(Table 3.22)**.

Imphal East (including Jiribam) district has a population of 456,113. The district has a sex ratio of 1017 female per 1000 male, which is better than the corresponding National figures. The population of Schedule Caste and Schedule Tribes constitute 3.5% and 6.1% respectively of the total population **(Table 3.19)**. Luwang (Loowang), Khuman (Khooman), Moirang and Meithei (Meitei) are the notably different tribes occupying the different portions of the Valley. The literacy rate of the district stands at 81.9% **(Table 3.20)**. Agriculture is the main occupation of the people. The main food crops are paddy, potato and vegetables. Among the cash crops are sugar cane, maize, pulse, oil seed and other vegetables etc. Besides these spices like chilli, onion, ginger, turmeric and coriander of very good quality are grown in the district. The soil and climate favour for mass plantation of horticulture products in the

district. Therefore, horticulture products have been acquiring popularity with the people in the district. Apart from this, handloom and handicraft goods are the important cottage and home industries taken up by the people. Handloom products like, Wangkhei Phi, Lashing Phi and Phanek and its different designs made by these weavers are in great demand both in the home and outside markets as well. This occupation provides employment to almost women in the district. This can certainly be developed in the district by upgrading the skills of artisans introducing of improved looms and provision of cheap yarns. Work participation rate is about 42.7%, out of which 60.3% are male workers and 39.7% are female workers. Among the total work force, 74.6% are Main Workers and 25.4% are Marginal Workers **(Table 3.21)**. About 19.2% workers are cultivators and 6.5% are agricultural labourers. About 66.1% of work force is engaged in other than agricultural activities including 8.2% household industrial workers **(Table 3.22)**.

Imphal West district has a total population of 517,992 as per the census of 2011. The district has the distinction of having a positive sex ratio of 1031 female per 1000 male. 4.7% of the population belongs to Schedule Tribes while Schedule Castes constitute around 3.2% of the population **(Table 3.19)**. Luwang (Loowang), Khuman (Khooman), Moirang and Meithei (Meitei) are the notably different tribes occupying the different portions of the Valley. The literacy rate of the district is 86.1% **(Table 3.20)**. Majority of population i.e. 55.51% reside in urban areas. Imphal west being a largely urban district is comparatively more industrialized than rest of the state. However, majority of the industries located in the district are cottage industries like Handloom and Handicrafts. Work participation rate is about 41.2%, out of which 60.2% are male workers and 39.8% are female workers. Among the total work force, 77.8% are Main Workers and 22.2% are Marginal Workers **(Table 3.21)**. About 18.1% workers are cultivators and only 3% are agricultural labourers. About 71.9% of work force is engaged in other than agricultural activities including 6.9% household industrial workers **(Table 3.22)**.

Senapati (including Kangpokpi) district is an entirely rural economy and agriculture is the main occupation of the people in the district. The district has a population of 4,79,148. The district has a sex ratio of 937 female per 1000 male. The population of Schedule Caste and Schedule Tribes constitute 0.2% and 87.5% respectively of the total population **(Table 3.19).** Aimol**,** Gangte, Kharam, Koirao, Kom are the tribes residing in the district. Aimol is listed under the Kuki tribes found living both in Assam and Manipur. They speak Aimol language, classified under Kuki-Chin-Mizo language. Gangte are one of the major Kuki-Chin tribes with Christianity being their apex religion. They are also one of the educated and a developed lot with 99% literacy rate. Kharam are settled in 7 villages, of which Kharam Pallen village is their main biggest settlement. They were recognized as a scheduled tribe in 2003. Most of them

follow Christianity. Koirao also calls themselves 'Thangals'. They are close-knit and live in hill villages mostly located along the National Highway No. 2. Thangals generally dress in bright and colorful attires. Koms speak language similar to that of Koireng, Aimol and Chiru and closely related to the Hmar. Christianity is its main religion. Some major festivals of Koms are Seling, Hlungphun, Belam and Lamkut. Paddy, Maize, Cabbage, Potato, cereals are the main crops of the district. Both jhum and terrace cultivation is done on the hill slopes of the district. Rice accounts for more than 90 percent of the total land area under cultivation. Although the average land holding is one of the lowest in India, yield per acre is comparatively high. The most important industry from the point of view of employment potential and volume of output is the handloom and handicraft industry, which is mainly run on a small-scale household industry basis. Moreh, which is 110 km away from Imphal, has emerged as an international trade centre with the inauguration of Indo-Myanmar Border Trade 1995. It is believed to be the prospective economic bridge between India and the other industrially developing South East Asian countries. Work participation rate is about 48.8%, out of which 53.1% are male workers and 46.9% are female workers. Among the total work force, 79.5% are Main Workers and 20.5% are Marginal Workers **(Table 3.21)**. About 80.7% workers are cultivators and only 2.7% are agricultural labourers. About 15.5% of work force is engaged in other than agricultural activities including 1.2% household industrial workers **(Table 3.22)**.

Table 3.19: Demographic Profile of Districts Belonging to Study Area

Districts	No. of Household	Population			Sex Ratio	Scheduled Caste				Scheduled Tribe			
		Total	Male	Female		Total	Male	Female	%	Total	Male	Female	%
1	2	3	4	5	6 = (5/4*1000)	7	8	9	10 = (7/3*100)	11	12	13	14 = (11/3*100)
Bishnupur	46580	237399	118782	118617	999	22113	11085	11028	9.3	3287	1625	1662	1.4
Imphal East & Jiribam	92124	456113	226094	230019	1017	15839	8055	7784	3.5	27657	13500	14157	6.1
Imphal West	111156	517992	255054	262938	1031	16530	8308	8222	3.2	24161	11560	12601	4.7
Senapati & Kangpokpi	83411	479148	247323	231825	937	1000	536	464	0.2	419210	214519	204691	87.5
TOTAL	**333271**	**1690652**	**847253**	**843399**	**995**	**55482**	**27984**	**27498**	**3.3**	**474315**	**241204**	**233111**	**28.1**

Source: Census of India, 2011

Table 3.20: Literacy Profile of Districts Belonging to Study Area

Districts	Total population			Population (above 6 years)			Literate (Number)			Literate Rate (%)		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
1	2	3	4	5	6	7	8	9	10	11 = (8/5*100)	12 = (9/6*100)	13 = (10/7*100)
Bishnupur	237399	118782	118617	206096	102590	103506	156333	87313	69020	75.9	85.1	66.7
Imphal East & Jiribam	456113	226094	230019	396177	195243	200934	324664	173314	151350	81.9	88.8	75.3
Imphal West	517992	255054	262938	456117	223307	232810	392626	205985	186641	86.1	92.2	80.2
Senapati & Kangpokpi	479148	247323	231825	415813	213860	201953	264477	148012	116465	63.6	69.2	57.7
TOTAL	**1690652**	**847253**	**843399**	**1474203**	**735000**	**739203**	**1138100**	**614624**	**523476**	**77.2**	**83.6**	**70.8**

Source: Census of India, 2011

Table 3.21: Occupational Pattern of Districts Belonging to Study Area

District	Total Population	Working Population												Non Worker			
		Total Worker				Main Worker				Marginal Worker							
		Total	Male	Female	%*	Total	Male	Female	%**	Total	Male	Female	%***	Total	Male	Female	%****
Bishnupur	237399	109937	62807	47130	46.3	76423	53158	23265	69.5	33514	9649	23865	30.5	127462	55975	71487	53.7
Imphal East & Jiribam	456113	194848	117562	77286	42.7	145343	100014	45329	74.6	49505	17548	31957	25.4	261265	108532	152733	57.3
Imphal West	517992	213387	128540	84847	41.2	166009	110440	55569	77.8	47378	18100	29278	22.2	304605	126514	178091	58.8
Senapati & Kangpokpi	479148	233622	124143	109479	48.8	185725	101924	83801	79.5	47897	22219	25678	20.5	245526	123180	122346	51.2
TOTAL	**1690652**	**751794**	**433052**	**318742**	**44.5**	**573500**	**365536**	**207964**	**76.3**	**178294**	**67516**	**110778**	**23.7**	**938858**	**414201**	**524657**	**55.5**

Source: Census of India, 2011

*Note: *Total Worker% = Total Worker/ Total Population x 100, **Main Worker% = Main Worker/ Total Worker x 100, *** Marginal Worker% = Marginal Worker/ Total Worker x 100, **** Non Worker% = Non Worker/ Total Population x 100*

Table 3.22: Main Worker Profile of Districts Belonging to Study Area

Districts	Main Worker	Cultivators				Agricultural Labour				Household Industry Worker				Other Worker			
		Total	Male	Female	%*	Total	Male	Female	%**	Total	Male	Female	%***	Total	Male	Female	%****
Bishnupur	76423	26542	21569	4973	34.7	4745	2755	1990	6.2	5560	1455	4105	7.3	39576	27379	12197	51.8
Imphal East & Jiribam	145343	27895	23350	4545	19.2	9398	5480	3918	6.5	11908	2829	9079	8.2	96142	68355	27787	66.1
Imphal West	166009	30101	23001	7100	18.1	5044	3057	1987	3.0	11439	3576	7863	6.9	119425	80806	38619	71.9
Senapati & Kangpokpi	185725	149797	77987	71810	80.7	5039	2315	2724	2.7	2185	1060	1125	1.2	28704	20562	8142	15.5
TOTAL	**920410**	**434544**	**262931**	**171613**	**47.2**	**42827**	**23204**	**19623**	**4.7**	**44794**	**13562**	**31232**	**4.9**	**398245**	**281576**	**116669**	**43.3**

Source: Census of India, 2011

*Note: *Total Cultivator% = Total Cultivator/ Main Worker x 100, **Total Agricultural Labour% = Total Agricultural Labour/ Main Worker x 100, ***Household Industry Worker% = Total Household Industry Worker/ Main Worker x 100, **** Total Other Worker% = Total Other Worker/ Main Worker x 100*

Chapter 4 MAJOR FEATURES OF FINAL ROUTE

4.1 INTRODUCTION

Environmental impact of transmission and distribution (T&D) line projects are not far reaching and are mostly localized to RoW. However, T&D project has some effects on natural and socio-culture resources. These impacts can be minimized by careful route selection. To minimize these possible impacts, MSPCL & IA at the system planning stage itself try to avoid ecological sensitive areas like forest. Wherever such infringements are substantial, different alternative options are considered to select most viable route alignment. For further optimization of route modern survey techniques/tools like GIS, GPS aerial photography is also applied. Introduction of GIS and GPS in route selection result in access to updated/latest information, through satellite images and further optimization of route having minimal environmental impact. Moreover, availability of various details, constraints like topographical and geotechnical details, forest and environmental details etc. help in planning the effective mitigate measures including engineering variations depending upon the site situation/location. The route/site selection criteria followed is detailed below in the ensuing paragraphs.

4.2 ENVIRONMENTAL CRITERIA FOR ROUTE SELECTION

For selection of optimum route, the following points are taken into consideration:

i. The route of the proposed lines does not involve any human rehabilitation.
ii. Any monument of cultural or historical importance is not affected by the route of the line.
iii. The proposed route does not create any threat to the survival of any community with special reference to Tribal Community.
iv. The proposed route does not affect any public utility services like playgrounds, schools, other establishments etc.
v. The line route does not pass through any sanctuaries, National Park etc.
vi. The line route does not infringe with area of natural resources.

In order to achieve this, MSPCL undertook route selection for individual transmission & distribution lines in close consultation with representatives of concerned Forest Department and the Department of Revenue. Although under National law, MSPCL has the right of eminent domain, yet alternative alignments are considered keeping in mind the above-mentioned factors

during site selection, with minor alterations often added to avoid environmentally sensitive areas and settlements at execution stage.

- As a rule, alignments are generally cited away from major towns, whenever possible, to account for future urban expansion (refer **Figure 4.1 to Figure 4.5** and **Map 1** to **Map 3** for final route of all T&D network).
- Similarly, forests are avoided to the extent possible, and when it is not possible, a route is selected in consultation with the local Divisional Forest Officer, that causes minimum damage to existing forest resources.
- Alignments are selected to avoid wetlands and unstable areas for both financial and environmental reasons.

In addition, care is also taken to avoid National Parks, Sanctuaries, Eco-sensitive zones, Tiger reserves, Biosphere reserves, Elephant corridors and IBA sites etc. Keeping above in mind the routes of proposed lines under the project have been so aligned that it takes care of above factors. As such, different alternatives for transmission lines were studied with the help of Govt. published data like Forest atlas, Survey of India etc. and Google Maps to arrive at the most optimum route, which can be taken up for detailed survey and assessment of environmental & social impacts for their proper management.

Similarly, the TOR for detailed survey using modern tool like GIS/GPS also contained parameters to avoid/reduce environmental impact while deciding the final route alignment. The major objectives for detailed survey that are part of contract are summarized below:

(i) The alignment of transmission line shall be most economical from the point of view of construction and maintenance.

(ii) Routing of transmission line through protected and reserved forest area should be avoided. In case it is not possible to avoid the forest or areas having large trees completely then keeping in view of the overall economy, the route should be aligned in such a way that cutting of trees is minimum.

(iii) The route should have minimum crossing of major rivers, railway lines, and national/state highways, overhead EHP power lines and communication lines.

(iv) The number of angle point shall be kept to a minimum.

(v) The distance between the terminal points specified shall be kept shortest possible, consistent with the terrain that is encountered.

(vi) Marshy and low line areas, river beds and earth slip zones shall be avoided to minimum risk to the foundations.

(vii) It would be preferable to utilize level ground for the alignment.

(viii) Crossing of power line shall be minimal. Alignment will be kept at a minimum distance of 300 meters from power lines to avoid induction problems on the lower voltage lines.

(ix) Crossings of communication lines shall be minimized and it shall be preferably at right angle, proximity and paralyses with telecom lines shall be eliminated to avoid danger of induction to them.

(x) Area subjected to flooding searches streams shall be avoided.

(xi) Restricted areas such as civil and military airfield shall be avoided. Care shall also be taken to avoid the aircraft landing approaches.

(xii) All alignment should be easily accessible both in dry and rainy seasons to enable maintenance throughout the year.

(xiii) Certain areas such as query sites, tea, tobacco and saffron fields and rich plantation, gardens and nurseries that will present the owner problems in of right of way and leave clearance during construction and maintenance should be avoided.

(xiv) Angle point should be selected such that shifting of the point within 100 m radius is possible at the time of construction of the line.

(xv) The line routing should avoid large habitation densely populated areas to the extent possible.

(xvi) The area requires special foundations and those prone to flooding should be avoided.

(xvii) For examination of the alternatives and identification of the most appropriate route, besides making use of information/data/details available/extracted through survey of India topographical maps and computer aided processing of NRSA satellite imagery, the contractor shall also carry out reconnaissance/preliminary survey as may be required for the verification and collection of additional information/data/details.

(xviii) The contractor shall submit his preliminary observation and suggestion along with various information/data/details collected and also processed satellite imagery data, topographical map data marked with alternative routes etc. The final evaluation of the alternative routes shall be conducted by the contractor in consultation with owners' representatives and optimal route alignment shall be proposed by the contractor. Digital terrain modeling using contour data from

topographical maps as well as processed satellite data shall be done by the contractor for the selected route. A flythrough perspective using suitable software(s) shall be developed or further refinement of the selected route. If required site visit and field verification shall be conducted by the contractor jointly with the owners' representatives for the proposed route alignment.

(xix) Final digitized route alignment drawing with the latest topographical and other details/features including all river railway lines, canals, roads etc. up to 8 Kms on both side of selected route alignment shall be submitted by the contractors for owner's approval along with report containing other information / details as mentioned above.

The route finalized after detailed survey by contractor follows all the environmental criteria laid down for consideration of route selection. The major features encountered in the finalized route are elaborated in the ensuing paragraphs.

4.2.1 Transmission Lines

The transmission line scope includes following subprojects:

i. Imphal (PG) – Ningthoukhong 132 kV D/C Line – 32.525 km;
ii. LILO of Yurembam (Imphal-State) – Karong at Gamphajol – 1.47 km

In the instant project also, criteria for route selection as mentioned above, has been duly adhered to and the proposed Imphal (PG) – Ningthoukhong 132 kV D/C Transmission Line route have been selected from analysis of three (03) alternatives routes as described in the IEAR. Subsequently, the proposed route was considered for detail survey by Contractor Agency (after awarding of contract). During detailed survey minor alterations as well as geometrical corrections of the route have been carried out which seems inevitable due to actual ground conditions with prime objective of avoiding forest/private plantation areas, settlements, Common Property Resource (CPR), and also considering the technical feasibility of the route from operation and maintenance point of view in consultation with the local village councils prevalent in the project area. Efforts of IA/MSPCL in effectively integrating safeguard and engineering measures successfully avoided impact on forest and minimized impact on environment. For changes in scope of work with respect to IEAR scope i.e. changes in the route alignment based upon alternatives studies and detailed survey for transmission line is given is **Table 4.1**.

Since the length of the LILO of Yurembam (Imphal-State) – Karong at Gamphajol is 1.47 km only therefore no alternative route have been explored in the instant subproject.

4.2.2 Distribution Lines

The distribution line scope includes following subprojects:

i. LILO from Mongsangei to Kakwa at Pishum – 4.2 km;
ii. 33 kV line from Mongsangei to Hiyanthang substation – 4.82 km;
iii. 33 kV line from Iroisemba to Takyel substation – 7.0 km;
iv. 33 kV line from Moirang to Kwatka substation – 6.33 km;
v. 33 kV line from Nambol to Leimapokpam substation – 6.286 km

The proposed distribution lines connect 2 substations in close vicinity and are having line length of less than 10 km, thus, having negligible environment and social impacts including no involvement of any forest area. Hence, alternative has not been studied for the distribution lines under instant project. For changes in scope of work with respect to IEAR scope i.e. changes in the route alignment based upon detailed survey for distribution line is given is **Table 4.1**.

Table 4.1: Change in Scope of Work w.r.t. IEAR

S. No.	Scope as per IEAR	Current Status	Justification/ Remarks
Transmission Component			
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line – **30.70 km**	Imphal (PG) – Ningthoukhong 132 kV D/C Line – **32.525 km**	No change in the route, however, length has slightly increased when optimized during ground truthing survey.
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol – **1.7 km**	LILO of Yurembam (Imphal-State) – Karong at Gamphajol – **1.47 km**	No change in the route, however, length has slightly decreased when optimized during ground truthing survey.
Distribution Component			
1	Pishum - Mongsangei 33 kV line – **5 km (UG) + 5 km**	LILO from Mongsangei to Kwatka at Pishum – **0.157 km**	Change in current status is due to the change in route as location of Pishum sub-station has been changed. With the change in sub-station location length of line was reduced by 9.8 km and hence resulted in reduced environmental and social issues.
2	LILO of Yurembam- Mayang-Imphal line at Hiyangthang - **4 km**	33 kV line from Mongsangei to Hiyanthang substation – **4.82 km**	Change in current status is due to the change in route.
3	33 kV line from Iroisemba to Takyel substation – **7.0 km**	33 kV line from Iroisemba to Takyel substation – **7.0 km**	Alternate land for substation has been handed over to POWERGRID. Geo-Technical and Soil investigations works

S. No.	Scope as per IEAR	Current Status	Justification/ Remarks
			are completed, however, reports are awaited, therefore route of the line is yet to be finalized.
4	LILO of Moirang - Moirangkhunou 33 kV line at Kwatka - **9.2 km**	33 kV line from Moirang to Kwatka substation – **6.33 km**	Change in current status is due to the change in route.
5	33 kV line from Nambol to Leimapokpam substation – **7.11 km**	33 kV line from Nambol to Leimapokpam substation – **6.286 km**	Meticulous realignment during ground truthing survey has reduced line length further.

Source: Detailed Survey of POWERGRID/ Contractor

Figure 4.1: Satellite Imagery Showing Route of Imphal (PG) – Ningthoukhong 132 kV D/C Transmission Line

Figure 4.2: Satellite Imagery Showing Route of LILO of Yurembam (Imphal-State) – Karong at Gamphajol

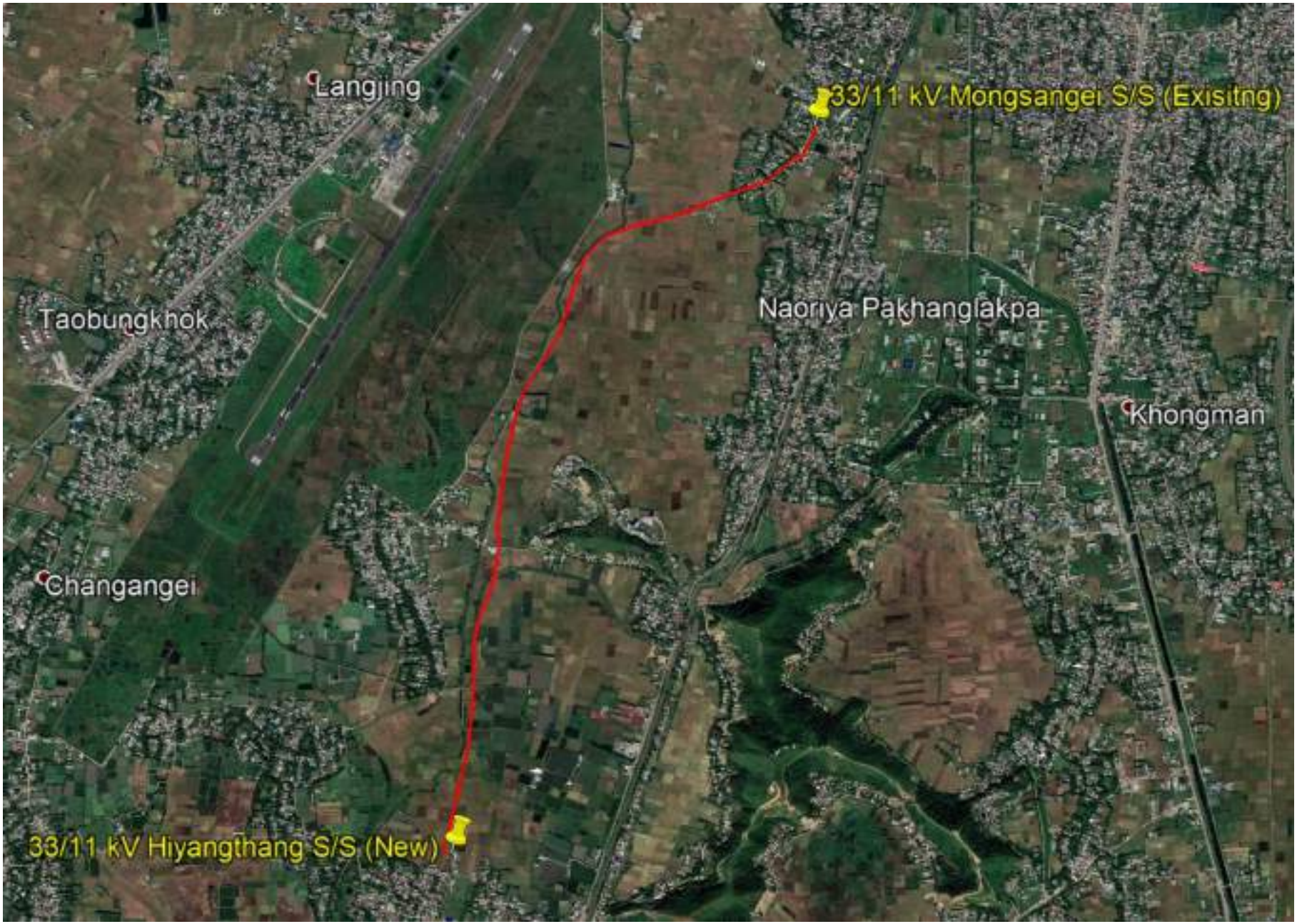


Figure 4.3: Satellite Imagery Showing Route of 33 kV Distribution Line from 33/11 kV Mongsangei to 33/11 kV Hiyanthang Substation

Figure 4.4: Satellite Imagery Showing Route of 33 kV Distribution Line from 33/11 kV Moirang to 33/11 kV Kwakta Substation

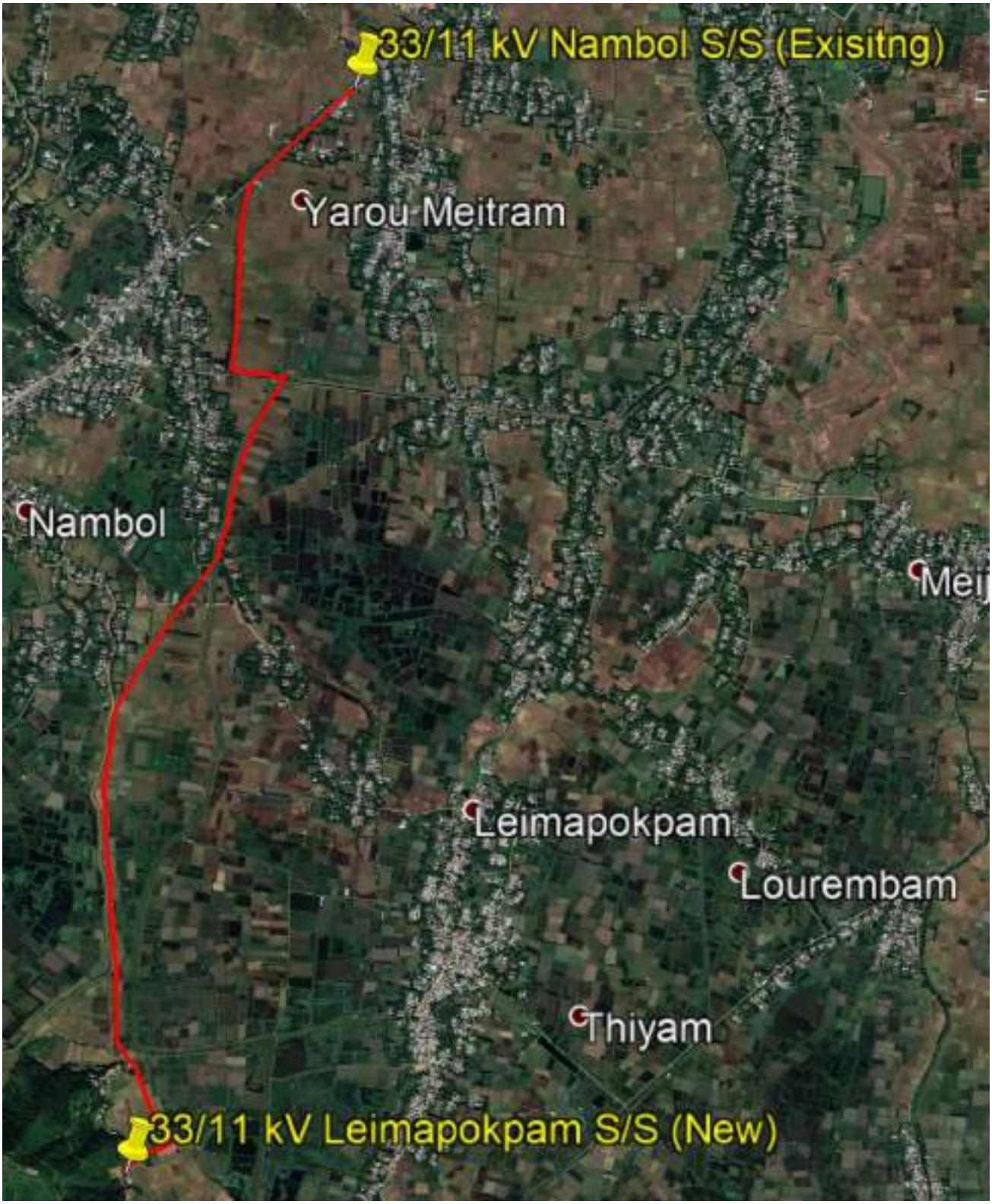


Figure 4.5: Satellite Imagery Showing Route of 33 kV Distribution Line from 33/11 kV Nambol to 33/11 kV Leimapokpam Substation

Figure 4.6: Satellite Imagery Showing Route of LILO from Mongsangei to Kwatka at Pishum

4.2.3 Sub-stations

For sub-station, site selection analysis of 2-3 alternatives sites is usually carried out based on environment and social aspects and technical requirement. Such analysis considers various site-specific parameters that include availability of infrastructure facilities such as access roads, water, distance from railheads, type of land (Government/ revenue/private land); social impacts such as number of families getting affected; CPR including feasibility of acquisition. The finalization of substation land is done based on above analysis and site visit/verification. The social aspects are provided due weightage after technical requirement in decision making for selection/finalization of land for substation.

In the instant case also land for all the proposed substations, either in possession of MSPCL or identified for purchase on willing seller –willing buyer basis were acquired as per above mentioned analysis and site visit/ verification. Also, as per the provisions of ESPPF, all land received from MSPCL and direct purchases were reviewed/ approved by a broad-based committee

comprising representatives of different sections including those from the IA and Govt. of Manipur.

The finalized location of transmission and distribution substations is given below in **Table 4.2**.

Table 4.2: Finalized Location of Transmission & Distribution Substation

S. No.	Name of Substation	Earlier Identified Land as per IEAR	Finalized Land (Actual)	Reason for Change
A	**Transmission Substation**			
1	132/33 kV substation at Gamphajol (New)	The proposed land is at Gamnom in Senapati district.	The proposed land is at Gamnom in Senapati district.	Remain Unchanged
2	132/33 kV Imphal (PG) substation (Extension)	In the campus of existing Imphal Sub-station	In the campus of existing Imphal Sub-station	Remain Unchanged
3	132/33 kV substation at Ningthoukhong (Extension & Augmentation)	In the campus of existing Ningthoukhong Sub-station	In the campus of existing Ningthoukhong Sub-station	Remain Unchanged
4	132/33 kV substation at Yaingangpokpi (Extension)	In the campus of existing Yaingangpokpi Sub-station	In the campus of existing Yaingangpokpi Sub-station	Remain Unchanged
B	**Distribution Substation**			
6	New 33/11kV substation at Pishum (GIS)	Near Pishumthong Bazar, Imphal West	The proposed land is at Khongman in Imphal East district Co-ordinates: 24°45'5.84" N, 93°56'3.63" E	As the identified land parcel was in densely populated area therefore, to avoid RoW issue and new land finalized by MSPCL and handover to POWERGRID
7	33/11kV substation at Hiyanthang (New)	Nearby Meilambi Road in Imphal West district	Near public play ground in Hiyanthang in in Imphal East district Co-ordinates: 24°43'49.35" N, 93°53'56.20" E	Remain Unchanged
8	33/11kV substation at Takyel (New)	In an Institution area in Imphal West district		Since the site was geologically not feasible therefore, alternate land has been handed over to POWERGRID. Geo-Technical and Soil

S. No.	Name of Substation	Earlier Identified Land as per IEAR	Finalized Land (Actual)	Reason for Change
				investigations works are completed, however, reports are awaited, therefore location of substation is yet to be finalized.
9	33/11kV substation at Kwakta (New)	In Kwatra village bordering on Imphal-Churachandrapur Road in Bishnupur district.	The proposed land is at kwakta in Bishnupur district Co-ordinates: 24°27'12.96" N, 93°43'45.04" E	New land finalized approx. 1.5 km from earlier location as land owner & MSPCL could not reach a common agreement.
10	33/11kV substation at Leimapokpam (New)	Near Imphal-Churachandrapur Road in Bishnupur district.	The proposed land is near playground at Ishok in Bishnupurdistrict Co-ordinates: 24°40'55.72" N, 93°50'35.45" E	New land finalized by MSPCL approx. 2.5 km from earlier location as land owner & MSPCL could not reach a common agreement.
11	33/11 kV substation at Moirang (Extension)	Scope added	In the campus of existing Moirang Sub-station	NA
12	33/11 kV substation at Nambol (Augmentation)	Scope added	In the campus of existing Nambol Sub-station	NA
13	33/11 kV substation at Kangpokpi (Augmentation)	Scope added	In the campus of existing Kangpokpi Sub-station	NA
14	33/11 kV substation at Ningthoukhong (Augmentation)	Scope added	In the campus of existing 132/33 kV Ningthoukhong Sub-station	NA
15	33/11 kV substation at Khwairakpam (Augmentation)	Scope added	In the campus of existing Khwairakpam Sub-station	NA
16	33/11 kV substation at Moirangkhunou (Augmentation)	Scope added	In the campus of existing Moirangkhunou Sub-station	NA
17	33/11 kV substation at	Scope added	In the campus of existing 132/33 kV Yaingangpokpi	NA

S. No.	Name of Substation	Earlier Identified Land as per IEAR	Finalized Land (Actual)	Reason for Change
	Yaingangpokpi (Augmentation)		Sub-station	
18	33/11 kV substation at Saikul (Augmentation)	Scope added	In the campus of existing Saikul Sub-station	NA
19	33/11 kV substation at Tadubi (Augmentation)	Scope added	In the campus of existing Tadubi Sub-station	NA
20	33/11 kV substation at Karong (Augmentation)	Scope added	In the campus of existing Karong Sub-station	NA
21	33/11 kV substation at Maram (Augmentation)	Scope added	In the campus of existing Maram Sub-station	NA

Source: Detailed Survey of POWERGRID/ Contractor

132/33 kV Substation at Gamphajol (New)

Extension of Existing 132/33 kV Substation at Imphal (POWERGRID)


Existing 132/33 kV Substation at Ningthoukhong (Bay Extension & Augmentation)


Existing 132/33 kV Substation at Yaingangpokpi (Bay Extension)


33/11 kV Substation at Pishum (New)


33/11 kV Substation at Hiyanthang (New)


33/11 kV Substation at Kwatka (New)


33/11 kV Substation at Leimapokpam (New)


Existing 33/11 kV Substation at Moirang (Extension)


Existing 33/11 kV Substation at Nambol (Augmentation)


Existing 33/11 kV Substation at Kangpokpi (Augmentation)


Existing 33/11 kV Substation at Khwairakpam (Augmentation)


Existing 33/11 kV Substation at Yaingangpokpi (Augmentation)


Existing 33/11 kV Substation at Saikul (Bay Extension)


Existing 33/11 kV Substation at Tadubi (Augmentation)


Existing 33/11 kV Substation at Karong (Augmentation)


Existing 33/11 kV Substation at Maram (Augmentation)

4.3 MAJOR FEATURES OF FINAL ROUTE

4.3.1 Transmission Lines

Of the 2 transmission lines, LILO of Yurembam (Imphal-State) – Karong at Gamphajol is passing through hilly terrain while Imphal (PG) – Ningthoukhong 132 kV D/C line is passing through plains. Almost entire landuse beneath these lines is agriculture land (**refer Figure 4.1 & 4.2**). The lines do not pass through any settlement. The lines route doesn't involve any notified forest land which would necessitate forest clearance under Forest (Conservation) Act, 1980. Besides all protected areas like National Parks, Wildlife Sanctuaries,

Biosphere Reserve etc.; Natural habitats, IBAs, Sacred groves, Wetlands etc. have been completely avoided. It has been observed that there are some variations in final route length of lines from earlier routes so that environment & social sensitive areas are avoided/ minimized. However, increase in total line length by just 1.60 km for both the lines (from earlier 32.40 km to 34.00 km) without any change in land use and other base line data, no additional impacts of any kind apart from earlier identified impacts in IEAR/EMP are anticipated. A total of around 121 towers are being/to be erected for both the proposed transmission lines having a total line length of 34.00 km.

4.3.1.1 Imphal (PG) – Ningthoukhong 132 kV D/C Line

The transmission line passes through plain paddy fields owned by individual households. Major crossing en route of the line are:

- 33 kV line between tower 2 and tower 4 and between tower 14 and tower 15
- 132 kV S/C Imphal – Ningthoukhong line between 29 and between 30 and between tower 94 and tower 95
- 132 kV S/C Imphal – Loktak line between 30 and between 31 and between tower 93 and tower 94
- 132 kV D/C Ningthoukhong – Churachandpur line between tower 114 and tower 115
- 400 kV D/C Imphal – Thoubal line between tower 35 and tower 36
- Proposed railway line between tower 14 and tower 15
- National Highway 150 between tower 84 and tower 85 and between tower 105 and tower 106
- River between tower 16 and tower 17
- 11kV lines, nalas, unmetalled roads, metaled roads, village roads and footpaths.

The line length of final route (**Table 4.1**) has been increased by just 1.825 km i.e. from 30.70 km to 32.525 km so that environment & social sensitive areas are avoided/ minimized. Though there is negligible increase in line length, no additional impacts of any kind apart from earlier identified impacts in IEAR/EMP were found. Moreover, environment & social safeguard issues which have been taken care off are: -

- Habitation areas along the route have been completely avoided
- Forests of any type have been completely avoided
- It is ensured that common property resources (CPR) are not impacted.
- Any areas/monuments of archaeological importance are also not encountered along the route.
- All critical environmental area have been completely avoided.

The line has a total 116 towers. The types of towers used are double circuit (DA, DB, DC and DD) towers. Due to various type of crossings height of 48 towers have been increased by 3m, 6 towers by 6m, 4 towers by 9m, 4 towers by 18m and 1 tower 25 m. All the tower locations are easily accessible through existing road to carryout construction and maintenance activity and construction of new approach road is not required. Details of tower schedule of final route alignment describing important features of line route are placed as **Annexure II**.




Habitation avoided at various stretches

4.3.1.2 LILO of Yurembam (Imphal-State) – Karong at Gamphajol

The transmission line passes through paddy fields and private lands owned by individual households. The selected line does not pass through any National Highway, Power line, Railway crossings, settlement or any other critical environmental area. However, the line is crossing a village road, metal road, drain and one stream, which do not require any special towers.

The line length of final route (**Table 4.1**) has been reduced by 0.23 km i.e. from 1.70 km to 1.47 km due to optimization during ground truthing survey. The length and route of the line is moreover same as given in the IEAR therefore, no additional impacts of any kind apart from earlier identified impacts in IEAR/EMP were found. The line has a total 5 towers without any National Highway (NH), railways and major river crossings. The types of towers used are double circuit DD towers. All the tower locations are easily accessible through existing road to carryout construction and maintenance activity and construction of new approach road is not required. Details of tower schedule of final route alignment describing important features of line route are placed as **Annexure II**.

4.3.2 Distribution Lines

All the distribution lines are passing through plains, comprising of agricultural land, private plantation and govt./ barren lands, along existing roads and bunds and do not involve any reserve/protected forest land (**refer Figure 4.3-4.6**). Out of the 5 distribution lines, 33 kV line from Iroisemba to Takyel substation is yet to be finalized, therefore, major features of final route has been studied/ described for rest of the four distribution lines. It has been observed that there are variations in final route length of lines from earlier routes so that environment & social sensitive areas are avoided/ minimized. Moreover, the length of 4 final route has been decreased by 12.71 km i.e. from 30.31 km to 17.60 km due to change in sub-station location, change in route of line and optimization during ground truthing survey. Considering that distribution line has minimum environmental footprints without any change in land use and other base line data, no additional impacts of any kind apart from earlier identified impacts in IEAR/EMP are anticipated. A total of around 459 poles are erected for all 4 finalised distribution lines having a total line length of 17.60 km.

4.3.2.1 33 kV line from 33/11 kV Mongsangei to 33/11 kV Hiyangthang Sub-station

Total length of the line is 4.82 km, of which, 2.3 km of the line passes through agricultural land, 1.27 km passes through private plantation and the rest 1.25 km passes through govt. land. The selected line does not pass through any National Highway, Railway crossings, settlement or any other critical environmental area. However, the line is crossing a 33 kV line between Four Pole (**FP**) 01 and Double Pole (**DP**) 01; 11 kV line between DP-08 and DP-09; Nala between SP-55 and SP-56; pond; village road; metal road; and LT line.

Since the route of the line has been changed from earlier envisaged LILO of Yurembam- Mayang-Imphal line at Hiyangthang to Mongsangei – Hiyanthang line, therefore the line length of final route (**Table 4.1**) has been increased by 0.82 km only i.e. from 4.0 km to 4.82 km. Though there is a increase in line length it is expected that the resultant environmental and social footprints are nil as it travels along existing road and through agricultural fields, hence, no felling of tree will required, only lopping of tree branches will suffice for ROW clearance. The line has total 116 poles. The types of poles used are 12 mtr. SP, DP and FP and 14.5 mtr. DP. As preventive measures, anti climbing sets have been placed on the route. All the pole locations are easily accessible through existing road to carryout construction and maintenance activity and construction of new approach road is not required.

Route along the existing Road to Avoid Habitation Area at Mongsangei

Route along the existing Road & Agricultural Fields

4.3.2.2 33 kV line from 33/11 kV Moirang to 33/11 kV Kwatka Sub-station

Total length of the line is 6.33 km, of which, 4.91 km of the line passes through agricultural land and the rest 1.42 km passes through private plantation. The selected line does not pass through any National Highway, Railway crossings, settlement or any other critical environmental area. However, the line is crossing 33 kV line between SP1/1 and DP2 and between FP35 and DP36; 11 kV line between DP16 and SP16/1; Canal between FP7 and SP7/1 and between FP21 and DP22; roads and LT lines.

Since the route of the line has been changed from earlier envisaged LILO of Moirang – Moirangkhunou 33 kV line at Kwatka to Moirang – Kwatka, therefore the line length of final route (**Table 4.1**) has been decreased by 2.87 km i.e. from 9.20 km to 6.33 km. There is a significant decrease in line length, also the line is passing through agricultural and private plantation land therefore, the resultant environmental and social footprints are nil. No felling of tree will required. The line has total 175 poles. The types of poles used are 12 mtr. SP, DP and FP, 14.5 mtr. SP, DP and FP. As preventive measures, anti climbing sets have been placed on the route. All the pole locations are easily accessible through existing road to carryout construction and maintenance activity and construction of new approach road is not required.

Route along the Agricultural Land to Avoid Habitation Area


4.3.2.3 33 kV line from 33/11 kV Nambol to 33/11 kV Leimapokpam Sub-station

The total line length i.e. 6.286 km, of which, 4.95 km of the line passes through agricultural land, 0.977 km passes through private plantation and the rest 0.359 km passes through riverine. The selected line does not pass through any National Highway, Railway crossings, settlement or any other critical environmental area. However, the line is crossing 400 kV D/C between SP-31 and SP-32 11kv line between SP-9 and SP-10, between SP-61 and SP-62 and between SP-116 and SP-117; nala and metal road.

The line length of final route (**Table 4.1**) has been decreased by 0.82 km i.e. from 7.11 km to 6.286 km due to further optimization during ground truthing survey. The line has a total 157 poles. The types of poles used are 12 mtr. SP, DP and FP. As preventive measures, anti climbing sets have been placed on the route. All the pole locations are easily accessible through existing road to carryout construction and maintenance activity and construction of new approach road is not required.


Route along the Canal to Avoid Habitation Area & Agricultural Land

Route along the National Highway to Avoid Habitation Area & Agricultural Land

4.3.2.4 LILO from Mongsangei to Kwatka at Pishum

Total length of the line is 0.157 km only. The only feature crossed by the selected line National Highway 102 between SP-1 and SP-2A and between SP-2 and FP-3.

Since the route of the line has been changed from earlier envisaged Pishum to Mongsangei line, therefore the line length of final route (**Table 4.1**) has been drastically decreased by 9.843 km i.e. from 10 km to 0.157 km only. The resultant environmental and social footprints are nil as in this negligible route length it either travels or crosses the existing National Highway only. The line has total 11 poles. The types of poles used are SP, DP and FP. All the pole locations are easily accessible through existing road to carryout construction and maintenance activity and construction of new approach road is not required.

Route and location of Poles of the LILO

Chapter 5 POTENTIAL ENVIRONMENTAL IMPACTS, EVALUATION AND ITS MANAGEMENT

5.1 INTRODUCTION

Environmental impacts of Transmission & Distribution (T & D) projects are not far reaching and are mostly localized to RoW (refer **Table 5.1**). However, T & D projects have some effects on natural and socio-culture resources. All possible measures have been taken during the finalization of route alignment as described in the earlier chapter for the proposed transmission/distribution system, however, due to the peculiarity of terrain where project is being implemented, some environmental impacts may be there. The explanations in brief with regard to possible environmental impact and measures taken to minimize the same are given in ensuing paragraph.

Table 5.1: RoW Width

Transmission Voltage	Max. RoW (m)
132 kV	27
33 kV	15

5.2 IMPACT DUE TO PROJECT LOCATION

5.2.1 Resettlement

Land is required for

a) erection of towers/ pole for transmission and distribution lines and

b) construction of substations.

As explained in previous chapter during line routing stage itself all measures have been undertaken by IA to avoid settlements such as cities, villages etc. in line with the guiding principle of avoidance as per ESPPF. During detail survey modern techniques/tools like GIS, GPS, and aerial photography were utilized to further optimization the final route alignment avoiding human habitation and other ecological and socially sensitive areas. Moreover, the project does not require any resettlement of villagers as no land is acquired for tower/pole foundation as per existing law.

The present subprojects involves construction of one new 132/33 kV sub-station at Gamphajol and three new 33/11 kV sub-stations at Hiyanthang, Kwakta and Leimapokpam for which fresh lands have been secured through private purchase on willing–buyer and willing-seller basis on

negotiated/market rate. A total of 4.63 acre land has been secured for these sub-stations from 4 private persons who willing sold their land. Apart from this, for the construction of 2 new 33/11 kV sub-station at Takyel and Pishum (GIS), 0.839 acre of Govt. land has been provided by MSPCL. The augmentation/extension work at sub-stations are being undertaken in the already existing MSPCL sub-stations premise and no acquisition of fresh land was required for this purpose. Since, no involuntary acquisition was involved and fresh lands were secured only through private purchase there is no R & R and resettlement issues.

5.2.2 Impact on Soil & Surface Geology

In plain areas impact on soil & geology is almost negligible as the excavated pit material is stacked properly and back filled as well as used for resurfacing the area. On hill slopes where soil is disturbed and prone to erosion is suitably protected by revetment, breast walls, and proper drainage.

5.2.3 Impact on Land for Tower Base & Pole

As per the assessment carried out in CPTD by PGCIL, the land requirement for erection of tower legs is very small i.e. for each leg of tower actual construction is done on a small square area with side length ranging from 0.20 to 0.30 meter depending on the types of tower. Four such square pieces of land will be required to place the legs of tower. The area that becomes unavailable because of the erection of tower legs for an average 132 kV D/c transmission tower ranges from 0.16-0.36 sq m of land. Thus, the actual impact is restricted to 4 legs of the tower and agriculture can continue as clearly depicted in the **Figure 5.1**. In case of 33 kV distribution line area that becomes unavailable because of the erection of pole is insignificant as approx. 1 sq. ft. land area is occupied for one pole (refer **Figure 5.2**). Due diligence confirms that land is either agricultural or barren, and current land use is not altered and resumed after construction.

As already explained, the impact of transmission line is restricted to 4 legs of the tower and agriculture can continue after construction activity is over. The average land area will be unavailable for agriculture after erection of one 132 kV T/L tower and one pole for 33 kV D/L is approx. 0.25 sq m & 0.092 sq m, respectively. Based on above, total land loss for construction of 33.995 km of 132 kV transmission line and 17.593 km of 33 kV distribution line proposed under the present scheme is estimated 72.474 sq m. However, compensation toward loss of land shall be provided to APs which is part of RoW compensation. Details of land loss for tower base & pole are given in **Table 5.2**.

Table 5.2: Estimation of Actual Loss of Land for Tower Base & Pole

S. No.	Name of Line	Line Length (Kms.)	Total Tower/ Pole (Nos.)	Land loss per tower/ pole base (sq m)	Total land loss area for tower & pole base (sq m)
A	**Transmission Lines**				
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line	32.525	116	0.25	29
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	1.47	5	0.25	1.25
	TOTAL - A	**33.995**	**121**	**0.25**	**30.25**
B	**Distribution Lines**				
3	LILO from Mongsangei to Kwatka at Pishum	0.157	11	0.092	1.012
4	33 kV line from Mongsangei to Hiyanthang substation	4.82	116	0.092	10.672
5	33 kV line from Moirang to Kwatka substation	6.33	175	0.092	16.1
6	33 kV line from Nambol to Leimapokpam substation	6.286	157	0.092	14.44
	TOTAL - B	**17.593**	**459**	**0.092**	**42.224**
	TOTAL A+B	**51.588**	**580**		**72.474**

Source: Detailed Survey of POWERGRID/ Contractor

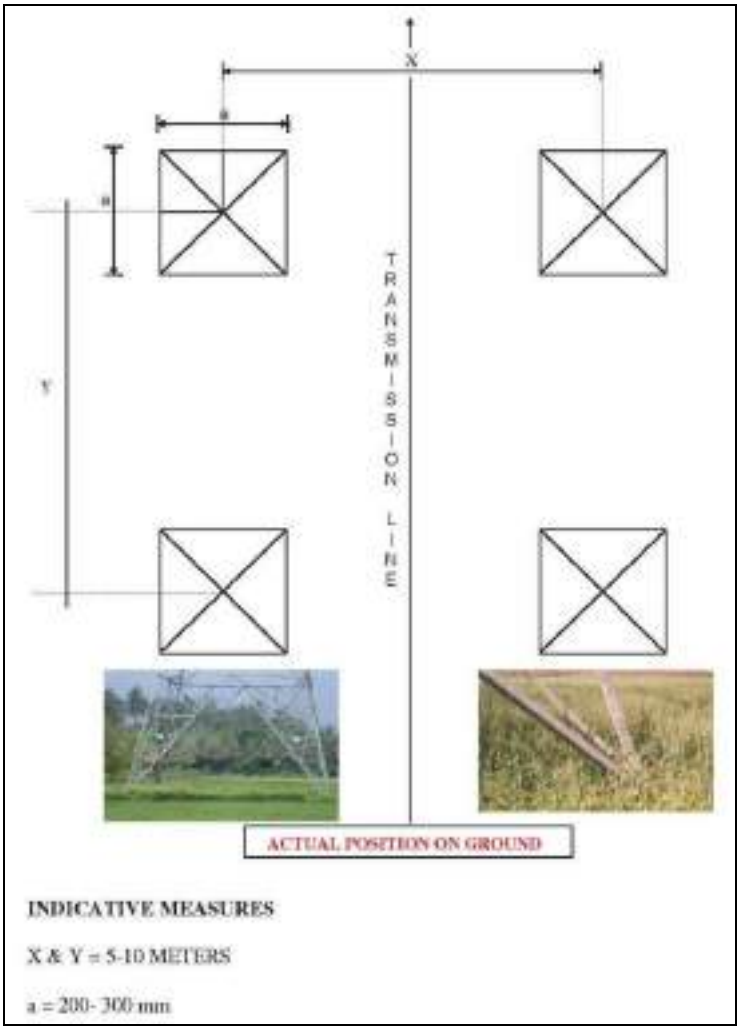


Figure 5.1: Typical Plan of Transmission Line Tower Footing

Figure 5.2: 33 kV Lines (Single & H Pole) Depicting Base Area Impact

5.2.4 Impact on Crop Area (RoW Corridor & Tower/Pole)

Construction of line in crop season is avoided as far as possible. In case when installation of towers/poles impacts on agricultural activity, detailed assessment/survey is conducted looking at existing crops, general crop patterns, seasonal particulars, nature and extent of yield. This data is compiled and analysed to study the extent and nature of impact.

For the temporary loss of crops, only agricultural land and private plantation land are considered for estimation. The damages are not done in complete RoW of line (27 m for 132 kV D/c) but mostly restricted to tip to tip of the conductor and tower base area where average affected width/corridor would be limited to 20 m (maximum). In 33 kV distribution lines, damages are minimal (mostly near bi-pole/quad-pole structure) however, 10 m corridor is considered for accessing the damages. Moreover, all efforts were made to reduce the damages to crops and to minimize the impacts whatsoever. One of the reasons is that schedules of construction activities are undertaken in lean

season or post-harvest periods. Assets of any sorts were not acquired but during construction, only temporary damages occurred.

Based on the above estimation, the total land considered for crop damage for transmission/distribution line corridor and tower/pole foundation for the entire subproject is 207.71 acre. Details of estimated impacted area for crop damages are given in **Table 5.3**.

5.2.5 Impact on Trees

Construction of line in fruit bearing season is avoided as far as possible. Tree compensation is calculated on the basis of tree enumeration, tree species and an estimate of the compensation will be calculated on the basis of 8 years yield (assessed by revenue/horticulture department).

Total numbers of trees affected due to construction of 33.995 km of 132 kV line is 51 nos. (refer **Table 5.4**). Trees were not affected due to the construction of distribution lines. It is pertinent to mention here that no tree has been felled, only pollarding/ pruning of trees have been carried out during stringing operation.

5.2.6 Impact on Other Assets (Small Shed in Agriculture Fields)

It has been observed during survey that approximately 17 numbers of small structures exist along the right of way of proposed transmission and distribution lines. These are small storage sheds/huts which are mostly temporary structure associated with the agricultural fields. People do not use these small structures/sheds for residential purpose and they use it as storage of agricultural purpose only. However, efforts have been made to avoid these structures completely through minor alterations of the route alignment. Details on impacts on small structures are given in **Table 5.5**.

5.2.7 Affected Persons

Affected Persons (APs) are those who are affected due to the various civil works like impact on other assests, damage to trees due to pollarding/ pruning or some partial damage to produces during stringing. Though the impact is temporary. The estimated number of affected persons are approximately 385. It is once again pertinent to mention here that persons got affected due to some temporary damages which lasted during construction phase only. The persons details are given in **Table 5.6**. The number of APs in the table refers to the most conservative option. State Utilities/ POWERGRID scheduled the civil works in such a way to minimize impacts and substantially reduce the damages to crops and therefore the number of affected persons and Agricultural Households (AHH).

Table 5.3: Estimation on Loss of Land for Crop Damage due to Overhead Lines

S. No.	Name of Line	Width Considered for Estimation of Loss of Crops and other impacts (m)	Total Agricultural Land (km)	Total Private Plantation (km)	Total Line Length Considered for Crop Compensation (km)	Total Land Area considered for Crop Compensation (acre)
A	**Transmission Lines**					
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line	20	32.525	Nil	32.525	160.74
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	20	1.47	Nil	1.47	7.26
	TOTAL - A		**33.995**	**Nil**	**33.995**	**168.00**
B	**Distribution Lines**					
3	33 kV line from Mongsangei to Hiyanthang substation	10	2.3	1.27	3.57	8.82
4	33 kV line from Moirang to Kwatka substation	10	4.91	1.42	6.33	15.64
5	33 kV line from Nambol to Leimapokpam substation	10	4.95	0.977	5.927	14.65
	Sub Total		**12.16**	**3.667**	**15.827**	**39.11**
	TOTAL		**46.155**	**3.667**	**49.822**	**207.11**

Source: Detailed Survey of POWERGRID/ Contractor

Table 5.4: Loss of Trees

S. No.	Name of Line	Trees in Private Area (No.)	Trees in Govt. Area (No.)	Total Trees (No.)
1	Imphal (PG) – Ningthoukhong 132 kV D/C Transmission Line	48	Nil	**48**
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	3	Nil	**3**
	TOTAL	**51**	**Nil**	**51**

Source: Detailed Survey of POWERGRID/ Contractor

Table 5.5: Loss of Other Assets

S. No.	Name of Line	No. of Storage Sheds/ Huts
A	**Transmission Lines**	
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line	10
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	1
B	**Distribution Lines**	
3	33 kV line from Mongsangei to Hiyanthang substation	2
4	33 kV line from Moirang to Kwatka substation	2
5	33 kV line from Nambol to Leimapokpam substation	2
	TOTAL	**17**

Source: Detailed Survey of POWERGRID/ Contractor

Table 5.6: Details of Affected Persons

S. No.	Name of Line	Total Affected Persons
A	**Transmission Lines**	
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line	300
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	6
B	**Distribution Lines**	
3	33 kV line from Mongsangei to Hiyanthang substation	25
4	33 kV line from Moirang to Kwatka substation	24
5	33 kV line from Nambol to Leimapokpam substation	30
	TOTAL	**385**

Source: Detailed Survey of POWERGRID/ Contractor

5.2.8 Other Damages

Other damages like bunds, water bodies, fish ponds, approach paths, drainage and irrigation canals etc. have been avoided. However, if damaged, the Revenue Department will assess the cost of damage as per State Govt. norms. The total estimate will be submitted for approval to the competent authority. Payments will be made to owners in the presence of local revenue authorities or village head/ Sarpanch and respective acknowledgements will be obtained and POWERGRID/ MSPCL will pay the compensation. Hindrances to power, telecom carrier & communication lines etc. will be paid as per Govt. norms.

5.2.9 Land Value Depreciation

It is evident that electric power being an enabler sector acts as a catalyst for the growth and development of areas having accessibility to it. Based on past experience land prices are generally expected to rise in the areas receiving power. In the present project, transmission lines pass through agriculture fields, private plantation area and govt. land (mostly uninhabited and scrub land), where the land-use is not going to change in foreseeable future. Therefore, the value of land is not adversely affected to a significant degree. Moreover, distribution lines are primarily intended to provide power supply to populated area which boost the economic status as well as land price of the area, thus, outweighing possible negative impacts, if any.

5.2.10 Historical/Cultural Monuments/Value

Final routes of transmission and distribution line and sites for construction of new sub-stations don't involve any monuments of historical or cultural significance.

5.2.11 Encroachment into Precious Ecological Areas

In accordance with the policy of route selection, IA/Utility have taken all precautions right from the planning stage itself to avoid routing of line through forest, protected areas like national park, wildlife sanctuary, biosphere reserve/ biodiversity hotspot and other ecological sensitive areas. Moreover, the proposed lines don't involve any forest area, therefore, provisions of the Forest (Conservation) Act, 1980 shall not prevail.

5.2.12 Encroachment into Other Valuable Lands

GoMan adopted the MoP guidelines dated 15th October 2015 for land compensation for tower footing and RoW Corridor on 28th March 2018 which provide payment of @ 85% and @ 15% of land value towards compensation for land coming under tower base and line corridor respectively. Further, as per said guidelines land compensation provisions is only applicable to new or ongoing transmission lines and shall not be applicable in case of existing line, stringing of 2nd circuit, reconductoring/re stringing, repairing, construction of existing towers etc. Since in instance project new transmission line is proposed therefore said guidelines shall be applicable. In case of 132 kV transmission line, area that becomes unavailable because of the erection of tower is around 0.25 sq m. as this land area is occupied for one tower. As already mentioned in Table 5.2, total land loss area for 121 towers is 30.25 sq m, therefore, compensation of tower footing is being paid for this 30.25 sq m of land. Additionally, as mentioned in Table 4.3, total land under RoW corridor is 226.80 acre, therefore, compensation of RoW corridor is being paid for this 226.80 acre of land. The details about the cost of land compensation for tower base & RoW corridor is given below in **Table 5.7**.

Table 5.7: Cost of Land Compensation for Tower Base & RoW Corridor

S. No.	Name of Line	Line Length (km)	Land Area for Tower Base (acre)	Land Area for RoW Corridor* (acre)	Avg. Cost of Land (Lakhs / acre)	Total in Lakhs (Tower base @ 85% & Corridor@15%)
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line	32.525	1.171	217	15.00	503.18
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	1.47	0.053	9.80	15.00	22.73
	TOTAL	**33.995**	**1.224**	**226.80**	**15.00**	**525.91**

**Effective RoW corridor has been considered after excluding tower base area*
Source: CPTD Plan prepared by PGCIL

In case of 33 kV distribution line, area that becomes unavailable because of the erection of pole is insignificant as approximately one sq. ft. land area is occupied for one pole. As already mentioned in Table 5.2, total land loss area for 459 poles is only 42.224 acre, therefore, land value for pole base is not considered for land compensation.

Following cardinal principles of avoidance, minimization, MSPCL/ POWERGRID has selected and finalized the routes of transmission line with due consideration of the avoidance or minimization of impacts toward temporary damages on crops/ trees/ structures, if any coming in the Right of Way (RoW) during construction. Similarly, the route of all the 33 kV distribution lines are mostly selected /finalized along the existing roads (PWD roads/Village roads etc.) involving minimum habitated areas and also through agricultural and barren lands wherever possible.

During project implementation also, due to inherent flexibility in phasing construction activity in lean period or rescheduling the construction activity in cropped area for some period to facilitate crop harvesting, temporary impacts associated with Transmission Lines are further minimized to a great extent. However, if it is unavoidable and is likely to affect project schedule, compensation is given at market rate for standing crops in consultation with revenue department and affected person based on assessment of actual damages. In the instant project also all possible measures are taken to avoid damages to crop/trees through taking up the construction activities during lean period or post-harvest season. As per the prevailing norms farming activity is allowed after the construction work is completed. However, compensation for the loss of crops/trees/any structure paid to APs for the area of damage to mitigate the impacts probably 3 times i.e. during foundation work, tower erection & stringing as per the prevailing situation, which is stringing in this case. The details about the cost of compensation for crops and trees is given below in **Table 5.8**.

Table 5.8: Cost of Compensation for Crops and Trees

S. No.	Name of Line	Line Length (km)	Compensation/ Km (Rs. in lakh)	Total compensation cost for Crops & trees (Rs. in lakh)
A	**Transmission Lines**			
1	Imphal (PG) – Ningthoukhong 132 kV D/C Line	32.525	5.0	162.63
2	LILO of Yurembam (Imphal-State) – Karong at Gamphajol	1.47	5.0	7.35
B	**Distribution Lines**			
3	33 kV line from Mongsangei to Hiyanthang substation	3.57	0.5	1.79
4	33 kV line from Moirang to Kwatka substation	6.33	0.5	3.17
5	33 kV line from Nambol to Leimapokpam substation	6.286	0.5	3.14
	TOTAL	**50.181**		**178.08**

Source: CPTD Plan prepared by PGCIL

As already stated, no physical displacement is envisaged in the proposed project. Similarly, displacement of structures is normally not envisaged due to flexibility of routing of transmission/distribution line. However, whenever it is necessary, compensation for structures has been/ is being provided. In the instant case, 17 nos. of small structures/sheds likely to be encountered in the right of way of proposed distribution lines. These are small sheds/ small storage which are associated with the agricultural fields. People do not use these small structures/ sheds for residential purpose. The compensation has been/ is being paid to the APs as decided by committee based on state government norms.

In line with the compensation procedures laid down in ESPPF & CPTD, compensation towards damage to tree/crop and land diminution value have been/ are being paid to affected persons after assessment of actual damage based on market rate and verification by concerned revenue authorities. A sample case of compensation payment including notice to land owner, assessment and verification by revenue authority and payment to affected person etc. is enclosed as **Annexure III**.

5.2.13 Interference with Other Utilities and Traffic

As per regulations, it is mandatory for IA/Utility to seek clearance prior to construction from department of Railways, Telecommunications and wherever necessary from aviation authorities that are likely to be affected by the construction of transmission lines. The transmission and distribution lines do not interfere with telecommunication towers. Further, railway lines and aviation routes are not present in the project locations. It is therefore not

required to avail clearances from Department of Railways, Department of Telecommunications, and the Ministry of Aviation.

NH-39, NH-53 and NH-150 are the main roads, which connect the project sites through various state highways, district roads and village roads. Traffic on NH-39 is comparatively more than traffic on NH-53 and NH-150. As regard inference with traffic, it is to may be noted that execution of the projects covered in this report has not resulted in any steep rise in traffic volume. Further, the present project requires very less vehicular movement and that too restricted to construction period only. Hence, no steep rise in traffic volume is anticipated/ observed.

5.2.14 Interference with Drainage Pattern

As the transmission lines are constructed aerially and the blockage of ground surface is limited to area of tower footings, which is very small, there is little possibility of affecting drainage pattern. The transmission & distribution lines proposed under this scheme don't involve any tower/ pole to be placed in river bed which could interfere with existing drainage patterns. Further, to avoid any interfere, DC towers are being used instead DB tower as single span limit is crossed in the stretches where TL/ DL is crossing river, cross-arm strengthening has been suggested. Another measure already suggested in EMP and in place is to avoid dumping of fill materials in sensitive drainage area. In case of substations, all drainage channels along or inside substations are being trained and connected to main or existing drainage to avoid any erosion due to uncontrolled flow of water.

5.2.15 Impact Due to Construction of New Substation, Bay Extension and Augmentation

The project component consists of establishment of 132/33 kV sub-station at Gamphajol; five 33/11 kV sub-stations at Pishum, Hiyanthang, Takyel, Kwatka and Leimapokpam; bay extension of three 132/33 kV sub-stations and bay extension/ augmentation of eleven 33/11 kV sub-stations. Fresh lands were secured through private purchased on negotiated rates based on "willing buyer-willing seller basis" for establishing the new 132/33 kV and three new 33/11 kV sub-station. For establishing rest of the two new 33/11 kV sub-stations Govt. land has been transferred by MSPCL. Bay extensions/ augmentation has been carried out in the existing sub-stations which are under the control of PGCIL or MSPCL. Since involuntary acquisition is not involved, R&R will not be an issue in the instant project. The details are provided below in **Table 5.9**.

Table 5.9: Details of Land Securing Method for New Sub-stations

S. No.	Name of Sub-station	Land Area (acre)	No. of Land Owner	Land Securing Method
A	**Transmission Scheme**			
1	132 kV at Gamphajol	2.96	1	willing buyer-willing seller basis
B	**Distribution Scheme**			
2	33 kV at Pishum (GIS)	0.249	NA	Govt. land through transfer
3	33 kV at Takyel	0.59	NA	Govt. land through transfer
4	33 kV at Hiyanthang	0.73	1	willing buyer-willing seller basis
5	33 kV at Kwatka	0.31	1	willing buyer-willing seller basis
6	33 kV at Leimapokpam	0.63	1	willing buyer-willing seller basis

Source: Detailed Survey of POWERGRID/ Contractor

The other environmental impacts that impact environment due to construction/ bay extension of sub-station are uncontrolled silt runoff, nuisance to nearby area, inadequate resurfacing for erosion control, inadequate disposition of borrow area, workers health/ safety. All these impacts and their management are discussed in detail in Section 5.4.1.

Another impact is construction of access road. Access to all the new/ existing sub-stations is along existing roads or village paths; minor improvements to paths have been made where necessary, but no major construction of roads, except, 33/11 kV sub-stations at Kwatka where approach road of just 03 m have been constructed.

The approach road has been constructed on already acquired land for the construction of sub-station. Since none of these segments require any additional land and thus have insignificant environmental and social impacts, these would fall in low risk category as per E & S screening criteria.

However, Construction of road may lead to soil erosion, increase the airborne dust particles, nuisance to nearby area, require land for temporary accessibility etc. Since the length of road constructed in the present schemes is 3 m only, hence this impact is not anticipated.

5.2.16 Impact on Indigenous People

Government of India, under Article 342 of the Constitution, considers the following characteristics to define indigenous peoples [Scheduled Tribes (ST)]:

i. tribes' primitive traits;
ii. distinctive culture;

iii. shyness with the public at large;
iv. geographical isolation; and
v. social and economic backwardness before notifying them as a Scheduled Tribe.

Essentially, indigenous people have a social and cultural identity distinct from the 'mainstream' society that makes them vulnerable to being overlooked or marginalized in the development processes. STs, who have no modern means of subsistence, with distinctive culture and are characterized by socio-economic backwardness, could be identified as Indigenous Peoples. Indigenous people are also characterized by cultural continuity. Constitution of India identifies schedule areas which are predominately inhabited by such people.

Further, under Article 371 C of Constitution of India provides special provision to the State of Manipur for the Constitution and functions of a committee of the Legislative Assembly of the State consisting of members of that Assembly elected from the Hill Areas of the State. Under this Manipur (Hill Areas) District Council Act was enacted in 1971 which has provisions similar to those contained in the Sixth Schedule and has established six Autonomous Hill District Councils, covering 5 hill districts of the State. These Autonomous Hill District Councils (AHDC) are empowered to maintain and manage the property: movable and immovable, and institutions under their jurisdiction (e.g. in the field of agriculture, animal husbandry, community development, social and tribal welfare, village planning, management of any forest except RF, regulation of the Jhum /shifting cultivation or any other matter.) Under this act, the administrations of the Tribal areas is vested in village/district council under supervision of concerned DC at local/district level and Hill area Committee at State level. All activities sited in AHDC area needs their consent.

Since, the project under NERPSIP is envisaged for economic uplifting of the NE region, hence, no indigenous population will be negatively impacted in the project area. However, in accordance with the provisions of Social Management Framework (SMF, A-C) placed in the Environment and Social Policy and Procedures (ESPPF) of MSPCL all social issues shall be dealt separately. The SMF has been given as **Annexure IV**.

5.2.17 Environmental & Social Impact Matrix Due to Route Alignment

Based on the above analysis of final route of transmission and distribution lines and location of EHV and DMS sub-stations, the summarized environmental & social impact matrix is presented below in **Table 5.10**.

Table 5.10: Summary of Impacts

S. No.	PARAMETERS	EXTENT OF IMPACT
1. A.	**Total Line length -** (TL -33.995 km, DL- 17.60 km)	The TL length has increased by approx. 1.525 km, while the DL length has decreased by approx. 12.71 km. Thus, the total line length has been reduced by 11.185 km. Due to this reduction in final route of line length, the resultant environmental footprints were less as envisaged earlier. Though final route length of TL has increased, still no additional impacts of any kind apart from earlier identified impacts in IEAR/ EMP are anticipated as there is no change in land use and other base line data. Moreover, changes in the final route length have been made so as to avoid/ minimize environment & social sensitive areas. As compared to IEAR, no additional impacts are anticipated.
B.	**Terrain:** Hilly and Plain area	Out of the total 51.595 km of t/L and D/L, only 1.47 km passes through hilly terrain. The slope of this hilly terrain is less than 5 degree and the land use beneath this TL is well terraced agricultural land, therefore, no adverse impact is anticipated. All the other components of the sub-project i.e. TL, DL and transformers are on plain terrain therefore, no adverse impact on the terrain has been observed due to the construction of sub-stations as well as due to the TL and DL.
2.	Forest land traversed (km)	No notified forest. Only private plantation and govt. land of approx. 4.917 km of total line length is having vegetation encountered. It is estimated that maximum 51 trees will be felled.
3.	Forest type	NA
4.	Forest density	NA
5.	Rare/endangered flora	No rare/endangered flora found in project area.
6.	Rare/ endangered fauna	No rare/endangered flora found in project area.
7.	Migrating Wildlife/ breeding ground	NA
8.	National Park / sanctuaries	No protected areas involved
9.	Wet land traversed	None
10.	Soil erodibility	Low
11.	Historical / Cultural monuments	None
12.	Total Affected Persons (APs)	As per assessment carried out under CPTD, total APs are 385, of which 306 are due to TLs and 79 are due to DLs. All APs will be compensated as per the Govt. norms.
13.	Relocation of villagers	None
14.	Area of actual land loss under Tower Base	Total 72.474 sq m of actual loss of land will be taking place under tower/ pole base, of which 30.25 will be under tower base and 42.224 under pole. This loss is temporary in nature i.e. during construction time only. APs are being compensated for actual land loss.
15.	Affected Structures	17 small sheds being used for agricultural purpose shall be affected due to TLs. APs are being compensated for affected structures.
16.	Temporary Damage to Crop	Total 207.11 acre of area has been estimated to come under temporary damage to crop. This loss is temporary in nature i.e.

S. No.	PARAMETERS	EXTENT OF IMPACT
		during construction time only. APs are being compensated for actual land loss.
17.	Loss/ Hindrance to Public Utilities	Negligible, restricted to construction phase only.

5.3 ENVIRONMENTAL PROBLEMS DUE TO DESIGN

5.3.1 Escape of Polluting Materials

The equipment installed on lines and substations are static in nature and do not generate any fumes or waste materials. However, detailed specification with respect to equipment design and substation drainage and sewage design has been included in tender document to avoid any incidence of land and water contamination. Transformers have been designed with oil spill containment systems having sump of capacity of 200% of oil volume of largest transformer, and purpose-built oil, lubricant and fuel storage system, complete with spill cleanup equipment. Substations include drainage and sewage disposal systems to avoid offsite land and water pollution. Apart from this, solid waste like packing materials, cables, aluminum conductor, sand, aggregate material, cements and steel generated during construction is carefully handled and removed from the sites periodically to avoid any contamination.


Drainage and Sewage system within the 33/11 kV Hiyanthang Substation


Drainage within the 33/11 kV Kwakta Substations

5.3.2 Explosion/Fire Hazards

During the survey and site selection for transmission lines, and substations, it has been ensured that these are kept away from oil/gas pipelines and other sites with potential for creating explosions or fires. Fires due to flashover from lines can be a more serious problem in forest. However, adequate safety measures are taken to avoid such incidence. In the present project, the route line routes and substations are not located close to the vicinity of oil/gas pipelines or other installations with potential fire/ explosion hazard. Apart from this, automatic tripping mechanism for transmission/distribution and substations are being installed so that line gets disconnected in fraction of seconds to prevent fire hazards. Also, fire wall between transformers are being constructed to prevent fire from spreading. Firefighting instruments including fire extinguishers are kept in appropriate place for immediate action in case of any fire hazard.

The only substation which is surrounded by residential area is 33/11 kV new sub-station at Pishum (GIS). It may be noted that sub-stations are being constructed on the land provided by MSPCL after considering all the risks and after following ESPPF. Measures taken at Pishum (GIS) sub-station to avoid any such hazard are construction of fire wall between transformers and the boundary wall of the substation is high as compared to other substations. Apart from Pishum (GIS) sub-station there is no sub-station that needs such additional attention.

Fire Wall at 33/11 kV new sub-station at Pishum (GIS)

5.3.3 Erosion Hazards due to Inadequate Provision for Resurfacing of Exposed Area

Construction of 132kV line involves only small-scale excavation of area i.e. 3m L x 3m W x 3m H for tower footing that may result in generation of 108 m^3 of excavated material from each tower. In case of 132/33 kV substation foundation, excavation of soil to the tune of 7500 m^3 is required depending on site condition. Similarly, in case of 33 kV line, soil excavation is limited to 0.72

m^3 for each pole, and for 33/11 kV sub-station, excavation of around 2000 m^3 is required. It has been worked out that a total of approximately 30,891 m^3 (121x108 + 1x7500 + 448x0.72 + 5x2000) of excavated materials gets generated for construction of 121 towers, 1 new 232/33 kV sub-station, 448 poles and 5 new 33/11 KV substations proposed under present scheme. However, all the soil excavated for pole footings and substations construction are optimally (about 80-90%) utilized for backfilling and the remaining soil being spread evenly and compacted. Top soil disturbed during the development of sites are used to restore the surface of the platform. Infertile and rocky material are used as fill for substation/ and tower/pole foundations. Hence, possibility of erosion of exposed area due to construction activity is negligible.

5.3.4 Environmental Aesthetics

Since spacing between the towers/poles in case of 132 kV transmission & 33 kV distribution lines is approximately 300 meters and 100 meters, respectively, these don't affect the visual aesthetics of the localities particularly when it is ensured to route the lines as far away from the localities as possible. MSPCL takes up plantation of trees to buffer the visual effect around its substations and to provide better living conditions. Wherever MSPCL feels it appropriate, discussions are held with local Forest Department officials to determine feasibility of planting trees along roads running parallel to transmission lines to buffer visual effect in these areas. In addition, towers are painted grey or green to merge with the background.

5.3.5 Noise/Vibration Nuisances

The equipment installed at substation are mostly static and are so designed that the noise level always remains within permissible limits i.e. 85 dB as per Indian standards. Transformers with maximum noise emitting level of 75 dB and DG set with proper enclosures are part of equipment specification/ design criteria. Some noise is unavoidable during construction phase like noise produced by concrete mixing equipment and excavators which are temporary and only in day time. However, regular monitoring by IA/Contractors and due maintenance of equipment are ensured to keep the noise level well within the prescribed limit. Further, to contain the noise level within the permissible limits whenever noise level increases beyond permissible limits, measures like providing sound and vibration dampers and rectification of equipment are undertaken. In addition, plantations of sound absorbing species like Casuarinas, Tamarind, and Neem are raised at all the substations that reduce the sound level appreciably.

5.3.6 Blockage of Wildlife Passage/ Impact on Avifauna

The proposed transmission & distribution lines are not passing through any forest area, wildlife area. Since there is no protected area or demarcated/ documented migration path of wildlife like elephant corridor existing near to subproject locations, hence, possibility of any disturbance to wildlife is not imminent.

Avian hazards are mostly encountered in bird sanctuaries area, IBAs and fly path of migratory bird predominantly related to nesting site. Since in the instant case due to routing of line away from such areas, bird hit/electrocution is not anticipated. Although the incidence of avian hazards is rare due to the distance between the conductors, however, as an additional measure to prevent any avian hazards, bird guards/ anti perch devices are integral part of tower design (drawing attached as **Annexure V**).

5.4 ENVIRONMENTAL PROBLEMS DURING CONSTRUCTION PHASE

5.4.1 Uncontrolled Silt Runoff

Almost all the tower/ pole are in plain area, therefore, there was no impact due to the silt runoff. In case of distribution lines all the excavated soil is backfilled and compacted immediately after erection of tubular poles.

In case of sub-station, existing one are located on flat land and adjacent to existing road and new ones are also being constructed on flat land after site clearing and leveling. It is also being ensured that new sub-stations are close to existing road and construction of approach road is avoided as far as possible.

As already explained, during construction limited quantity of excavated material is generated from tower/pole foundations and sub-station foundation. However, adequate measures have been taken to store excavated materials properly for refilling after construction is over. Further, excavation is avoided in rainy days. Hence, uncontrolled silt run off is not anticipated. However, during construction, precautions have been taken by contractors to avoid any such runoff of excavated material from the construction sites. Moreover, sub-stations are being constructed above the high flood level (HFL) by raising the foundation pad, therefore, are not prone to flooding/ erosive losses of soil.

So far there are no instances with potential of erosion during construction of above said lines. Similarly, there are no instances of erosion/losses of soils into adjoining area as all the overburden are being backfilled within the substation boundary walls and properly managed. The substations are not located in the vicinity of water bodies or ecologically sensitive areas.


Earth cutting and Surface levelling at 132/33 kV Gamphajol Substation


Levelled surface at 132/33 kV Imphal (PGCIL) Substation


Levelled surface at 33/11 kV Pishum (GIS) and Hiyanthang Substations


Levelled surface at 33/11 kV Kwakta and Leimapokpam Substations

5.4.2 Nuisance to Nearby Properties

During site selection due care is taken to keep the transmission & distribution lines and substations away from settlements. Further, all the construction activities are undertaken through the use of small mechanical devices e.g. tractors and manual labour, therefore, nuisance to the nearby properties if any, is not expected. The construction activities are normally undertaken in lean period and post harvesting to avoid/minimize such impact. All construction sites of new sub-station are prohibited for general public both due to its separation/demarcation by boundary wall and also due to statutory provisions. Hence, any adverse impact arising during the construction of substation is temporary i.e. will last during construction phase only, and limited to the boundaries of proposed substation only and neither impacts nearby habitat/property nor health & safety of neighboring community.

Boundary Walls at 132/33 kV Gamphajol Substation

Boundary Walls at 33/11 kV Pishum (GIS) Substation


Boundary Wall and Gate at 33/11 kV Hiyanthang Substation


Boundary Wall and Gate at 33/11 kV Kwakta Substation


Boundary Wall and Gate at 33/11 kV Leimapokpam Substation

5.4.3 Interference with Utilities and Traffic and Blockage of Access Way

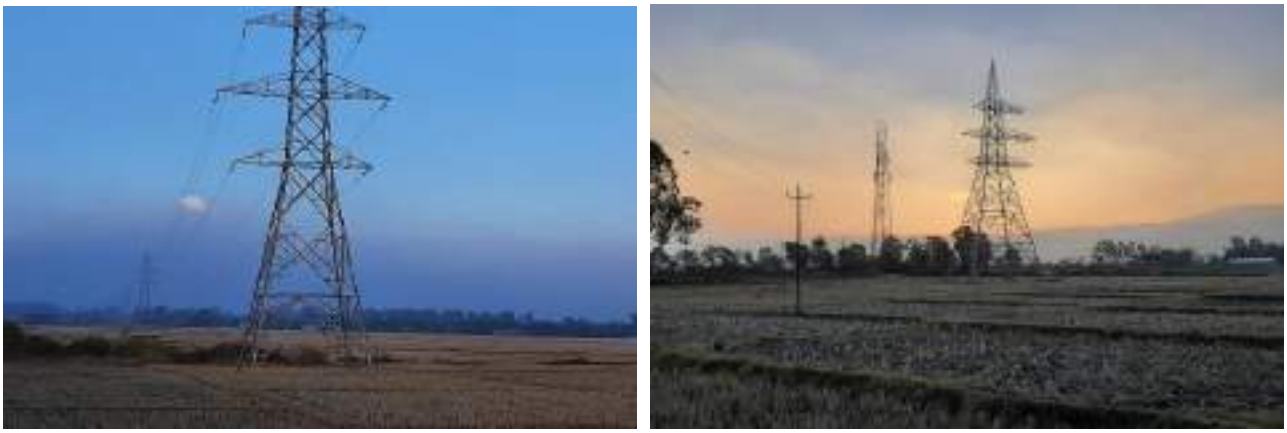
Since all the locations of subprojects are not well connected through rail link, transportation of construction materials was mostly through road network. Access to the site was along existing roads or village paths; minor improvements to paths has been made where necessary.

The transmission and distribution lines do not interfere with telecommunication towers. Further, railway lines and aviation routes are not present in the project locations. Therefore, interfere with utilities and block the access way in this regard is also not at all expected. As and when a

transmission line crosses any road, the short span angle (DT) towers are located at a distance so as not to cause any hindrance to the movement of traffic. Stringing at the construction stage is carried out during lean traffic period in consultation with the concerned authorities and angle towers are planted to facilitate execution of work in different stages.

5.4.4 Inadequate Resurfacing for Erosion Control

As explained earlier, almost all the towers locations are on plain surface, therefore, there were no instances of soil erosion due to tower errection. The excavated material is being backfilled and any remaining earth, if any have been spread around the base and compacted. Till date no instances with potential of erosion observed during construction of above said lines. Further, construction is generally undertaken in dry/non- monsoon period.



Tower from Ningthoukhong to Imphal (PGCIL) Substations

Tower of LILO of 132 KV S/C Yurembam - Karong at Gamphajol

Similarly, existing sub-stations are located on flat land but new sub-stations are being constructed on flat land after site clearing and leveling. Further, due to undulating terrain and for slope protection, retaining / RRM walls have been planned/ being implemented as erosion protection measure in the sub-stations mentioned in **Table 5.11**.

Table 5.11: Details of Slope Protection Measures

S. No.	Location	Measure Type	Purpose of Measure	Present Status
1	Establishment of 33/11 kV Sub-station at Hiyanthang (New)	RRM Wall	To avoid soil erosion	Completed
2	Establishment of 33/11 kV Sub-station at Pishum (New)	Retaining Wall	To avoid soil erosion	Completed
9	In all sub-stations	Stone Pitching	To retain the soil	Provided

RRM Wall at 33/11 kV Hiyanthang S/s

Retaining Wall at 33/11 kV Pishum (GIS) S/s

Stone Pitching at 33/11 kV Hiyanthang S/s

Stone Pitching at 33/11 kV Kwatka S/s

Stone Pitching at 33/11 kV Leimapokpam S/s

For pole and sub-station located on flat terrain, problem of soil erosion is not envisaged. Few such instances have been demonstrated with the help of following photographs.


Poles from Mongsangei to Hiyanthang Substations


Poles from Moirang to Kwakta Substations


Poles from Nambol to Leimapokpam Substations

5.4.5 Inadequate Disposition of Borrow Area

As mentioned earlier the tower/pole foundations involve excavations on small scale basis and the excavated soil is utilized for back filling. In case of substations, generally the sites are selected in such a manner that the volume of cutting is equal to volume of filling avoiding borrowing of the area. In the instant project also, the excavated material is disposed off in the same sub-

station premises only. However, for 33/11 kV substations at Hiyanthang & Kwakta excess 4345 m^3 and 571 m^3 respectively soil was required in excess soil, the same was borrowed from private land with due consent from land owner.

5.4.6 Protection of Worker's Health/Safety

All health & safety issues and their management aspects are integral part of project/contract specific safety plan **(Annexure VI)**, which is also part of contract conditions. Various aspects such as, work and safety regulations, workmen's compensation, insurance are adequately covered under the General Conditions of Contract (GCC), a part of bidding documents. Project is being executed as per the approved plan and is regularly monitored by dedicated Safety personnel. Moreover, for strict compliance of safety standard/plan a special provision as a deterrent has been added in the contract which provides for a heavy penalty of Rs.10 lakhs for each accidental death and Rs 1.0 lakh for each injury and is deducted from the contractor's payment and paid to the deceased/affected family **(Annexure VII)**.

Additionally, work and safety regulations, workmen's compensation, insurance are adequately covered under the General Conditions of Contract (GCC), a part of bidding documents. The project authority ensures that all contractors are operating with valid labor license as per provision under section – 12(1) of the Contract Labour (Regulation & Abolition) Act, 1970 and also certified under Section- 7(3) of the Building and Other Construction Workers (Regulation of Employment and Condition of Service) Act, 1996 from Ministry of Labour & Employment. Besides, the contractors have obtained requisite insurance policy as per provisions of Employee Compensation Act, 1923 for its employed workforce. Sample copy of labor license and insurance policy for workers is attached as **Annexure VIII**.

Efforts are being made to hire labourers locally to the extent possible, else same have been outsourced. The workers have been provided with PPEs such as boots and helmets. Mock drills such as fire safety, first aid etc. are conducted periodically to enhance the preparedness level of the workforce. Safety induction & awareness programme including HIV/AID are also conducted at every active site. Safety film for transmission project in local language is shown to workers for better awareness. Proper drinking water has also been provided. First aid boxes and provisions for treatment in case of emergencies were arranged locally/ nearby towns.

Since the work is either completed or at halt at all the sites in the project district, except at 2 sub-stations where also work is progressing at slow pace,

therefore, compliance for protection of worker's health/ safety could not be carried out. However, the site incharges have ensured full compliance of worker's health/ safety during construction time. No instance of any sort of mis happening with worker's health/ safety also justifies compliance of worker's health/ safety.

Protection of Workers Health and Safety at various construction sites


132/33 kV Gamphajol Sub-station


132/33 kV Ningthoukhong Sub-station

Labour Camps at various Construction Sites

132/33 kV Gamphajol Sub-station

132/33 kV Ningthoukhong Sub-station

5.5 ENVIRONMENTAL PROBLEMS RESULTING FROM OPERATION

5.5.1 O&M Staff/Skills Less Than Acceptable Resulting in Variety of Adverse Effects

The O& M program is normally implemented by substation personnel for both the lines as well as substations. Monitoring measures employed include patrolling and thermo-vision scanning. The supervisors and managers entrusted with O&M responsibilities are intensively trained for necessary skills and expertise for handling these aspects. A monthly preventive maintenance program is carried out to disclose problems related to cooling oil, gaskets, circuit breakers, vibration measurements, contact resistance, condensers, air handling units, electrical panels and compressors. Any sign of soil erosion is also reported and rectified. Monthly monitoring reports are generated and appraised to Management, including a report of corrective action taken and a schedule for future action.

MSPCL follows the best international practices while designing its system to maintain acceptable prescribed Electro Magnetic Field (EMF) level. The ICNIRP guideline for acceptable EMF level for the general public (up to 24 hours a day) is a maximum exposure level of 1,000 mG or 100μT. Further, because of health and safety issues such as fire safety, safe voltages on metallic parts of buildings, and safety clearances to avoid flashover, the transmission lines do not pass directly over any residential properties and as such the potential for EMF effects to occur is further diminished.

Poly Chlorinated Biphenyls (PCBs) due to their high heat capacity, low flammability and low electrical conductivity were extensively used as insulating material in capacitors and transformers. But after the finding that these PCBs are non-biodegradable and have carcinogenic tendency, their use in electrical equipment as insulating medium has been banned all over the world long back. However, it has been reported in some studies that chances of contamination of oil with PCB is possible. Keeping that in mind, MSPCL has discontinued procurement of electrical equipment containing PCB more than 2 mg/kg and specification (as per IEC 61619 or ASTM D4059) is being stated in the tender document. Moreover, the subject scheme doesn't involve replacement of any PCB containing equipment, hence no disposal of such equipment is anticipated.

5.6 CRITICAL ENVIRONMENTAL REVIEW CRITERIA

5.6.1 Loss of Irreplaceable Resources

In the instant project none of the project elements encroach upon any forest area, protected areas, and ecologically sensitive areas hence, the problem of losing natural resources is not anticipated.

5.6.2 Accelerated Use of Resources for Short-term Gains

The subprojects are not making use of any natural resources occurring in the area during construction and are not utilizing the same during maintenance phases. The construction material such as tower members, cement etc. are being sourced from factories while the excavated soil is being reused for backfilling to restore the surface. During construction of transmission line, very small quantity of water is required which is met from nearby existing source or through tankers. However, for substation water requirement is met mostly by ground water derived by digging a borewell during construction as well as for operational stage. Moreover, provision of rain water harvesting in all proposed substations under the present scheme has been made to conserve precious water resources and enhance the ground water level. The aggregates used for construction are already available within sub-station area due to cutting, thus no new borrow area will be created. Hence, it may be seen that the activities associated with implementation of subject project shall not cause any accelerated use of resources for short term gain.

5.6.3 Endangering of Species

As described earlier, no endangered species of flora and fauna exist in the subprojects area getting affected and considering aerial nature of transmission and distribution project, there is no possibility of endangering/ causing extinction of any species. As route of 33 kV line from Iroisemba to Takyel substation is yet to be finalized therefore, floral and faunal surveys could not be undertaken. However, considering the location of Iroisemba and Takyel sub-stations and route being considered for the D/L, presence of any endangered species of flora and fauna is nil as route being considered for finalization is along the existing road in the habitated areas of Iroisemba and Takyel.

5.6.4 Promoting Undesirable Rural-to Urban Migration

The subprojects will not cause loss of land holdings that normally trigger migration. It also does not involve resettlement due to acquisition of any private land holdings. Hence, there is no possibility of any migration.

5.7 PUBLIC CONSULTATION

Public consultation/ information dissemination is a continuous process starting with the project conception and continues during project implementation and even during O&M stage. Public is informed about the project at every stage of execution. During survey, MSPCL & POWERGRID site officials met people and informed them about the routing of transmission and distribution lines. During the construction, every individual, on whose land tower is erected and people affected by RoW, were consulted. Apart from this, Public consultation using different technique like Public Meeting, Small Group Meeting, informal Meeting have been carried out during different activities of project cycle. During such consultation, the public is informed about the project in general and in particular about the following:

- Complete project plan (i.e. its route and terminating point and substations, if any, in between);
- Design standards in relation to approved international standards;
- Health impacts in relation to EMF;
- Measures taken to avoid public utilities such as school, hospitals, etc.;
- Other impacts associated with transmission & distribution lines and MSPCL approach to minimizing and solving them;
- Trees and crop compensation process.

In the instant project also, many group meetings were organized (informally and formally) by IA & MSPCL in all villages where the interventions are happening. These meetings were attended by Village Panchayat members, senior/respected person of village, interested villagers/general public and representatives from MSPCL & IA. To ensure maximum participation, prior intimation in local language was given and such notices were also displayed at prominent places/panchayat office etc. During consultations/interaction processes with people of the localized areas, MSPCL field staffs explained benefit of the project, impacts of transmission line, payment of compensation for damaged of crops, trees, huts etc. as per The Indian Electricity Act, 2003 and The Indian Telegraph Act, 1885 and measures to avoid public utilities such as schools, hospital etc. People more or less welcomed the construction of the proposed project. Various issues inter alia raised by the people during public consultation and informal group meetings are as follows;

- To involve village headman during survey work/finalization of line corridor;
- To engage local people in various works associated with construction of line and if required proper training may be provided to engage them.
- To provide flexibility in disbursement of compensation;

- Direct payment of compensation to affected land owners and expeditious disbursement of compensation.

Also, during site visits, consultations were conducted with various stake holders belonging to community and affected people. Target group included contractor, contractor's labor, IA & MSPCL Staff and villagers. These consultations were carried out to capture the views of stakeholders about the project plan, design and layout of the project, environmental and social impacts, compensation process, benefits or drawback of the project etc.

It needs to be emphasized that public consultation was kept restricted due to the apprehensions of IA and contractors for security and other law & order related issues which were communicated and advised to field team at onset of field surveys itself and hence limited stakeholder consultations have been carried out. However, it was ensured that consultations representatively covered most stakeholders involved.

Major findings of the consultations are summarized below:

- People are well aware about the project, its various components and confirmed that IA & MSPCL informs about the project at every stage of execution.
- Considering that the state of electricity supply in the state is very weak, people welcomed the project as it will not only improve overall power supply situation but will also improve reliability, quality, security and enhancement of power supply of the state.
- People confirmed that IA & MSPCL are taking every step possible to avoid/ minimize the environmental and social impacts along the route of transmission lines and at site of sub stations.
- People confirmed that community reserves, sacred groves and community conserved areas are completely avoided while finalizing the route of lines.
- People also confirmed that their common property resources such as cemetery, school, community hall, habitation areas etc. have been completely avoided while finalizing the route of lines.
- People informed that staff of IA/ contractor are easily approachable and are very open to address their grievances. As a result, no written grievance has been received till date.
- People are very much happy with the rate of compensation being given to them and they are being involved in the process of deciding the rate of compensation.

- People confirmed that there is no disturbance of any sort to their life/ livelihood due to the construction or various other activities being carried out under the project.
- No cases of conflict between migrant and local population has been reported till date.
- Execution of project work provides opportunities to local contractors to get involved in construction, fabrication, transportation etc. activities.
- Most of the sub-contracts are awarded/ being awarded to local peoples.
- Contractor prefer and engage local peoples for skilled and unskilled works
- Local villagers rented out their buildings to contractor and IA for temporary offices and staff quarters in local that helps in income generation
- Wherever possible contractor and IA purchase daily need requirements for local vendors and shopkeepers that helps in economic upliftment of the area
- The contractor labor informed that they have been provided with PPEs such as boots and helmets.
- Mock drills such as fire safety, first aid etc. are conducted periodically to enhance the preparedness level. Safety induction & awareness programme including HIV/AID are also conducted. Safety film for transmission project in local language is shown for better awareness.
- First aid boxes and provisions for treatment in case of emergencies are arranged locally/ nearby towns.
- It was revealed that contractor and IA work with close coordination with village heads and community to avoid any misunderstanding during work

Details of public consultation meetings carried out during site visit and public consultation using different technique like Public Meeting, Small Group Meeting, informal Meeting undertaken by IA & MSPCL including minutes of meeting, list of participants and photographs are enclosed as **Annexure IX**.

5.8 COMPLIANCE OF EMP

The IA has a continuous monitoring mechanism of the project w.r.t. compliance of the mandatory requirements as stipulated in the IEAR. As many provisions of EMP related to construction contractor, EMP has been made integral part of contract document for its proper implementation by contractor/sub-contractor. Thus, the adherence to the clauses by the contractor is regularly monitored especially in respect of various

implementation E & S measures including health and safety aspects. As part of the present study, mitigation measures as stipulated in the IEAR have been critically assessed/evaluated for compliance through physical inspection, verification of record/ documents/ drawing, interaction with project officials/contractor/ villagers/construction workers and PRA etc. Based on above, a detailed compliance status w.r.t. each identified impacts enlisted in EMP have been prepared and is presented in **Table 5.12**.

Table 5.12: Compliance of EMP

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
Pre-Construction				
1	Location of overhead line towers/ poles/ underground distribution lines and alignment & design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Complied with. Route alignment criterion is part of survey contract wherein all statutory Electrical clearances as stipulated under CEA's regulations, 2010 (Measures related to safety & electric supply) are considered/ ensured.
2	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	PCBs not used in substation transformers or other project facilities or equipment.	Complied with. Part of technical specification of transformer. PCB is not used or non-detectable level (i.e. less than 2mg/kg) as per IEC 61619 or ASTM D4059
			Processes, equipment and systems not to use chlorofluorocarbons (CFCs), including halon, and their use, if any, in existing processes and systems should be phased out and to be disposed of in a manner consistent with the requirements of the Government	Complied with. CFC free equipments are being procured.
3	Transmission/ Distribution line design	Exposure to electromagnetic interference	Line design to comply with the limits of electromagnetic interference from overhead power lines	Complied with. MSPCL follows the best international practices while designing its system to maintain acceptable prescribed Electro Magnetic Field (EMF) level. Designed as per guidelines of ICNIRP and ACGIH and checked by CPRI & M/s PTI, USA
4	Substation location and design	Exposure to noise	Design of plant enclosures to comply with noise regulations.	Complied with. Transformers with maximum noise emitting level of 75 dB specified in tender specifications. Sound proof enclosures used for D.G sets

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
		Social inequities	Careful selection of site to avoid encroachment of socially, culturally and archaeological sensitive areas (i. g. sacred groves, graveyard, religious worship place, monuments etc.)	Complied with. No encroachment of any socially sensitive areas due to proposed substations.
5	Location of overhead line towers/poles/ laying of underground distribution line & alignment and design	Impact on water bodies	Avoidance of such water bodies to the extent possible. Avoidance of placement of tower inside water bodies to the extent of possible	Complied with. Part of detailed alignment survey and design. No tower/pole located in water bodies.
		Social inequities	Careful route selection to avoid existing settlements and sensitive locations	Complied with. Part of detailed tower/pole alignment survey design. All socially sensitive areas including habitated areas avoided for TLs. However, DLs due to their functional mandate are bound to pass through habited areas.
			Minimise impact on agricultural land	Complied with. Though major section of proposed lines are routed through agricultural land in order to avoid impact on environmentally/ socially sensitive areas, efforts such as scheduling of construction lean/ post-harvest period, consultation with local authorities/ autonomous councils etc. are being made to minimize impacts on agricultural land/produce to the extent possible
			Careful selection of site and route alignment to avoid encroachment of socially, culturally and archaeological sensitive areas (i. e. sacred groves, graveyard, religious worship place, monuments etc.)	Complied with. All settlements & ecologically sensitive areas avoided.
6	Involuntary acquisition or	Social inequities	Compensation and R&R measures as per	Since no involuntary acquisition of land is

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
	permanent land acquisition for substation.		provision of RFCTLARRA, 2013	involved, there is no R&R issue.
7	Line through protected area/ precious ecological area	Loss of precious ecological values/ damage to precious species	Avoid siting into such areas by careful site and alignment selection (National Parks, Wildlife Sanctuary, Biosphere Reserves/ Biodiversity Hotspots)	Complied with. Part of detailed siting and alignment survey/design. All such areas are avoided
			Minimize the need by using RoW wherever possible	
8	Line through identified Elephant corridor / Migratory bird	Damage to the Wildlife/ Birds and also to line	Study of earmarked elephant corridors to avoid such corridors, Adequate ground clearance, Fault clearing by Circuit Breaker, Barbed wire wrapping on towers, reduced spans etc., if applicable	Not Applicable as there are no wildlife corridors
			Avoidance of established/ identified migration path (Birds & Bats). Provision of flight diverter/reflectors, Bird guard, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc., if applicable	Complied with. All such identified/ established birds migratory path have been avoided.
9	Line through forestland	Deforestation and loss of biodiversity, edge effect	Avoid siting of line by careful site and alignment selection	Complied with. Proposed line routes of TL/DL have been finalised by taking consideration of minimum impact on forest area after consultation with forest authorities and/or village councils in case of private /community forest.
			Minimise the need by using existing towers, tall towers and RoW, wherever possible	
			Measures to avoid invasion of alien species	Invasion of alien species not anticipated
			Obtain statutory clearances from the Government	Not applicable as there is no involvement of forest land
			Consultation with autonomous councils wherever required	Complied with.
10	Lines through farmland	Loss of agricultural production/ change in cropping pattern	Use existing tower or footings wherever possible	Complied with. While passing through agricultural land construction activities are scheduled mostly
			Avoid siting new towers on farmland	

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
			wherever feasible	during lean period so that damage to standing crop is avoided. However, full compensation as per assessment of revenue authorities is paid to land owner/farmer in case of inevitable damages.
11	Noise related	Nuisance to neighbouring properties	Substations sited and designed to ensure noise will not be a nuisance	Complied with. Part of detailed equipment design. Substations are appropriately sited and away from settlement area. Transformers with maximum noise emitting level of 75 dB and DG set with proper enclosures are part of equipment specification/ design criteria.
12	Interference with drainage patterns/Irrigation channels	Flooding hazards/ loss of agricultural production	Appropriate sitting of towers to avoid channel interference	Complied with. Part of detailed alignment survey, Interference with drainage patterns/ irrigation channels not anticipated
13	Escape of polluting materials	Environmental pollution	Transformers designed with oil spill containment systems, and purpose-built oil, lubricant and fuel storage system, complete with spill cleanup equipment.	Complied with. Part of detailed equipment design /drawings. Designed with oil spill containment systems having sump of capacity of 200% of oil volume of largest transformer.
			Substations to include drainage and sewage disposal systems to avoid offsite land and water pollution.	Complied with. Proper drainage and sewage system are part of detailed substation layout and design /drawings based on site condition.
14	Equipment submerged under flood	Contamination of receptors	Substations constructed above the high flood level (HFL) by raising the foundation pad	Complied with. Part of detailed substation layout and design /drawings. All substations are being constructed above HFL.
15	Explosions /Fire	Hazards to life	Design of substations to include modern firefighting equipment	Complied with. Part of detailed substation layout and design /drawings. Compliance assured by site manager

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
			Provision of firefighting equipment to be located close to transformers	Complied with. Part of detailed substation layout and design /drawings. Compliance assured by site manager
Construction				
16	Equipment layout and installation	Noise and vibrations	Construction techniques and machinery selection seeking to minimize ground disturbance.	Complied with (Refer Section 5.3.5). Noise produced by concrete mixing equipment and excavators are temporary and confined to day time only. No ground disturbance observed.
17	Physical construction	Disturbed farming activity	Construction activities on cropping land timed to avoid disturbance of field crops (within one month of harvest wherever possible).	Complied with (Refer Section 5.2.5). Excavations not done during monsoon which is the cropping period. However, full compensation as per assessment of revenue authorities are being paid to land owner/ farmer by IA/MSPCL in case of inevitable damages. Till date no grievance has been received in this regard
18	Mechanized construction	Noise, vibration and operator safety, efficient operation	Construction equipment to be well maintained.	Complied with (Refer Section 5.3.5). Some noise is unavoidable during day time but no noise at night as no work is being undertaken at night. Noise levels' measurements are done regularly by IA & Construction contractor. Noise level measured during site visits to all active sites found to be within permissible limits (<75 dB). Till date no grievance has been received in this regard
		Noise, vibration, equipment wear and tear	Turning off plant not in use.	Complied with.
19	Construction of roads for	Increase in airborne dust	Existing roads and tracks used for	Complied with.

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
	accessibility	particles	construction and maintenance access to the line wherever possible.	Existing roads and tracks have been used for construction and maintenance.
		Increased land requirement for temporary accessibility	New access ways restricted to a single carriageway width within the RoW.	Complied with. Most of the tower locations are easily accessible through existing roads/ paths. All substations sites are located close to existing road.
20	Construction activities	Safety of local villagers	Coordination with local communities for construction schedules, Barricading the construction area and spreading awareness among locals	Complied with (Refer Section 5.4.2). Excavated areas are barricaded and restriction to enter work site during construction have been strictly followed. Till date no grievance has been received in this regard
		Local traffic obstruction	Coordination with local authority/ requisite permission for smooth flow of traffic	Complied with. Most of the tower/pole locations are in farm/barren land. Hence, no traffic obstruction is witnessed. For substation location, smooth traffic flow is ensured by project authorities/contractor in close co-ordination with local authorities wherever necessary.
21	Temporary blockage of utilities	Overflows, reduced discharge	Measure in place to avoid dumping of fill materials in sensitive drainage area	Complied with (Refer Section 5.3.5). No dumping is observed. All overburden is managed optimally by reutilizing it as fill materials.
22	Site clearance	Vegetation	Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure minimal clearance.	Complied With. Prior to undertaking clearance, marking has been undertaken to ensure minimal removal of vegetation during detailed survey. Minimum trees have been felled for construction of T&D network and sub-stations. (Refer Section 4.6.4)
			No use of herbicides and pesticides	Not Applicable
23	Trimming	Fire hazards	Trees allowed growing up to a height within	Complied With.

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
	/cutting of trees within RoW		the RoW by maintaining adequate clearance between the top of tree and the conductor as per the regulations.	Regulated felling in RoW is being carried out with the permission of owner and revenue authorities keeping required electrical clearance as per applicable norms (CEA's regulations, 2010 (Measures related to safety & electric supply)
		Loss of vegetation and deforestation	Trees that can survive pruning to comply should be pruned instead of cleared.	Complied With. Actual damage/tree felling is minuscule and limited 3m strip below each conductor and not in entire RoW. However, after stringing natural vegetation is allowed to regrowth in all these cleared strips except for one strip which is kept clear of vegetation for maintenance purpose. In remaining RoW area, only pruning/ pollarding is done to maintain electrical clearance.
			Felled trees and other cleared or pruned vegetation to be disposed of as authorized by the statutory bodies.	Complied With. Felled trees are handed over to land owner. IA/MSPCL have no role in storage or disposal of felled trees/wood
24	Wood/ vegetation harvesting	Loss of vegetation and deforestation	Construction workers prohibited from harvesting wood in the project area during their employment, (apart from locally employed staff continuing current legal activities)	Complied with. Cooking Gas/ fuel wood is being provided by the Contractor.
25	Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Soil excavated from tower footings/ substation foundation disposed of by placement along roadsides, or at nearby house blocks if requested by landowners	Complied with (Refer Section 5.4.1). Soil backfilled and excess spread out evenly and compacted. Excavated soil was properly stored and no dumping observed in visited sites/ location.
26	Substation construction	Loss of soil	Loss of soil is not a major issue as excavated soil will be mostly reused for filling. However, in case of requirement of excess soil the same will be met from existing	Complied with (Refer Section 5.4.1, 5.4.4 & 5.4.5). Excavated soil used optimally for backfilling and distribution within the substations'

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
			quarry or through deep excavation of existing pond or other nearby barren land with agreement of local communities	boundary is adequate. However, for 33/11 kV substations at Hiyanthang & Kwakta where excess soil was required, the same borrowed from private land with due consent from land owner.
		Water pollution	Construction activities involving significant ground disturbance (i.e. substation land forming) not undertaken during the monsoon season	Complied with No construction during monsoons. No seepage or water pollution observed.
27	Site clearance	Vegetation	Tree clearances for easement establishment to only involve cutting trees off at ground level or pruning as appropriate, with tree stumps and roots left in place and ground cover left undisturbed	Complied with Already explained at clause no. 23.
28	Substation foundation/ Tower erection disposal of surplus earthwork/fill	Waste disposal	Excessfill from substation/tower foundation excavation disposed of next to roads or around houses, in agreement with the local community or landowner	Complied with (Refer Section 5.4.1 & 5.4.4) Excavated soil optimally used. Backfilling and spreading of excess soil within substation area undertaken by project authorities.
29	Storage of chemicals and materials	Contamination of receptors (land, water, air)	Fuel and other hazardous materials securely stored above high flood level.	Proper compliance to be ensured. To be stored in designated area inside the premise at most sites.
30	Construction schedules	Noise nuisance to neighbouring properties	Construction activities only undertaken during the day and local communities informed of the construction schedule.	Complied with Construction in day time only
31	Provision of facilities for construction workers	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities.	Complied with (Refer Section 5.4.6). However, there is scope for further improvement in improving the living conditions of workers
32	Influx of migratory workers	Conflict with local population to share local resources	Using local workers for appropriate asks	Complied with (Refer Section 5.4.6). Local workforces have been given preference based on skill levels.
33	Lines through farmland	Loss of agricultural	Use existing access roads wherever possible	Complied with.

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
		productivity	Ensure existing irrigation facilities are maintained in working condition	Observation already provided at Clause no 19 above. Repair/restoration done immediately wherever required. Till date no grievance has been received in this regard.
			Protect /preserve tops soil and reinstate after construction completed	
			Repair /reinstate damaged bunds etc. after construction completed	
		Social inequities	Land owners/ Farmers compensated for any temporary loss of productive land as per existing regulation.	Compensation for land and damage to crop/tree etc. is being paid to land owner after assessment by revenue authorities. It is suggested that project authorities expedite process for early payment
34	Uncontrolled erosion/silt runoff	Soil loss, downstream siltation	Need for access tracks minimised, use of existing roads.	Complied with (Refer Section 5.4.1). Observation already provided at Clause no 19 above. Construction during monsoon avoided as far as possible.
			Limit site clearing to work areas	
			Regeneration of vegetation to stabilise works areas on completion (where applicable)	
			Avoidance of excavation in wet season	
			Water courses protected from siltation through use of bunds and sediment ponds	
35	Nuisance to nearby properties	Losses to neighbouring land uses/ values	Contract clauses specifying careful construction practices.	Complied with (Refer Section 5.4.2). Good construction practices with proper scheduling of construction activities observed in all active sites. No major deviation with respect to contract conditions by the contractor found/reported
			As much as possible existing access ways will be used	
			Productive land will be reinstated following completion of construction	
		Social inequities	Compensation will be paid for loss of production, if any.	Observation already provided at Clause no 33 above.
36	Flooding hazards due to construction impediments of natural drainage	Flooding and loss of soils, contamination of receptors (land, water)	Avoid natural drainage pattern/ facilities being disturbed/blocked/ diverted by ongoing construction activities	Complied with. Good construction management practices are being employed at sites to avoid blockage of natural drainage and resultant flooding.

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
37	Equipment submerged under flood	Contamination of receptors (land, water)	Equipment stored at secure place above the high flood level (HFL)	Complied with Substations are constructed above HFL
38	Inadequate siting of borrow areas (quarry areas)	Loss of land values	Existing borrow sites will be used to source aggregates, therefore, no need to develop new sources of aggregates	Complied with. Observation already provided at Clause no 26 above.
39	Health and safety	Injury and sickness of workers and members of the public	Safety equipment's (PPEs) for construction workers Contract provisions specifying minimum requirements for construction camps Contractor to prepare and implement a health and safety plan. Contractor to arrange for health and safety training sessions	Not fully complied with (Refer Section 5.4.6) Safety equipment available but often not used by workers. Worker facilities/camp available but needs further improvement with respect to sanitation. Health & safety plan in place, however proper implementation needs to be ensured. No major accident/incident reported for any site till date. More training to be conducted to create awareness on use of PPEs /safety gear.
40	Inadequate construction stage monitoring	Likely to maximise damages	Training of environmental monitoring personnel Implementation of effective environmental monitoring and reporting system using checklist of all contractual environmental requirements Appropriate contact clauses to ensure satisfactory implementation of contractual environmental mitigation measures.	More specific and periodic awareness/ training on IEAR, ESPPF etc. requirements for effective implementation/ monitoring of provisions of IEAR, ESPPF and contract conditions to achieve 100% compliance. It is suggested to deploy environmental professionals for effective environmental monitoring and reporting system.
Operation and Maintenance				
41	Location of line towers/poles and overhead/ underground line alignment & design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Complied/Being complied. Route alignment criterion is part of survey contract which was followed thoroughly during construction and no incident have been reported so far.
42	Line through identified bird flyways, migratory path	Injury/ mortality to birds, bats etc. due to collision and electrocution	Avoidance of established/ identified migration path (Birds & Bats). Provision of flight diverter/reflectors, elevated perches,	Complied/Being complied. The line routes don't form part of any such areas. Moreover, no incident of injury

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
			insulating jumper loops, obstructive perch deterrents, raptor hoods etc., if applicable	/mortality of avifauna due to construction of lines have been reported from any sites so far.
43	Equipment submerged under flood	Contamination of receptors (land, water)	Equipment installed above the high flood level (HFL) by raising the foundation pad.	Complied/ Being complied. Already part of detailed substation design.
44	Oil spillage	Contamination of land/nearby water bodies	Substation transformers located within secure and impervious sump areas with a storage capacity of at least 100% of the capacity of oil in transformers and associated reserve tanks.	Complied/ being complied Oil sump of sufficient capacity already provided for each transformer which was also part of detailed substation design. However, no spillage of transformer oil is observed/ reported so far.
45	SF6 management	Emission of most potent GHG causing climate change	Reduction of SF6 emission through awareness, replacement of old seals, proper handling & storage by controlled inventory and use, enhance recovery and applying new technologies to reduce leakage	Complied/ being complied. Regular monitoring and controlled inventory is ensured to avoid any leakage of SF6.
46	Inadequate provision of staff/workers health and safety during operations	Injury and sickness of staff /workers	Careful design using appropriate technologies to minimise hazards	Complied/ being complied. All safety related precautions/ systems/ plans are in place. Proper safety training for workers are being conducted on regular interval including mock drills on fire and other occupational hazards. However, more training to be conducted to create awareness on use of PPEs /safety gear.
			Safety awareness raising for staff.	
			Preparation of fire emergency action plan and training given to staff on implementing emergency action plan	
			Provide adequate sanitation and water supply facilities	
47	Electric Shock Hazards	Injury/ mortality to staff and public	Careful design using appropriate technologies to minimise hazards	Complied/ being complied. Used of technology like tripping line/substation in milliseconds in case of any hazards. Boundary and Security fences are maintained at each substation. Sufficient barriers with warning sinages are maintained at appropriate places of line/substation. Further, regular awareness/ mock drill on electrical safety and other occupational hazards are being
			Security fences around substations	
			Barriers to prevent climbing on/ dismantling of transmission	
			Appropriate warning signs on facilities	
			Electricity safety awareness raising in project areas	

Cl. No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Compliance Status
				undertaken.
48	Operations and maintenance staff skills less than acceptable	Unnecessary environmental losses of various types	Adequate training in O&M to all relevant staff of substations & transmission/ distribution line maintenance crews. Preparation and training in the use of O&M manuals and standard operating practices	Being complied. Regular trainings are being imparted to staffs engaged in O & M activity based on their skill at regular interval
49	Inadequate periodic environmental monitoring.	Diminished ecological and social values.	Staff to receive training in environmental monitoring of project operations and maintenance activities.	Being complied.
50	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	Processes, equipment and systems using cholofluorocarbons (CFCs), including halon, should be phased out and to be disposed of in a manner consistent with the requirements of the Govt.	Complied/ Being complied. Already part of equipment specification (CFC Free)
51	Transmission/ distribution line maintenance	Exposure to electromagnetic interference	Transmission/ distribution line design to comply with the limits of electromagnetic interference from overhead power lines	Complied/ Being complied. Designed as per guidelines of ICNIRP and ACGIH and checked by CPRI &M/s PTI, USA.
52	Uncontrolled growth of vegetation	Fire hazard due to growth of tree/shrub /bamboo along RoW	Periodic pruning of vegetation to maintain requisite electrical clearance. No use of herbicides/ pesticides	Being complied.
53	Noise related	Nuisance to neighbouring properties	Substations sited and designed to ensure noise will not be a nuisance.	Complied/ being complied. The average noise level reported at the boundary of substation is well within permissible limit.

5.9 CONCLUSIONS

It is vivid from the above discussion that all transmission & distribution line routes and substations location have been selected judiciously by considering the technical, environmental, socio-economic aspects. Though some changes in line length & route alignment have been observed in transmission /distribution lines as compared to IEAR scope but as a result careful route selection IA could able to avoid ecologically & socially sensitive areas including forest, protected areas, PCR etc. completely in all the lines and substations being implemented under this project.

The provisions of IEAR & EMP are being implemented at ground level and strict compliance by construction contractors is ensured through regular monitoring by IA. So far, no major impacts apart from earlier identified impacts are anticipated due to such changes in scope. Besides, all other applicable laws/rules/regulations of the country & funding agencies are being complied with and till date no violation/ penalty with respect to contravention of any regulations has been reported. During assessment, it has also been observed that so far, the project has achieved zero fatality with no major non-compliance of EMP/Contract provisions as stipulated in IEAR, which is an indicative of the strict vigil of the IA.

It has also emerged from the survey & PRA exercise that the PAPs were appreciative of the project and hoped that the power scenario would improve after commissioning of the project. Local people also benefited through project related employment that was being generated. However, following suggestions may be considered to further improve the safeguard measures and also enhance the environmental sustainability of project.

- It has been observed that till date no Environment Officer/ staff responsible for EHS has been posted on permanent basis in Manipur. In the past 2 Environment Officer/ staff responsible for EHS had been posted, however, their tenure in the state was for couple of months.
- During the construction phase, the implementing agency needs to ensure strict compliance of the contract provisions/EMP by Contractor especially in respect of workers health and safety.
- Along with labours, supervisors, engineers and Staff of Implementing Agency (IA) should also need to follow the health and safety precautions.
- Need of regular induction and training program for labours and engineers at all sites.
- Training for PMU staff regarding monitoring and implantation of EMP as proposed in IEAR. It is suggested to deploy more environmental

professionals for effective environmental monitoring and reporting system.

- Lack of coordination between IA officers and contractors regarding implementation of Health and Safety Plan.
- Records of labour registration, health checkup of labours and other working staff need to be maintained at all sites and strictly monitoring to avoid engagement of child labour.
- Training and awareness regarding cleanliness and solid waste disposal to maintain the hygiene in the labour camps and construction sites.
- Demarcation and protection for sites where work has been on hold due to various reasons to avoid accidents and runoff of excavated soil from construction sites
- Project staff of the implementing agency should be well versed with the contents of the IEAR so as to ensure proper compliance by the contractors.

Overall, the commissioning of the project will augment the power distribution and availability in the region which will further catalyze economic activity and development of the area/region.

Chapter 6 MONITORING AND ORGANIZATION SUPPORT STRUCTURE

For smooth implementation of this project, following administrative and functional set up have been institutionalized for project implementation, review and monitoring etc.

6.1 ADMINISTRATIVE ARRANGEMENT FOR PROJECT IMPLEMENTATION

Central Project Implementation Unit (CPIU) - A body responsible for coordinating the preparation and implementation of the project housed within the IA's offices at Guwahati. The "Project-In-Charge" of IA & Head of each of the SPCU shall be a member of CPIU.

State Project Coordination Unit (SPCU) – A body formed by the State Utility and responsible for coordinating with IA in preparing and implementing the project at the State level. It consists of experts across different areas from the Utility headed by an officer of the rank not below Chief Engineer, from the Utility.

Project Implementation Unit (PIU) – A body formed by the IA, including members of Utility on deputation, and responsible for implementing the Project across the State, with its personnel being distributed over the work site/s & operating in close association with the SPCU/ CPIU. PIU reports to the State level "Project Manager" nominated by the Project-in-Charge of IA. The IA has a Core team stationed at the CPIU on a permanent basis, and other IA officers (with required skills) make visits as and when required by this core team. This team represents IA is responsible for all coordination with SPCU, PIU, within IA and MoP, GoI. CPIU also assists MoP, GoI in monitoring project progress and coordination with The Bank.

6.2 REVIEW OF PROJECT IMPLEMENTATION PROGRESS

To enable timely implementation of the project/subprojects, following committee has been set up to review the progress;

A. **Joint Co-ordination Committee (JCC):** IA and SPCU nominate their representatives in a body called JCC to review the project. IA specifies quarterly milestones or targets, which are reviewed by JCC through a formal monthly review meeting. This meeting forum is called as Joint Co-ordination Committee Meeting (JCCM). The IA convenes & keeps record of every meeting. MoP, GoI and The Bank join in as and when needed.

B. High Power Committee (HPC): The Utility in consultation with its State Government has constituted a High Power Committee (HPC) consisting of high level officials from the Utility, State/ District Administration, Law enforcement agencies, Forest Department, etc. so that various permission/ approvals/ consents/ clearances etc. are processed expeditiously so as to reach the benefits of the Project to the end consumers. HPC meets on bimonthly basis or earlier, as per requirement. This forum is called as High Power Committee Meeting (HPCM) and the SPCU keeps records of every meeting. Minutes of the meeting will be shared with all concerned and if required, with GoI and The Bank.

C. Contractor's Review Meeting (CRM): Periodic Review Meeting is held by officials of PIU with Contractors at field offices, State Head Quarters (PIU location) and if required with core team of IA at Guwahati. These meetings are called "Contractor's Review Meeting" (CRM). PIU shall keep a record of all CRMs, which shall be shared with all concerned and if required, with GoI and The Bank.

D. Review meetings are held among MoP, GoI, The Bank, State Government, Utility and IA, at four (4) months interval or earlier if needed, primarily to maintain oversight at the top level, and also to debottleneck issues that require intervention at GoI/ State Government level. Minutes of the meeting shall be prepared by IA and shared with all concerned.

6.3 E&S MONITORING

The arrangement for monitoring and reviewing of project from the perspective of environment and social management forms part of overall arrangements for project management and implementation environment. Environmental monitoring is a continuous process throughout the Project life cycle starting from site selection to construction and maintenance stage. As IA, POWERGRID endeavours to implement the project in close coordination with the respective state power utilities and departments. POWERGRID has been implementing the project based on the Implementation/Participation agreements that were signed separately between POWERGRID and the Power utilities.

The IA has appointed dedicated Environment Officer in each state including Manipur to oversee the E&S management. Besides, MSPCL also has a separate cell at the Circle office level namely Environment and Social Management Unit (ESMU) headed by Chief Engineer (Power) for proper implementation and

monitoring of environmental & social management measures. Apart from day to day E&S monitoring other major responsibilities are;

- Coordinating environmental and social commitments and initiatives with various multilateral agencies, MoEF&CC and Govt. of Manipur.
- Coordination of all environmental activities related to a project from conceptualization to operation and maintenance stage.
- Advising site offices to follow-up with the state forest offices and other state departments for expediting forest clearances and other E&S issues of various projects.
- Providing a focal point for interaction with the MoEF&CC for expediting forest clearances
- Training of Circle and Site officials on E&S issues arising out of Transmission/Distribution projects and their management plan.
- Training of other departments to familiarize them with the ESPP document.

Additionally, Field In-Charge reviews the progress on daily basis and periodic review by higher management including review by Heads of SPCU and CPIU undertaken wherein apart from construction issues the environmental aspects of the projects are discussed and remedial measures taken wherever required. Besides, Periodic Contractor's Review Meeting (CRM) are being held by officials of PIU with Contractors at field offices, State Head Quarters (PIU location) and with CPIU at Guwahati for better co-ordination and resolution any pending issues. The World Bank mission team also visits various sites every six months to review the progress status including ground level implementation of safeguard measures. Any observation/agreed action plan suggested by the Bank is religiously complied in time bound manner. Additionally, review meeting among MoP, GoI, The Bank, State Governments., Utility and IA being held periodically to maintain oversight at the top level and also to debottleneck issues that require intervention at GoI/ State Government level.

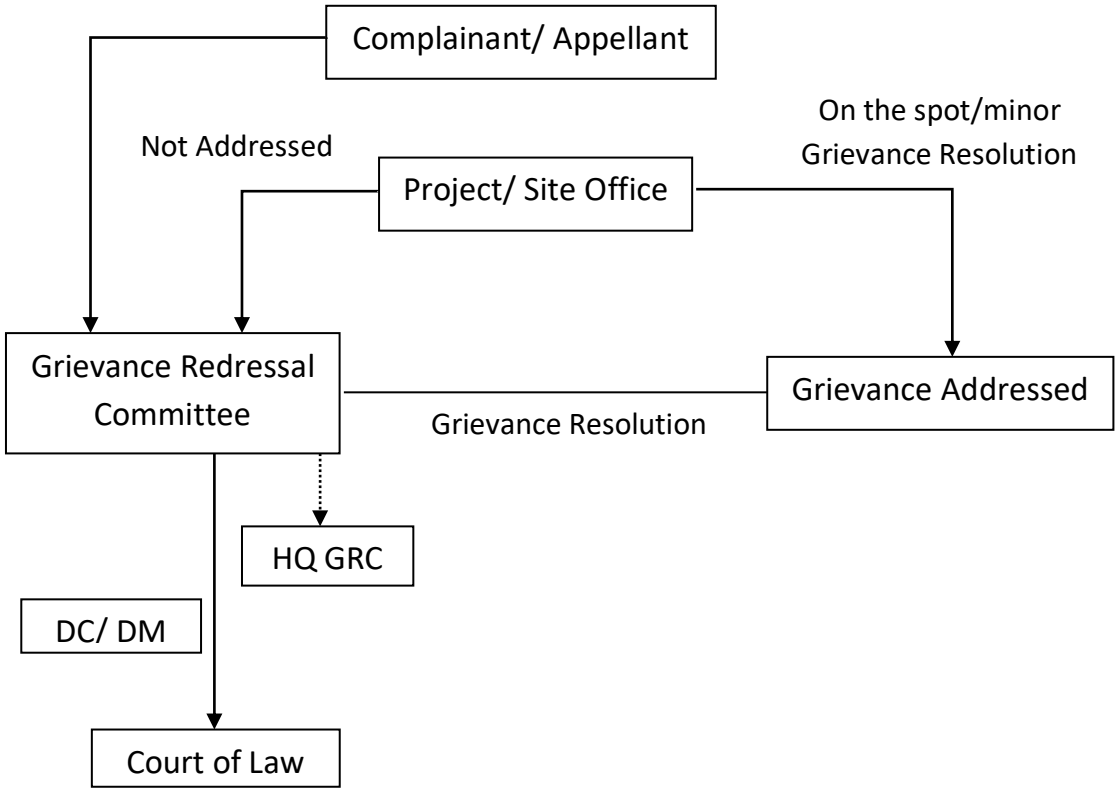
The Capacity building and Institutional Strengthening program of the IA is held intermittently to enhance the skills of the project officials. Besides, separate E&S training are also organized for Official of State Utility under Capacity Building & Institutional Strengthening (CBIS) programme. Further, State utility meetings between IA and MSPCL are held on a monthly/ bimonthly basis to assess the work progress and difficulties encountered in respect of land acquisition, RoW and compensation if any.

The IA has a continuous monitoring mechanism of the project w.r.t. compliance of the mitigation measures as stipulated in the IEAR. Thus, the

adherences to the clauses by the contractors are regularly monitored especially in respect of various implementations of E&S measures including health and safety aspects. Due to such strong institutional support structure coupled with monitoring mechanism in place, no major non-compliance was observed/reported during the implementation of projects till date. The project has so far had zero fatality which is indicative of the strict vigil of the IA. During the present study, it was observed that mitigation measures as suggested in IEAR are mostly complied with even though some gaps were found with respect to proper documentation and condition of labour camp at one of the DMS sub-station.

6.4 GRIEVANCE REDRESSAL MECHANISM (GRM)

Grievance Redress Mechanism (GRM) is an integral and important mechanism for addressing/resolving the concern and grievances in a transparent and swift manner. In accordance with the provision in ESPPF, Grievance Redress Committees (GRC) have to be constituted in Manipur both at the project/site level and at Corporate/HQ. This GRC is aimed to provide a trusted way to voice and resolve environment & social concerns of the project, and to address the concerns of the affected person/community in a time bound manner without impacting project implementation. The flow chart showing Grievance Redressal Mechanism is presented below.



The above referred GRCs are meant to act as supplement/ complement and in no way substitute the legal systems, especially embedded within RFCTLARR Act 2013, The Electricity Act, 2003, and Right to Information Act.

Apart from above, grievance redressal is in built in crop/tree/tower footing compensation process where affected persons are given a chance to place their grievances after issuance of notice by revenue officials on the basis of assessment of actual damages. Grievances received towards compensation are generally addressed in open forum and in the presence of many witnesses. Process of spot verification and random checking by the district collector/ its authorized representative also provides forum for raising the grievance towards any irregularity/complain. Moreover, MSPCL & POWERGRID officials also address to the complaints of affected farmers and the same are forwarded to revenue official for doing the needful, if required.

It may also be noted that concerns of public are addressed regularly through public consultation process which started from project planning to construction and will be continued in operation and maintenance also. Besides, many concerns/grievances from affected persons/public have been received by Site Offices which are also regularly tracked for early resolution. However, it has been observed that most of them were minor in nature and were resolved instantly and amicably by Site Officials after discussion & deliberation with affected person/ in consultation of revenue/district officials.

6.4.1 Grievances Received & Resolved

Till date only verbal grievances have been received at site during project execution. These grievances were resolved at the site itself. Details of complaints received up to May, 2021 are given in **Table 6.1**.

Table 6.1: Details of Complaints

S. No.	Name of the Subproject /State	Location	Name of complainants	Date of complaints	Main Issue of complaints	Status of complaint
A.	**Court Cases**					
No Court Case has been registered so far against any subprojects under NERPSIP						
B.	**Written Complaints**					
No written complaint has been received so far						
C.	**Verbal Complaints**					
No verbal complaint has been received so far						

ANNEXURE I

List of Angiosperm

List of Angiosperms

Family	Botanical Name
Acanthaceae	*Barleria cristata*
Acanthaceae	*Justicia adhatoda*
Acanthaceae	*Strobilanthes auriculatus*
Acanthaceae	*Thunbergia coccinea*
Acanthaceae	*Strobilanthes hamiltoniana*
Altingiaceae	*Altingia excelsa*
Amaranthaceae	*Achyranthes aspera*
Amaranthaceae	*Amaranthus viridis*
Amaranthaceae	*Chenopodium album*
Anacardiaceae	*Rhus chinensis*
Anacradiaceae	*Mangifera sylvatica*
Apiaceae	*Centella asiatica*
Araceae	*Alocasia fornicata*
Araliaceae	*Brassaiopsis glomerulata*
Araliaceae	*Trevesia palmata*
Araliaceae	*Brassaiopsis hainla*
Arecaceae	*Calamus tenuis*
Asteraceae	*Artemisia capillaris*
Asteraceae	*Chromolaena odorata*
Cannabaceae	*Trema orientalis*
Cannabaceae	*Celtis australis*
Combretaceae	*Combretum decandrum*
Commelinaceae	*Commelina benghalensis*
Cyperaceae	*Carex longipes*
Cyperaceae	*Cyperus exaltatus*
Cyperaceae	*Cyperus rotundus*
Dilleniaceae	*Dillenia indica*
Dipterocarpaceae	*Shorea assamica*
Euphorbiaceae	*Macaranga denticulata*
Euphorbiaceae	*Ostodes paniculata*
Euphorbiaceae	*Mallotus paniculatus*
Fabacaea	*Acacia farnesiana*
Fabaceae	*Albizia procera*
Fabaceae	*Bauhinia variegata*
Fabaceae	*Dalbergia pinnata*
Fabaceae	*Erythrina variegata*
Fabaceae	*Hardwickia binata*
Fabaceae	*Mimosa pudica*
Fagaceae	*Castanopsis indica*
Juglandaceae	*Engelhardtia spicata*
Lamiaceae	*Callicarpa arborea*
Lamiaceae	*Gmelina arborea*
Lamiaceae	*Elsholtzia blanda*
Lauraceae	*Litsea monopetala*
Lythraceae	*Duabanga grandiflora*
Magnoliaceae	*Magnolia champaca*

Family	Botanical Name
Magnoliaceae	*Magnolia liliifera*
Malvaceae	*Bombax ceiba*
Malvaceae	*Kydia calycina*
Malvaceae	*Pterospermum acerifolium*
Meliaceae	*Chukrasia tabularis*
Meliaceae	*Toona ciliata*
Moraceae	*Ficus semicordata*
Moringaceae	*Moringa oleifera*
Orchidaceae	*Bulbophyllum roxburghii*
Orchidaceae	*Bulbophyllum wallichii*
Orchidaceae	*Ceratostylis teres*
Orchidaceae	*Dendrobium hookerianum*
Orchidaceae	*Eria acervata*
Pandanaceae	*Pandanus odorifer*
Phyllanthaceae	*Bischofia javanica*
Phyllanthaceae	*Phyllanthus emblica*
Plantaginaceae	*Plantago major*
Poaceae	*Phragmites karka*
Poaceae	*Poa annua*
Poaceae	*Saccharum spontaneum*
Simaroubaceae	*Ailanthus integrifolia*
Theaceae	*Schima wallichii*
Urticaceae	*Urtica dioica*
Zingiberaceae	*Alpinia nigra*
Acanthaceae	*Erantheumum pulchellum*
Achariaceae	*Gynocardia odorata*
Anacardiaceae	*Mangifera indica*
Araceae	*Arisaema concinnum*
Araceae	*Arum dioscoridis*
Araceae	*Colocasia forniculata*
Arecaceae	*Areca catechu*
Arecaceae	*Trachycarpus martianus*
Arecaceae	*Calamus erectus*
Asparagaceae	*Asparagus racemosus*
Asteraceae	*Ageratum conyzoides*
Asteraceae	*Artemisia nilagirica*
Asteraceae	*Bidens pilosa*
Asteraceae	*Chromolaena odorata*
Asteraceae	*Mikania micrantha*
Asteraceae	*Parthenium hysteropharus*
Balsaminaceae	*Impatiens bicornuta*
Begoniaceae	*Begonia nepalensis*
Begoniaceae	*Begonia palmata*
Bignoniaceae	*Oroxylum indicum*
Burseraceae	*Garuga pinnata*
Calophyllaceae	*Mesua ferrea*

Family	Botanical Name
Caryophyllaceae	*Brachystemma calycinum*
Caryophyllaceae	*Drymaria diandra*
Combretaceae	*Terminalia myriocarpa*
Commelinaceae	*Cyanotis vaga*
Convolvulaceae	*Argyreia argentea*
Costaceae	*Costus speciosus*
Cucurbitaceae	*Hodgsonia heteroclita*
Dioscoreaceae	*Dioscorea bulbifera*
Euphorbiaceae	*Euphorbia pulcherrima*
Euphorbiaceae	*Ricinus communis*
Fabaceae	*Acrocarpus fraxinifolius*
Fabaceae	*Albizia chinensis*
Fabaceae	*Acacia pennata*
Fabaceae	*Crotalaria pallida*
Fabaceae	*Derris scandens*
Fabaceae	*Senna tora*
Hydrangeaceae	*Hydrangea macrophylla*
Lamiaceae	*Tectona grandis*
Lamiaceae	*Ocimum tenuiflorum*
Lauraceae	*Phoebe hainesiana*
Lauraceae	*Phoebe paniculata*
Loranthaceae	*Loranthus gracilifolius*
Lythraceae	*Lagerstroemia parviflora*
Malvaceae	*Grewia nervosa*
Malvaceae	*Urena lobata*
Malvaceae	*Sida rhombifolia*
Malvaceae	*Abutilon indicum*
Malvaceae	*Sida cordifolia*
Melastomataceae	*Melastoma malabathricum*
Melastomataceae	*Oxyspora paniculata*
Menispermaceae	*Cocculus orbiculatus*
Moraceae	*Artocarpus chama*
Moraceae	*Artocarpus heterophyllus*
Moraceae	*Ficus glomerata*
Moraceae	*Ficus roxburghii*
Moraceae	*Morus macroura*
Musaceae	*Musa balbisiana*
Musaceae	*Musa laterita*
Myrtaceae	*Syzygium tetragonum*
Oleaceae	*Jasminum amplexicaule*
Orchidaceae	*Diplomeris pulchella*
Orchidaceae	*Vanda coerulea*
Oxalidaceae	*Oxalis corniculata*

Family	Botanical Name
Phyllanthaceae	*Sauropus androgynus*
Poaceae	*Dendrocalamus giganteus*
Poaceae	*Saccharum spontaneum*
Poaceae	*Bambusa balcooa*
Poaceae	*Bambusa khasiana*
Poaceae	*Bambusa pallida*
Poaceae	*Dendrocalamus hamiltonii*
Poaceae	*Dendrocalamus strictus*
Poaceae	*Yushania hirsuta*
Poaceae	*Arundinaria hirsuta*
Poaceae	*Arundo donax*
Poaceae	*Chrysopogon aciculatus*
Poaceae	*Cynodon dactylon*
Poaceae	*Digitaria ciliaris*
Poaceae	*Eragrostis amabilis*
Poaceae	*Imperata cylindrica*
Poaceae	*Pogonatherum biaristatum*
Poaceae	*Themeda villosa*
Poaceae	*Thysanolaena latifolia*
Polygonaceae	*Fagopyrum esculentum*
Polygonaceae	*Persicaria chinensis*
Polygonaceae	*Polygonum affine*
Rosaceae	*Rubus paniculatus*
Rubiaceae	*Adina cordifolia*
Rutaceae	*Murraya paniculata*
Sapindaceae	*Sapindus rarak*
Scrophulariaceae	*Buddleja asiatica*
Simaroubaceae	*Alangium chinense*
Solanaceae	*Datura metel*
Solanaceae	*Physalis minima*
Solanaceae	*Solanum americanum*
Sterculiaceae	*Sterculia villosa*
Urticaceae	*Debregeasia longifolia*
Urticaceae	*Girardinia diversifolia*
Urticaceae	*Elatostema sessile*
Urticaceae	*Lecanthus peduncularis*
Verbenaceae	*Lantana camara*
Violaceae	*Viola diffusa*
Zingiberaceae	*Globba marantina*
Zingiberaceae	*Hedychium spicatum*
Zingiberaceae	*Amomum dealbatum*
Zingiberaceae	*Zingiber officinale*

ANNEXURE II

Details of Tower Schedule of 132kV Lines

CLIENT: P.G.C.I.L

DETAILED SURVEY TOWER SCHEDULE

LINK: 132 KV DC IMPHAL TO NINTHOUKHONG TRANSMISSION LINE

SL NO	AP NO	TOWER NO	TYPE OF TOWER	REMARKS	ANGLE OF DEVIATION	SPAN (IN M)	SEC. LENG.	CUMLTV LENGTH	R.L	SUM OF ADJ. SPAN	WIND SPAN	WEIGHT SPAN IN (HOT) LEFT	WEIGHT SPAN IN (HOT) RIGHT	WEIGHT SPAN IN (HOT) TOTAL	WEIGHT SPAN IN (COLD) LEFT	WEIGHT SPAN IN (COLD) RIGHT	WEIGHT SPAN IN (COLD) TOTAL	MAJOR CROSSING DETAIL	VILL NAME	GPS CO-ORDINATE WGS-84 EASTING	GPS CO-ORDINATE WGS-84 NORTHING
1			Gantry						788.87	43.00	21.50		32.84	32.87		45.16	40.94		VILL-YUREMBAM	93°52'18.20"	24°47'2.8"
2	1	1/0	DD+3(Auxiliary Arm Suggested)		47°50'21"RT	43	43	43	788.7	166.00	83.00	10.11	73.71	83.82	2.44	74.84	82.78		VILL-YUREMBAM	93°52'18.08"	24°47'4.18"
3	2	2/0	DD+0		51°00'48"RT	123	123	166	787.94	229.00	114.50	50.29	43.87	98.16	43.19	44.64	87.81	33KV, S/S Boundary, 11KV	VILL-YUREMBAM	93°52'22.37"	24°47'8.8"
4	3	3/0	DD+0		59°48'09"RT	106	106	272	788.24	432.00	216.00	58.13	144.49	202.59	64.39	135.87	197.76	33KV, Nala, 11KV	VILL-YUREMBAM	93°52'30.01"	24°47'6.25"
5		3/1	DA+3	Used +3 tower at 3/1 due to Ground Clearance in between 3/0 & 3/1		308			787.6	634.00	317.00	171.55	161.68	333.23	180.13	163.38	343.51			93°52'34.11"	24°46'57.40"
6		3/2	DA+3	Used +3 tower at 3/2 due to Ground Clearance in between 3/1 & 4/0		318			787.15	636.00	318.00	156.32	173.83	330.15	154.62	183.22	337.84			93°52'38.51"	24°46'47.85"
7	4	4/0	DC+0		20°57'23"RT	316	952	1224	787.53	638.00	319.00	144.11	126.84	271.08	134.78	105.84	240.61	2 Nos. Nala, Pond, Vill Road	VILL-YUREMBAM	93°52'41.34"	24°46'38.71"
8		4/1	DA+6	Used +6 tower at 4/1 due to Clearance from 11 KV line in between 4/0 & 5/0		320			787.39	640.00	320.00	193.16	199.68	392.84	204.14	224.81	428.95	2 Nos. Nala, Pond, Mutual Road		93°52'42.64"	24°46'28.37"
9	5	5/0	DB+0		11°04'05"LT	320	640	1864	786.38	640.00	320.00	120.32	142.71	263.03	95.19	121.76	216.95	Pond, Mutual Road, 11KV, Nala	VILL-YUREMBAM	93°52'44.30"	24°46'18.04"
10		5/1	DA+3	Used +3 tower at 5/1 due to Ground Clearance for both side		320			786.43	640.00	320.00	177.29	172.36	349.65	185.24	180.18	365.42			93°52'47.74"	24°46'08.25"
11	6	6/0	DD+0		43°50'52"RT	320	640	2504	787.25	630.00	315.00	147.64	146.66	294.30	139.82	131.58	271.40	2 Nos. Vill Road	VILL-YUREMBAM	93°52'51.15"	24°45'58.41"
12		6/1	DA+3	Used +3 tower at 6/1 due to Ground Clearance for both side		310			786.7	625.00	312.50	169.34	177.02	346.36	177.42	189.38	367.80			93°53'48.26"	24°45'48.35"
13		6/2	DB+0	Used B type tower instead of A due to Wt. Span Limit Crossed		315	625	3129	786.34	635.00	317.50	137.98	112.95	250.93	135.62	65.15	201.77			93°52'41.21"	24°45'40.02"
14	1	7/0	DD+9	Used +9 tower at 7/0 & 8/0 due to Proposed Rail way line crossing	08°43'35"RT	320	320	3449	785.81	535.00	267.50	201.46	107.19	308.24	236.83	114.24	341.03	2 Nos. Vill Road, Nala	VILL-YUREMBAM	93°52'38.26"	24°45'30.82"
15	8	8/0	DD+9		14°37'24"RT	215	215	3664	785.41	506.00	253.00	105.81	202.48	308.29	104.74	238.56	343.30	Vill Road, 11KV, Lt Line, 33KV, Proposed Railway	VILL-BHARATPUR	93°52'31.78"	24°45'25.31"
16		8/1	DB+0	Used B type tower instead of A due to Wt. Span		291	291	3955	786.27	608.00	304.00	88.57	143.41	232.00	52.44	134.00	186.44			93°52'23.73"	24°45'18.20"
17		8/2	DA+3	Used +3 tower at 8/2 due to Ground Clearance for both side		317			784.88	633.00	316.50	173.49	177.46	350.95	182.99	189.78	372.77	River		93°52'14.88"	24°45'12.12"
18	9	9/0	DD+0		36°35'03"RT	316	633	4588	784.5	658.00	329.00	138.58	135.63	274.21	126.22	113.30	239.52		VILL-BHARATPUR	93°52'06.37"	24°45'06.19"
19		9/1	DB+6	Used +6 tower at 9/1 due to Ground Clearance for Low side		342	342	4930	785.16	672.00	336.00	296.33	187.70	484.03	225.70	213.42	487.11			93°51'56.68"	24°45'05.73"
20	10	10/0	DD+0		31°12'29"LT	330	330	5260	785.21	630.00	315.00	112.29	136.84	249.17	111.59	128.57	240.15	Nala, Vill Road, Mutual Road, Play Ground	VILL-BHAMDIAR	93°51'43.77"	24°45'05.17"
21		10/1	DA+3	Used +3 tower at 10/1 due to Ground Clearance for both side		300			784.30	615.00	307.50	165.12	173.87	338.99	171.43	187.54	358.97	Upnepal Road		93°51'33.48"	24°44'59.10"

Checked and found to be in order.

SUBMITTED BY:
SHYAMA POWER(I) LTD.

Abdur Rahman
Asst. Engineer, N.E.R.P.S.I.P., Power and Corporation of India Ltd., Imphal

CHECKED BY:
P.G.C.I.L

N. RAJEN SINGH
Senior DGM (N.E.R.P.S.I.P.)
POWERGRID, Imphal

[illegible] DHIRENDRA SINGH
Sr. General Manager, N.E.R.P.S.I.P.
[illegible]

APPROVED BY:
P.G.C.I.L

CLIENT:P G.C.I.L

DETAILED SURVEY TOWER SCHEDULE

LINK:132 KV DC IMPHAL TO NINTHOUKHONGTRANSMISSION LINE

SL NO	AP NO	TOWER NO	TYPE OF TOWER	REMARKS	ANGLE OF DEVIATION	SPAN (IN M)	SEC LENG.	CUMLTV LENGTH	RL	SUM OF ADJ SPAN	WIND SPAN	WEIGHT SPAN IN (HOT) LEFT	WEIGHT SPAN IN (HOT) RIGHT	WEIGHT SPAN IN (HOT) TOTAL	WEIGHT SPAN IN (COLD) LEFT	WEIGHT SPAN IN (COLD) RIGHT	WEIGHT SPAN IN (COLD) TOTAL	MAJOR CROSSING DETAIL	VILL NAME	GPS CO-ORDINATE WGS-84 EASTING	GPS CO-ORDINATE WGS-84 NORTHING
21		1011	DA+3	Used +3 tower in 1011 due to Ground Clearance [illegible]		315			784.98	615.00	307.50	163.12	175.87	338.99	171.43	161.50	332.93			93°51'33.48"	24°44'59.70"
22		1012	DA+0 2			290			784.18	605.00	302.50	159.13	145.63	304.76	127.50	146.02	273.53			93°51'24.22"	24°44'53.95"
23		1013	DA+0 2			302			784.08	592.00	296.00	144.37	152.15	296.52	143.58	152.06	295.64			93°51'15.69"	24°44'48.68"
24		1014	DA+0 3			301			783.9	603.00	301.50	149.86	148.51	298.37	149.14	147.25	296.39			93°51'06.81"	24°44'43.18"
25		1015	DA+0 4			284			784.23	585.00	292.50	152.49	141.55	294.04	153.55	141.27	295.07			93°50'57.86"	24°44'37.70"
26		1016	DA+0 5			300			784.3	584.00	292.00	142.45	151.63	294.08	142.73	152.67	295.40	FP		93°50'49.61"	24°44'32.63"
27		1017	DA+0 6			300			784.03	600.00	300.00	148.37	158.69	306.06	147.34	152.72	300.14			93°50'40.78"	24°44'27.08"
28	11	11/0	DD+0 2		18°36'54"RT	270	2192	7652	783.75	570.00	285.00	148.31	48.57	196.88	145.20	-64.25	19.01		VILL-DHANBAR	93°50'31.48"	24°44'21.67"
29	12	12/0	DD+18 1	Used +18 tower at 12/0 due to Clearance from 132 kV line in between 12/0 & 13/0	26°59'13"RT	225	210	7922	784.25	495.00	247.50	259.45	191.67	451.06	316.22	248.44	500.40	11KV, Vill Road, Play Ground	VILL THANKO	93°50'22.70"	24°44'19.4"
30	13	13/0	DD+3 3	Used +18 with [illegible] tower at 14/0 and +3 tower at 13/0 due to Clearance from 132 kV line in between 13/0 & 14/0	40°11'00"RT	284	225	8147	783.45	486.00	243.00	33.31	59.89	91.24	-16.81	15.17	-1.64	33KV S/C IMPHAL - NINTHOUKHONG T/L, Play Ground	VILL-THANKO	93°50'14.76"	24°44'20.85"
31	14	14/0	DD+18 [illegible] RCI 2		21°50'19"RT	280	261	8408	783.61	541.00	270.50	201.11	261.67	462.78	245.43	258.12	504.36	33KV S/C IMPHAL - LOKTAK T/L, Pond	VILL-THANKO	93°50'06.78"	24°44'26.93"
32		14/1	DB+C 4	Used B type tower instead of A due to Wt. Span		225	280	8688	783.80	505.00	252.50	18.33	84.20	102.53	-58.73	44.20	1.51	Nala, Pond		93°49'55.21"	24°44'35.61"
33		14/2	DA+3			250			784.34	475.00	237.50	140.16	146.19	286.59	159.12	159.60	318.32	Road		93°49'43.27"	24°44'42.51"
34	15	15/0	DD+[illegible](Auxiliary Arm Suggested) 5	Used +3 tower at 14/2 & 15/0 due to Wt. Span instead of 14/2	57°47'11"LT	106	475	9163	784.42	356.00	178.00	401.11	84.71	190.53	90.40	109.06	198.46		VILL-KHABI	93°50'00.45"	24°44'50.33"
35		15/1	Gantry 1			60			784.28	166.00	83.00	19.29	30.33	49.59	-2.06	30.49	18.43	Unmetal Road	14/0 - DD	93°48'56.99"	24°44'51.18"
36		15/2	Gantry 2			102			784.26	162.00	81.00	29.74	9.56	39.26	29.51	-16.68	12.83	400KV D/C Imphal - Thoubal T/L	14/1 - DA	93°48'54.62"	24°44'51.66"
37	16	16/0	DD+0 6		35°50'45"RT	332	268	9431	784.77	434.00	217.00	91.44	144.22	235.66	118.69	133.54	252.33		VILL-KHABI	93°48'51.30"	24°44'52.49"
38	16A	16A/0	DC+3 1		20°40'02"LT		332	9763	786.38	657.00	328.50	185.76	164.40	350.16	199.36	163.60	362.96	Unmetal Road, Nala	VILL-KHABI	93°48'43.52"	24°45'00.73"

Santosh

SUBMITTED BY.
SHYAMA POWER(I) LTD.

Abdur Rahman 31/12/18
Field Engineer (N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

CHECKED BY:
P.G.C.I.L

31/12/18
H. RAJEN SINGH
Senior DGM (N.E.R.P.S.I.P.)
POWERGRID, Imphal

[illegible]
Sr. General Manager (N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

APPROVED BY:
P.G.C.I.L

CLIENT:P.G.C.I.L

DETAILED SURVEY TOWER SCHEDULE

LINK:132 KV DC IMPHAL TO NINTHOUKHONGTRANSMISSION LINE

SL NO	AP NO	TOWER NO	TYPE OF TOWER	REMARKS	ANGLE OF DEVIATION	SPAN IN (M)	SEC. LENG.	CUMULATIVE LENGTH	R.L.	SUM OF ADJ. SPAN	WIND SPAN	WEIGHT SPAN IN (HOT) LEFT	WEIGHT SPAN IN (HOT) RIGHT	WEIGHT SPAN IN (HOT) TOTAL	WEIGHT SPAN IN (COLD) LEFT	WEIGHT SPAN IN (COLD) RIGHT	WEIGHT SPAN IN (COLD) TOTAL	MAJOR CROSSING DETAIL	VILL. NAME	GPS CO-ORDINATE WGS-84 EASTING	GPS CO-ORDINATE WGS-84 NORTHING
38	16A	16A/0	DC+3	Used +3 tower at 16A/0 & 17/0 due to Ground Clearance in between 16A/0 & 17/0	20°00'02" LT	328	325	10088	769.30	657.00	328.50	183.70	164.40	350.11	198.30	165.60	363.90	Nala		93°49'49.82"	24°45'00.79"
39	17	17/0	DD+3		53°38'53" LT	313			785.00	638.00	319.00	160.50	157.35	317.86	159.40	151.75	311.15	Nala	VILL-KHABI	93°49'33.44"	24°45'6.19"
40		17/1	DA+3	Used +3 tower at 17/1 due to Wt. Span limitation		356			784.82	611.00	305.50	155.75	143.52	299.27	155.23	140.06	295.32	Nala		93°49'23.74"	24°45'1.35"
41		17/2	DA+3	Used +3 tower at 17/2 due to Ground Clearance on both sides		320			785.82	613.00	306.50	154.48	170.54	325.02	157.95	177.22	335.17	Metal Road, LT Line		93°49'13.53"	24°44'57.54"
42		17/3	DA+0			295			788.90	615.00	307.50	149.46	151.04	300.50	142.78	116.95	259.73	Unmetal Road		93°49'3.1"	24°44'53.58"
43		17/4	DA+0			285	1511	11599	788.04	580.00	290.00	137.96	133.86	248.42	158.05	130.00	288.05	Vill Road		93°48'52.90"	24°44'49.89"
44	18	18/0	DC+0		15°02'26" RT	318			789.21	600.00	301.50	150.14	137.44	287.58	150.95	125.75	276.70		VILL-KANGMONG	93°48'44.24"	24°44'46.37"
45		18/1	DA+3	Used +3 tower at 18/1 due to Ground Clearance on both side		317			789.99	634.00	317.00	180.56	169.14	349.70	144.37	125.88	270.10			93°48'38.09"	24°44'44.68"
46		18/2	DA+0			301			791.43	618.00	309.00	147.86	140.86	288.72	149.12	124.75	275.87	Vill Road		93°48'21.90"	24°44'42.99"
47		18/3	DA+0			303			792.78	604.00	302.00	160.14	133.06	293.20	166.35	121.38	287.63			93°48'11.41"	24°44'41.38"
48		18/4	DA+0			287			795.01	590.00	295.00	164.94	123.46	295.55	181.63	112.29	295.90	Vill Road, Pond		93°48'00.79"	24°44'38.77"
49		18/5	DA+0			282			796.64	574.00	287.00	161.39	124.16	285.55	172.21	161.91	284.65			93°47'50.77"	24°44'38.24"
50		18/6	DA+0			304	2117	13716	801.7	591.00	295.50	167.00	142.51	309.35	175.09	136.50	311.59	Unmetal Road		93°47'40.85"	24°44'36.71"
51	19	19/0	DD+0		47°44'47" LT	320			803.28	624.00	312.00	141.49	184.91	326.00	167.50	162.60	330.10	Vill Road	VILL-KANGMONG	93°47'30.02"	24°44'35.1"
52		19/1	DA+3	Used +3 tower at 19/1 due to Ground Clearance in between 19/0 & 19/1		320			806.40	640.00	320.00	195.09	138.74	333.83	217.38	125.26	342.19	Nala		93°47'21.87"	24°44'26.42"
53		19/2	DA+3	Used +3 tower at 19/2 & 19/3 due to Ground Clearance in between 19/2 & 19/3		330			810.25	640.00	320.00	188.26	131.54	319.80	194.77	113.52	308.29			93°47'17.64"	24°44'17.74"
54		19/3	DA+3			320			815.25	640.00	320.00	188.46	130.58	319.04	206.48	111.93	318.05	Vill Road		93°47'11.45"	24°44'09.08"
55		19/4	DA+3	Used +3 tower at 19/4 due to Ground Clearance in between 19/4 & 19/5					820.44	640.00	320.00	189.42	149.51	338.93	208.05	142.81	350.91			93°47'05.28"	24°44'06.36"

Santosh

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Abdur Rahman
Field Engineer (N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

CHECKED BY:
P.G.C.I.L

H. RAJEN SINGH
Senior DGM (N.E.R.P.S.I.P.)
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KH. DHIRENDRA SINGH
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Power Grid Corporation of India Ltd.

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P.G.C.I.L

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DETAILED SURVEY TOWER SCHEDULE

LINK:132 KV DC IMPHAL TO NINTHOUKHONGTRANSMISSION LINE

SL NO	AP NO	TOWER NO	TYPE OF TOWER	REMARKS	ANGLE OF DEVIATION	SPAN IN (M)	SEC. LENG.	CUMULTV LENGTH	R.L	SUM OF ADJ. SPAN	WIND SPAN	WEIGHT SPAN IN (HOT) LEFT	WEIGHT SPAN IN (HOT) RIGHT	WEIGHT SPAN IN (HOT) TOTAL	WEIGHT SPAN IN (COLD) LEFT	WEIGHT SPAN IN (COLD) RIGHT	WEIGHT SPAN IN (COLD) TOTAL	MAJOR CROSSING DETAIL	VILL NAME	GPS CO-ORDINATE WGS-84 EASTING	GPS CO-ORDINATE WGS-84 NORTHING
55		194	DA+3	Used +3 tower at 194 due to Ground Clearance in between 194 & 195		320			820.44	640.00	320.00	189.42	149.51	338.93	208.45	147.87	356.92	Vill Road		93°47'35.26"	24°44'00.33"
56		195	DA+0			300			826.29	620.00	310.00	170.49	126.30	296.79	172.13	118.29	288.42	Metal Road		93°46'59.45"	24°43'52.24"
57		196	DA+0			306			830.21	606.00	303.00	173.70	133.91	307.61	183.71	120.82	300.54	Nala		93°46'53.63"	24°43'45.04"
58		197	DA+0			317			832.40	623.00	311.50	172.09	131.55	303.64	184.18	114.48	298.66	Road		93°46'47.40"	24°43'36.34"
59		199	DA+3	Used +3 tower at 199 due to Ground Clearance for both side		294			834.14	611.00	305.50	185.45	170.01	355.47	203.32	164.39	367.11	Road		93°46'41.25"	24°43'26.74"
60	70	200	DD+0		30°14'58"LT	254	2517	18533	833.47	548.00	274.00	123.99	121.64	245.63	136.48	118.33	254.66	Nala, 11KV, Metal Road	VILL-LEIMARAM	93°46'35.30"	24°43'15.43"
61		201	DA+3	Used +3 tower at 201 due to Wt. Span limitation		308			830.96	562.00	281.00	132.36	174.67	307.03	135.75	187.76	323.51	Unmetal Road		93°46'34.77"	24°43'10.19"
62		202	DA+3	Used +3 tower at 202 due to Ground Clearance in between 201 & 202		316			827.65	624.00	312.00	133.33	191.98	325.31	120.24	213.50	333.74	Nala		93°46'34.08"	24°43'00.25"
63		203	DA+3	Used +3 tower at 203 & 204 due to Wt. Span exceeding at 203 & 204		318			821.75	634.00	317.00	124.02	190.49	314.50	102.50	210.41	312.92			93°46'33.3"	24°42'49.64"
64		204	DA+3			317			816.21	635.00	317.50	123.51	182.49	306.00	107.37	214.02	321.39			93°46'32.64"	24°42'39.64"
65		205	DA+3	Used +3 tower at 205 due to Ground Clearance in between 205 & 206		314			810.27	631.00	315.50	124.51	217.95	342.46	122.98	236.53	359.51	Metal Road		93°46'31.92"	24°42'29.56"
66		206	DB+0	Used DB tower instead of A due to Wt. Span		277	4824	18360	802.72	591.00	295.50	96.45	96.00	192.45	57.46	69.08	126.54	Nala		93°46'31.21"	24°42'19.16"
67	71	21/0	DB+0		06°49'09"RT	300	277	18637	809.21	577.00	288.50	181.40	117.65	299.05	207.92	97.16	305.08		VILL-LERENGBAM	93°46'30.8"	24°42'10.21"
68		21/1	DA+3	Used +3 tower at 21/1 & 21/2 due to Clearance from 11 KV line in between 21/1 & 21/2		320			811.56	620.00	310.00	182.35	148.01	330.35	202.84	124.08	326.90	11KV, Metal Road		93°46'28.87"	24°42'00.59"
69		21/2	DA+3			302			815.44	622.00	311.00	181.99	161.51	343.53	195.92	168.77	364.19	Nala		93°46'27.02"	24°41'50.33"
70		21/3	DA+0			297			816.66	599.00	299.50	140.43	166.58	307.01	139.15	178.00	318.76			93°46'25.27"	24°41'40.65"
71		21/4	DA+0			288			819.72	583.00	291.50	130.42	144.62	299.05	118.91	184.83	303.67			93°46'23.56"	24°41'31.15"
72		21/5	DA+0						809.48	585.00	292.50	115.28	190.69	305.97	101.83	216.16	317.99			93°46'21.90"	24°41'21.59"

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Field Engineer (NERPSIP)
Power Grid Corporation of India Ltd.
Imphal, Manipur

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P.G.C.I.L

R. RAJEN SINGH
Senior DGM (N.E.R.P.S.I.P)
POWERGRID, Imphal

Sr. General Manager (N.E.R.P.S.I.P)
Power Grid Corporation of India Ltd.

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DETAILED SURVEY TOWER SCHEDULE

LINK:132 KV DC IMPHAL TO NINTHOUKHONGTRANSMISSION LINE

SL NO	AP NO	TOWER NO	TYPE OF TOWER	REMARKS	ANGLE OF DEVIATION	SPAN IN (M)	SEC. LENG.	CUMLTV LENGTH	RL	SUM OF ADJ SPAN	WIND SPAN	WEIGHT SPAN IN (HOT) LEFT	WEIGHT SPAN IN (HOT) RIGHT	WEIGHT SPAN IN (HOT) TOTAL	WEIGHT SPAN IN (COLD) LEFT	WEIGHT SPAN IN (COLD) RIGHT	WEIGHT SPAN IN (COLD) TOTAL	MAJOR CROSSING DETAIL	VILL.NAME	GPS CO-ORDINATE WGS-84 EASTING	GPS CO-ORDINATE WGS-84 NORTHING
72		2215	DA+3						809.68	585.00	292.50	115.36	190.69	306.05	101.15	216.78	317.93			93°45'21.60"	24°41'21.96"
73		2216	DB+0	Used B type tower instead of A due to Wt. Span		289	1004	20411	802.89	583.00	291.50	108.31	116.77	225.08	82.17	101.33	183.51			93°45'20.13"	24°41'12.56"
74		2217	DA+0			276			806.41	570.00	285.00	129.23	123.31	252.54	172.67	100.30	269.91			93°45'18.51"	24°41'03.21"
75	22	2220	DB+0		09°43'29"LT	304	570	23011	809.96	614.00	307.00	170.69	166.97	337.63	145.70	111.39	257.09	Vill Road, Nala	VILL-LEMARAM	93°45'16.88"	24°40'54.12"
76		2221	DA+3	Used +3 tower at 2221 due to Ground Clearance in between 2220 & 2221		320			805.72	640.00	320.00	153.03	196.63	349.63	141.61	219.81	361.42	11KV, Metal Road		93°45'16.56"	24°40'45.31"
77		2222	DA+3	Used +3 tower at 2222 & 2223 due to Wt. Span imbalance at 2222 & 2223		320			799.27	628.00	314.00	123.38	109.61	233.01	100.19	289.43	389.55			93°45'17.01"	24°40'33.51"
78		2223	DA+3			310			793.9	638.00	319.00	428.37	186.25	314.61	108.97	202.07	311.84			93°45'17.07"	24°40'22.97"
79		2224	DA+0			320			792.27	638.00	319.00	133.75	172.86	306.62	117.13	141.64	258.77	Unmetal Road, Nala		93°45'17.13"	24°40'12.56"
80		2225	DA+3	Used +3 tower at 2225 due to Ground Clearance in between 2224 & 2225		318			788.84	589.00	294.50	145.14	147.82	292.95	136.16	155.62	291.98	Unmetal Road, Nala		93°45'17.19"	24°40'02.22"
81		2226	DA+3	Used +3 tower at 2226 due to Clearance from 11 KV line in between 2225 & 2226		271			785	531.00	269.00	123.18	159.14	282.36	115.38	175.45	290.83	11KV		93°45'17.24"	24°39'53.41"
82	23	2230	DB+0		12°57'17"RT	257	2134	23145	784.22	443.00	221.50	101.92	59.56	161.48	91.56	42.04	133.60		VILL-LEMARAM	93°45'17.32"	24°39'44.74"
83		2231	DA+3	Used +3 tower at 2231 due to Clearance from 11 KV line in between 2230 & 2231		176			783.95	463.00	231.50	116.14	158.16	274.30	103.96	107.45	211.41	Metal Road, 11KV		93°45'16.08"	24°39'39.11"
84	24	2235	DD+0		41°11'57"LT	297	464	23609	784.63	409.00	204.50	138.14	26.72	165.15	119.55	20.60	140.24	11KV	VILL-BISAMPUR	93°45'14.05"	24°39'29.90"
85	25	2240	DD+3	Used +3 tower at 2240 due to Clearance from 11 KV line in between 2240 & 2241	36°44'18"RT	172	127	23736	783.28	428.00	214.00	85.68	169.72	255.40	101.31	180.30	281.62	11KV, NH-150	VILL-BISAMPUR	93°45'15.11"	24°39'28.39"
86		2241	DA+3	Used +3 tower at 2241 due to Ground Clearance in between 2240 & 2241		306			780.47	626.00	313.00	136.28	178.20	314.48	125.70	140.12	315.42	Nala		93°45'14.30"	24°39'18.80"
87		2242	DB+0	Used B type tower instead of A due to Wt. Span		320	626	24256	780.28	597.00	298.50	141.80	122.13	163.93	130.28	111.76	242.04	Pond		93°45'12.59"	24°39'08.25"
88		2243	DA+0			277			782.78	595.00	297.50	154.85	126.94	280.81	165.24	106.64	271.88	11KV, Unmetal Road		93°45'11.08"	24°38'57.46"
89		2244	DA+3	Used +3 tower at 2244 due to Ground Clearance for both side		318			785.38	638.00	319.00	191.06	133.13	324.19	211.36	116.11	327.47			93°45'08.24"	24°38'47.51"

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Field Engineer (N.E.R.P.S.I.P.)
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LINK:132 KV DC IMPHAL TO NINTHOUKHONGTRANSMISSION LINE

DETAILED SURVEY TOWER SCHEDULE

CLIENT:P.G.C.I.L

SL NO	AP NO	TOWER NO	TYPE OF TOWER	REMARKS	ANGLE OF DEVIATION	SPAN IN (M)	SEC. LENG	CUMILTY LENGTH	RL	SUM OF ADJ. SPAN	WIND SPAN	WEIGHT SPAN IN (HOT) LEFT	WEIGHT SPAN IN (HOT) RIGHT	WEIGHT SPAN IN (HOT) TOTAL	WEIGHT SPAN IN (COLD) LEFT	WEIGHT SPAN IN (COLD) RIGHT	WEIGHT SPAN IN (COLD) TOTAL	MAJOR CROSSING DETAIL	VILL NAME	GPS CO-ORDINATE WGS-84 EASTING	GPS CO-ORDINATE WGS-84 NORTHING
89		2594	DA+3	Used +3 tower at 2594 due to Ground Clearance for both side		320			785.39	630.00	319.00	191.06	133.13	324.19	311.36	146.15	327.40			93°46'08.24"	24°39'47.31"
90		2595	DA+3	Used +3 tower at 2595 & 2596 due to Ground Clearance in between 2595 & 2596		320			790.42	640.00	320.00	186.87	135.79	322.66	204.89	130.41	328.35	Nala, Unmetal Road		93°46'07.44"	24°39'33.07"
91		2596	DA+3			310	1553	25899	798.39	639.00	319.00	174.71	169.95	350.16	199.53	176.89	376.42			93°46'16.05"	24°39'20.07"
92	26	2600	DD+0		23°34'30"LT	310	318	26227	795.47	636.00	318.00	148.05	146.73	294.78	148.41	82.94	231.37		VILL-BISHNUPUR	93°46'03.69"	24°38'16.05"
93	27	2700	DD+6	Used +6 tower at 2700 and +18 at 2800 due to Clearance from 132 KV line in between 2700 & 2800	50°14'12"LT	236	385	26432	795.88	575.00	261.50	191.21	7.11	198.32	226.04	-52.57	173.46	VIII Road	VILL-BISHNUPUR	93°46'08.51"	24°38'08.62"
94	28	2800	DD+18		08°26'31"RT	425	825	26857	796.61	530.00	165.00	195.45	205.96	401.41	251.51	192.64	450.40	132KV S/C IMPHAL - LOKTAK T/L, VIII Road	VILL-BISHNUPUR	93°46'13.11"	24°38'3.65"
95	29	2900	DD+9	Used +9 tower at 2900 due to Clearance from 132KV line in between 2800 & 2900	82°35'38"RT	320			794.09	443.00	221.50	-98.56	165.84	67.28	-167.26	169.54	1.65	132KV S/C IMPHAL - NINTHOUKHONG T/L	VILL-BISHNUPUR	93°46'06.1"	24°38'1.32"
96		2901	DA+6	Used +6 tower at 2901 due to Wt. Span		310			788.09	638.00	319.00	154.16	146.07	300.23	150.46	170.35	321.40	Metal Road		93°46'17.22"	24°37'50.57"
97		2902	DA+3	Used +3 tower at 2902 due to Clearance from 11 KV line in between 2902 & 3000		287	925	27782	789.62	605.00	302.50	151.93	166.63	318.56	147.45	184.28	331.73			93°46'17.74"	24°37'40.39"
98	30	3000	DD+0		21°59'31"RT	320			787.90	607.00	303.50	126.37	110.69	237.06	109.32	85.76	194.98	11KV, Metal Road	VILL-BISHNUPUR	93°46'16.22"	24°37'31.45"
99		3001	DA+3	Used +3 tower at 3001 & 3002 due to Ground Clearance in between 3001 & 3002		320			802.9	640.00	320.00	203.31	158.47	361.78	230.74	151.50	381.24			93°46'18.37"	24°37'24.61"
100		3002	DA+3			320			802.87	640.00	320.00	166.51	151.79	317.23	162.50	185.65	348.15	Nala, Metal Road		93°46'10.52"	24°37'11.19"
101		3003	DA+3	Used +3 tower at 3003 due to Wt. Span Limitation		320			800.1	640.00	320.00	144.30	169.47	313.76	174.35	175.46	349.82	Unmetal Road		93°46'06.57"	24°37'01.97"
102		3004	DA+3	Used +3 tower at 3004 due to Ground Clearance for both side		320			798.43	640.00	320.00	150.53	188.74	339.27	144.54	206.94	351.48			93°46'02.82"	24°36'52.14"
103		3005	DA+0			320			796.36	640.00	320.00	131.26	158.53	289.79	113.06	157.59	270.65	11KV, Unmetal Road		93°45'58.97"	24°36'42.37"
104		3006	DA+3	Used +3 tower at 3006 due to Ground Clearance for both side		320	2240	29733	793.82	640.00	320.00	161.47	181.24	342.71	102.40	211.01	313.41			93°45'55.12"	24°36'32.58"
105	31	3100	DD+0		52°05'22"RT	206	206	29939	791.11	526.00	263.00	128.76	21.53	152.34	108.99	-26.73	82.26	Nala	VILL-BISHNUPUR	93°45'51.32"	24°36'22.85"
106	32	3200	DD+6	Used +6 tower at 3200 due to Clearance from 11 KV line in between 3200 & 3300	58°23'00"LT				794.03	465.00	232.50	182.43	179.04	361.47	232.71	211.32	444.03	NH-150, 2 Nos. 11KV	VILL-BISHNUPUR	93°45'44.47"	24°36'20.67"

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POWERGRID, Imphal

31/12/15

KH. DHIRENDRA SINGH
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Power Grid Corporation of India Ltd.

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DETAILED SURVEY TOWER SCHEDULE

LINK:132 KV DC IMPHAL TO NINTHOUKHONGTRANSMISSION LINE

SL NO	AP NO	TOWER NO	TYPE OF TOWER	REMARKS	ANGLE OF DEVIATION	SPAN (IN LMT)	SEC. LENG	CUMLTV. LENGTH	R.L.	SUM OF ADJ SPAN	WIND SPAN	WEIGHT SPAN IN (HOT) LEFT	WEIGHT SPAN IN (HOT) RIGHT	WEIGHT SPAN IN (HOT) TOTAL	WEIGHT SPAN IN (COLD) LEFT	WEIGHT SPAN IN (COLD) RIGHT	WEIGHT SPAN IN (COLD) TOTAL	MAJOR CROSSING DETAIL	VILL NAME	GPS CO-ORDINATE WGS-84 EASTING	GPS CO-ORDINATE WGS-84 NORTHING
106	32	3320	DD+6 /	Used +6 tower at 3320 due to Clearance from 11KV line in between 3320 & 3330	58°23'00" LT	364			794.13	467.00	233.50	183.41	178.99	362.40	232.73	211.32	444.05	11KV, LT Line, Unpaved Road	VILL-BISHNUPUR	93°45'44.47"	24°36'20.40"
107	33	3330	DB+0 11		05°05'30" LT	280	364	10189	789.01	541.00	270.50	90.01	142.53	232.54	49.64	144.02	193.66	Nala	VILL-NINTHOUKHONG	93°45'42.35"	24°36'13.45"
108		3331	DA+3 38	Used +3 tower at 3331 due to Ground Clearance on both side		319			789.62	599.00	299.50	137.47	170.42	307.89	135.87	177.35	313.21	2 Nos. Nala		93°45'40.96"	24°36'09.43"
109		3332	DA+3 39	Used +3 tower at 3332 due to Ground Clearance on both side		320			787.7	639.00	319.50	148.58	174.46	323.04	141.87	183.41	325.28	Metal Road		93°45'39.35"	24°35'53.15"
110		3333	DA+0 24			320			788.15	640.00	320.00	145.54	162.10	307.64	136.39	163.43	299.82			93°45'37.76"	24°35'42.84"
111		3334	DA+0 25			320			787.78	640.00	320.00	157.90	138.91	296.81	156.57	125.56	282.13	Vill Road		93°45'36.16"	24°35'32.93"
112		3335	DA+3 40	Used +3 tower at 3335 due to Ground Clearance on both side		318	1825	12014	788.5	638.00	319.00	181.89	171.14	353.04	194.44	180.15	374.59			93°45'34.65"	24°35'22.22"
113		3336	DB+0 12	Used B type tower instead of A due to Wt. Span Limit Crossed		320	320	12334	788.23	638.00	319.00	166.06	23.89	189.94	157.05	-42.50	115.55	Unmetal & Vill Road		93°45'32.86"	24°35'11.97"
114	34	3340	DD+25 1	Used +25 tower at 3340 and +9 at 3350 due to Clearance from 132 KV line in between 3340 & 3350	04°30'46" RT	405	449	12499	788.24	629.00	314.50	396.11	322.28	418.39	382.30	491.84	874.14	132KV D/C Ningthoukhong - Churachandpur	VILL-NINTHOUKHONG	93°45'31.37"	24°35'4.88"
115	35	3350	DD+9 5		02°00'30" RT	30	33	12525	788.16	439.00	49.50	-303.73	569.62	296.53	-382.64	827.44	444.00	11KV, S/S Boundary	VILL-NINTHOUKHONG	93°45'30.51"	24°34'59.25"
116			Gantry						788.97	30.00	15.00	-419.62		-419.62	-792.84		-792.84			93°45'30.22"	24°34'57.71"

Santosh

SUBMITTED BY:
SHYAMA POWER(I) LTD.

Abdul Rahman
Field Engineer (N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

CHECKED BY:
P.G.C.I.L

H. RAJEN SINGH
Senior DGM (N.E.R.P.S.I.P.)
POWERGRID, Imphal

KH. DHIRENDRA SINGH
Sr. General Manager (N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

APPROVED BY
P.G.C.I.L

CLIENT: P.G.C.I.L.

DETAIL SURVEY TOWER SCHEDULE

LINK:LILO OF 132KV SC YUREMBAM - KARONG AT GAMPHAJOL

SL NO	AP NO	TOWER NO	TYPE OF TOWER	REMARKS	ANGLE OF DEVIATION	SPAN IN (M)	SEC. LENG.	CUMULTV. LENGTH	R.L	C.P.D.	LEVEL DIFF.	SUM OF ADJ. SPAN	WIND SPAN	WEIGHT SPAN IN (HOT)			WEIGHT SPAN IN (COLD)			MAJOR CROSSING DETAIL	VILL NAME	GPS CO-ORDINATE WGS-84	
														LEFT	RIGHT	TOTAL	LEFT	RIGHT	TOTAL			EASTING	NORTHING
1		EXT-89	B+0		1°0'35'24"LT				105.38	0		258.00	129.00		137.48	137.48		143.01	143.01		VILL:-GAMPHAJOL	93°55'7.89"	25°1'54.79'
2	1	1/0	DD+0	Proposed on line Tower	90°00'00"RT	258	258	258	105.16	1	-1.22	296.00	148.00	-20.42	183.69	304.12	114.99	287.99	402.98		VILL.-GAMPHAJOL	93°55'10.46"	25°2'2.76"
3	2	2/0	DD+0		36°5'32"LT	38	38	296	104.71	1	-3.45	121.00	60.50	-145.69	117.88	-32.19	-249.99	264.24	14.26		VILL:-GAMPHAJOL	93°55'11.71"	25°2'2.23"
4	3	3/0	DD+0		4°°1'19"LT	83	83	379	95.47	1	-6.24	345.00	172.50	-94.88	213.00	118.12	-181.24	265.91	84.67	FP*	VILL:-GAMPHAJOL	93°55'14.65"	25°2'2.71"
5	4	4/0	DD+0		37°39'45"RT	262	262	641	83.54	1	-11.93	328.00	164.00	-48.40	112.06	160.56	-3.91	162.28	158.38	Vill Road, Nala	VILL:-GAMPHAJOL	93°55'20.41"	25°2'9.45"
6	5	5/0	DD+0		12°22'46"RT	66	66	707	80.66	1	-2.86	114.00	57.00	-46.16	124.73	88.57	-96.28	204.85	108.57		VILL:-GAMPHAJOL	93°55'22.65"	25°2'9.97"
7		BAY	BAY			48	48	755	76.73	0	-2.93	48.00	24.00	-86.73		-86.73	-156.85		-156.85	Metal Road, Drain, S/S Boundary	VILL:-GAMPHAJOL	93°55'24.19"	25°2'10.05"
8	1	1/0	DD+0	Proposed on line Tower	90°00'00"RT				105.16	1		80.00	40.00	183.69	43.85	227.55	287.99	46.30	334.28		VILL:-GAMPHAJOL	93°55'10.46"	25°2'2.76"
9		EXT-90	A+0	DUE TO WT. SPAN VIOLATION, USED A 'DB' TYPE TOWER INTEND OF EXISTING SUSPENSION TOWER AT LOCATION NO - 90.		80	80	835	103.99	0	-0.17	80.00	40.00	36.15		36.15	33.70		33.70	FP	VILL.-GAMPHAJOL	93°55'11.26"	25°2'5.21"

* As per the recomendation from Engineering Dept., RHQ, Guwahati replacement of existing tower T-90 is not required since AP-1 and T-90 is almost in the same alignment.

KH. DHERENDRA SINGH
Senior General Manager (N.E.R.P.S.I.P)
Power Grid Corporation of India Ltd.
Imphal, Manipur.

03/08/19

H. RAJEN SINGH
Senior DGM (N.E.R P.S.I.P.)
POWERGRID, Imphal

03/08/2019

Abdur Rohman
Field Engineer N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

SUBMITTED BY:
SHYAMAPOWER(I) LIMITED.

CHECKED BY:
P.G.C.I.L.

APPROVED BY:
P.G.C.I.L.

ANNEXURE III

Sample Case of Compensation Payment

POWER GRID CORPORATION OF INDIA LTD

LAND COMPENSATION ASSESSMENT SHEET

पावरग्रिड

605

NAME OF THE TRANSMISSION SYSTEM: 132 KV Imphal Ningthoukhong Line

Sl. No	Loc. No / Span	Notice No. / Date	Name of Cultivator with father's name	Village, Tahsil, District	Khasara/ Dag/ Patta No.	Affected Land size	Area	Rate in Rs. per Unit	Compensation Payable in Rs.	Bank Details	Remarks
	25/5 DA+3	Notice no. 353 Dated - 24/09/2020	Thadingjam Dinesh Singh S/O Th. (Late) Tombi Singh	Village - 37 Bishnupur District	Patta - 36/1120 Dag - 1047/1991	5.96 X 5.96 meter	35.52 m² = 382.35 ft²	Rs 100/- per sq. ft.	Rs. 38,500.13/-	AC - 04840101 52785 IFSC - UTBI0APA0380	

Enclosure: Application/Circle rate/ Guideline value/ Stamp Act rates list available with District Magistrate

25/09/2020

एच. राजेन सिंह/H. Rajen Singh
General Manager

Seal and Signature of POWERGRID

1/10/2020

Manager
Sub-Division
Transmission Division-I MSPCL

Seal and Signature of State Electricity Utility

Bishnupur, Manipur

Seal and Signature of Circle Office/Revenue Authority

MANIPUR STATE POWER COMPANY LIMITED

(Under Department of Power Manipur State
Executing Agency: Power Grid Corporation of India Ltd. (A Govt. of India Enterprise)
Office Address: Yurembam, Imphal 795113 Contact No: 9862679704

353

NOTICE CUM COMPENSATION CERTIFICATE FOR LAND

Serial No.: State/Line/ Number

Date.. 24/09/2020.

To,

Sri/Ms. Thoudangjam Dinesh Singh .... S/W/o. Th. (Lt.) Tomba Singh .... Village. Utlou / Ngaikhongpokpi

Tahsil........ District Imphal West / Bishnupur ..... State.... Manipur.......

Subject: Construction of 132 kV Power Transmission System from.. Imphal ......to... Ningthoukhong Under NERPSIP

Sir/Madam,

Under the power vested in the Electricity Act 2003, Section 68 and 164 read with part III of Indian Telegraph Act 1885 and The Central Electricity Authority (measures relating to Safety and Electric Supply) Regulation 2010. A notice is hereby given that 132 kV D/c.. Imp - Ningthoukhong Transmission Line will go through your property.

Certain minimum unavoidable damage of Crop/Tree is likely to take place during the Foundation/ Erection/ Stringing works of the aforesaid transmission line. The tree(s) or crop(s) so fell/Cut or dealt with will be handed over to you. You are therefore requested to remain present to receive the same personally. The compensation for yield component of the tree (s) so fall and the crop(s) actually/ damaged will be paid to you as assessed by the Executive Magistrate/ Revenue Department or any other Competent Authority or any other Competent Authority specified by the appropriate Government in this behalf.

Sl. No.	LOCATION/ SPAN	LAND KHASARA/DAG/PATTA No.	DETAILS OF LAND AFFECTED AT TOWER FOOTING/ ROW DURING CONSTRUCTION		
			DIMENSION OF LAND	AREA OF LAND	REMARKS
	25/5 DA+3	Patta - 36/1124 Dag - 1017/994 Village - 37	(5.96 x 5.96) meter	35.52 m²	The land belong to Th. (Late) Tomba Singh. However, the notice is received by his son Th. Dinesh Singh. (Death certificate is enclosed)

*GIRTH OF TREE MEANS CIRCUMFERENCE AT CHEST LEVEL
Received Notice with consent for work.

For and on behalf of...... MSPCL .... State Electricity Corporation Ltd.

Owner's Signature Th. Dinesh Singh.
Sign of Witness I. [signature]
Sign of Witness II. Th. Madhijit

Signature of POWERGRID

VERIFICATION BY REVENUE AUTHORITY

Certified that Land under Khasra / Dag / Patta No. .... of Village..........
Tahsil.............. District.............. State.............. belongs
to Sri/ Smt.............. Son/ Wife of..............
He/ She is sole /shared owner of the above mentioned Land/ property

Seal & Signature of Circle Officer / Revenue Authority
Sub-Divisional Officer
Bishnupur, Manipur

MANIPUR STATE POWER COMPANY LIMITED

(Under Department of Power Manipur State

Executing Agency: Power Grid Corporation of India Ltd. (A Govt. of India Enterprise)

Office Address: Yurembam, Imphal 795113 Contact No: 9862639704

353

NOTICE CUM COMPENSATION CERTIFICATE FOR LAND

Serial No.: State/Line/ Number

Date 24/09/2020

To,

Sri/Ms Thoidingjam Anand Sija S/W/o Th (Lt) Tomba Sija Village Utlou / Ngaikhongpokpi

Tahsil .... District Imphal West / Bishnupur State Manipur

Subject: Construction of 132 kV Power Transmission System from Imphal to Ningthoukhong under NERPSIP

Sir/Madam,

Under the power vested in the Electricity Act 2003, Section 68 and 164 read with part III of Indian Telegraph Act 1885 and The Central Electricity Authority (measures relating to Safety and Electric Supply) Regulation 2010. A notice is hereby given that 132 kV D/c Imp - Ningthoukhong Transmission Line will go through your property.

Certain minimum unavoidable damage of Crop/Tree is likely to take place during the Foundation/ Erection/ Stringing works of the aforesaid transmission line. The tree(s) or crop(s) so fell/Cut or dealt with will be handed over to you. You are therefore requested to remain present to receive the same personally. The compensation for yield component of the tree (s) so fall and the crop(s) actually/ damaged will be paid to you as assessed by the Executive Magistrate/ Revenue Department or any other Competent Authority or any other Competent Authority specified by the appropriate Government in this behalf.

Sl. No.	LOCATION/ SPAN	LAND KHASARA/DAG/PATTA No.	DETAILS OF LAND AFFECTED AT TOWER FOOTING/ ROW DURING CONSTRUCTION		
			DIMENSION OF LAND	AREA OF LAND	REMARKS
	25/5 DA+3	Patta - 36/1124 Dag - 1012/1114 Village - 37	(5.96 × 5.96) meter	35.52 m²	The land belong to Th. (Late) Tomba Sija. However, the notice is received by his son Th. Anand Sija. (Death Certificate is enclosed)

*GIRTH OF TREE MEANS CIRCUMFERENCE AT CHEST LEVEL

Received Notice with consent for work.

For and on behalf of MSPCL State Electricity Corporation Ltd

Owner's Signature Th. Dinesh Singh.

Sign of Witness I [signature]

Sign of Witness II [signature]

Signature of POWERGRID

VERIFICATION BY REVENUE AUTHORITY

Certified that Land under Khasra / Dag / Patta No. .... of Village ....

Tahsil .... District .... State .... belongs

to Sri/ Smt .... Son/ Wife of ....

He/ She is sole /shared owner of the above mentioned Land/ property

Seal & Signature of Circle Officer / Revenue Authority

Sub-Divisional Officer Bishnupur

दिनांक / Date

PAY 2246

L. Bikramjit Singh
Field Engineer (S.C.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

RUPEES

या धारक को OR BEARER

रु.Rs.

अदा करें

A/c No. 0484010132705'

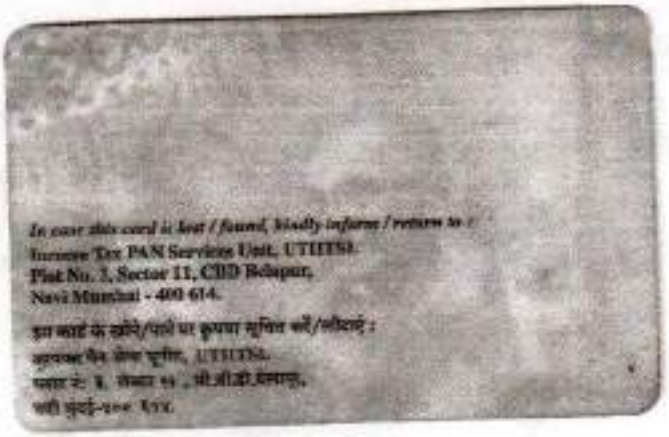
टी.आर.क्र. T.R. No.

CANCELLED

इटेड बैंक ऑफ़ इंडिया
ITED BANK OF INDIA
बाजार शाखा, पावनाबाजार, पो.आ.इंफाल, मणिपुर - 795 001.
abazar Branch, Paonabazar, P.O.Imphal, Manipur - 795 001.
MS/UQ
UTBI0PAO380

N. Dinesh Singh.

⑈574576⑈ 000027000⑆ 10



2/5/15

L. Dinesh Singh
Field Engineer (N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

बचत बैंक के मुख्य नियम-हमारे प्रिय ग्राहकों के सूचनार्थ

- जमा पर्ची को शाखा अधिकारी द्वारा सत्यापित कर हस्ताक्षर करने के बाद कैश काउन्टर पर नकद प्रस्तुत करें।
- कैश काउन्टर छोड़ने से पहले नोटों की गिनती सुनिश्चित करें।
- भारतीय रिजर्व बैंक के मानदंड के अनुसार नोट बिना पिन लगाए/बिना सिलाई किए की अवस्था में ही भेजें। यह सुनिश्चित करें कि वैसे नोटों में गंदे या कटे-फटे नोट नहीं हों। इनका विनिमय अलग से करना है।
- चैक बुक, पास बुक, एटीएम कार्ड एवं डेबिट कार्ड को सुरक्षित स्थान पर रखें।
- चैक बुक, पास बुक, एटीएम कार्ड एवं डेबिट कार्ड को खो जाने अथवा नष्ट होने पर शाखा को तुरंत सूचित करें।
- चैक जारी करते समय पर्याप्त राशि का रहना सुनिश्चित करें, निधि के अभाव में चैक वापस होना फौजदारी अपराध है और न्यायालय में वाद चलाया जा सकता है।
- खाताधारक के निधन होने पर खाते की राशि के शीघ्र निपटान के लिए नामांकन सुविधा का व्यवहार करना चाहिए। इसका लाभ लेने पर पास बुक के मुख्य पृष्ठ पर 'नामजदगी पंजीकृत' लिख दिया जाएगा। इसके साथ ही यदि ग्राहक चाहे तो नामजद व्यक्ति का नाम भी उस पर लिख दिया जाएगा। नामजद व्यक्ति का नाम काटने/उसे बदलने की अनुमति दी जाती है।
- ब्याज भारतीय रिजर्व बैंक के निर्देशिका के अनुसार दैनिक उत्पाद आधार पर छमाही विराम पर, भुगतान किया जाएगा।
- दूसरे खाते में जमा-आदेश सहित स्थायी अनुदेश की सुविधा सशुल्क उपलब्ध है।
- बैंक के साथ पत्राचार करते समय अपनी खाता संख्या का उल्लेख करें।
- रिकार्ड किए गए पते में परिवर्तन होने पर तुरंत बैंक को सूचित करें और इस परिवर्तित पते का सबूत दें।
- एक नियमित अंतराल में अपना पासबुक अद्यतन कराना सुनिश्चित करें। विसंगति मिलने पर शाखा अधिकारी को तदनुसार सूचित करें।
- अचल खाते (2 वर्ष या अधिक के लिए अपरिचालित या निष्क्रिय खाते) में अगर निर्धारित न्यूनतम राशि का निर्वाह नहीं किया गया तो तिमाही आधार पर प्रासंगिक प्रभार देना होगा।
- बचत खाते में निकासी की सीमा - एक कैलेंडर अर्द्ध वर्ष में 50 से ज्यादा आहरण करने से सेवा प्रभार देना होगा।
- कोर बैंकिंग शाखा के ग्राहकों का बैंक के किसी कोर बैंकिंग शाखा में अपना पासबुक अद्यतन कराने की सुविधा उपलब्ध है।
- ग्राहक सेवा संबंधी नि:शुल्क फोन संख्या : 1800 345 0345 कार्ड खो जाने की सूचना 1800 1033470 पर किसी भी क्षण दे सकते हैं।
- ऑम्बुड्समैन से सम्पर्क का विवरण : Reserve Bank of India, Kolkata - 700001, Tel : 033 2230 6222
- बैंक का वेबसाइट एवं इ-मेल पता : www.unitedbankofindia.com, ubihoc@vsnl.com / homail@unitedbank.co.in

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BRANCH NAME : PAONABAZAR(0484)   IFSC : UTBI0PAO300   MICR CODE : 795027007   NEW / CONTINUATION PASSBOOK

BR. ADDRESS : PAONABAZAR
PO-IMPHAL
PAONABAZAR
PIN - 795001   Phone - 2221206

United Bank of India
(A Govt. of India Undertaking)

युनाइटेड बैंक ऑफ इंडिया
(भारत सरकार का उपक्रम)

ACCOUNT NO. : 0484010132705

CUSTOMER ID : 00450272
OPENED ON : 14-08-2007
ISSUE DATE : 28-12-13 BY SERAMJ02
NOMINEE : NOMINATION REGISTERED
EMAIL ID : ____________
OPERATED BY : SELF

ACCT HOLDER : THOIDINGJAM DINESH SINGH
CUST ADDRESS : URIPOK ACHOM LEIKAI IMPHAL WEST
MANIPUR
IMPHAL , PIN - 795001
MANIPUR INDIA

PAN :

MOBILE NO. : [illegible]120473

VIGNI [illegible]

शाखा प्रबंधक
Branch Manager

2x

L. Bi[illegible] Singh
Field Engineer (N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

Government of India

AADHAAR

सूचना

- आधार पहचान का प्रमाण है, नागरिकता का नहीं ।
- पहचान का प्रमाण ऑनलाइन प्रमाणीकरण द्वारा प्राप्त करें ।

INFORMATION

- Aadhaar is proof of identity, not of citizenship .
- To establish identity, authenticate online .

- आधार देश भर में मान्य है ।
- आधार भविष्य में सरकारी और गैर-सरकारी सेवाओं का लाभ उठाने में उपयोगी होगा ।
- Aadhaar is valid throughout the country .
- Aadhaar will be helpful in availing Government and Non-Government services in future .

आधार

Unique Identification Authority of India

Address:
URIPOK ACHOM LEIKAI, URIPOK, Imphal, Imphal West, Manipur, 795001

3523 5745 2219

1947 1800 300 1947

help@uidai.gov.in

www.uidai.gov.in

आधार

भारत सरकार

Unique Identification Authority of India

Government of India

Enrollment No.: 2009/00151/00510

28/10/2012

To
Thoidingjam Dinesh Singh
URIPOK ACHOM LEIKAI
URIPOK
Imphal
Imphal West
Manipur 795001
9856128473

MN179985275FT

आपका आधार क्रमांक / Your Aadhaar No. :

3523 5745 2219

आधार - आम आदमी का अधिकार

भारत सरकार

Government of India

Thoidingjam Dinesh Singh
Father : Th Tomba Singh
Year of Birth : 1973
Male

3523 5745 2219

आधार - आम आदमी का अधिकार

L. Bikramjit Singh
Field Engineer (N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd.
Imphal, Manipur

M. L. R. FORM [illegible]
(See Rule 57)

[illegible] B.T. — [illegible] — [illegible] 69-[illegible]

[illegible]	[illegible]	পাট্টাদারগী [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
২	৩	৪	৫	৬	৭	৮	৯	১০	১১	১২	১৩	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]				Partition Case no. 72/500 [illegible] 1993 D.dt. 28/4/93 [illegible]

Certified to be true Copy

[illegible] 28/4/93

[redacted]

L. Billygraham Singh
Field Engineer (N.E.R.P.S.I.P.)
Power Grid Corporation of India Ltd
Imphal, Manipur

Checked and found Correct
[illegible] 11/6/2020

[illegible] 28/4/93

ANNEXURE IV

Social Management Framework

Annexure -3

SOCIAL MANAGEMENT FRAMEWORK

Part A: Acquisition of Lands and Structures.

1. The availability of land for substations is a potential social issue as fresh lands will be required for construction of substations. MSPCL shall secure/acquire the required land either through direct purchase on willing buyer & willing seller basis on negotiated rate or by invoking provisions of RFCTLARRA, 2013. The present land availability status of substations involved in tranche-1 is provided in **Table –1.**

Table – 1: Land Availability Status for Substation

Sl. No.	Name of the substation	Scope of work	Land Status
A.	**Transmission Substations**		
1	132/33 kV Gamphajol	New	Land for all substations are available with MSPCL except for Gamphajol.
2	132/33 kV Imphal	Extension	
3	132/33 kV Ningthoukhong	Extension	
4	132 kV Kackching	Extension	
5	132 kV Yainganpokpi	Extension	
6	132/33 kV Kongba	Extension	
7	132 kV Churachandpur	Extension	
8	132/33 kV Rengpang	Augmentation	
9	132/33 kV Jiribam	Augmentation	
B.	**Distribution Substations**		
1	33/11 kV Distribution Substation (24 Nos.)	New/ Augmentation	Land for 13 substations available with MSPCL. For remaining substation land being acquired through private purchase on negotiated rate.

2. As per the provisions of ESPPF land for substations covered under tranche-1 can be secured through following three methods;

   i) Purchase of land on willing buyer & Willing Seller basis on negotiated rate;

   ii) Voluntary Donation; and

   iii) Involuntary Acquisition. .

3. In case of procurement of land through private purchase, MSPCL shall ensure that compensation/rate for land is not less than the rate provided in the new land acquisition act, 2013. The finalization of land price/negotiation shall be through a committee. In order to comply with this provision MSPCL may organize an awareness camp where provisions of new act in respect of basis/modalities of compensation calculation shall be explained to land owners with specific State provision if any.

4. In the case of voluntary donation of land, it is to ascertained that the land owner/user(s) are not subjected to undue pressure for parting of land. Apart from this following shall also be ensured:

   - All out efforts shall be made to avoid any physical relocation/displacement due to loss of land;
   - The MSPCL shall facilitate in extending 'gratitude' to the land donor(s) in lieu of the 'contribution' if so agreed. The same shall be documented in the shape of MoU between donor and utility.
   - Subsequently title of land shall be transferred in the name of MSPCL.

   All land donations (as well as purchases) will be subject to a review/ approval from a committee comprising representatives of different sections including those from the IA and GoMan.

5. In case of land acquired through involuntary acquisition, provisions of RFCTLARRA, 2013 shall be adopted. RFCTLARRA, 2013 has replaced the old Land Acquisition Act, 1894 and has come into force from 1st January 2014. The new act i.e. RFCTLARRA, 2013 authorizes State Govt. (i.e. GoMan) or its authorized Government agency to complete the whole process of acquisition of private land by following the laid down procedures in the act/rules which include detailed Social Impact Assessment (SIA) and preparation/disclosure of Social Impact Assessment Plan (SIMP). Responsibility for SIA and R&R rests with the government of Manipur and MSPCL's responsibility is limited to identification and selection of suitable land based on technical requirement and ensuring budget allocation.

6. The provisions of new RFCTLARR Act, 2013 has brought about synergies with the World Bank policy and practices. These imply provisions like Social Impact Assessment; R&R Provisions and Entitlements; Focus on those losing livelihoods; Census surveys and R&R Plan; Providing options and choices; Replacement cost of Land and Assets (Net of Taxes); Additional provisions for disadvantaged groups; Full payment of compensation and R&R prior to taking over of land and assets and Consultations & Disclosures, Post implementation social audit and impact evaluation etc that are also key to the World Bank Involuntary Resettlement Policy.

Safeguards against land acquisition:

7. The act has many provisions which will safeguard against indiscriminate acquisition of farm land and associated impacts like project specific SIA to conclude whether the proposed acquisition serves the public purpose; estimation of affected families and families likely to be displaced; extent of lands, public and private, houses, settlements and other CPRs likely to be affected; whether the extent of land proposed is absolutely bare minimum requirement; whether other alternative sites were considered and found not feasible and whether the social benefits outweigh social costs. Act has special provisions for land inhabited by SCs, STs; provisions restricting acquisition of land in excess of requirement. It discourages acquisition of multi-crop and irrigated land, and makes consent of land owners mandatory for private & PPP projects.

Entitlements:

8. The entitlements with regard to compensation and assistances towards land acquisition or loss of any assets or livelihood for all categories of people being affected due to land acquisition is briefly outlined in **Table – 2**.

Table -2 : **Compensation and R & R Entitlement framework for Land Acquisition**

<table>
<tr><th colspan="2">A. Comprehensive Compensation Package</th></tr>
<tr><th>Eligibility for Entitlement</th><th>Provisions</th></tr>
<tr><td>The affected families
• <u>Land Owners: includes any perso</u>
i) whose name is recorded as (he owner of the land or building or part thereof, in the records of the authority concerned;
or
ii) any person who is granted forest rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or under any other law for the time being in force;
or
iii)who is entitled to be granted Patta rights on the land under any law of the State including assigned lands:
or
iv) any person who has been declared as such by an order of the court or Authority;</td><td>Determination of Compensation :
1. Market value of the land
• as specified in the Indian Stamp Act, 1899
or
• the average of the sale price for similar type of land situated in the village or vicinity,
or
• consented amount of compensation as agreed in case of acquisition of lands for private companies or for public private partnership project.
whichever is higher
Market value x Multiplier* between 1 to 2 in rural areas only (No multiplier in urban areas).
2. Value of the assets attached to land:
Building/Trees/Wells/Crop etc. as valued by relevant govt. authority;
Land compensation = 1+2
3. Solatium: 100% of total compensation
Total Compensation : 1+2+3</td></tr>
<tr><td colspan="2">(*) Precise scale shall be determined by the State Govt.
The indicative values of multiplier factor based on distance from urban areas as provided in the act.</td></tr>
<tr><td colspan="2"><table>
<tr><th>Radial Distance from Urban area (Km)</th><th>Multiplier Factor</th></tr>
<tr><td>0-10</td><td>1.00</td></tr>
<tr><td>10-20</td><td>1.20</td></tr>
<tr><td>20-30</td><td>1.40</td></tr>
<tr><td>30-40</td><td>1.80</td></tr>
<tr><td>40-50</td><td>2.00</td></tr>
</table></td></tr>
<tr><td colspan="2">B. R&R Package
Elements of Rehabilitation and Resettlement Entitlements for all the affected families (both land owners and the families whose livelihood is primarily dependent on land acquired) in addition to compensation provided above</td></tr>
</table>

Sl. No.	Elements of R& R Entitlements	Provision
1.	Subsistence grant/allowance for displaced families	Rs. 3000 per month per family for 12 months
2.	The affected families shall be entitled to:	a. Where jobs are created through the project, mandatory employment for one member per affected family; **or** b. Rupees 5 lakhs per family; **or** c. Rupees 2000 per month per family as annuity for 20 years, with appropriate index for inflation; **The option of availing (a) or (b) or (c) shall be that of the affected family**
3.	Housing units for displacement: i) If a house is lost in rural areas: ii)If a house is lost in urban areas	i. A constructed house shall be provided as per the Indira Awas Yojana specifications. ii. A constructed house shall be provided, which will be not less than 50 sq. mts. in plinth area. **In either case the equivalent cost of the house may also be provided in lieu of the house as per the preference of the project affected family.** The stamp duty and other fees payable for registration of the house allotted to the affected families shall be borne by the Requiring Body.
4.	Transportation cost for displaced families	Rs 50,000/- per affected family
5.	Resettlement Allowance (for displaced families)	Onetime Rs 50,000/- per affected family
6.	Cattle shed/ petty shop cost	Onetime financial assistance as appropriate for construction as decided by St. Govt. subject to minimum of Rs.25,000/-
7.	Artisan/small traders/others (in case of displacement)	Onetime financial assistance as appropriate as decided by St. Govt. subject to minimum of Rs.25,000/-

Special Provisions for SCs/STs

In addition to the R&R package, *SC/ST families will be entitled to the following additional benefits:*

1. One time financial assistance of Rs. 50,000 per family;
2. Families settled outside the district shall be entitled to an additional 25% R&R benefits;
3. Payment of one third of the compensation amount at very outset;
4. Preference in relocation and resettlement in area in same compact block;
5. Free land for community and social gatherings;
6. In case of displacement, a *Development Plan is to be prepared*
7. *Continuation of reservation and other Schedule V and Schedule VI area benefits from*

displaced area to resettlement area.

Social Impact Management Plan (SIMP):

Establishment of Institutions

9. The following bodies are to be established permanently in the state (to cater to all projects proposed in future):

- **The State Social Impact Assessment Unit;**
  - ✓ selecting the SIA team for each project from the individuals and institutions registered/empanelled in the State Database
  - ✓ To develop Project specific ToR
  - ✓ Ensuring no conflicts of interest involving the team members

- **Land Acquisition Rehabilitation and Resettlement Authority**
  - ✓ Appointment of Presiding Officer

- **The office of the Commissioner Rehabilitation & Resettlement**
  - ✓ Appointment of Commissioner Rehabilitation and Resettlement
  - ✓ Appointment of Project Specific Administrator for Rehabilitation and Resettlement

- **The State Level Monitoring Committee**
- **User-friendly website as a public platform to disclose entire work flow of each acquisition case.**
- **Formulation of Expert group to study SIA report and recommendation**
  - ✓ Commissioner, R&R to appoint the members of the Expert Group
  - ✓ Names of group members to be publically disclosed

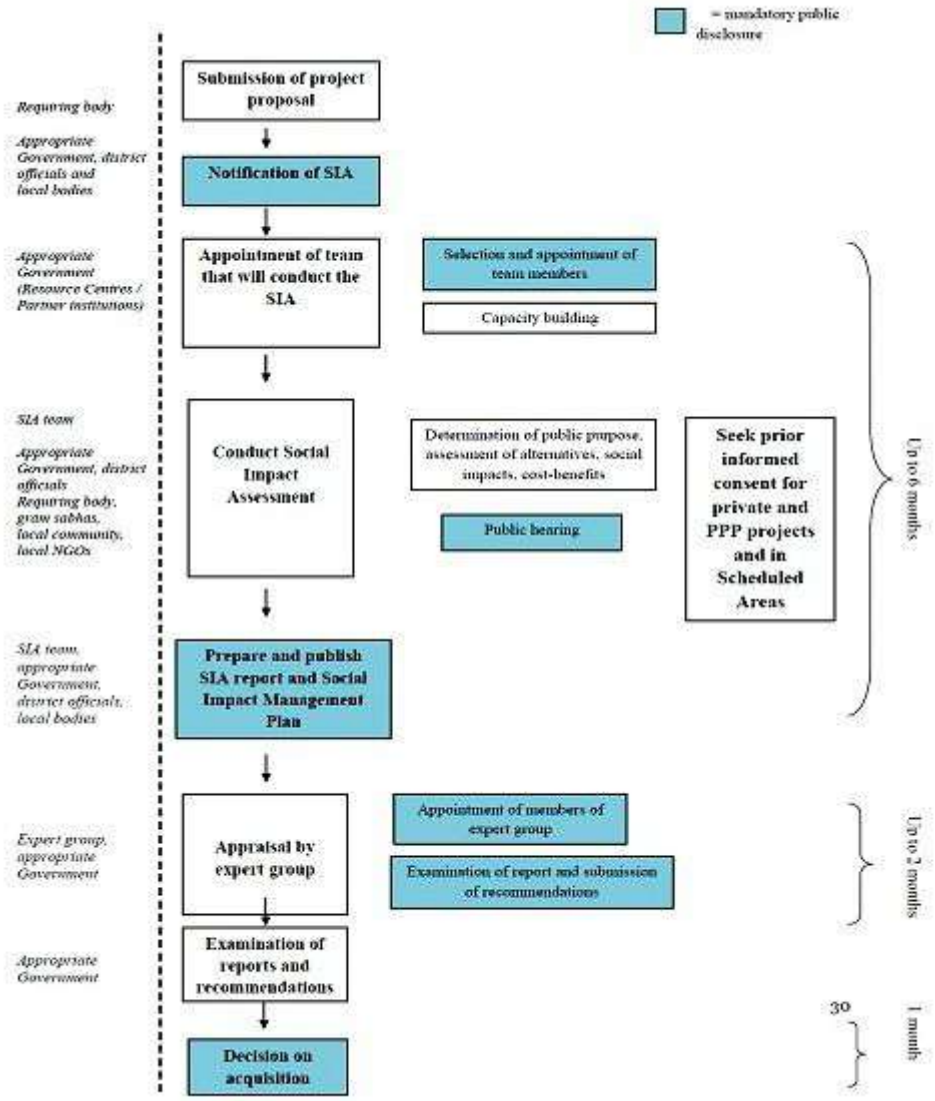
10. On confirmation of the scheme and finalization of land after exploring alternative site, the MSPCL would submit a proposal for acquisition of private selected land detailing the extent of land and its exact location. After due process of approval the government shall notify the affected area where selected land is situated for conducting detailed social assessment.

Social Impact Assessments

- A detailed Social Impact Assessment (SIA) studies shall be undertaken by an Independent Agency/Institution on a project specific TOR. The SIA agency shall first consult the concerned Panchayat, Municipality, District/Village Council at village level or ward level in the affected area to carry out SIA study. SIA shall assess the purpose of acquisition and estimate the affected families, gender, social group carry out analysis regarding impact on community properties, assets and infrastructure particularly roads, public transport, drainage, sanitation, sources of drinking water, sources of water for cattle, community ponds grazing land, plantations, public utilities electricity supply and health care facilities. The SIA agency shall also prepare a Social Impact Management Plan (SIMP) listing ameliorative measures required for addressing the likely impact vis-à-vis intended benefit of the project. The SIA report and SIMP shall be subject to public hearing in the affected area after giving adequate publicity for the venue, time etc to ascertain the views of affected families/communities which shall be included in the SIA.

The final SIA report shall be published including its translation in local language and shall also be made available to Panchyats, District/Village Councils & Deputy Collector/District Magistrate office for wider circulation. Explicit consent will be required in the case of lands in respect of tribal areas from the Village Councils. The process flowchart of SIA is presented in **Fig-1**.

Fig-1 Process Flow chart of Social Impact assessment (SIA)



Compensation and Rehabilitation and Resettlement (R&R):

- Based on the SIMP, the Collector shall discuss the Package in a meeting with the Rehabilitation and Resettlement committee at project level, and submit the Package to Commissioner Rehabilitation and Resettlement along with his/ her remarks.
- The Commissioner Rehabilitation and Resettlement shall, after due vetting, accords approval to the scheme and make it available in public domain.
- After approval of R & R plan by Commissioner R & R, the Collector shall issue two awards one for land compensation based on procedures described in act & State's rules

and second for R & R as per approved SIMP .

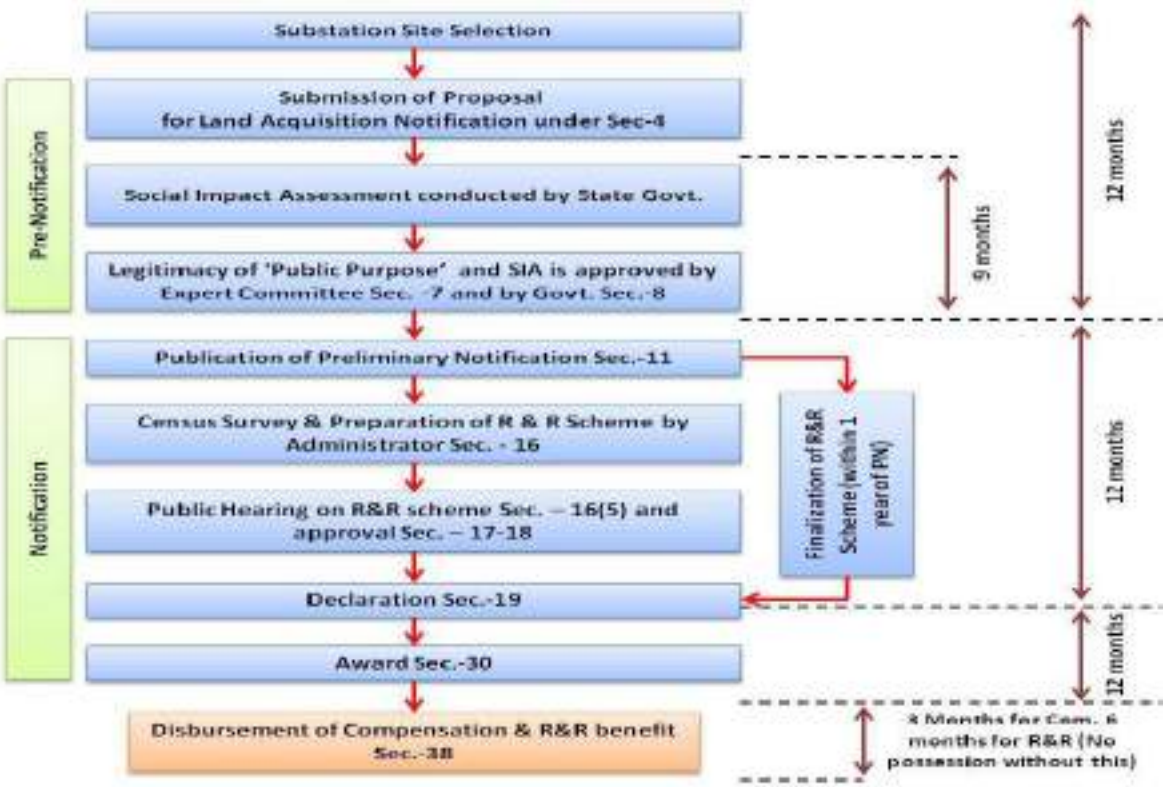
- The Collector shall take possession of land after ensuring that full payment of compensation as well as rehabilitation and resettlement entitlements are paid or tendered to the entitled persons within a period of three months for the compensation and a period of six months for the monetary part of rehabilitation and resettlement entitlements as approved and commencing from the date of the award.

- The Collector shall be responsible for ensuring that the rehabilitation and resettlement process is completed in all its aspects before displacing the affected families.

- The Collector shall, as far as possible. not displace any family which has already been displaced by the appropriate Government for the purpose of acquisition under the provisions of this Act, and if so displaced, shall pay an additional compensation equivalent to that of the compensation determined under this Act for the second or successive displacements.

The complete activity flow chart is described in **Fig -2**. It may take about three years to complete the processes. It is also mandatory that no construction can start without the full payment of the compensations.

Fig. -2 : Activity Chart of RFCTLARRA,2013



PART B:

Compensation Plan for Temporary Damages (CPTD) towards Erection of Tower/ Poles for Transmission/ Distribution lines

1. Land requirements for erecting tower/ poles for transmission/ distribution lines are just minimal. All it requires is to place the foot, four of which warrants an area of 4-6 sq- ft. Lands in respect of the right of way are not acquired as agricultural activities can continue beneath the tower. Further, line alignments are done in such a way so as to avoid settlements and / or structures. Due to inherent flexibility in locating the poles, MSPCL avoids habituated area completely hence no relocation of population on account of TL/DL lines are envisaged. Thus, the actual impact is restricted to 4 legs of the tower. Agriculture can continue, as clearly depicted in the **Figure-3**. As per existing law, land for tower/pole and right of way is not acquired and agricultural activities are allowed to continue after construction activity. However, MSPCL pays compensation to the affected persons/ community for all damages including cost of land below tower to its owner without acquiring it. Thus, compensations are made for following:

(i) Land cost of tower footings;
(ii) Standing crops;
(iii) Trees, if any;
(iv) Other assets like well and
(v) Any other damages/ effects.

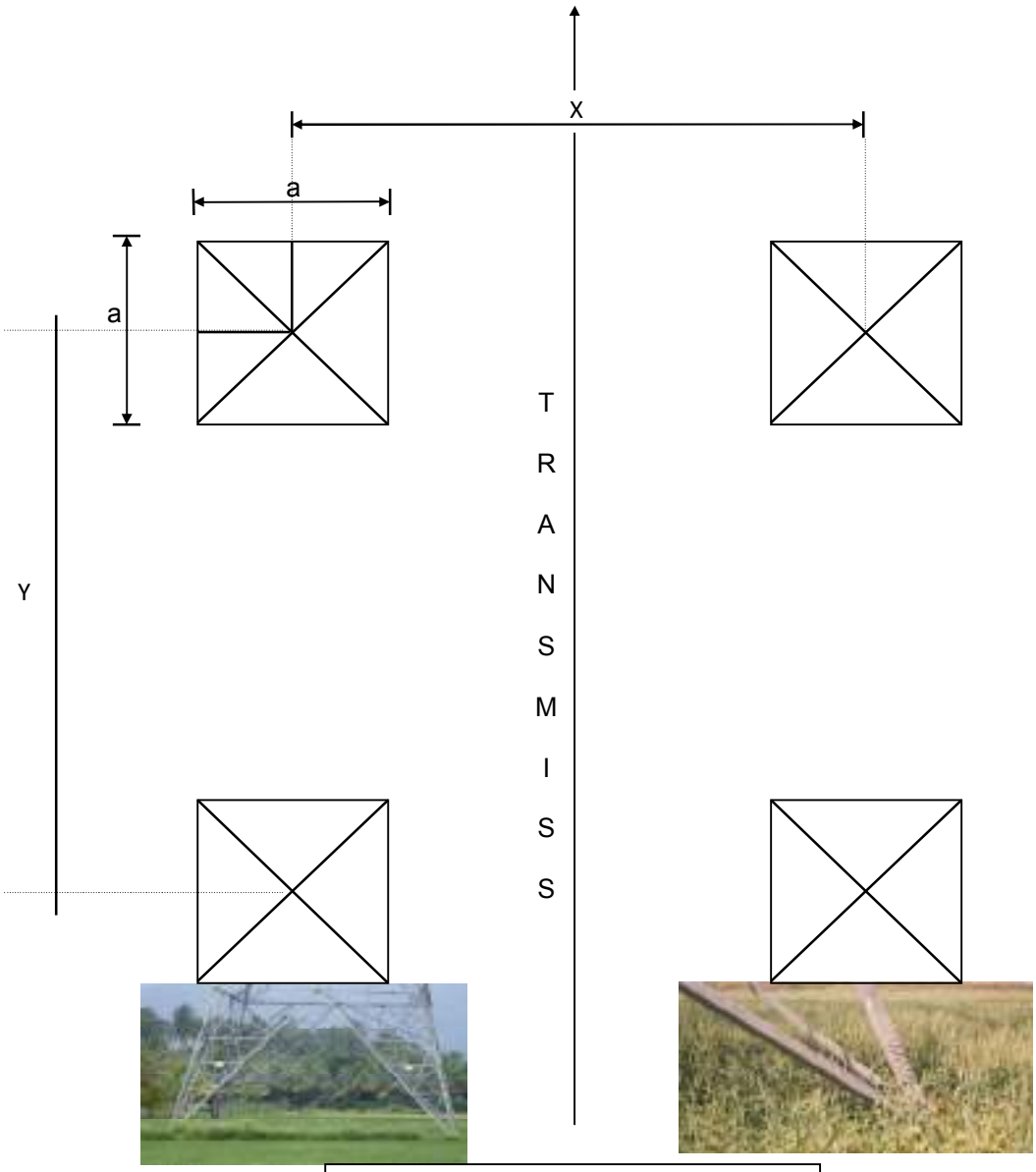
Capturing all these, the Implementing agency (IA) will prepare a Compensatory Plan for Temporary Damage (CPTD). The content/coverage of a typical CPTD is placed at the end.

2. **Process**. MSPCL through its "Bee" line survey (i.e. a desk review) on Survey of India (SOI) map (topo-sheets) preferably on 1:50,000 Scale, the Forest Atlas and or Google Earth map examine various route options at least 3 (Three) alternatives referring 'Bee' line as a guiding one between two or multiple origins of proposed transmission/distribution line avoiding/minimizing environmentally and socially sensitive areas based on base line data/information.

3. Taking reference to this desk review, a reconnaissance survey in-house or through other agency/ or walk-over survey is undertaken with hand-held GPS for on-site verifications to confirm findings of desk review survey or otherwise. During Recce or W/O survey it may also be possible to identify other better option of route following the criteria of avoidance & minimization, if so the same, after having collected/updated information/data may be considered as another alternative.

4. A Social (and Environmental) Assessment is conducted in respect of each of the chosen lines of alignment. The process involved extensive consultations with land owners/farmers and different stakeholders.

FIG. 3 : TYPICAL PLAN OF TRANSMISSION LINE TOWER FOOTING



INDICATIVE MEASURES

X & Y = 10-15 METERS

a = 300- 450 mm

5. During the process public views and necessary inputs about surroundings/ villages/crops etc. are also necessary and noted for screening/scoping. After comparison and analysis of all E & S parameters so gathered for all alternatives and considering other significant economic benefit associated with the project/subproject, the most optimum route having minimum environment & social impact is selected for further investigation.

6. Site office will consults with state forest departments if the line is passing through forest areas. Revenue authorities will be consulted for their views on revenue/other lands. Experts' assistance will be taken, as appropriate, on valuing crops, trees and other assets.

7. Social Assessment concludes with: (i) selection of an optimum line; and (ii) a Social Management Plan viz., CPTD. All these are disclosed widely among the stakeholders as well as on the internet and evince a feedback. Due approval will be sought from District/ Village Councils. In case the scheme/project is implemented in predominantly tribal area a separate and comprehensive analysis in respect of likely impact both positive and negative shall be carried out and will be incorporated in the CPTD.

8. Responsibility for the conduction of SA, preparation of CPTD rests with the IA. The ultimate authority for vetting the affected persons and the nature and extent of compensations rests with the Collector. The entitlement matrix for planning compensation for possible impact is as follows:

Entitlement Matrix for CPTD

S. No	ISSUE/IMPACT	BENEFICIARY	ENTITLEMENT OPTIONS
1.	Land area below tower base.	Owner	100% land cost at market value as ascertained by revenue authorities or based on negotiated settlement without actual acquisition/title transfer.
2.	Loss/damage to crops and trees in line corridor	Owner/Tenant/ sharecropper/ leaseholder	Compensation to actual cultivator at market rate for crops and 8 years income for fruit bearing trees*. APs will be given advance notice to harvest their crops. All timber* will be allowed to retain by the owner.
3.	Other damages (if applicable)	All APs	Actual cost as assessed by the concerned authority.
4.	Loss of structure		
(i)	House	Titleholders	Cash compensation at replacement cost (without deduction for salvaged material) plus Rs. 25,000/- assistance (based on prevailing GOI norms for weaker section housing) for construction of house plus transition benefits as per category-5 below.
(ii)	Shop/ Institutions/ Cattle shed	Individual/ Titleholders	Cash compensation plus Rs. 10000/- for construction of working shed/shop plus

S. No	ISSUE/IMPACT	BENEFICIARY	ENTITLEMENT OPTIONS
			transition benefits as per category-5 below
5.	Losses during transition under (i) & (ii) above for Shifting / Transport	Family/unit	Provision of transport or equivalent cash for shifting of material/ cattle from existing place to alternate place
6	Tribal/ Vulnerable APs	Vulnerable APs1	One time additional lump sum assistance not exceeding 25% of total compensation on recommendation of State Authority/ADC/VC.

* Assistance/help of Forest department for timber yielding trees and Horticulture department for fruit bearing trees shall be taken for assessing the true value.

9. A notice under Indian Telegraph Act/Electricity Act, 2003 is served to the landowners informing that the proposed transmission line is being routed through the property of the individual concerned. The notice shall contain the particulars of the land, ownership details and the details of the trees/crops inevitability likely to be damaged during the course of the construction of the proposed transmission line and acknowledgement received from land owner. A copy of said notice is further issued to the Revenue Officer, who has been authorized by the Manipur Govt. for the purpose of assessment/valuation and disbursement of compensation to the affected parties.

10. The revenue officer shall further issue a notice of intimation to the concerned landowner and inspect the site to verify the documents related to the proof of ownership and a detailed Mouja list is prepared for the identified trees and crops inevitability damaged during the course of the construction. For assessing the true value of timber yielding trees help of forest officials is taken and for fruit bearing trees help of Horticulture department is taken.

11. The Mouja list shall contain the land owner details type of tree/crop, its present age, variety, yielding pattern etc. and the same is prepared at site in the presence of the land owner. These Mouja lists are further compiled and a random verification is conducted by the concerned District Collector or his authorized representative in order to ascertain the assessment carried out by the revenue office is genuine and correct. After this process the District collector issues a tree cutting permit to MSPCL to enable removal / damage to the standing tree/crop identified in the line corridor.

12. Once the tree/crop is removed / damaged, MSPCL shall issue a tree cutting/crop damaged notice to the land owner with a copy to the Revenue Officer to process the compensation payment. Based on the above the compensation payment is generated by means of a computerized programme developed by the National Informatics Center exclusively for this purpose. The detailed Valuation statement thus generated using this programme is verified at various levels and approval of payment of compensation is accorded by the concerned District Collectors.

[1] Vulnerable APs include scheduled tribes residing in scheduled areas/ physically handicapped/ disabled families etc.

13. On approval of compensation, the revenue officer shall further intimate the amount payable to the different landowners and MSPCL arranges the payment by way of Demand Draft to the affected parties. The payment is further disbursed at the local village office after due verification of the documents in presence of other witnesses.

Content of Compensation Plan For Temporary Damages (CPTD)

Section - I: Project Description: Brief description of the background, benefits of the project, objective of compensation plan.

Section – II: Project Impacts : Minimization of impacts**,** description of alternative studies made for proposed route of transmission line including systematic analysis of different alternative studied with reference to particular environmental & social parameters like involvement of forest, protected areas, significant economic benefit associated with the project and without the project etc. and reason for selection of proposed route, analysis of impacts including numbers of affected persons/household, land use traversed etc.

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Section – III: Socio-economic and Environmental Analysis for CPTD: Description of the physical, physiographical, socio-economic condition of the project area including other demographic features of the project area, Preliminary Social assessment, Impact due to project location and design and Critical social review criteria

Section -IV: Compensation Framework: Description of compensation plan, Procedure for tree/crops/land compensation.

Section – V: Stakeholders Participation & Compensation: Public Consultation during Preliminary Survey and peoples reaction/suggestion if any, Plan for further consultation during implementation

Section – VI: Institutional Arrangements for Implementation and Monitoring: Describing the implementation schedule, Grievances Redressal Mechanism, Disclosure, Evaluation and monitoring plan. Budget provision for compensation

Part C: Tribal People Development Framework

The preliminary assessments made during the project preparation have established that there are tribal people in the project area. It is also ascertained that they do have a collective attachment to the project area particularly in the scheduled area and that they may get affected by the project interventions. Accordingly, to ensure focused and exclusive attention towards such tribals it is envisaged to develop a "Tribal People Development Plan" (TPDP). Since proposed investment programs involve many sub-projects/schemes linear in nature running in different geographical area of state due to which precise information about the tribal people likely to be impacted is not yet firmed up. In order to overcome this limitation, a Tribal People Development Framework (TPDF) is developed which sets out approach and methodology for the preparation of a TPDP.

TPDF Objectives and Policies

1. The objectives of the TPDF are to ensure that if indigenous peoples[2](referred to as tribal in India) tribal are affected by a project/scheme they:

   i) are adequately and fully consulted;
   ii) receive benefits and compensation equal to that of the mainstream population:
   iii) are provided with special assistance as per laws and policies because of their vulnerabilities vis-à-vis the mainstream population; and
   iv) receive adequate protection against project adverse impacts on their culture identities.

   There are several policies which provide a legal framework for ensuring dedicate attention to the tribals. Article 366(25) of the Indian constitution refers to Scheduled Tribes (STs) as those communities who are scheduled in accordance with Article 342 of the Constitution. According to Article 342 of the Constitution, STs are the tribes or tribal communities or part of or groups within these tribes and tribal communities which have been declared as such by the President through a public notification. Identification of tribes is a State subject. Thus, classification of a tribe would

[2] * ***Indigenous People (IP)*** *referred as tribal in India are the distinct groups identified based on their social, cultural, economic, and political traditions and institutions, which are distinct from the mainstream or dominant society and culture. Tribal with similar cultural characteristics are known as 'Adivasi' in Hindi and are recognized as Schedule Tribes (STs) as per the Indian Constitution.*
As per OP-4.10 definition these are Members of a distinct indigenous cultural group, Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories, Customary cultural, economic, social, or political institutions that are separate from those of the dominant society or culture, An indigenous language, often different from the official language of the country or region

depend on the status of that tribe in the respective State. Further the Fifth and Sixth Schedule of the constitution provides special provision for tribals in selected regions of the country.

2. The World Bank's Operational Policy on Indigenous Peoples (OP 4.10) aims at ensuring that the development process fosters full respect for the dignity, human rights and cultures of indigenous peoples, thereby contributing to the Bank's mission of poverty reduction and sustainable development. It also recognizes that the identities, cultures, lands and resources of indigenous peoples are uniquely intertwined and especially vulnerable to changes caused by development programs hence require special measures to ensure that they are included in and benefit from these programs as appropriate.

Identification of Indigenous Peoples

3. The term "Indigenous Peoples" is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:

   (a) Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
   (b) Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
   (c) Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture;
   (d) An indigenous language, often different from the official language of the country or region.

4. The hill areas of the State are governed by a special State legislation i.e the Manipur Hill Areas District Councils Act, 1971. This Act has provisions similar to those contained in the Sixth Schedule and has established six Autonomous Hill District Councils in Manipur, covering 5 districts.

Tribal People Development Framework (TPDF)

5. The TPDF seeks to ensure that tribal communities are informed, consulted, and mobilized to participate in the subproject preparation. The Framework is intended to guide selection and preparation of additional subprojects under the Project where impacts on tribal people are identified to ensure better distribution of the Project benefits and promote development of the indigenous peoples in the Project areas. The framework is prepared in accordance with both the Indian Constitution provisions, RFCTLARRA, 2013 and World Bank's OP-4.10 and serves the following purposes:

   (a) Identification of the tribal people likely to be impacted by the project interventions;

(b) Assess the nature and extent of impacts likely to occur as a result of the project interventions;

(c) Prepare a plan (TPDP) outlining measures towards avoiding/ minimizing the negative impacts as well as enhance positive impacts;

(d) Outlines an approach for the conduction of social assessment for ensuring free, prior, and informed consultation with the affected tribal communities at each stage of project preparation and implementation;

(e) Putting in place an implementation arrangements of the TPDP, its disclosure and mechanisms to address any grievances.

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TPDF – Land Acquisition and Resettlement

6. Whenever after initial screening it is found that some land belonging to tribal community /communities is being needed to be involuntary acquired for setting up of a substation demonstrating/substantiating such acquisition is done only as a last resort by completing the technical investigation including assessment of alternatives and detailed surveys. The detailed report along with land requirement is submitted to the Government of Manipur (GoMan) for further processing as per provisions of RFCTLARRA, 2013. GoMe then initiates a SIA through an Independent Agency with a project specific terms of reference. The SIA agency shall first consult the concerned Panchayat, Municipality, District/Village Council at village level or ward level in the affected area to carry out SIA study. SIA shall assess the purpose of acquisition and estimate the affected families, gender, social group carry out analysis regarding impact on community properties, assets and infrastructure particularly roads, public transport, drainage, sanitation, sources of drinking water, sources of water for cattle, community ponds grazing land, plantations, public utilities electricity supply and health care facilities. The SIA agency shall also prepare a Social Impact Management Plan (SIMP) listing ameliorative measures required for addressing the likely impact vis-à-vis intended benefit of the project. The SIA report and SIMP shall be subject to public hearing in the affected area after giving adequate publicity for the venue, time etc to ascertain the views of affected families/communities which shall be included in the SIA. The final SIA report shall be published including its translation in local language and shall also be made available to Panchayats, District/Village Councils & Deputy Collector/District Magistrate office for wider circulation. Detailing of the same is provided below:

(i) the prior consent of the concerned Gram Sabha or the Panchayats or the autonomous District Councils at the appropriate level in Scheduled Areas under the Fifth Schedule to the Constitution, as the case may be, shall be obtained in all cases of land acquisition in such areas, before issue of a notification under this Act, or any other Central Act or a State Act for the time being in force.

(ii) Provided that the consent of the Panchayats or the Autonomous Districts Councils shall be obtained in cases where the Gram Sabha does not exist or has not been constituted.

(iii) In the case of a project involving land acquisition on behalf of a Requiring Body which

involves involuntary displacement of the Scheduled Castes or the Scheduled Tribes families, a Development Plan shall be prepared in such a form as may be prescribed. laying down the details of procedure for settling land rights due, but not settled and restoring titles of the Scheduled Tribes as well as the Scheduled Castes on the alienated land by undertaking a special drive together with land acquisition. This plan is targeted at both SCs and STs, but, for the current purpose, it is referred to as Tribal People Development Plan (TPDP) and contents of such a Development Plan are provided at the end.

(iv) the TPDP also contain a program for development of alternate fuel, fodder and non-timber forest produce resources on non-forest lands within a period of five years sufficient to meet the requirements of tribal communities as well as the Scheduled Castes.

(v) In the case of land being acquired from the members of the Scheduled Castes or the Scheduled Tribes, at least one-third of the compensation amount due shall be paid to the affected families initially as first instalment and the rest shall be paid after taking over of the possession of the land.

(vi) The affected families of' the Scheduled Tribes shall be resettled preferably in the same Scheduled Area in a compact block so that they can retain their ethnic, linguistic and cultural identity.

(vii) The resettlement areas predominantly inhabited by the Scheduled Castes and the Scheduled Tribes shall get land, to such extent as may be decided by the appropriate Government free of cost for community and social gatherings.

(viii) Any alienation of tribal lands or lands belonging to members of the Scheduled Castes in disregard of the laws and regulations for the time being in force shall be treated as Null and void. and in the case of acquisition of such lands, the rehabilitation and resettlement benefits shall be made available to the original tribal land owners or land owners belonging to the Scheduled Castes.

(ix) The affected Scheduled Tribes. other traditional forest dwellers and the Scheduled Castes having fishing rights in a river or pond or dam in the affected area shall be given fishing rights in the reservoir area of the irrigation or hydel projects.

(x) Where the affected families belonging to the Scheduled Castes and the Scheduled Tribes are relocated outside of the district. then they shall be paid an additional 25% rehabilitation and resettlement benefits to which they are entitled in monetary terms along with a one-time entitlement of Rs. 50,000/-.

(xi) All benefits, including the reservation benefits available to the Scheduled Tribes and the Scheduled Castes in the affected areas shall continue in the resettlement area.

(xii) Whenever the affected families belonging to the Scheduled Tribes who are residing in the Scheduled Areas referred to in the Fifth Schedule or the tribal areas referred to in the Sixth Schedule to the Constitution are relocated outside those areas, than, all the statutory safeguards. entitlements and benefits being enjoyed by them under this Act shall be extended to the area to which they are resettled regardless of whether the resettlement area is a scheduled Area referred to in the said Fifth Schedule or a tribal area referred to in the said Sixth Schedule. or not.

(xiii) Where the community rights have been settled under the provisions of the Scheduled 'tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. The same shall be quantified in monetary amount and be paid to the individual conceded who has been displaced.

Following entitlement matrix shall be the basis for providing compensation and compatible R&R measures for tribal peoples:

COMPENSATION & R&R ENTITLEMENTS FOR LAND ACQUISITION

A. Comprehensive Compensation Package	
Eligibility for Entitlement	**Provisions**
The affected families • **Land Owners: includes any person-** v) whose name is recorded as (he owner of the land or building or part thereof, in the records of the authority concerned; or vi) any person who is granted forest rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or under any other law for the time being in force; or vii) who is entitled to be granted Patta rights on the land under any law of the State including assigned lands: or viii) any person who has been declared as such by an order of the court or Authority;	**Determination of Compensation :** **4. Market value** of the land • as specified in the Indian Stamp Act, 1899 or • the average of the sale price for similar type of land situated in the village or vicinity, or • consented amount of compensation as agreed in case of acquisition of lands for private companies or for public private partnership project. **whichever is higher** Market value x **Multiplier* between 1 to 2 in rural areas only (No multiplier in urban areas).** **5.** Value of the assets attached to land: Building/Trees/Wells/Crop etc. as valued by relevant govt. authority; **Land compensation = 1+2** **6. Solatium:** 100% of total compensation **Total Compensation** : **1+2+3**

(*) Precise scale shall be determined by the State Govt.
The indicative values of multiplier factor based on distance from urban areas as provided in the act.

Radial Distance from Urban area (Km)	Multiplier Factor
0-10	1.00
10-20	1.20
20-30	1.40
30-40	1.80
40-50	2.00

B. R&R Package

Elements of Rehabilitation and Resettlement Entitlements for all the affected families (both land owners and the families whose livelihood is primarily dependent on land acquired) in addition to compensation provided above

Sl. No.	Elements of R& R Entitlements	Provision
1.	Subsistence grant/allowance for displaced families	Rs. 3000 per month per family for 12 months
2.	The affected families shall be entitled to:	d. Where jobs are created through the project, mandatory employment for one member per affected family; **or** e. Rupees 5 lakhs per family;

		or f. Rupees 2000 per month per family as annuity for 20 years, with appropriate index for inflation; **The option of availing (a) or (b) or (c) shall be that of the affected family**
3.	Housing units for displacement: iii) If a house is lost in rural areas: iv) If a house is lost in urban areas	iii. A constructed house shall be provided as per the Indira Awas Yojana specifications. iv. A constructed house shall be provided, which will be not less than 50 sq. mts. in plinth area. **In either case the equivalent cost of the house may also be provided in lieu of the house as per the preference of the project affected family.** The stamp duty and other fees payable for registration of the house allotted to the affected families shall be borne by the Requiring Body.
4.	Transportation cost for displaced families	Rs 50,000/- per affected family
5.	Resettlement Allowance (for displaced families)	Onetime Rs 50,000/- per affected family
6.	Cattle shed/ petty shop cost	Onetime financial assistance as appropriate for construction as decided by St. Govt. subject to minimum of Rs.25,000/-
7.	Artisan/small traders/others (in case of displacement)	Onetime financial assistance as appropriate as decided by St. Govt. subject to minimum of Rs.25,000/-

Special Provisions for SCs/STs

In addition to the R&R package, *SC/ST families will be entitled to the following additional benefits:*

8. One time financial assistance of Rs. 50,000 per family;
9. Families settled outside the district shall be entitled to an additional 25% R&R benefits;
10. Payment of one third of the compensation amount at very outset;
11. Preference in relocation and resettlement in area in same compact block;
12. Free land for community and social gatherings;
13. In case of displacement, a *Development Plan is to be prepared*
14. *Continuation of reservation and other Schedule V and Schedule VI area benefits from displaced area to resettlement area.*

Consultations and Participation Framework

7. The World Bank OP 4.10 on Indigenous Peoples too emphasizes "a process of free, prior, and informed consultation with the affected tribal People's communities at each stage of the project, and particularly during project preparation, to fully identify their views and ascertain their broad community support for the project. To ensure peoples participation in the planning phase and aiming at promotion of public understanding and fruitful solutions of developmental problems various sections of project affected persons and other stakeholders were and will be engaged in consultations throughout the project planning and implementation stages. In this project, however,

it will go beyond consultations, as it is mandatory for the project to seek consent for all plans (SIMP and CPTD) from the Tribal Councils.

8. Public participation, consultation and information dissemination begins with initial phases of project preparation. Public consultation activities and information dissemination to PAPs and local authorities continues as the project preparation activities proceed in a project. Through respective local governments and civil society, PAPs are regularly provided with information on the project and the resettlement process prior to and during the project preparation and implementation stages. Information dissemination and consultations shall be a continuous process during preparation, implementation, Monitoring and Evaluation. The information dissemination and consultation with PAPs shall include but not be limited to the following:

    (i) project description and its likely impacts,
    (ii) objective of the surveys
    (iii) entitlement provisions for different impacts.
    (iv) Mechanisms and procedures for public participation and consultation
    (v) Resettlement options
    (vi) Grievance redress mechanisms and procedures
    (vii) Tentative implementation schedule
    (viii) Role and responsibilities of different actors
    (ix) Preferences for mode of compensating for affected fixed assets
    (x) Household consultations for skill improvement training, use of compensation amount and livelihood restoration

9. A detailed consultation and communication procedure placed at **Annexure-23** shall be used for each subproject as part of the TPDP. Some of the methods that can be used for the purpose of communication will include provisions of information boards, pamphlets distribution, wall paintings, drum beating, organizing meetings with key informants and village committees and opinion gathering through post cards, phones and Short Messaging services (SMSes). The GRM as detailed out in main document shall also be applicable without any discrimination for TPDF. The following information shall be included in the TPDP:

    - Description followed by analysis of the social structure of the population.
    - Inventory of the resources and analysis of the sources of income of the population
    - Information about the systems of production practiced by tribals
    - Relationship of tribal groups to the proposed project
    - Examination of land tenure issues including lands under customary rule and assurance of continued use of these resources by the groups involved.
    - Strategy for local participation including mechanisms defined with the assistance and in consultation with tribal peoples for their participation in decision making process throughout project planning, implementation and evaluation cycle.
    - Summary of Public Consultation process.

- Identification of development interventions or mitigation activities including measures to enhance tribal participation in the activities proposed under the project
- An implementation schedule with benchmarks to assess progress
- Monitoring and evaluation, including specific indicators
- Detailed cost estimates/budget and financing plan and sources of funds for the TPDP covering planned activities.
- Organisation support/ institutional capacity like the government institutions responsible for tribal development
- Maps

Tribal Land Acquisition Process:

10. Land acquisition processes that need to be completed in a sequence has already been discussed in main ESPPF report and **Annexure-4**. However, special provisions as applicable to the lands acquisition in Tribal /scheduled areas are enumerated below:

S. No.	Aspects	Actions	Special provisions for tribal /Scheduled Areas
1	Preliminary Investigation for determination of Social Impact and public purpose.	Notification for the commencement of Social Impact assessment study to be made available in local language to concerned Panchayat/Municipality and to offices of district collector/sub-divisional magistrate/tehsil (hereinafter referred to as local bodies)	As far as possible, no acquisition of land shall be made in the Scheduled Areas Where such acquisition does take place it shall be done only as a demonstrable last resort
		Consultation with the concerned Panchayat, Municipality or Municipal Corporation, as the case may be and carry out a social impact assessment (SIA) study	Land for traditional tribal institutions and burial and cremation grounds taken into consideration while conducting the SIA
		SIA study to be made public in manner specified in the Act	
		Preparation of Social Impact Management Plan (SIMP)	In case of a project involving land acquisition /involuntary displacement of the Scheduled Castes or the Scheduled Tribes families, a Development Plan shall be prepared laying down the details of procedure for settling land rights due but not settled and restoring titles of the scheduled Tribes as well as the Scheduled Castes on the alienated land by undertaking a special drive together with land acquisition The Development Plan shall also contain a programme for development of alternate fuel, fodder and non-timber

			forest produce resources on non-forest lands within a period of five years sufficient to meet the requirements of tribal communities as well as the Scheduled Castes.
		Public hearing for Social Impact Assessment (when prepared under section-4 of the act)	
2	Appraisal of SIA by expert group	SIA report is evaluated by an independent multi-disciplinary Expert Group, as may be constituted by appropriate Govt.	
		Recommendations of the expert group made available to the local bodies and in the affected areas in local language	
		The appropriate govt. would recommend the such area for acquisition after examining the expert group report (and report from the collector if any)	
3	Publication of preliminary notification	Notification (hereinafter referred to as preliminary notification) to that effect along with details of the land to be acquired in rural and urban areas shall be published (Notification to be issued within 12 months from DoA of SIA)	ln case of acquisition or alienation of any land in the Scheduled Areas, the prior consent of the concerned Gram Sabha or the Panchayats or the autonomous District Councils, at the appropriate level in Scheduled Areas under the Fifth Schedule to the Constitution, as the case may be, shall be obtained. in all cases of land acquisition in such areas, including acquisition in case of urgency, before issue of a notification under this Act, or any other Central Act or a State Act for the time being in force.
		Immediately after issuance of the notification, the concerned Gram Sabhas at the village level, municipalities in case of municipal areas and the Autonomous Councils in case of the areas referred to in the Sixth Schedule to the Constitution, shall be informed of the contents of the notification issued under the said sub-section in all cases of land acquisition at a meeting called especially for this purpose.	

		After issuance of notice, the Collector shall, before the issue of a declaration under section 19, undertake and complete the exercise of updating of land records as prescribed within a period of two months.	
		Preliminary survey of land	
		Payment for damage (if any) during survey	
4	Preparation of Rehabilitation and Resettlement Scheme by the Administrator	Upon the publication of the preliminary notification by the Collector, the Administrator for Rehabilitation and Resettlement shall conduct a survey and undertake a census of the affected families	
		The Administrator shall, based on the survey and census prepare a draft Rehabilitation and Resettlement Scheme (including time limit)	The affected families of the Scheduled Tribes shall be resettled preferably in the same Scheduled Area in a compact block so that they can retain their ethnic, linguistic and cultural identity. The resettlement areas predominantly inhabited by the Scheduled Castes and the Scheduled Tribes shall get land, to such extent as may be decided by the appropriate Government free of cost for community and social gatherings. The affected Scheduled Tribes, other traditional forest dwellers and the Scheduled Castes having fishing rights in a river or pond or dam in the affected area shall be given fishing rights in the reservoir area of the irrigation or hydel projects.
		The draft Rehabilitation and Resettlement scheme referred to in sub-section (2) shall be made known locally by wide publicity in the affected area and discussed in the concerned Gram Sabhas or Municipalities	
		A public hearing shall be conducted in such manner as may be prescribed, after giving adequate publicity about the	Provided further that the consultation with the Gram Sabha in Scheduled Areas shall be in accordance with the provisions of the Provisions of the

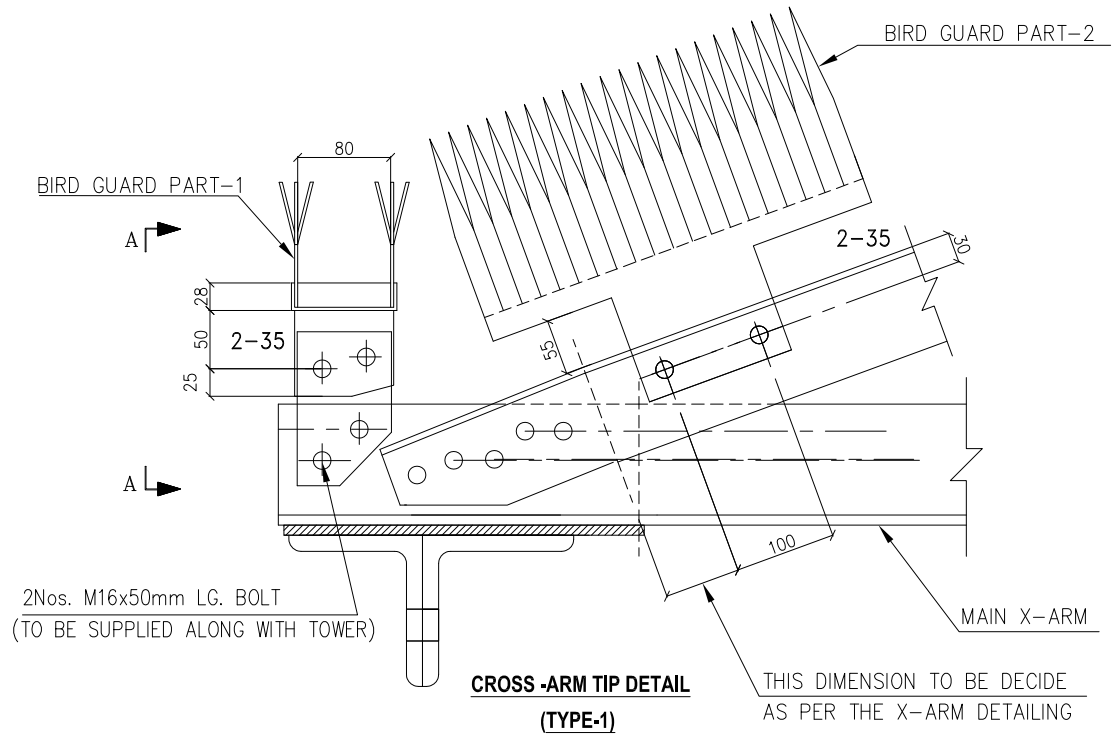
		date, time and venue for the public hearing at the affected area:	Panchayats (Extension to the Scheduled Areas) Act, 1996.
		The Administrator shall, on completion of public hearing submit the draft Scheme for Rehabilitation and Resettlement along with a specific report on the claims and objections raised in the public hearing to the Collector.	
		The Collector shall review the draft Scheme submitted by the Administrator with the Rehabilitation and Resettlement Committee at the Rehabilitation project level constituted under section 45:	
		The Collector shall submit the draft Rehabilitation and Resettlement Scheme with his suggestions to the Commissioner Rehabilitation and Resettlement for approval of the Scheme.	
		Approved Rehabilitation and Resettlement Scheme to be made public	
		Publication of declaration and summary of Rehabilitation and Resettlement.	
5	Land to be marked out, measured and planned including marking of specific areas	The Collector shall thereupon cause the land to be marked out and measured, and a plan to be made of the same.	
6	Notice to persons interested and making of statements	The Collector to publish the public notice on his website and cause public notice to be given at convenient places, to stating that the Government intends to take possession of the land, and that claims to compensations and rehabilitation and resettlement for all interests in such land may be made to him	
		The collector may require a statement containing the name	

		of every person possessing any interest in the land and nature of interest for three years preceding the date of statement	
7	Enquiry and land acquisition award by Collector	the Collector shall proceed to enquire into the objections (if any) which any person interested has stated	
		The Collector shall make an award within a period of twelve months from the date of publication of the declaration under section 19	
8	Determination of amount of compensation	Determination of market value of the land by the collector	In case of land being acquired from members of the Scheduled Castes or the Scheduled Tribes, at least one-third of the compensation amount due shall be paid to the affected families initially as first instalment and the rest shall be paid after taking over of the possession of the land.
		The market value is multiplied by a factor as described in the first schedule of the Act	
		Determination of value of things attached to land or building	
		Determination of value of things attached to land or building	
9	Rehabilitation and Resettlement Award for affected families	The Collector shall pass Rehabilitation and Resettlement Awards for each affected family in tenns of the entitlements provided in the Second Schedule	Where the affected families belonging to the Scheduled Castes and the Scheduled Tribes are relocated outside of the district, then, they shall be paid an additional twenty-five per cent R&R benefits to which they are entitled in monetary terms along with a one-time entitlement of fifty thousand rupees. Where the community rights have been settled under the provisions of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, the same shall be quantified in monetary amount and be paid to the individual concerned who has been displaced due to the acquisition of land in proportion with his share in such community rights.
		Provision of infrastructural	All benefits, including the reservation

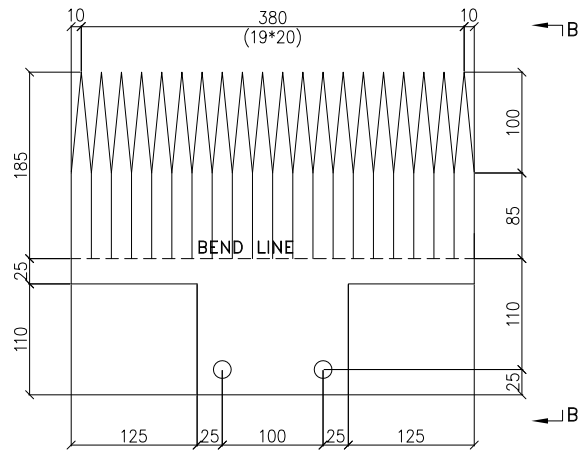
		amenities in resettlement area	benefits available to the Scheduled Tribes and the Scheduled Castes in the affected areas shall continue in the resettlement area Whenever the affected families belonging to the Scheduled Tribes who are residing in the Scheduled Areas referred to in the Fifth Schedule or the tribal areas referred to in the Sixth Schedule to the Constitution are relocated outside those areas, than, all the statutory safeguards. Entitlements and benefits being enjoyed by them under this Act shall be extended to the area to which they are resettled regardless of whether the resettlement area is a Scheduled Area referred to in the said Fifth Schedule or a tribal area referred to in the said Sixth Schedule or not.

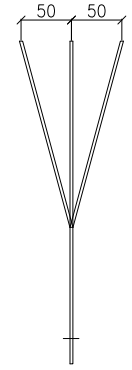
ANNEXURE V

Drawing of Bird Guard/ Anti Perching Devices



CROSS -ARM TIP DETAIL
(TYPE-1)

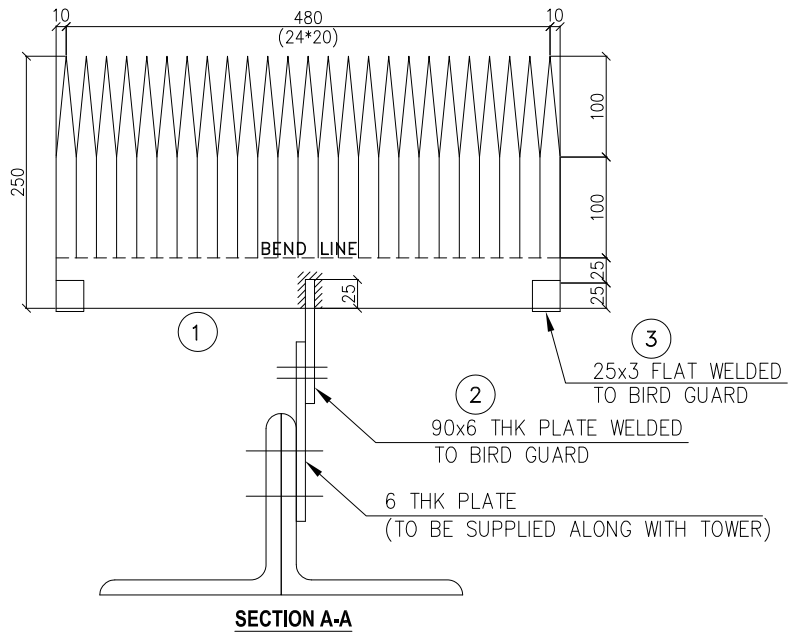




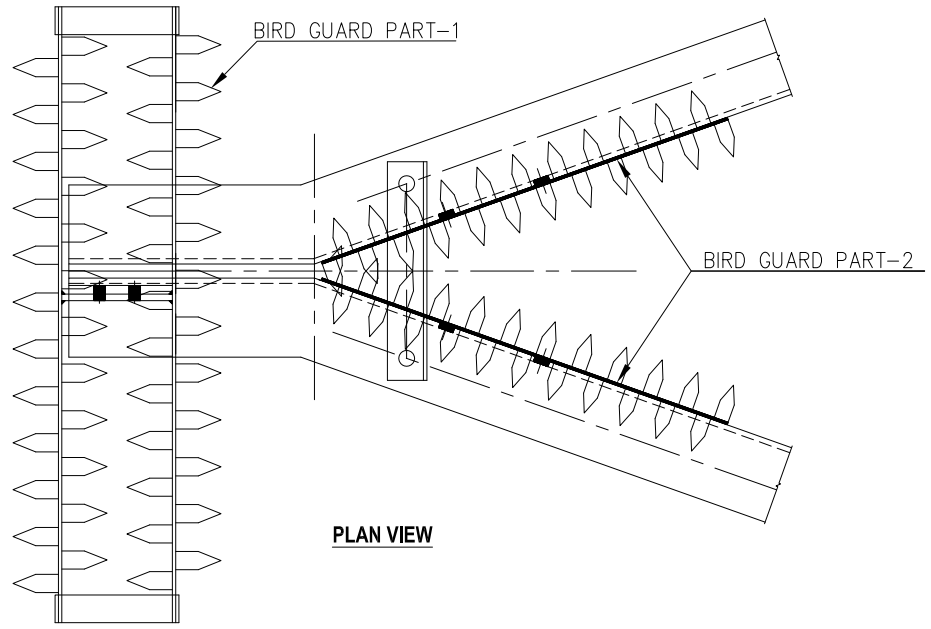
VIEW B-B

④ 320x3THK.-400LG.
QTY: 2 NOS / SETS

BIRD GUARD PART-2



SECTION A-A

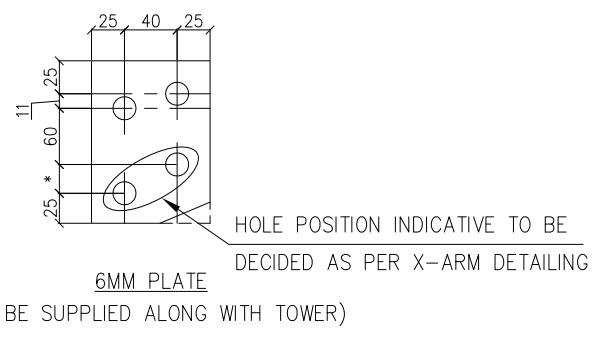


PLAN VIEW

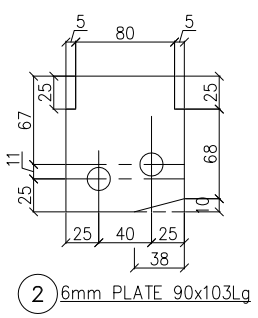
MATERIAL LIST / SETS (TYPE-1)				
NO	DESC.	QTY./ SET	WT/PC (kg)	TOTAL (kg)
1	3 THK 250x500 LG	2	2.944	5.888
2	6 THK 90x103 LG	1	0.437	0.437
3	3 THK 25x140 LG	2	0.082	0.164
4	3MM THK 320x400 LG	2	3.014	6.028
	16ø x35MM Lg B&N	6	0.119	0.714
	16ø 3.5mm SP.Washer	6	0.009	0.054
			GRD. TOTAL=13.285	

NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. GALVANISED AFTER FABRICATION.
3. FIXING ARRANGEMENT TO BE CHECKED WITH TOWER.
4. SUITABLE PROVISION OF CLEAT/PLATE/HOLE TO BE PROVIDED ON SUSPENSION TOWER FACILITING INSTALLATION OF BIRD GUARD AFTER STRINGING.
5. ONE SET OF BIRD GUARD FOR I-STRING (TYPE-1) INCLUDES.
   A) BIRD GUARD PART-1(TYPE-1) = ONE NUMBER
   B) BIRD GUARD PART-2 = TWO NUMBERS
6. HOLE FOR FIXING BG PART-2 TO BE ENSURED ON TOWER MEMBER.
7. 6MM PLATE & 2 Nos. M16x50 Lg. BOLT & NUT TO BE SUPPLIED ALONG WITH TOWER



6MM PLATE
(TO BE SUPPLIED ALONG WITH TOWER)

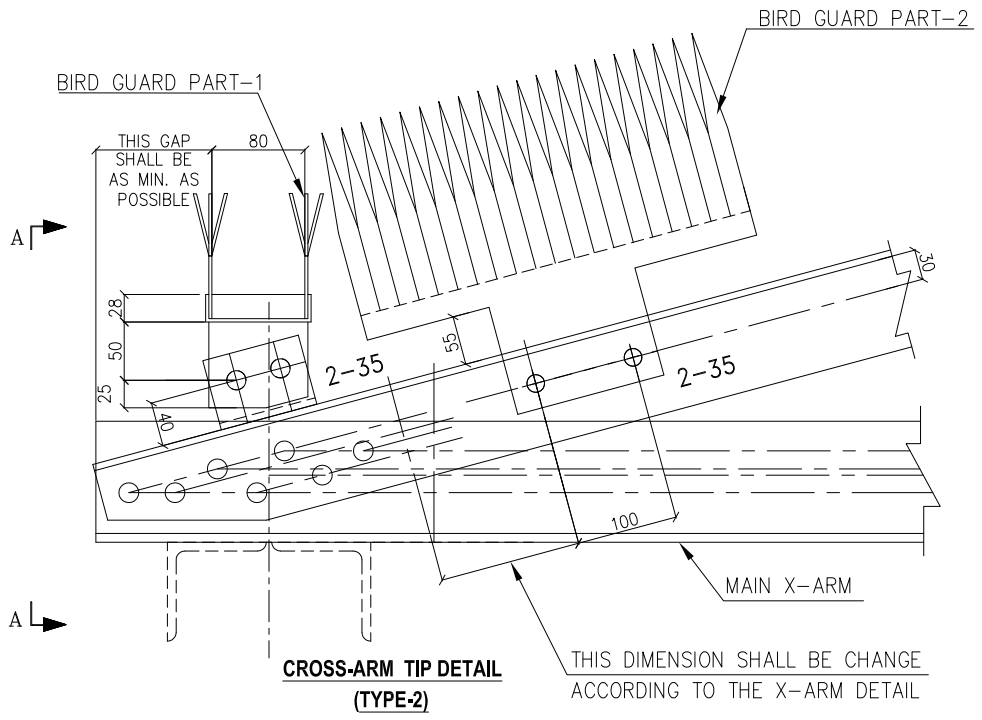


② 6mm PLATE 90x103Lg

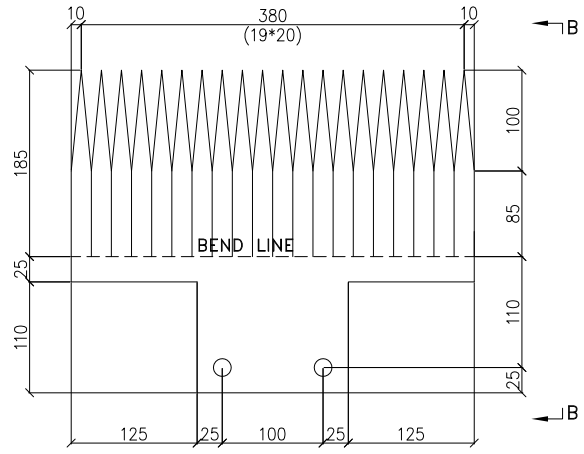
POWER GRID CORPORATION OF INDIA LIMITED

TITLE : **DETAILS OF BIRD GUARD FOR I-STRING (TYPE - 1)-REVISED**

DRAWING No. CC:ENGG:TLACC:BG (SHEET 1 of 2)

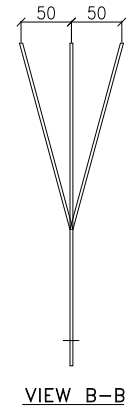


CROSS-ARM TIP DETAIL (TYPE-2)

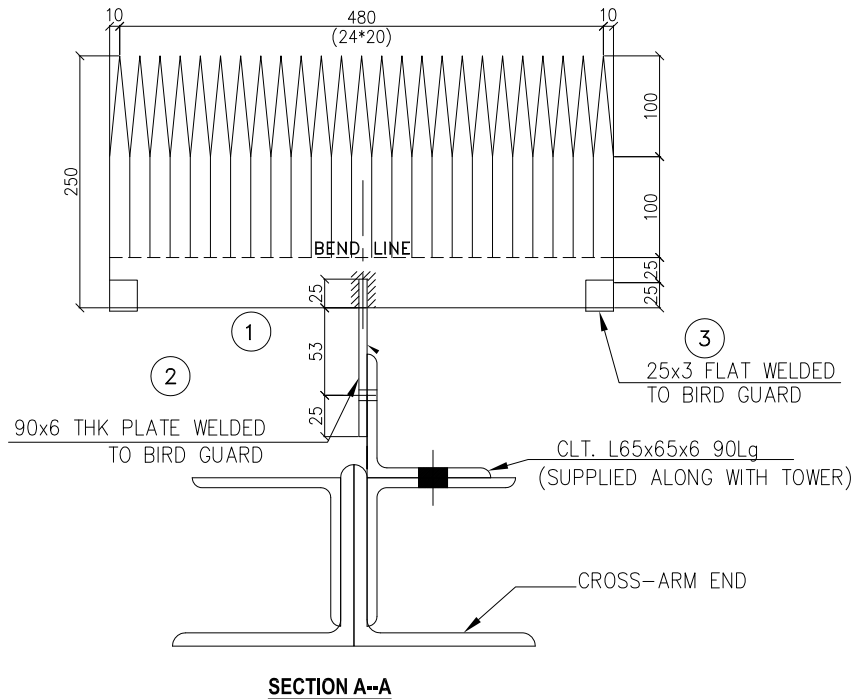


4 — 320x3THK.-400LG.
QTY: 2 NOS / SETS

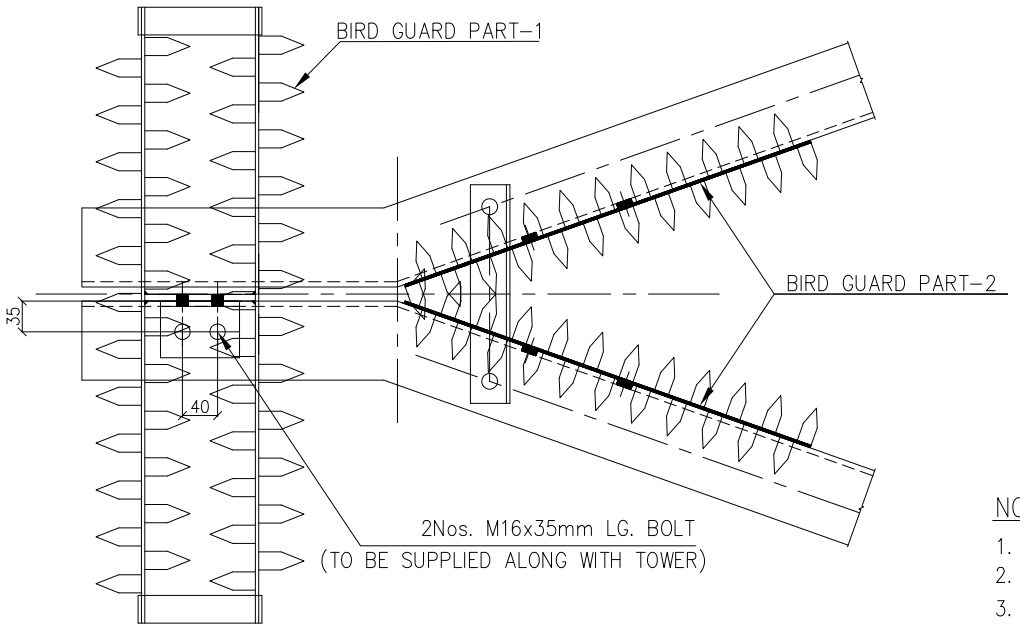
BIRD GUARD PART-2



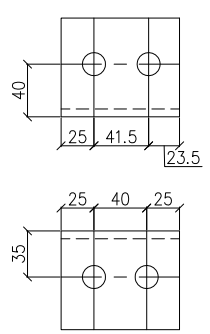
VIEW B-B



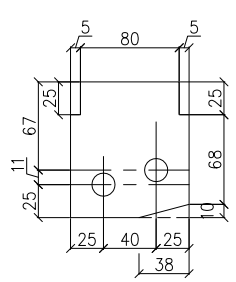
SECTION A--A



PLAN VIEW



CLT. L65x65x6 90Lg
(TO BE SUPPLIED ALONG WITH TOWER)



②6mm PLATE 90x103Lg

MATERIAL LIST / SETS (TYPE-2)				
NO	DESC.	QTY./ SET	WT/PC (kg)	TOTAL (kg)
1	3 THK 250x500 LG	2	2.944	5.888
2	6 THK 90x103 LG	1	0.437	0.437
3	3 THK 25x140 LG	2	0.082	0.164
4	3MM THK 320x400 LG	2	3.014	6.028
	16ø x35MM Lg B&N	6	0.119	0.714
	16ø 3.5mm SP.Washer	6	0.009	0.054
			GRD. TOTAL=	13.285

NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. GALVANISED AFTER FABRICATION.
3. FIXING ARRANGEMENT TO BE CHECKED WITH TOWER.
4. SUITABLE PROVISION OF CLEAT/PLATE/HOLE TO BE PROVIDED ON SUSPENSION TOWER FACILITING INSTALLATION OF BIRD GUARD AFTER STRINGING.
5. ONE SET OF BIRD GUARD FOR I-STRING (TYPE-2) INCLUDES.
   A) BIRD GUARD PART-1(TYPE-2) = ONE NUMBER
   B) BIRD GUARD PART-2 = TWO NUMBERS
6. HOLE FOR FIXING BG PART-2 TO BE ENSURED ON TOWER MEMBER
7. L65x65x6-90Lg. & 2 Nos. M16x35 Lg. BOLT & NUT TO BE SUPPLIED ALONG WITH TOWER

POWER GRID CORPORATION OF INDIA LIMITED

TITLE :

DETAILS OF BIRD GUARD FOR I-STRING (TYPE - 2)-REVISED

DRAWING No. CC:ENGG:TLACC:BG (SHEET 2 of 2)

ANNEXURE VI

Signed Copy of Safety Plan Submitted by Contractor

shyama
power

Ref: SPIL/PGCIL/TW06/MAN/18831-42
Date:16th July 2018

To,
The General Manager
Powergrid Corporation of India Ltd.
Yurebam, Langjing, Achouba
Imphal West, Manipur- 795113

Kind Attn: K.D. Singh, General Manager

Ref: Transmission Line Tower Package TW06 for the states of Nagaland and Manipur for 132 kV transmission systems under NER POWER SYSTEM IMPROVEMENT PROJECT. Specification No. CC-CS/92/NER/TW=3774/G1 (Manipur Portion)

NOA No.: CC-CS/92-NER/TW-3774/1/G1/NOA-I/7692 dt 31-05-2018
CC-CS/92-NER/TW-3774/1/G1/NOA-II/7693 dt 31-05-2018

Sub: Submission of Safety Plan

Sir,

With reference to the above, we are submitting herewith our **"Safety Plan"** for Transmission Package TW 06 for your kind information and necessary record.

Thanking you and assuring you of our best services at all the time.

Yours faithfully,

For **Shyama Power India Ltd.**

Authorised Signatory

. Encl: As Above

Receipt No. 1386 24/12/18
POWERGRID, Imphal

Shyama Power India Limited
An ISO 9001 : 2008 Company

Corporate Office :
Plot No. 49, Sector- 44,
Gurugram - 122002, Haryana (India)
Tel. : (0124) - 264 5000
Fax : (0124) - 264 5120

CIN No. U45203NL1998PLC005301

Website : www.shyamapower.com
E-mail : info@shyamapower.com

Regd. Office :
Naga Cottage, Circular Road,
Dimapur-797 112, Nagaland (India)
Ph.: +91-3862-226177

মণিপুর मणिपुर MANIPUR 01AA 270790

SAFETY PLAN

THIS SAFETY PLAN is made this 16th day of July, 2018 by **M/s Shyama Power India Ltd.**, a Company registered under Companies Act 1956 having its Registered Office at **Naga Cottage, Circular Road, Dimapur- 797112, Nagaland** and Head office at **Plot No. 49, Sector- 44, Gurgaon – 122002 (Haryana)** (herein after called as "Contractor' which expression shall include its successors and permitted assigns) for approval of **Power Grid Corporation of India Ltd.** a Company incorporated under the Companies Act , **1956** having its Registered Office at B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110016 for its Contract for its Contract for **Transmission Line Tower Package TW06 for the states of Nagaland and Manipur for 132 kV transmission system under NER POWER SYSTEM IMPROVEMENT PROJECT against Specification No : CC-CS/92-NER/TW-3774/1/G1(MANIPUR PORTION).**

Whereas **PGCIL has** awarded to the Contractor aforesaid Contract vide its Notification of Award/ Contact No **CC-CS/92-NER/TW-3774/1/G1/NOA-I/7692 & CC-CS/92-NER/TW-3774/1/G1/NOA-II/7693 dt 31-05-2018** (hereinafter called the Contract) in terms of which the contractor is required to submit 'Safety Plan' along with certain documents to the Engineer in Charge/ Project Manager of the Employer within sixty (60) days of Notification of Award for its Approval.

NOW THEREFORE, the Contractor undertakes to execute the Contract as per the Safety Plan as follows:-

1. THAT the Contractor shall execute the works as per provisions of Bidding Documents including those in regard to Safety Precautions/ Provisions as per statutory requirements.

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Treasury Officer, TMI

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Address .....

K. Rajiba Singh
Licensed Stamp Vendor

2. THAT the Contractor shall execute the works in a well- planned manner from the commencement of Contract as per agreed mile stones of work completion schedule so that planning and execution of construction works goes smoothly and consistently throughout the contract duration without handling pressure in last quarter of their financial year/ last months of the Contractor and the shall be finalized in association with POWERGRID Engineer In-charge/ Project Manager from time to time as required.

3. THAT the Contractor has prepared the safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site/ store etc. to be executed at site, which is enclosed at **Annexure – 1 A (SP)** for acceptance and approval of Engineer In-charge/ Project Manager. The Contractor shall ensure that on approval of the same from Engineer In-charge/ Project Manager, the approved copies will be circulated to Employer's personnel at site (Supervisor(s) Executives(s)] and Contractor's personnel at site (Gang Leader, supervisor(s) etc.] in their local language/ language understood by gang.

THAT the Contractor has prepared minimum manpower deployment plan, activity wise as stated above, which is enclosed at **Annexure- 1 B (SP)** for approval of Engineer In-charge/ Project Manager.

4. THAT the Contractor shall ensure while executing works that they will deploy minimum 25% of their own experienced work force who are on the permanent roll of the Company and balance 75% can be a suitable mixed with the hired gangs/ local workers/ casual workers if required. The above balance 75% work force should be provided with at least 10 days training by the construction agencies at sites and shall be issued with a certificate. No worker shall be engaged without a valid certificate. Hired gang workers shall also follow safe working procedures and safety norms as is being followed by Company's workmen. It should also be ensured by the contractor that certified fitters who are climbing towers/ doing stringing operations can be easily identifiable with a system like issue of Badge/ Identification cards (ID cards) etc. Colour identification batches should be worn by the workers. Contractor has to ensure that inexperience workers/ unskilled workers should not be deployed for skilled job.

5.THAT the Contractor's Gang leader/ Supervisor/ Senior most member available at every construction site shall brief to each worker daily before start of work about safety requirement and warn about imminent dangers and precautions to be taken against the imminent dangers (Daily Safety Drill). This is to be ensured without fail by Contractor and maintain record of each gang about daily safety instructions issued to workers and put up to POWERGRID site- In-charge for his review and record.

6. THAT the Contractor shall ensure that working Gangs at site should not be left at the discretion of their Gang Leaders who are generally hired and having little knowledge about safety. Gang leader should be experienced and well versed with the safe working procedures applicable for transmission line/ Sub Station works. In case gang is having Gang Leader not on permanent roll of the Company then additional Supervisor from Company's own roll having thorough knowledge about the works would be deployed so as to percolate safety instructions up to the grass root level in healthy spirits. Contractor has to ensure close supervision while executing critical locations of transmission lines/ sub stations and ensures that all safety instructions are in place and are being followed.

7. THAT the Contractor shall maintain in healthy and working condition all kind of Equipments/ Machineries/ Lifting tools/ Lifting tackles/ Lifting gears/ All kind of Ropes including wire ropes/ Polypropylene ropes etc. used for Lifting purpose during execution of the Project and get them periodically examined and load tested for safe working load in accordance with relevant provisions and requirement of Building & other construction workers Regulation of Employment and Conditions of Services Act and Central Rule 1998, Factories Act 1948. Indian Electricity Act 2003 before start of the project. A register of such examinations and tests shall be properly maintained by the contractor and will be promptly produced as and when desired by the Engineer In-charge/ Project Manager or by the person

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authorized by him. The Contractor has to ensure to give special attention on the formation / condition of eye splices of wire rope slings as per requirement of IS 2762 Specification for wire rope slings and sling legs.

THAT the Contractor has prepared a list of all Lifting machines, lifting Tools/ Lifting Tackles/ Lifting Gears etc. All types of ropes and Slings which are subject to safe working load is enclosed at **Annexure-2 (SP)** for review and approval of Engineer In-charge/ Project Manager.

8. THAT the Contractor has to procure sufficient quantity of Personal Protective Equipment (PPE) conforming to Indian/ International standards and provide these equipment to every workman at site as per need and to the satisfaction of Engineer- In-charge/ Project Manager of POWERGRID. The Contractor's Site Supervisor/ Project Manager has to ensure that all workmen must use Personal Protective Equipment at site. The Contractor shall also ensure that Industrial Safety helmets are being used by all workmen at site irrespective of their working (at height or on ground). The Contractor shall further ensure use of safety shoes by all ground level workers and canvas shoes for all workers working at height. Rubber Gum Boots for workers working in rainy season and concreting job, Use of Twin Lanyard Full Body Safety harness with attachment of light weight such as aluminum alloy etc. and having features of automatic locking arrangement of snap hook, by all workers working at height for more than three meters and also for horizontal movement on tower shall be ensured by contractor. The Contractor shall not use ordinary half body safety harness at site. The Contractor has to ensure use of Retractable type fall arrestors by workers for ascending/ descending on suspension insulator string and other similar workers etc. Use of Mobile fall arrestor for ascending/ descending from tower by all workers. The contractor has to provide cotton/ leather hand gloves as per requirement, Electrical Resistance Hand gloves for operating electrical installations/ switches, face shield for protecting eyes while doing welding works and Dust masks to workers as per requirement. **The Contractor shall also provide Reflective Jackets to all workmen working on the site including differently colored such Jackets to the persons working at height.** The Contractor will have to take action against the workers not using Personal Protective Equipment at site and those workers shall be asked to rest for that day also their Salary be deducted for that day. POWERGRID may issue warning letter to Project Manager of contractor in violation of above norms.

THAT the Contractor shall prepare a detailed list of PPEs, activity wise, to commensurate with manpower deployed, which is enclosed at **Annexure- 3 (SP)** for review and approval of Engineer In-charge/ Project Manager. It shall also be ensured that the sample of these equipment shall be got approved from POWERGRID supervisory staff before being distributed to workers. The contractor shall submit relevant test certificates as per IS/International Standard as applicable to PPEs used during execution of work. All the PPE's to be distributed to the workers shall be checked by POWERGRID supervisory staff before its usage.

The Contractor also agrees for addition/ modification to the list of PPE, if any, as advised by Engineer In-charge/ Project Manager.

9. THAT the Contractor shall procure, if required sufficient quantity of Earthing Equipment/ Earthing Devices complying with requirements of relevant IEC standards (Generally IECs standard for Earthing Equipment's/ Earthing Devices are – 855, 1230, 1235 etc.) and to the satisfaction of Engineer In-charges/ Project Manager and contractor to ensures to maintained them in healthy condition.

THAT the Contractor has prepared/ worked out minimum number of healthy Earthing Equipment with Earthing lead conforming to relevant IS/ European standards per gang wise during stringing activity/ as per requirement, which is enclosed herewith at **Annexure- 4 (SP)** for review and acceptance of Engineer – In- Charge/ Project Manager prior to execution of work.

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10. THAT the Contractor shall provide communication facilities i.e. Walky- Talkie/ Mobile Phone. Display of Flags/ whistles for easy communication among workers during Tower erection/ stringing activity, as per requirement.

11. THAT the Contractor undertakes to deploy qualified safety personnel responsible for safety as per requirements of Employer/ Statutory Authorities.

THAT the Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as qualified safety officer having diploma in safety to supervise safety aspects of the equipment and workmen who will coordinate with Engineer In-charge/ Project Manager/ Safety Coordinator of the Employer. In case of work being carried out through sub-contractors the sub-contractor's workmen/ employees will also be considered as the contractor's employees/ workmen for the above purpose. If the number of workers are less than 250 then one qualified safety officer is to be deployed for each contract. He will report directly to his head of organization and not the Project Manager of contractor. He shall also not be assigned any other work except assigning the work of safety. The curriculum vitae of such person shall be got cleared from POWERGRID Project Manager/ Construction staff.

The Contractor shall deploy one dedicated Safety Staff(s) for every 200 kms of a Transmission Line Project.

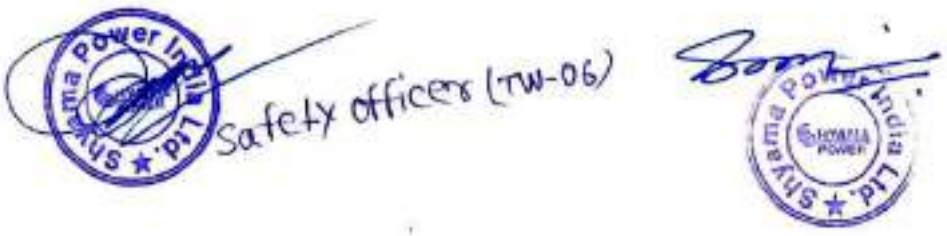
The name and address of such safety officer of contractor will be promptly informed in writing to Engineer In-charge with a copy to safety officer- In-charge before start of work or immediately after any change of the incumbent is made during the currency of the contract. The list is enclosed at **Annexure – 5 A (SP).**

THAT the Contractor has also prepared a list including details of Explosive Operator (if required). Safety Officer/ Safety Staff/ Safety supervisor/ nominated person for safety for each erection/ stringing gang, list of personnel trained in First Aid Techniques as well as copy of organization structure of the Contractor in regard to safety. The list is enclosed at **Annexure – 5 B (SP).**

12. The Project Manager shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/ or property, and/ or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury / accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.

13. THAT, if, any Employer's Engineer/ supervisor at site observes that the Contractor is failing to provide safe working environment at site as per agreed Safety Plan / POWERGRID Safety Rule/ Safety Instructions/ Statutory safety requirement and creates hazardous conditions at site and there is possibility of an accident to workmen or workmen of the other contractor or public or the work is being carried out in an unsafe manner or he continues to work even after being instructed to stop the work by Engineer/ Supervisor at site/ RHQ/ Corp. Centre, the Contractor shall be bound to pay a penalty of Rs. 10,000/- per incident per day till the instructions are complied and as certified by Engineer/ Supervisor of Employer at site. The work will remain suspended and no activity will take place without compliance and obtaining clearance/ certification of the Site Engineer/ Supervisor of the Employer to start the work.

14. THAT, if the investigation committee of Employer observes any accident or the Engineer In-charge/ Project Manager of the Employer based on the report of the Engineer/ Supervisor of the Employer at site



observes any failure on the Contractor' s part to comply with safety requirement/ safety rules/ safety standards/ safety instruction as prescribed by the Employer or as prescribed under the applicable law for the safety of the equipment, plant and personnel and the Contractor does not take adequate steps to prevent hazardous conditions which may cause injury to its own Contractor's employees or employee of any other Contractors or Employer or any other person at site or adjacent thereto, or public involvement because of the Contractor's negligence of safety norms, the Contractor shall be liable to pay a compensation of Rs. 10,00,000/- (Rupees Ten lac only) per person affected causing death and Rs. 1,00,000/- (Rupees One lac only) per person for serious injuries 25% or more permanent disability to the Employer for further disbursement to the deceased family/ injured persons. The permanent disability has the same meaning as indicated in Workmen's Compensation Act 1923. The above stipulations are in addition to all other compensation payable to sufferer as per workmen compensation Act/ Rules.

Notwithstanding above, **the Contractor shall also be responsible for payment of sum as indicated below additionally which shall be deposited in Safety Corpus Fund pursuant to GCC Sub- Clause 18.3.3.26:**

a	**Upon 1st Fatal Accident due to negligency by the Contractor**	**Rs. 50,00,000/-**
b	**Upon 2nd Fatal Accident due to negligency by the Contractor**	**Rs. 75,00,000/-**
c	**Upon 3rd Fatal Accident due to negligency by the Contractor**	**Rs. 1,00,00,000/-**
d	**Re-occurrence of Fatal Accident even after 3rd Fatal Accident due to negligency by the Contractor**	**Rs. 1,00,00,000/- per fatal accident**
e	**Tower Collapse leading to more than one (01) death attributable to the Contractor as per the Accident Enquiry Committee Report**	**Rs. 1,00,00,000/- per fatal accident in addition to a,b,c or d above, as applicable**

THAT as per the Employer's instructions, the Contractor agrees that this amount shall be deducted from their running bill(s) immediately after the accident. That the Contractor understands that this amount shall be over and above the compensation amount liable to be paid as per the Workmen's Compensation Act/ other statutory requirement/ provisions of the Bidding Documents.

15. THAT the Contractor shall submit Near- Miss- Accident report along with action plan for avoidance such incidence/ accidents to Engineer- In- charge/ Project Manager. Contractor shall also submit Monthly Safety Activities report to Engineer- In-charge/ Project Manager and copy of the Monthly Safety Activities report also to be sent to Safety- In-charge at RHQ of the Employer of his review record and instructions.

16. THAT the Contractor is submitting a copy of Safety Policy/ Safety Documents of its Company which is enclosed at **Annexure- 6 (SP)** and ensure that the Safety Policy and safety documents are implemented in healthy spirit.

17. THAT the Contractor shall make available of First Aid Box (Contents of which shall be as per Building & other construction workers (Regulation of Employment and Conditions of Services Act and Central Rule 1998/ POWERGRID Guidelines) to the satisfaction of Engineer In-Charge/ Project

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Manager with each gang at site and not at camp and ensures that trained persons in First Aid Techniques with each gang before execution of work.

18. THAT the Contractor shall submit an 'Emergency Preparedness Plan' for different incidences i.e. Fall from height, Electrocution, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp/ Store, Flood, Storm , Earthquake, Militancy etc while carrying out different activities under execution i.e. Foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site/ store etc. which is enclosed at **Annexure- 7 (SP)** for approval of the Engineer In-Charge/ Project Manager before start of work.

19. THAT the Contractor shall organize Safety Training Programs on Safety, Health and Environment and for safe execution of different activities of works i.e. Foundation works including civil works, erection, stringing (as applicable), testing & commissioning , disposal of materials at site/ store etc. for their own employees including sub-contractor workers on regular basis.

The Contractor, therefore, submits copy of the module of training program, enclosed at **Annexure- 9 (SP)** , to Engineer In-charge/ Project Manager for its acceptance and approval and records maintained.

20. THAT the Contractor shall conduct safety audit, as per the Safety Audit Check Lists enclosed at **Annexure- 8 (SP)** , by his Safety Officer(s) every month during construction of Transmission Lines/ Substations / any other work and copy of the safety audit report will be forwarded to the Employer's Engineer In-charge/ Site In-charge/ Project Manager for his comments and feedback. During safety audit, healthiness of all Personal Protective Equipment's (PPEs) shall be checked individually by safety officer of contractor and issue a certificate of its healthiness or rejection of faulty PPEs and contractor has to ensure that all faulty PPEs and all faulty lifting tools and tackles should be destroyed in the presence of POWERGRID construction staff. Contractor has to ensure that each gang be safety audited at least once in two months. During safety audit by the contractor, Safety officer's feedback from POWERGRID concerned shall be taken and recorded. The Employer's site officials shall also conduct safety audit at their own from time to time when construction activities are under progress. Apart from above, the Employer may also conduct surveillance safety audits. The Employer may take action against the person / persons as deemed fit under various statutory acts/ provisions under the Contract for any violation of safety norms/ safety standards.

21. THAT the Contractor shall develop and display Safety Posters of construction activity at site and also at camp where workers are generally residing.

22. THAT the Contractor shall ensure to provide potable and safe drinking water for workers at site/ at camp.

23. THAT the Contractor shall do health checkup of all workers from competent agencies and reports will be submitted to Engineer In-Charge within fifteen (15) days of health checkup of workers as per statutory requirement.

24. THAT the Contractor shall submit information along with documentary evidences in regard to compliance to various statutory requirements as applicable which are enclosed at **Annexure- 10 A (SP).**

The Contractor shall also submit details of Insurance Policies taken by the Contractor for insurance coverage against accident for all employees are enclosed at **Annexure- 10 B (SP).**

25. THAT a check-list in respect of aforesaid enclosures along with Contractor's remarks, wherever required, is attached as **Annexure -Check list** herewith.

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THE CONTRACTOR shall incorporate modifications/ changes in this 'Safety Plan' necessitated on the basis of review/ comments of the Engineer In-Charge/ Project Manager within fourteen (14) days of receipt of review/ comments and on final approval of the Engineer In-Charge/ Project Manager of the 'Safety Plan', the Contractor shall execute the works under the contract as per approved 'Safety Plan'. Further, the Contractor has also noted that the first progressive payment towards Services Contract shall be made on submission of 'Safety Plan' along with all requisite documents and approval of the same by the Engineer In-Charge/ Project Manager.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day, month and year first above mentioned.

For and on behalf of

M/s **Shyama Power India Ltd.**

Signature:

Name : Sanjesh Kumar Singh.
Address: Plot No. 49, Sector- 44,
Gurgaon – 122002 (Haryana)

WITNESS

1 Signature:

Name : Yumnam Wanglennganba

Address: Lilong Chajing Awang Leikai

2. Signature: Santosh Majumdar.

Name: Santosh Majumdar

Address: Sarkar Para Road, Nabadwip, Nabadwip, Nadia-741302

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Annexure – Check List

S.N.	Details of Enclosure	Status of submission of information/ documents	Remarks
1	**Annexure – 1 A (SP)** Safe Work procedure for each activity i.e. Foundation works including civil works, erection, stringing (as applicable), testing &commissioning, disposal of materials at site/ store etc. to be executed at site.	Yes	
2	**Annexure- 1 B (SP)** Manpower deployment plan, activity wise foundation works including civil works, erection, stringing (as applicable), testing &commissioning, disposal of materials at site/ store etc.	Yes	
3	**Annexure- 2 (SP)** List of Lifting Machines i.e. Crane, Hoist, Triffor, Chain Pulley Blocks etc. and Lifting Tools: and Tackles i.e. D shackle, Pulleys, come along clamps, wire rope slings etc. and all types of ropes i.e. Wire ropes, Poly propylene Rope etc. used for lifting purposes along with test certificates.	Yes	
4	**Annexure – 3 (SP)** List of Personal Protective Equipment (PPE), activity wise including the following along with test certificate of each as applicable:- 1. Industrial Safety Helmet to all workmen at site, (EN 397/ IS 2925) with chin strap and back stay arrangement. 2. Safety shoes without steel toe to all ground level workers and canvas shoes for workers working on tower. 3. Rubber Gum Boot to workers working in rainy season/ Concreting job. 4. Twin lanyard full body safety harness with shock absorber and leg strap arrangement for all workers working at height for more than three meters. Safety Harness should be with attachments of light weight such as of aluminum alloy etc. and having a feature of automatic locking arrangement of snap hook and comply with EN 361/ IS 3521 standards. 5. Mobile fall arrestors for safety of workers during their ascending/ descending from tower/ on tower. EN 353-2 (Guided type fall arresters on a flexible anchorage line). 6. Retractable type all arrestor (EN 360: 2002) for	Yes	

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	ascending/ descending on suspension insulator string etc. 7. Providing of good quality cotton hand gloves/ leather hand gloves for workers engaged in handling of tower parts or as per requirement at site. 8. Electrical Resistance hand gloves to Workers for handling electrical equipment/ Electrical connections. IS: 4770. 9. Dust masks to workers handling cement as per requirement. 10. Face shield for welder and Grinders. IS: 1179/IS: 2553. 11. Other PPEs, if any, as per requirement etc.		
5	**Annexure – 4 (SP)** List of Earthing Equipments/ Earthing Devices with earthing lead conforming to IECs for earthing equipment are (855, 1230, 1235 etc.) gang wise for stringing activity as per requirement.	Yes	
6	**Annexure – 5 A (SP)** List of Qualified safety Officer (s) along with their contact details	Yes	
7	**Annexure – 5 B (SP)** Details of explosive Operator (If required), Safety Officer/ Safety supervisor for every erection/ stinging gang, any other person nominated for safety, list of personnel trained in First Aid as well as brief information about safety set up by the contractor along with copy of organization of the contractor in regard to safety.	NA	
8	**Annexure – 6 (SP)** Copy of Safety Policy/ Safety Document of the contractor's company.	Yes	
9	**Annexure – 7 (SP)** 'Emergency Preparedness Plan for different incidences i.e. Fall from height, Electrocution, Sun stroke, Collapse of Pit, Collapse of tower, snake Bite, Fire in camp/ Store, Flood, storm, earthquake, Militancy, etc. While carrying out different activities under execution i.e. Foundation works including civil works, erection, stringing (as applicable), testing &commissioning, disposal of materials at site/ store etc.	Yes	
10	**Annexure – 8 (SP)** Safety Audit Check Lists	Yes	

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11	**Annexure – 9 (SP)** Copy of the module of Safety Training Programs on Safety, Health and Environment, safe execution of different activities of works for Contractor's own employees on regular basis and sub- contractors employees.	Yes	
12	**Annexure – 10 A (SP)** Information along with documentary evidences in regard to the Contractor's compliance to various statutory requirements including the following :-		
i)	Electricity Act 2003	Yes	
ii)	Factories Act 1948	Yes	
iii)	Building and other construction workers (Regulation of employment &conditions of Services act and Central act 1996) and Welfare Cess Act 1996 with rules.	Yes	
iv)	Workmen Compensation Act 1923 and Rules.	Yes	
v)	Public Insurance Liabilities Act 1991 and Rules	Yes	
vi)	Indian Explosive Act 1948 and Rules	NA	
vii)	Indian Petroleum Act 1934 and Rules	NA	
viii)	License under the contract Labour (Regulation & Abolition) Act 1970 and Rules.	Yes	
ix)	Indian Electricity Rule 1956 and amendments if any, from Time to Time.	Yes	
x)	The Environment (Protection) act 1986 and Rules.	Yes	
xi)	Child Labour (Prohibition &Regulation) Act 1986	Yes	
xii)	National Building code of India 2005 (NBC 2005)	NA	
xiii)	Indian Standards for construction of Low/ Medium/ High/ Extra High voltage Transmission Line.	Yes	
xiv)	Any other statutory requirement(s)	No	
13	**Annexure – 10 B (SP)** Details of Insurance Policies along with documentary evidences taken by the Contractor for the Insurance coverage against accident for all employees as below:		
i)	Under Workmen Compensation Act 1923 and Rules.	Yes	
ii)	Public Insurance Liabilities Act 1991	Yes	
Iii)	Any Other Insurance Policies	No	

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Safety plan

1. To ensure high degree of safety at all level of employees & workman no one is allowed to enter inside the construction site without **safety shoes** and **safety helmet.**
2. All contractor employees & worker medical certificate, address proof, 2 color photographs submitted to Shyama Power India Ltd. site office.
3. No workmen are allowed to perform their duty with use of proper **safety gadgets** as per job requirement.
4. Only approved type quality **ISI Personal Protective Equipment (PPE)** is being used at site.
5. Brief safety talk is being delivered by site engineer /Concerned Supervisor/Forman before starting the job.
6. Detail safety talk through **Safety Meeting** is being delivered by Safety officer at site twice in a week (on Monday Friday) before starting the job.
7. To ensure high degree of safety, excavations and **openings** are securely and adequate fenced/barricaded where ever required.
8. Proper means of **access and egress** are made with temporary railings and other practices being ensured as per requirement.
9. All **electrical installation** is fully protected. As per engineering standard double earthling are made for all welding machines, rectifiers etc.ISI marked rubber mat is used in base of each electrical shed. Danger board is hung in front of each shed. At least one fire extinguisher (especially DCP type) is made available in each shed.
10. In any circumstance **damage cable** shall not be used for power supply.
11. Welding cable will be connected through lugs only.
12. Power supply for portable electrical switch board is being taken only through **ELCB.**
13. Three **pin industrial type plug top** is being used to tape off supply for electrical equipment.
14. **Gas cylinder** is being transported through trolley only.
15. **Flash back arrester** is being used for gas cutting set.
16. We are being ensured sufficient **illumination** at work place for safe working condition when natural light is not adequate for clear visibility. We are making special arrangement mainly during later hours.
17. To ensure **good housekeeping** dust bins are kept at suitable locations at site. A system to removal of unwanted materials from site is also being maintained.
18. Suitable number of fully maintained **First Aid box** is made available at site.
19. In any circumstance **no material** shall be dropped from height randomly. It should be lowered in a proper way.
20. We take serious action against **safety violations** immediately with a view that no one is above the discipline of site.
21. Wearing and anchoring of **safety belt** is compulsory for working above one point eight meter height. Safety net is being used as an additional protection to arrest the fall of man and material from height where ever required.
22. The work is being executed in presence of **qualified/experience supervisors** who has safety first in mind.
23. A special arrangement to display **safety posters/banners** at suitable location of site is in progress.

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24. **Fire extinguishers** are placed in suitable location at site. A well maintained fire point with sand and water bucket is made available at site to face an unforeseen challenge.
25. All our tools and plants are in **good condition**.
26. All lifting **tools and tackles** are certified by competent person as a part of safety regulations.
27. Only **authorized personal** holding relevant license will drive and operate site plant and equipment. Cranes, dumpers, Transport, vehicles etc.
28. All employees & contractor vehicles insurance paper & driver license etc. submitted to Shyama Power India Ltd. site office.
29. Only **authorized personal** are allowed to repair commission electrical equipment's.
30. **Emergency telephone numbers, warning signs** etc. are displayed at strategic places at site.
31. All **scaffolding** is of rigid construction. Suitable access and egress are made by using ladder, temporary stair cases etc. No make shift access such as oil drums or pullers are being allowed.
32. **Nobody** is allowed within the plant premises without **gate pass.**
33. Preparation of sign board giving the following information to display at site is in progress.

(a) Name of contractor.
(b) Name of contractor's Site-in-Charge and telephone number.

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Safety work procedure for each activity

1. Excavation

Do's

A competent person must inspect the excavation:

- At the start of each shift before the works begin
- After any event likely to have affected the stability of the excavation
- After any accidental fall of rock, earth or other material.
- The area to be excavated will be totally barricaded to prevent access ofpersonal.
- The location will also have "entry restriction" board displayed.
- The general earth work will be clearing of the site and removal to a debris yard.
- All safety measures relevant to excavation work will be ensured for the safety of work and personal.
- Ensure that work permit is obtained before start of work.
- Trenches, pits, holes which result from excavation will be filled with desert fill and later compacted .The edge will have a slope as desired.
- Ensure that deep excavation (more 1.5 m deep) and cave-in is protected by shoring.
- Earthwork machinery would avoid the use of existing road by construction oftemporarytracks for performing the work.
- The house keeping will be done on regular basis.
- The equipment and machinery used in excavation and filling will be checked for their safety performance.
- Heavy Earth moving Equipment's (HEME) will be checked for any fuel and oil leakages and unwanted emissions operators shall also use ear protection if required.

Don'ts

- Explosives will not be used for excavation unless approval is taken from safety department.
- No excavated material will be allowed to get accumulated. The house keeping will be done regularly by housekeeping staff to keep the site clean.

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2. Electrical work

Do's

- Ensure that availability of signage "**High voltage**". When working on High VoltageEquipment's.
- Ensure that testing instruments are set in adequate testing range.
- Lock out & tag out, permit to system to be implemented.
- Keep live line working to a minimum and avoid redundant testing.
- Use insulated hand tools & adequately insulated rubber hand gloves for maintenance and repairing work.
- Use adequately insulated rubber hand gloves.
- Ensure phase separation barriers are in position.
- Ensure Electrical & Mechanical inter locks.
- Canopy/shed shall be provided on the electrical panels.

Don' ts

- Do not use flexible wire as test lamp lead. Use adequately insulated rigid wires.
- Earthing and ELCB shall not be provided with panel board and DB.

3. Shuttering

- Skilled workman will be deployed for materiel Handling /Shifting.
- In lifting operation tag / guide rope to be used in case of lifting / shifting with crane / Hydra.
- Only certified inspected /calibrated Equipment and authorized operator / person will be deployed.
- Dust Mask, Gloves, Ear plug to be ensured for concerned.
- Only trained person should be engaged for erection of shutter.
- The work should be carried out in close supervision.
- Unwanted and loose material to be removed immediately from the working platformand other will be stacked /stored properly.
- Close inspection will be carried out by execution and HS site personnel.
- Proper PPEs should be used during shuttering work.
- Training shall be given to all workers.
- Oil spillage shall be removed immediately.

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4. Batching Plant

- Ensure that hooks are not used during handling of cement bags.
- All personal handling equipment wears gloves/boots and nose mask.
- Permit to work must be taken from safety department for cleaning/maintenance of mixingdrum/plant.
- Before starting the concreting, ensure that lock out/tag out system is in place.
- Ensure sprinkling of water in aggregate before starting the concreting.
- Transmit mixer must be filled with indicator horn, back horn back light.
- Driver must have proper license.

5. Concrete Work

- Ensure that formwork and shores used for concrete work are structurally safe and are properly braced or tied so as maintain the position and shape of the structure.
- The formwork structure used for concrete work has sufficient gangway and other secure access for inspection if the structure is in two or more tiers.
- Ensure that all machinery used are in perfect running condition and periodic maintenance is also being carried out noise exposure is to be kept to the minimum and ear protection is also tobe used as required.
- Ensure that there is no undesired spillage of concrete during the work in case spillage take place collect the same and dispose properly.
- Ensure that the personal wear the necessary PPE's such as Gum Boots, apart from mandatory PPE's.

6. Working at height

Do's

- Specific supervisor shall supervise all WAH activity.
- Attendant must be a trained supervisor for critical job above 3m or trained worker for WAH job below 3 meter.
- Permit to be checked namely and properly displayed.
- Provided and ensure safe access and working platform for the working at height.
- Rope grip fall arrester shall be used if required.
- Cordon off the area below the working area for man movement.
- Ensure no loose material on walking platform and all hand tools are suitably seemed to avoid its fall.

Don'ts

- Keeping loose material on the platform.
- Dropping of material from height should be strictly prohibited.
- Tying safety belt at lower elevation than the working level of person.

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7. Arc Welding and Cutting

Do's

- The operator shall be properly trained and qualified to use the arc welder.
- Always use suitable handed gloves and welding screen during welding/cutting.
- Use only a suitable steel brush for removing slag from welded surface.
- The machine shall also be grounded and the grounding mechanism shall be periodically inspected.
- Operation and maintenance of the arc welding equipment shall be as per manufacture recommendations.
- When electrode holders are not in use, they shall be placed so as not to make electrical contact with personal or conducting object.
- ELCB shall be provided with panel board and DB.
- Every metal body should be earthed.

Don'ts

- No welding during rainy season.
- Person should not stand on wet area during welding.
- Earthing cable not to be more than one meter away from the job.

8. Metal Scaffolds and Towers

- Ensure that metal scaffolds and towers are erected in accordance with the manufacturer's specifications and that the recommended load limits are not exceeded.
- Position metal scaffolds so that they will not come in contact with energized electrical conductor.
- Plumb and level all scaffolds and towers. Use rolling scaffolds only on firm, level and clean surface.
- Securely fasten all braces used in metal scaffolds.
- Cleat or secure scaffolds planking at both ends to prevent movement.
- Use a positive wheel-locking device to prevent all rolling scaffolds from accidentally moving while the scaffold is in use.
- Move all rolling scaffolds by applying force to the base only.
- Riding on rolling scaffolds while they are being moved is prohibited. Remove or secure all tools, materials, and equipment on the deck before moving the scaffolds.
- Do not allow the height of the work platform of the free standing scaffolds towers to exceed four times the smallest base dimension.
- Work only from scaffolds that have been approved and display a current signed scaffold permit.

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9. Housekeeping

- Walkways, aisles, stairways, fire escapes and all other passageways shall be kept clear of all obstructions.
- Tools and material should not be placed where they may cause tripping of stumbling
- Hazards or where they may fall and strike anyone below.
- Puddles of oil and water create a slipping hazard and should be cleaned up promptly.
- Nails in board, such as those removed from scaffolds, forms and packing boxes,
- Constitute a hazard and should be removed. The boards should be carefully stacked or stored.
- Dirty and oily waste rags should be deposited in approved containers and disposed off
- As soon as practicable to avoid fire hazard.
- Broken light bulbs, glass metal and scarp and other sharp objects should be dumped in places or containers provided specially for them.
- Discarded fluorescent and other gas filled tubes shall be disposed of safely.

10. Lifting Operation

Do's

- Lifting area should be barricaded before starting the job.
- Operators' to make sure that crane/Hydra are positioned properly and angle of boom is proper for weight being lifted.
- Mobile crane/Hydra shall be operated by authorized operator and outriggers are provided with crane shall, shall be fully extended.
- Lifting material weight must be checked before lifting and good conditioned/rated lifting tools and tackles must be used with color coding.
- Competent and trained slinger/ Blanks man shall be deployed for the job and the crane must have limit switch.
- All lifting tools shall be provided with a safety latch and no equipment shall be used under high wind/ heavy rain or if the weather condition is so, which may deemed unsafe.
- All lifting appliances shall be provided with a fire Extinguisher.
- Lifting machineries equipment and lifting tackles shall not use without current test certificate.
- Limit switch & Boom positioning angle and level indicator.

Don'ts

- Damage slings.
- Unhook the sling under tension.
- Person should not stand below the lift load.

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11. Crane Operation

Do's

- All equipment shall be in good state, properly maintained and have the proper required certificates.
- All equipment drivers shall have the adequate training and certificates.
- Make sure that all the controllers are in 'Off' position closing the main switch.
- Never pick a load behind the capacity of the crane.
- Do not raise lower the crane hook whilst it is out of your site, unless it is being a directed by a slinger.
- Do not allow the crane hook to rest in such that the rope become slack, stop the crane and report.
- While making any movement especially when rising are lowering the load, be sure that safety clear all the obstructions.
- Never allow any man to ride on an rope, sling or crane hook.

Don'ts

- Never use more than two controls at a time.
- Avoid the swinging the load.
- Avoid carrying the load over person on the floor.
- While carrying loads keep the load well clear of the men on the floor.
- Do not limit switch as a controller for the hoist.
- Never try to stop the crane travel by reversing the controllers.
- Never move the beyond the long travel limit by manipulating the controller.
- Before moving the crane using warning device.
- Never suddenly stop aload while lowering.

12. Lifting, Carrying and Hoisting

- Most lifting accidents are due to improper lifting methods rather than to lifting too heavy loads. When manually lifting heavy objects. Person should keep his back close to vertical and the lifting done with leg and arm thigh muscles rather than with back muscles.
- Bulky loads should be carried in such a way as to permit unobstructed view ahead.
- Pipes, conduits, reinforcing rods and other conducting material should not be carried on / above shoulders near exposed live electrical equipment or conductors in switchyards.
- Rope tackle and sling, wherever required, should be checked to ascertain that they have sufficient strength to perform the work in hand.
- Chains hoists will not be used until their condition is known to be satisfactory care should be taken to avoid overstraining hoisting equipment. Chains should be inspected before use and at intervals during extended operations to avoid failure of worn or weakened links, hook or other parts.
- No one shall stand or pass under any suspended load being handled by a crane, derrick or other hoisting equipment.
- Safe loads that can be lifted with various sizes of Nylon Manila and sisal ropes under different hitches are given in the attached chart. The values given are valid for undamaged ropes and when the loads are lifted with jerk.

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13. Testing & Commissioning

- **General Safety Rules for commissioning**

1. Safety documentation system as per Shyama Power Electrical Risk Prevention with work permit system LOTO must be established before commissioning work is started.And ensure all men and materials, are removed and bus bar chambers are closed before Meggering.
2. Ensure proper earthing before Meggering / high potential test is carried out.
3. Check the bus bar configuration etc. in case a part of the panel is being energized. In some cases, manufacturers extend the bus bars of one section to the other section, to save adopter panels.
4. Ensure thorough checking before carrying out high potential test, area should be cordoned off and suitable warning boards are to be provided.
5. Substation Grounding Practice
6. Use adequately insulated discharge rods with insulated wire for earth connections for discharging the de-energized linerecognizing that three types of voltages, i.e. static, capacitive coupled and electromagnetic induced voltage can exist in disconnected line.
7. It requires additional physical work, as well additional time to adequately ground the work area or equipment.
8. Ensure that connections are tight and adequate contact area is provided.

- **General Safety Rules for Testing**

When testing and maintenance on substation equipment involving personal contact with conductors, which are normally energized and have been de-energized, the following procedures shall be adhered to:

1. Ground all applicable phase loads before test leads are connected.
2. Remove only those that would interfere with testing.
3. Upon completion of tests, grounds shall he reinstalled and test leads removed, in that order.
4. Remove all temporary ground connections, before closing source side isolator; close CB after isolator is closed.

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MANPOWER DEPLOYMENT PLAN

Manpower will be deployed at the site according to the work execution plan depending upon the site conditions and climate. A specific number of workmen will be deputed for a particular job viz. civil and electrical in accordance to the safe and speedy execution of allotted work on daily basis. A summarized plan as given under-

Site In-Charge: Mr. Sanjesh Kumar Singh

Safety Officer: Maisnam Nabakumar Singh

Civil Works- **Civil Engineer: Santosh Majumdar**

Supervisor	Carpenter	Masson	Bar binder	Labour	Welder
5	8	8	10	80	2

Electrical Works- **Electrical Engineer: Utpal Pramanik**

Supervisor	Fitter	Electrician	Semi-Skilled	Labour	Welder
6	16	4	16	40	2

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LIST OF T&P AND MACHINES AT SITE

We hereby declare that T&P use by us at site are mentioned below-

For Civil Works-

Sr. No.	DESCRIPTION	QTY.	REMARKS
1-	MIXTURE	4	On Hiring basis
2-	HYDRAULIC CRANE	2	On Hiring basis
3-	TRACTOR TYPE BACK HOE EXCAVATOR WITH FRONT LOADER	1	On Hiring basis
4-	CHAIN TYPE EXCAVATOR	1	On Hiring basis
5-	WELDING MECHINE	2	Own

For Erection Works-

Sr. No.	DESCRIPTION	QTY.	REMARKS
1-	DERRIKS	4	Own
2-	HYDRAULIC CRANE	1	On Hiring basis
3-	PP ROPES	10	Own
4-	PULLYS	10	Own
5-	WELDING MECHINE	4	Own
6-	D-SHAKLES	20	Own
7-	WIRE ROPES	8	Own
8-	WIRE ROPES SLINGS	2	Own

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Personal Protective Equipment (PPE)

PPE Matrixactivity wise:

Activities/Persons \ PPE	Head Protection	Safety glass	Face shield	Foot Protection	Safety harness	Hearing protection	Hand Protection	High Visibility Jacket	Respiratory Protection
Executives / Supervisors	+	+		+				+	
Foreman	+			+				+	
Unskilled workmen	+			+				+	
Formwork	+			+				+	
Scaffolding	+			+	+			+	
Masonry works	+			+	+		+	+	
Bar-bending works	+			+			+	+	
Grinding/Polishing	+	+	+	+			+	+	
Rigging	+			+			+	+	
Welding/Cutting	+	+		+			+	+	
Painting	+	+	+	+			+	+	
Cement Feeding	+	+		+			+	+	+
Traffic Control	+			+				+	
Roof work	+			+	+			+	
Work at heights above 1.8 M.	+			+	+			+	

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Personal Protective Equipment (PPE)

PPE Matrixactivity wise:

PPE / Activities/Persons	Head Protection	Safety glass	Face shield	Foot Protection	Safety harness	Hearing protection	Hand Protection	High Visibility Jacket	Respiratory Protection
Executives / Supervisors	+	+		+				+	
Foreman	+			+				+	
Unskilled workmen	+			+				+	
Formwork	+			+				+	
Scaffolding	+			+	+			+	
Masonry works	+			+	+		+	+	
Bar-bending works	+			+			+	+	
Grinding/Polishing	+	+	+	+			+	+	
Rigging	+			+			+	+	
Welding/Cutting	+	+		+			+	+	
Painting	+	+	+	+			+	+	
Cement Feeding	+	+		+			+	+	+
Traffic Control	+			+				+	
Roof work	+			+	+			+	
Work at heights above 1.8 M.	+			+	+			+	

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List of Earthing Equipment/Earthing Devices

Sr. No.	Earthing Equipment/Earthing Device
1	Discharge Rod
2	Earth Resistance Tester
3	
4	
5	

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ANNEXURE VII

Safety/ Penalty Provisions in Contract Condition

PC 21.3.4 Replace the word *'may'* in line no. 10 with *'is'*.

Addition of New Clauses (PC21.3.5, PC21.3.6) after GC 21.3.4

PC 21.3.5 **Packing**

The Contractor shall provide such packing of the Goods as it is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit, exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

PC 21.3.6 The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract and, subject to any subsequent instruction ordered by the Employer consistent with the requirements of the Contract.

PC 21.4 Replace the word 'materials' in line no. 2 with 'Plant and Equipment'.

Add the word **'including liabilities for port charges if any'** after the word **'clearance'** in line no. 3.

Addition of Sub-Clauses (PC22.2.3.1, PC22.2.3.2, PC22.2.3.3, PC 22.2.3.4 of GC 22.2.3

PC 22.2.3.1 Compliance with Labour Regulations

During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all applicable existing labour enactments and rules made thereunder, regulations notifications and byelaws of the State or Central Government or local authority and any other labour law (including rules), regulations bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. The employees of the Contractor and the Sub-contractor in no case shall be treated as the

employees of the Employer at any point of time.

PC 22.2.3.2 The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments.

PC 22.2.3.3 If the Employer is caused to pay under any law as principal employer such amounts as may be necessary to cause or observe, or for non observance of the provisions stipulated in the notifications/ byelaws/Acts/ Rules/regulations including amendments, if any, on the part of the Contractor, the Employer shall have the right to deduct any money due to the Contractor under this contract or any other contract with the employer including his amount of performance security for adjusting the aforesaid payment. The Employer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

PC 22.2.3.4 Salient features of some major laws applicable to establishments engaged in building and other construction works are indicated at **Appendix-I** to PC.

Addition of New Sub-Clauses (PC22.4.1 to 22.4.3 including its sub-clauses) of GC 22.4

PC 22.4.1 **Protection of Environment**

The Contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as consequence of his methods of operation.

During continuance of the Contract, the Contractor and his Sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority.

Salient features of some of the major laws that are applicable are given below:

The Water (Prevention and Control of Pollution) Act, 1974. This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms

The Air (Prevention and Control of Pollution) Act, 1981. This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The Environment (Protection) Act, 1986. This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.

The Public Liability Insurance Act, 1991. This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under Environment (Protection) Act, 1986, and exceeding such quantity as may be specified by notification by the Central Government.

PC 22.4.2 (i) The Contractor shall (a) establish an operational system of managing environmental impacts, (b) carry out all the monitoring and mitigation measures set forth in the environment management plan attached to the Particular Conditions as **Appendix-II**, and (c) allocate the budget required to ensure that such measures are carried out. The

Contractor shall submit to the Employer (quarterly) semi-annual) reports on the carrying out of such measures.

(ii) The Contractor shall adequately record the conditions of roads, agricultural land and other infrastructure prior to transport of material and construction commencement, and shall fully reinstate road / pathways, other local infrastructure and agricultural land to atleast their pre-project condition upon construction completion.

(iii) The Contractor shall undertake detailed survey of the affected persons during transmission line alignment finalization under the Project, where applicable. and

(iv) The Contractor shall conduct health and safety programme for workers employed under the Contract and shall include information on the risk of sexually transmitted diseases, including HIV/AIDS in such programs.

PC 22.4.3 Safety Precautions

PC 22.4.3.1 The Contractor shall observe all applicable regulations regarding safety on the Site.

Unless otherwise agreed, the Contractor shall, from the commencement of work on Site until taking over, provide

a) fencing, lighting, guarding and watching of the Works wherever required, and

b) temporary roadways, footways, guards and fences which may be necessary for the accommodation and protection of Employer / his representatives and occupiers of adjacent property, the public and others.

PC 22.4.3.2 The Contractor shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to THE EMPLOYER or to others, working at the Site. The Contractor shall also be responsible for provision of all safety notices and safety equipment required both by the relevant legislations and the Engineer, as he may deem necessary.

PC 22.4.3.3 The Contractor will notify well-in advance to the Engineer of his intention to bring to the Site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. The Engineer shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the Contractor shall strictly adhere to and comply with such instructions. The Engineer shall have the right at his sole discretion to inspect any such container or such construction plant/equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use No claim due to such prohibition shall be entertained by the Owner and the Owner shall not entertain any claim of the Contractor towards additional safety provisions/conditions to be provided for/constructed as per the Engineer's instructions.

Further, any such decision of the Engineer shall not, in any way, absolve the Contractor of his responsibilities and in case, use of such a container or entry thereof into the Site area is forbidden by the Engineer, the Contractor shall use alternative methods with the approval of the Engineer without any cost implication to THE EMPLOYER or extension of work schedule

PC 27.4.3.4 Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying-out such provision and/or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act, 1948 and Petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Engineer. In case, any approvals are necessary from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same

PC 22.4.3.5 All equipment used in construction and erection by Contractor shall meet Indian/International Standards and where such standards do not exist, the Contractor shall

ensure these to be absolutely safe. All equipment shall be strictly operated and maintained by the Contractor in accordance with manufacturer's Operation Manual and safety instructions and as per Guidelines/rules of THE EMPLOYER in this regard.

PC 22.4.3.6 Periodical examinations and all tests for all lifting/hoisting equipment & tackles shall be carried-out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act 1910 and associated Laws/Rules in force from time to time. A register of such examinations and tests shall be properly maintained by the Contractor and will be promptly produced as and when desired by the Engineer or by the person authorised by him.

PC 22.4.3.7 The Contractor shall be fully responsible for the safe storage of his and his Sub-Contractor's radioactive sources in accordance with BARC/DAE Rules and other applicable provisions. All precautionary measures stipulated by BARC/DAE in connection with use, storage and handling of such material will be taken by the Contractor.

PC 22.4.3.8 The Contractor shall provide suitable safety equipment of prescribed standard to all employees and workmen according to the need, as may be directed by the Engineer who will also have right to examine these safety equipment to determine their suitability, reliability, acceptability and adaptability.

PC 22.4.3.9 Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person strictly in accordance with the Code of Practice/ Rules framed under Indian Explosives Act pertaining to handling, storage and use of explosives.

PC 22.4.3.10 The Contractor shall provide safe working conditions to all workmen and employees at the Site including safe means of access, railings, stairs, ladders, scaffoldings etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection, good and standard quality of material only shall

be used by the Contractor.

PC 22.4.3.11 The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Owner or other Contractors under any circumstances, whatsoever, unless expressly permitted in writing by THE EMPLOYER to handle such fuses, wiring or electrical equipment

PC 22.4.3.12 Before the Contractor connects any electrical appliances to any plug or socket belonging to the other Contractor or Owner, he shall:

a. Satisfy the Engineer that the appliance is in good working condition;

b. Inform the Engineer of the maximum current rating, voltage and phases of the appliances;

c. Obtain permission of the Engineer detailing the sockets to which the appliances may be connected.

PC 22.4.3.13 The Engineer will not grant permission to connect until he is satisfied that;

a. The appliance is in good condition and is fitted with suitable plug;
b. The appliance is fitted with a suitable cable having two earth conductors, one of which shall be an earthed metal sheath surrounding the cores.

PC 22.4.3.14 No electric cable in use by the Contractor/Owner will be disturbed without prior permission. No weight of any description will be imposed on any cable and no ladder or similar equipment will rest against or attached to it.

PC 22.4.3.15 No repair work shall be carried out on any live equipment. The equipment must be declared safe by the Engineer and a permit to work shall be issued by the Engineer before any repair work is carried out by the Contractor. While working on electric lines/equipment, whether live or dead, suitable type and sufficient quantity of tools will have to be provided by the Contractor to

electricians/workmen/officers.

PC 22.4.3.16 The Contractors shall employ necessary number of qualified, full time electricians/electrical supervisors to maintain his temporary electrical installation.

PC 22.4.3.17 The Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as safety officer to supervise safety aspects of the equipment and workmen, who will coordinate with the Project Safety Officer. In case of work being carried out through Sub-Contractors, the Sub-Contractor's workmen/employees will also be considered as the Contractor's employees/workmen for the above purpose.

The name and address of such Safety Officers of the Contractor will be promptly informed in writing to Engineer with a copy to Safety Officer-In charge before he starts work or immediately after any change of the incumbent is made during currency of the Contract.

PC 22.4.3.18 In case any accident occurs during the construction/ erection or other associated activities undertaken by the Contractor thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to the Engineer in prescribed form and also to all the authorities envisaged under the applicable laws.

PC 22.4.3.19 The Engineer shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Engineer within 3 days

of such stoppage of work and decision of the Engineer in this respect shall be conclusive and binding on the Contractor.

PC 22.4.3.20 The Contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided in para GCC 22.4.3.19 above and the period of such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of levy of liquidated damages.

PC 22.4.3.21 It is mandatory for the Contractor to observe during the execution of the works, requirements of Safety Rules which would generally include but not limited to following

Safety Rules

a) Each employee shall be provided with initial indoctrination regarding safety by the Contractor, so as to enable him to conduct his work in a safe manner.

b) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazards incident thereto, both to himself and his fellow employees.

c) Under no circumstances shall an employee hurry or take unnecessary chance when working under hazardous conditions.

d) Employees must not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and adequate fire fighting equipment shall be provided at crucial location.

e) Employees under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted to remain at work.

f) There shall be a suitable arrangement at every work site for rendering prompt and sufficient first aid to the injured.

g) The staircases and passageways shall be adequately lighted.

h) The employees when working around moving machinery, must not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall. Only experienced workers shall be permitted to go behind guard rails or to clean around energized or moving equipment.

i) The employees must use the standard protection equipment intended for each job. Each piece of equipment shall be inspected before and after it is used.

j) Requirements of ventilation in underwater working to Licenced and experienced divers, use of gum boots for working in slushy or in inundated conditions are essential requirements to be fulfilled.

k) In case of rock excavation, blasting shall invariably be done through Licenced blasters and other precautions during blasting and storage/transport of charge material shall be observed strictly.

PC 22.4.3.22 The Contractor shall follow and comply with all THE EMPLOYER Safety Rules, relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservations. In case of any discrepancy between statutory requirement and THE EMPLOYER Safety Rules referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent.

PC 22.4.3.23 If the Contractor fails in providing safe working

environment as per THE EMPLOYER Safety Rules or continues the work even after being instructed to stop work by the Engineer as provided in para GCC 22.4.3.19 above, the Contractor shall promptly pay to THE EMPLOYER, on demand by the Owner, compensation at the rate of Rs.5, 000/- per day of part thereof till the instructions are complied with and so certified by the Engineer. However, in case of accident taking place causing injury to any individual, the provisions contained in para GCC 22.4.3.24 shall also apply in addition to compensation mentioned in this para.

PC 22.4.3.24 If the Contractor does not take adequate safety precautions and/or fails to comply with the Safety Rules as prescribed by THE EMPLOYER or under the applicable law for the safety of the equipment and plant or for the safety of personnel or the Contractor does not prevent hazardous conditions which cause injury to his own employees or employees of other Contractors or THE EMPLOYER employees or any other person who are at Site or adjacent thereto, then the Contractor shall be responsible for payment of a sum as indicated below to be deposited with THE EMPLOYER, which will be passed on by THE EMPLOYER to such person or next to kith and kin of the deceased:

a	Fatal injury or accident causing death	Rs. 1,000,000/- per person
b.	Major injuries or accident causing 25% or more permanent disablement	Rs. 100,000/- per person

Permanent disablement shall have same meaning as indicated in Workmen's Compensation Act. The amount to be deposited with THE EMPLOYER and passed on to the person mentioned above shall be in addition to the compensation payable under the relevant provisions of the Workmen's Compensation Act and rules framed there under or any other applicable laws as applicable from time to time. In case the Contractor does not deposit the above mentioned amount with THE EMPLOYER, such

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amount shall be recovered by THE EMPLOYER from any monies due or becoming due to the Contractor under the contract or any other on-going contract.

PC22.4.3.25 If the Contractor observes all the Safety Rules and Codes, Statutory Laws and Rules during the currency of Contract awarded by the Owner and no accident occurs then THE EMPLOYER may consider the performance of the Contractor and award suitable 'ACCIDENT FREE SAFETY MERITORIOUS AWARD' as per scheme as may be announced separately from time to time.

PC22.4.3.26 The Contractor shall also submit 'Safety Plan' as per proforma specified in Section IX: Contract Forms, Part-3 of Bidding Documents alongwith all the requisite documents mentioned therein and as per check-list contained therein to the Engineer In-Charge for its approval within 60 days of award of Contract.

Further, one of the conditions for release of first progressive payment / subsequent payment towards Services Contract shall be submission of 'Safety Plan' alongwith all requisite documents and approval of the same by the Engineer In-Charge.

PC 22.6 Emergency Work (GC Clause 22.6)

Replace the words "Otherwise" with "In case such work is not in the scope of the Contractor", in the second last line of second paragraph of GC clause 22.6.

PC 23.3 Supplementing sub-clause GC 23.3

For notification of testing, four weeks shall be deemed as reasonable advance notice.

PC 23.7 Test and Inspection (GC Clause 23.7)

Replace the words "GC Sub-Clause 6.7" with "GC Sub Clause 46.1", in the last line of GC clause 23.7.

ANNEXURE VIII

Approved Labour License & Insurance Policy by Contractor

DMS-01

GOVERNMENT OF INDIA
MINISTRY OF LABOUR & EMPLOYMENT
OFFICE OF THE ASSISTANT LABOUR COMMISSIONER (CENTRAL)
KENDRIYA SADAN
CHIRUKANDI ROAD, RAMNAGAR, TARAPUR, SILCHAR-788 003, ASSAM
E-mail alc.sil-as@gov.in
TELEPHONE NO. 03842-268330

No. 46 (146)/2017 – S / A

Dated – 16.06.2020

To

M/s WINPOWER INFRA PVT. LTD.
POWER GRID CORPORATION OF INDIA LIMITED CONTRACTOR
REPRESENTED THROUGH: -
(1) SHRI ASHOK KUMAR AGARWALLA, MANAGING DIRECTOR
S/O LATE MADANLAL AGARWALLA
(2) SHRI SURESH KUMAR AGARWALLA, DIRECTOR
S/O LATE MADANLAL AGARWALLA
SINGHI HOUSE, RAJA MAIDAM ROAD, JORHAT – 785001, ASSAM
E-mail – info@winpowerinfra.com / M - 07896022425/09191591885.

Subject: Contract Labour (Regulation and Abolition) Act, 1970 and its Central Rules, 1971 - Renewal of Licence No. CLA/146/2017-S/A dated-16.06.2017.

Dear Sir,

Please refer to your Application No. Nil dated-21.05.2020 (received at this office on 21.05.2020) for Renewal of Licence along with Rs. 100/- (Rupees ONE HUNDRED) only deposited through online towards Renewal fee of the above noted Licence towards Renewal fee of the above noted Licence.

In this connection, please find enclosed herewith the original Licence duly RENEWED UP TO 14. 06. 2021 under the provision of Section-13 (3) of the Contract Labour (Regulation and Abolition) Act, 1970 read with Rule-29 of its Central Rules, 1971.

Please acknowledge the receipt of the same.

Enclo: 1 (ONE) LICENCE.

Yours faithfully,

Assistant Labour Commissioner (Central)
Government of India
SILCHAR

Asstt. Labour Commissioner (Central)
Silchar & Registering/ Licensing Officer
Under C.L. (R&A) Act, 1970

Copy forwarded to:

(1) The Labour Enforcement Officer (Central), LUMDING. A copy of the Form-II is enclosed.

(2) The Deputy General Manager, Power Grid Corporation of India Limited, Yurembam, P.O. Langjing Achouba, Imphal - 795113, Manipur for information.

Assistant Labour Commissioner (Central)
Government of India
SILCHAR

GOVERNMENT OF INDIA
MINISTRY OF LABOUR & EMPLOYMENT
OFFICE OF THE ASSISTANT LABOUR COMMISSIONER (CENTRAL)
KENDRIYA SADAN
CHIRUKANDI ROAD, RAMNAGAR, TARAPUR, SILCHAR-788 003, ASSAM
E-mail alc.sil-as@gov.in
TELEPHONE NO. 03842-267330

No. 46 (146)/2017 – S / A

Dated – 30.05.2019

To

M/s WINPOWER INFRA PVT. LTD.
POWER GRID CORPORATION OF INDIA LIMITED CONTRACTOR
REPRESENTED THROUGH: -
(1) SHRI ASHOK KUMAR AGARWALLA, MANAGING DIRECTOR
S/O LATE MADANLAL AGARWALLA
(2) SHRI SURESH KUMAR AGARWALLA, DIRECTOR
S/O LATE MADANLAL AGARWALLA
SINGHI HOUSE, RAJA MAIDAM ROAD, JORHAT – 785001, ASSAM
E-mail – info@winpowerinfra.com / M - 07086762359.

Subject: Contract Labour (Regulation and Abolition) Act, 1970 and its Central Rules, 1971 - Renewal of Licence No. CLA / 146 / 2017 – S /A dated-16.06.2017.

Dear Sir,

Please refer to your Application No. Nil dated-30.05.2019 (received at this office on 30.05.2019) for Renewal of Licence along with Rs.100/- (Rupees ONE HUNDRED) only deposited through bharatkosh.gov.in towards Renewal fee of the above noted Licence.

In this connection, please find enclosed herewith the original Licence duly RENEWED UP TO 14. 06. 2020 under the provision of Section-13 (3) of the Contract Labour (Regulation and Abolition) Act, 1970 read with Rule-29 of its Central Rules, 1971.

Please acknowledge the receipt of the same.

Enclo: 1 (ONE) LICENCE.

Yours faithfully,

Assistant Labour Commissioner (Central)
Government of India
SILCHAR

Asstt. Labour Commissioner (Central)
Silchar & Registering/ Licensing Officer
Under C.L. (R&A) Act. 1970

Copy forwarded to:

(1) The Labour Enforcement Officer (Central), LUMDING. A copy of the Form-II is enclosed.
(2) The Deputy General Manager, Power Grid Corporation of India Limited, Yurembam, P.O. Langjing Achouba, Imphal - 795113, Manipur for information.

Assistant Labour Commissioner (Central)
Government of India
SILCHAR

FORM-VI

(SEE RULE- 25(1)

GOVERNMENT OF INDIA

MINISTRY OF LABOUR & EMPLOYMENT

OFFICE OF THE LICENSING OFFICER

AND ASSISTANT LABOUR COMMISSIONER (CENTRAL)

COLLEGE ROAD, SILCHAR-788004, DIST. CACHAR, ASSAM

LICENCE NO. CLA/146/2017-S/A DATE: 16.06.2017

LICENCE FEE PAID	Rs.38.00 (RUPEES THIRTY EIGHT) ONLY	DEMAND DRAFT No. 302085 Dated – 05.06.2017 STATE BANK OF INDIA NEW SILCHAR BRANCH

LICENCE

1. Licence is hereby granted to M/s WINPOWER INFRA PVT. LTD., POWER GRID CORPORATION OF INDIA LIMITED CONTRACTOR, REPRESENTED THROUGH: - (1) SHRI ASHOK KUMAR AGARWALLA, MANAGING DIRECTOR, S/O LATE MADANLAL AGARWALLA (2) SHRI SURESH KUMAR AGARWALLA, DIRECTOR, S/O LATE MADANLAL AGARWALLA, SINGHI HOUSE, RAJA MAIDAM ROAD, JORHAT – 785001, ASSAM under Section 12(1) of the Contract Labour (Regulation and Abolition) Act, 1970 subject to the conditions specified in the ANNEXURE.

2. The Licence is for doing the work – "Service Contract for Package MAN-DMS-01 for Manipur associated with NER Power System Improvement Project vide Specification No. CC-CS/84-NER/REW-3385/1/G6 & Notification of Award (NOA) No. CC-CS/84-NER/REW-3385/1/G6/NOA-II/7185 dated-03.03.2017" in the establishment of Deputy General Manager, Power Grid Corporation of India Limited, Yurcmbam, P.O. Langjing Achouba, Imphal - 795113, Manipur.

3. The Licence shall remain in force TILL 14.06.2018

Date: 16.06.2017

16/06/17

Signature and Seal of Licensing Officer

Asstt. Labour Commissioner (Central)
Licensing & Registering Officer
Under C.L. (R&A) Act, 1970

RENEWAL
(Rule-29)

Date of Renewal	Fee paid for Renewal	Date of Expiry	Signature and Seal of Licensing Officer and Date
06-06-2018	Rs-50/-	14-06-2019	ALC(C) SILCHAR
30-05-2019	Rs-100/-	14-06-2020	ALC(C) SILCHAR
11-06-2020	Rs-100/-	14-06-2021	ALC(C) SILCHAR

ANNEXURE

THE LICENCE IS SUBJECT TO THE FOLLOWING CONDITIONS:

1. The Licence shall be non - Transferable.

2. The number of workmen employed as Contract Labour in the establishment shall not, on any day, exceed 30 (THIRTY) NOS.

3. Except as provided in the rules the fees paid for the grant, or as the case may be, for renewal of the licence shall be non refundable.

4. The rates of wages payable to the workmen by the contractor shall not be less than the rates prescribed for the Schedule Employment under the Minimum Wages Act, 1948, where applicable, and where the rates have been fixed by agreement, settlement or award, not less than the rates so fixed.

5. In case where the workmen employed by the contractor perform the same or similar kind of work as the workmen directly employed by the principal employer of the establishment the wage rates, holidays, hours of work and other conditions of service of the workmen of the contractor shall be the same as applicable to the workmen directly employed by the principal employer of the establishment on the same or similar kind of work. Provided that in the case of any disagreement with regard to the type of work the same shall be decided by the Chief Labour Commissioner (Central) New Delhi whose decision shall be final.

6. In other cases the wage rates, holidays, hours of work and conditions of service of the workmen of the contractor shall be such as may be specified in this behalf by the Chief Labour Commissioner (Central) New Delhi.

7. In every establishment where 20 (twenty) or more female workmen are ordinarily employed as contract labour there shall be provided 2(two) rooms of reasonable dimensions for the use of their children under the age of 6(six) years. One of such rooms would be used as a playroom for the children and the other as bedroom for the children. For this purpose the contractor shall supply adequate number of toys and games in the playroom and sufficient number of cots and beddings in the sleeping room. The standard of construction and maintenance of the crèches may be such as specified in this behalf by the Chief Labour Commissioner (Central) New Delhi.

8. The licence shall notify any change in the number of workmen or the conditions of work to the Licencing Officer.

9. Copy of the licence should be displayed at the work spot.

10. The Licence shall intimate within 15(fifteen) days the date of commencement/completion of the work to the Inspector in Form-VI-A under Rule-81 (3).

11. Renewal of Licence: Every such application shall be in Form-VII (in triplicate) and shall be made not less than 30(THIRTY) days before the date on which the licence expires.

Date: 16.06.2017

Assistant Labour Commissioner (Central) and
Licensing Officer and Registering Officer under
Contract Labour (Regulation and Abolition) Act, 1970

Asstt. Labour Commissioner (Central)
Pitchar & Registering/ Licensing Officer
Under C.L. (R&A) Act, 1970

DMB-02

पॉलिसी अनुसूची/ Policy Schedule - Employees Compensation Insurance

Policy Number:
200800412010000002

व्यवसाय स्रोत /Business Source: 016572

जारीकर्ता कार्यालय/Issuing Office

कार्यालय कोड /Office Code: 200800

कार्यालय पता /Office Address: MALIGAON DIVISION Maligaon Chariali, Guwahati, Dist: Kamrup, Assam - 781011, State Code: 18 , Assam
GSTIN: 18AACN9987E1Z2
Contact Number:
Mobile Number:

बिक्रय चैनल संख्या/Sales Channel Code: 9000144851
नाम /Name: Mrs Neelima Kalita Contact Number: 9435019376
सह दलाल कोड / Co Broker Code:

Customer Care Toll Free Number: 1800 345 0330
email:customer.support@nic.co.in

नेशनल इन्श्योरेन्स
National Insurance
Trusted since 1906

NATIONAL INSURANCE CO. LTD.
MALIGAON DIVISIONAL OFFICE
MALIGAON, GUWAHATI-781011

ग्राहक का नाम /Customer Name: WIN POWER INFRA (P) LTD

ग्राहक आईडी /Customer ID: 9701004834

पैन /PAN: AAACW4060D

पता/ Address: SINGHI HOUSE, R.M.ROAD, JORHAT DIST. : JORHAT, ASSAM, City: JORHAT, District: JORHAT, State: ASSAM, PIN: 785001
Cell: 9435015247

फोन /Phone:

ई-मेल /E-Mail:

पॉलिसी 22/05/2020 के 00:00 से 21/05/2021 की मध्य रात्रि तक प्रभावी /Policy Effective from 00:00 hours, on 22/05/2020 to midnight of 21/05/2021

प्रीमियम/ Premium	₹ 38,932.00	कवर नोट संख्या और तिथि/ Cover Note Number and Date	NA
CGST	₹ 3,504.00		
SGST/UTGST	₹ 3,504.00		
IGST	₹ 0.00		
केरल बाढ़ उपकर/Kerala Flood Cess	₹ 0.00	प्रस्ताव संख्या और तिथि/ Proposal Number and Date	880020052127332 2 Dt. 21/05/2020
कम:जीएसटी_टीडीएस/ Less:GST_TDS	₹ 0.00		
पुनर्प्राप्त योग्य स्टाम्प शुल्क/ Recoverable Stamp Duty	₹ 0.00	रसीद संख्या और तिथि/ Receipt Number and Date	200800812010000555 Dt. 22/05/2020
कुल /Total Amount	₹ 45,940.00	पिछली पॉलिसी संख्या और समाप्ती तिथि/ Previous Policy Number and Expiry Date	NA

(Rupees Forty Five Thousand Nine Hundred Forty Only.)

Joint Policyholder Name: NA

Joint Policyholder Address: NA

Laws: The Policy covers Liability of the **Insured** under the following Law(s) shown as covered, subject to claim being otherwise admissible as per terms, conditions and exclusions of the Policy and subject to **Limit of Indemnity** as stipulated against each Law

SL.No	Law	Limit of Indemnity	Coverage
1	Employee Compensation Act, 1923 and Subsequent amendments thereof prior to the date of issue of this Policy	Subject otherwise, to the terms, conditions &Exclusions of the Policy, the amount of liability incurred by the Insured.	Yes
2	Common Law Liability	Subject otherwise, to the terms, conditions & Exclusions of the Policy, the amount of liability incurred by the Insured, but not exceeding:- a)Limit Per Employee: ₹5,00,000.00 b)Limit per Accident: ₹15,00,000.00 c)Aggregate Limit(AOP): ₹15,00,000.00	Yes
3	Medical Expenses	Subject otherwise, to the terms, conditions & Exclusions of the Policy, the amount of liability incurred by the Insured, but not exceeding:- a)Limit Per Employee: ₹25,000.00 b)Aggregate Limit(AOP): ₹2,50,000.00	Yes

SL.No	Industry Type	Description of Work Done by Employees	Number of Employees	Declared Wages/ Contract Value	Place of Employment	Contractors Name, Contractors Address

Printed on 22/05/2020 by ID [illegible]

National Insurance Company Limited
CIN No. U10200WB1906GOI001713
IRDA Regn. No.58

Page No. 1

पंजीकृत एवं प्रधान कार्यालय : 3 Middleton Street, Kolkata 700 071
Registered & Head Office : 3 Middleton Street, Kolkata 700 071
Ph No.033-22831705-06 Fax: 033-22831712
email:website.administrator@nic.co.in

For any information please contact the Policy Issuing Office or visit our website at www.nationalinsuranceindia.com

पॉलिसी अनुसूची/ Policy Schedule - Employees Compensation Insurance

Policy Number: 20080041201000002	व्यवसाय सुत्रोत /Business Source: 015572
प्रतिभूत कार्यालय/**Issuing Office** कार्यालय कोड /Office Code: 200500 कार्यालय पता /Office Address: MALIGAON DIVISION Maligaon Chariali, Guwahati, Dist: Kamrup, Assam - 781011. State Code: 18_ Assam GSTIN: 18AAACN9967E1Z2 Contact Number: Mobile Number:	विक्रय चैनल कोड/**Sales Channel** Code: 9000144851 नाम /Name: Mrs Neelima Kalita Contact Number: 9435019376 सह दलाल कोड / Co Broker Code: **Customer Care Toll Free Number: 1800 345 0330** **email:customer.support@nic.co.in**

नेशनल इन्श्योरेन्स
National Insurance
Trusted since 1906

NATIONAL INSURANCE CO. LTD.
MALIGAON DIVISIONAL OFFICE
MALIGAON, GUWAHATI-781011

1	Industry Type:Electricity, Light and/or Power Supply Sub Industry Type:electricity light powr supply	AT MANIPUR UNDER POWER GRID CORP OF INDIA,SPECIFICATION NO.CC-CS/84-NER/REW-3385/1/G6/NOA-I/7184	7	Declared Wages:672000 Contract Value:0	SEMI-SKILLED ELECTRICAL WORKER	Contractors Name:NA Contractors Address:NA
2	Industry Type:Electricity, Light and/or Power Supply Sub Industry Type:electricity light powr supply	AT MANIPUR UNDER POWER GRID CORP OF INDIA,SPECIFICATION NO.CC-CS/84-NER/REW-3385/1/G6/NOA-I/7184	16	Declared Wages:1536000 Contract Value:0	UNSKILLED ELECTRICAL WORKER	Contractors Name:NA Contractors Address:NA
3	Industry Type:Electricity, Light and/or Power Supply Sub Industry Type:electricity light powr supply	AT MANIPUR UNDER POWER GRID CORP OF INDIA,SPECIFICATION NO.CC-CS/84-NER/REW-3385/1/G6/NOA-I/7184	7	Declared Wages:672000 Contract Value:0	SKILLED ELECTRICAL WORKER	Contractors Name:NA Contractors Address:NA

Clauses, Endorsements and Warranties Applicable:
Average Clause,
Occupational Diseases

जिसकी गवाही में हस्ति/ ताह /क्षर की उपरोक्त उल्लेखित कार्यालय पते पर अधोहस्ताक्षरी को विधिवत अधिकृत किया जा रहा है उसके हाथ नीचे स्थापित किए जाएं। यह अनुसूची, संलग्न पॉलिसी, खण्ड, पृष्ठांकन और पॉलिसी शब्दों, जो कंपनी वेबसाइट https://nationalinsurance.nic.co.in पर उपलब्ध है, को एक अनुबंध के रूप में एक साथ पढ़ा जाए तथा कोई भी शब्द या अभिव्यक्ति जिसके लिए यह विशिष्ट अर्थ पॉलिसी या अनुसूची के किसी भी हिस्से में संलग्न किया गया हो, एक ही अर्थ वहन करेगा चाहे जहाँ भी उल्लेखित हो। यह आश्वासन दिया जाता है कि प्रीमियम चेक के अस्वीकृति के मामले में, यह दस्तावेज स्वतः प्रारम्भिकता निरस्त हो जाएगी। /*IN WITNESS WHEREOF, the undersigned being duly authorized hereunto set his/ her hand at the office address mentioned above, this* **22/May/2020**.*This schedule, the attached policy, the clauses, the endorsements and policy wordings as available in the website* **https://nationalinsurance.nic.co.in** *shall be read together as one contract and any word or expression to which the specific meaning has been attached in any part of this policy or of the schedule shall bear the same meaning wherever it may appear. It is warranted that* ***IN CASE OF DISHONOUR OF THE PREMIUM CHEQUE, THIS DOCUMENT STANDS AUTOMATICALLY CANCELLED 'AB-INITIO'***

इंश्योरेन्सकंपनीलिमिटेड

मुद्रांक शुल्क Stamp Duty: (₹ 19.50)

कृते नेशनल इन्श्योरेन्स कंपनी लिमिटेड/ *For and on behalf of National Insurance Company Limited*

नेशनल इन्श्योरेन्स कम्पनी लिमिटेड
NATIONAL INSURANCE CO. LTD.
Authorized Signatory
Sr. Divisional Manager

TAX INVOICE

Invoice Serial No: 30100WOP00000002

नेशनल इन्श्योरेन्स
National Insurance
Invoice Date: 23/10/2020

Trusted since 1906

Details of Supplier
National Insurance Company Limited.,
MALIGAON DIVISION Maligaon Chariali, Guwahati. Dist: Kamrup, Assam - 781011
State : 18 , Assam
GSTIN No : 18AAACN9997E1Z2

NATIONAL INSURANCE CO. LTD.
MALIGAON DIVISIONAL OFFICE
MALIGAON, GUWAHATI-781011

Details Of Receiver : WIN POWER INFRA (P) LTD
Address : SINGHI HOUSE, R.M.ROAD, JORHAT DIST. : JORHAT, ASSAM
City : JORHAT,
District: JORHAT,
State: ASSAM
PIN: 785001.

Place Of Supply State : Assam
State Code : 18
GSTIN No : 18AAACW4060D1ZL

सेवा कोड/ SAC Code	सेवा का विवरण/ Description of Service	कुल/Total(₹)	छूट/ Discount	टैक्स योग्य मूल्य/Taxable Value(₹)	सीजीएसटी की राशि/ CGST		एसजीएसटी/यूटीजीएसटी/ SGST/UTGST		आईजीएसटी/IGST		केरल बाढ़ उपकर/Kerala Flood Cess
					दर/Rate	राशि/ Amount(₹)	दर/Rate	राशि/ Amount(₹)	दर/Rate	राशि/ Amount(₹)	राशि/Amount(₹)
997139	Other non-life insurance services (excluding reinsurance services)	38,932	0%	38,932	9%	3,504	9%	3,504	0%	0	0
TOTAL		38,932		38,932		3,504		3,504		0	0

कुल इनवॉयस मूल्य (अंकों में) /Total Invoice Value (In figures) :
₹ 45,940

कुल इनवॉयस मूल्य (शब्दों में)/Total Invoice Value (In words) : INR/Rupees
Fourty Five Thousand Nine Hundred Fourty
Only.

रिवर्स चार्ज के अधीन टैक्स की राशि/ Amount of Tax Subject to Reverse Charge : No

E.&.O.E

कृते नेशनल इन्श्योरेन्स कंपनी लिमिटेड/ *For and on behalf of National Insurance Company Limited*

अधिकृत हस्ताक्षरकर्ता/ Authorised Signatory
NATIONAL INSURANCE CO. LTD.

Sr. Divisional Manager

वसूली रसीद/Collection Receipt

नेशनल इन्श्योरेन्स
National Insurance
Trusted since 1906

जारीकर्ता कार्यालय कोड/Issuing Office Code : 200800
जारीकर्ता कार्यालय का नाम व पता/Name and Address of Issuing Office :
MALIGAON DIVISION Maligaon Chariali, Guwahati, Dist: Kamrup, Assam - 781011
राज्य कोड/State Code : 18 ,राज्य का नाम/State Name : Assam
जीएसटीआईएन/GSTIN : 18AAACN9967E1Z2
संपर्क संख्या/Contact Number :

NATIONAL INSURANCE CO. LTD.
MALIGAON DIVISIONAL OFFICE
MALIGAON, GUWAHATI-781011

रसीद सं./Receipt No : 200800812010000655	स्क्रॉल सं. (यदि कोई हो)/Scroll No(If any) :
रसीद की तिथि व समय/Receipt Date & Time : 22/05/2020. 12:01 hours	स्क्रॉल तिथि (यदि कोई हो)/Scroll Date(If any) :

श्री WIN POWER INFRA (P) LTD से के रूप में रुपये
Rs. 45,940.00 निम्नलिखित लेनदेन के अनुसार धन्यवाद सहित प्राप्त हुआ।
Received with thanks from WIN POWER INFRA (P) LTD a sum of Rs. 45,940.00 (Rupees Forty Five Thousand Nine Hundred Forty Only) by way of EFT/UPI/Bharat QR Code towards the following transactions.

भुगतान विवरण/Paymode Details :

भुगतान मोड का नाम/Paymode Name : EFT/UPI/Bharat QR Code	
संदर्भ सं./Ref No : NEFTINW0213904241	संदर्भ तिथि/Ref Date : 21/05/2020
बैंक का नाम (यदि कोई हो)/Bank Name(If any) : State Bank of India	बैंक शाखा (यदि कोई हो)/Bank Branch(If any) : SBI-Jorhat - A T Road

क्र. सं./ S. No	विभाग/ Dept / लेन-देन कोड/ Tr Cd	पॉलिसी/ एंडोर्समेंट Policy/Endorsement वर्ष/ Year	संख्या/ Number	व्यव. स्रोत कोड/ Biz Source Code / विक्रय चैनेल/ Sales Channel	व्यव.का वर्ग/ विवरण / Class of Business/Narration / लेखा विवरण/ Account Description	राशि रू./ Amount Rs.
1	41	2020	200800412010000002	015572	Employees Compensation Insurance	
	11			9000144851	Direct Premium	38,932.00
					CGST	3,504.00
					SGST	3,504.00
					Total	45,940.00

रोकड़िया/Cashier :

कृते नेशनल इन्श्योरेन्स कं. लि./For National Insurance Co. Ltd.
NATIONAL INSURANCE CO. LTD.

प्राधिकृत हस्ताक्षरकर्ता/Authorised Signatory
Sr. Divisional Manager

चेक द्वारा भुगतान किए जाने की स्थिति में रसीद चेक द्वारा भुगतान की प्राप्ति के बाद ही जारी किया जाएगा। सभी पत्राचारों में उपरोक्त वर्णित पॉलिसी जारी करनेवाले कार्यालय के पते पर दस्तावेज संख्या व पॉलिसी का वर्ष तथा संख्या उद्धृत किया जाना चाहिए। जब राशि 5000/- रूपए या उससे अधिक होगी तो राजस्व टिकट चिपकाया जाना आवश्यक होगा।

Receipt is subject to realisation of cheque when payment is made by cheque. Our document number and Date, Policy year and number should be quoted in all correspondence with us only to the Policy issuing office address mentioned above. Revenue stamp has to be affixed when the amount is of above Rs. 5000.

ANNEXURE IX

Public Consultation

Annexure IX

Details of Public Consultations


132 kV D/C Imphal (PG) – Ningthoukhong Line


132/33 kV Ningthoukhong Sub-station


132/33 kV Gamphajol Sub-station


LILO of Yurembam (Imphal-State) – Karong at Gamphajol

33/11 kV Kwakta Sub-station

33 kV Nambol - Leimapokpam Line

Photographs of Public Consultation held on 11th Nov., 2014 at Ningthoukhong


"PUBLIC MEETING"
11/11/2014 10:57


"MANIPUR STATE POWER COMPANY LIMITED"
PUBLIC MEETING"
b:-Construction of Transmission Lines under WORLD BANK assistance
11/11/2014 11:04

Attendance Sheet

Serial no.	Name	Father's name	Address	Age	Signature
1.	L. Naocha Gil	L. Bormingol Gil	Leimiram W5	25	L. Naocha
2.	M. Engocha Singh	M. Lukhoi Singh	Lleriousok W1	36	M. Ingocha
3.	M. Robi Singh	Late M Kulla Singh	Heirokok-a	42	M. Robi Singh
4.	Th. Sanatomba Singh	Th. Yumsnaogbi Devi	Heirok W2	36	Th. Sanatomba
5.	Th. Ibochouba Singh	Th. Yaima Singh	Heirok W2	40	Th. Ibochouba Singh
6.	Th Okchonu Rabi Singh	Th. Imo Singh	Ningthoukhong W4	35	TH. Rabi Singha
7.	A. Inaocha Singh	A. Irouthoiba Singh	Ningthoukhong W1	38	A. Inaocha Singh
8.	T. Boleison Singh	T Kesow Singh	Bishnupur W11	30	T. Boleison
9.	L. Risikanta Singh	L. (L) Gopen Singh	Bishnupur W-9	29	L. Risikanta
10.	N. Dipo Singh	N. Nillamani Singh	Bishnupur W-12	26	N. Dipo Singh
11.	R.K(O) Tombisana Devi	R.K. Sobachandra Singh	Ningthoukhong-12	51	R.K(O) Tombisana
12.	R.K.(O) Prema Devi	R.K. Ranjit Singh	Ningthoukhong-11	48	R.K Prema
13.	S. Memshakhi Devi	S.(L) Jatiswar Singh	Ningthoukhong-3	60	S. Memshakhi
14.	S. Jawambi Singh	S. Khera	Phonjeng Makha		S. Jawambi Singh
15.	Ch. Nabakumar Singh	(L) Kanlai	Moirang Mamang		Ch. Nabakumar
16.	S. Romesh Singh	(L) S. Nimaichand	Khejiri Mamang		S. Romesh Singh
17.	S. Dinter Singh	S Gopal Singh	Koirou		S. Winter Singh
18.	Ng. Birahari Singh	Ng Abung Kabi			Ng. Birahari

Attendance Sheet.

	Name	Sign.
(1)	N. G. Sarat Singh - E.D - MSPCL	
(2)	N. Bijit Singh - GM. MSPCL	
(3)	H. Shanti Kumar Singh - DGM. MSPCL	
(4)	S. Chandradhaja Singh - DGM. MSPCL	
(5)	A. Shanti Keshwar Sharma - DGM - MSPCL	
(6)	Ty. Gokul Singh - DGM - TCD(2)	
(7)	Ty. Kamini mohan Singh - DGM - TCD(1)	
~~(8)~~	~~M. Budhachandra Sharma DGM SSD(I)~~	
(8)	M. Budha Chandra Sharma DGM SSD-II	
(9)	H. R. Choudhury Chief Manager PGCIL	Recording.
(10)	Raktim Konwar Executive Trainee PGCIL.	Raktim Konwar.

OFFICE OF THE EXECUTIVE DIRECTOR (TECH)
MANIPUR STATE POWER COMPANY LIMITED (MSPCL): GOVT. OF MANIPUR
IMPHAL : 795001

Minutes / proceedings of Public consultation held on 11th November, 2014 at Ningthoukhong, Bishnupur District, Manipur under North Eastern Region Power System Improvement Project (NERPSIP) in Manipur

Subject - ***Construction of 132 KV D/C IMPHAL – NINGTHOUKHONG Transmission Line and associated 33 KV distribution lines under the scope of NERPSIP in Manipur.***

Annexure – Signatures of members of the Village council / general public and officials of MSPCL, Govt. of Manipur and Power Grid Corporation of India Limited (PGCIL) who attended the meeting. *(Photographs of the public meeting is also enclosed)*

Venue of the Meeting: - 132 KV NINGTHOUKHONG S/S (MSPCL OWNED)

The Dy. General Manager (S/s), MSPCL welcomed all the representatives of village council, general public and officials who had spare their valuable time to attend the hearing.

Thereafter, the Executive Director (Tech) MSPCL, gave a brief account about the North Eastern Region Power System Improvement Project (NERPSIP) and informed that the project will be funded jointly by Govt. of India and the World Bank. He explained the detail scope to be covered under NERPSIP for Manipur He informed that a 132 KV D/C transmission line connecting 400 KV IMPHAL (PGCIL) S/s to 132 KV NINGTHOUKHONG S/s (State Owned) is proposed to be constructed under the scheme for strengthening the existing transmission network. He also informed that various associated 33 KV distribution lines will also be constructed connecting proposed 33 KV Prompat, Takyel, Pishum (GIS), Hiyangthang, Usoipokpi, Sanjenbam, Chandel, Thangal, Thoubal, Andro, Kwakta, Leimaopokpam S/s for strengthening the existing distribution network and to ensure that the common public are directly benefited by the Project. He also informed that care will be taken to construct the line in such way as to avoid human habitat, but in case it is unavoidable, sufficient compensation will be paid by PGCIL as per State Government Assessment for which adequate provision has

been kept in the project cost. He sought the co-operation of all the public to make this project successful.

Since most of the public attending the meeting belong to Meitai Community, therefore all the deliberations were made in Manipuri Meitai language.

The public enquired various issues regarding compensation to be paid, final route of the line vis-à-vis affected persons, need for further consultation with the villagers etc.

In this regard, the Executive Director, other Senior Officials of MSPCL and POWERGRID representative explained that at present only a tentative route is identified for the line. However, a detail survey/check survey will be carried out before construction and accordingly each and every affected landowner / person will be identified for assessment of compensation. The compensation will be paid at par with Govt. rate after joint survey of the damages. It was also explained that every care will be taken to avoid any human habitation during final survey of the line and in case if it cannot be avoided the damages caused to the public will be adequately compensated.

In conclusion, the public has unanimously agreed that the construction of the transmission line and sub-stations and associated distribution lines is for the sole benefit of the State and the public, provided care should be taken to inflict minimum damage to crops, forests and any structure during construction.

The hearing concluded with the vote of thanks from the Dy. General Manager (S/s), MSPCL and also assured that all stake holder will be taken into confident during the construction.

MANIPUR STATE POWER COMPANY LIMITED (MSPCL):

OFFICE OF THE EXECUTIVE DIRECTOR (TECH)
MANIPUR STATE POWER COMPANY LIMITED (MSPCL): GOVT. OF MANIPUR
IMPHAL : 795001

North Eastern Region Power System Improvement Project(NERPSIP) গী মথাদা মণিপুরদা পাইখতকদবা থবক থৌরমশিংগী মতাংদা লিংথৌখোংদা নভেম্বরগী তাং ১১ দা পাংথোকখিবা মীয়ামগা থন্ন-লৈন্নবগী থৌরম অমদা থন্নখিবা ৱাফমশীং।

থন্নখিবা ৱাফম: NERPSIP গী মথাদা পাইখৎকদবা 400KV সব-স্তেসন (PGCIL) দগী লিংথৌখোংফাওবা তিংগদবা 132KV ট্রান্সমিসণ্ লাইন অমদি অসিগা লোইলবা 33KV দিস্ত্রিবিউসন্ লাইনশীং।

এন্নেক্সর: মীতিং অদুদা শরুক য়াখিবা Village Council গী মেম্বরশীং,মীয়ামগী মায়কৈদগী লাকপা মীহৎশীং, MSPCL অমদি PGCIL গী ওফফিসিয়েলশীংগী সহি য়াওবা চেশীং (মীতিং চখরিউদা লৌবা ফোটশীং)।

মক্ষম: MSPCLগী 132kv লিংথৌখোং সব-স্তেশন।

Dy. General Manager সব-স্তেশন লিংথৌখোং, MSPCL না মীতিং অদুদা মশাগী মতম কাইখোকুলা শরুক য়াবা লাকখিবা Village Council গী মেম্বরশীং,মীয়ামগী মায়কৈদগী লাকপা মীহৎশীং, MSPCL অমদি PGCIL গী ওফফিসিয়েলশীংবু তন্নাল্লা ওকখি।

মতুং তালা Executive Director(Tech),MSPCL না North Eastern Region Power System Improvement Project(NERPSIP)কি মতাংদা শল্লল্লা হাইখি অমদি মসিগী শেনফম তারত য়কার অমদি ৱর্ল বেঙ্কনা থুংশ্মল্লা পুথোঙদবনি হায়না ফোংদোকখি। মণিপুরদা NERPSIPকী মথাদা পায়থৎকদবা থবকশীংগী মতাংদা শন্দোকনা থংহনখি।হৌজিক পায়থৎকনি থন্নরিবা 400KV সব-স্তেসন (PGCIL) দগী লিংথৌখোংফাওবা তিংগদবা 132KV ট্রান্সমিসণ্ লাইন অসি লৈরিবা ট্রান্সমিসন্গী ফিতম ফগংহলবনবগী শরুক অমনি। মসিগা লোয়নগদবা 33kv লাইনশিং পায়থত্না 33kv পোরোম্পাৎ,তাকয়েল,সিশুম (GIS),হিয়াংথাং,ঊষয়পোকপী,যণজেনবম,চাওেল,থঙ্গাল,থৌবাল,অংগ্রো, ক্বাক্টা, লৈমপোকপম সব-স্তেশনশীংগা শন্নহলগা দিস্ত্রিবিউসনগী ফীতম ফগংহলগনি হায়নগু ফোংদোকখি। লাইনশিং অসি তিংদা য়ারিবমখৈ মীয়াম তাবা মক্ষম খৈদোকলবা হোৎলগনি অদুবু তঙাইফদবা লৈরগদি স্তেত সরকারনা লেপ্পগা মতিক চাবা স্কেটিপুরণ PGCIL না পীগনি মসিগী ওকলবা শেনফম থাকুলা থন্নে হায়পসু ফোংদোকখি। পায়থৎলকলিবা থবকশিং অসি মায় পাকনা লোইশিলবা ঙয়বা মীয়াল্লা মতেং পাংবিলবসু হায়জখি।

মীতিং অদুদা শরুক য়াখিবা মীওইশীং মৈতৈলা অয়াম্বা অইবনা মীতিং অদু মৈতৈলোন্দা অসুম পাংথোকখি।

স্কেটিপুরণগী মতাং , লাইনশিং অসি পুদুনা চংকদবা চপচাবা মফমশিং, মসিনা শোক্কদবা মীওইশীংগী মতাংদা মীয়ামগী মরক্তগী থংনিংবগা লোইননা মথা তানা মরি লৈলবা খুঙ্গাশীংগা খল্ল লৈলবা মথৌ ভাগনি হায়বা ফোংদোকনরকখি।

ব্রাফমসিগী মতাংদা Executive Director, শকলাইরবা MSPCL অমদি PGCIL গী ওফফিসিয়েলশীংনা খঙহল্লকখি মদুদিঃ হৌজিক হৌজিক্কি ওইনদি লাইনশিং পুদুনা চংকদবা মনফমশীং শরকী ওইরি অদুবু খবকশীং পায়খত্রিঙৈগী মাংওইননা ডিটইল-সের্ব/চেক-সের্ব তৌদুনা শোক্কদবা মফমশীং অমদি মীওইশীংগী তাংদাংবা অম থংদোক্কনি। মাং তাকপা খোক্কদবশীং অদু মরি লৈলবা খুঙ্গাশীংগা পুন্না থংদোক্কীন্নরগা সরকারগী চংনবী মতুং ঈন্না স্কেটিপুরণ পীথোক্কনি। মখক্তা হায়খিবাওন্না, য়ারিবমখৈ মীয়াম তাবা মফম খৈদোকলবা হোংলগনি অদুবু তঙাইফদবা লৈরগদি অমাং অতা খোকপশীং অদুগী মতিক চাবা স্কেটিপুরণ পীথোক্কনি।

অরোইবদা, পায়খংলকদৌরিবা ট্রান্সমিসণ্ লাইন অমদি সব-স্তেশনশীংগী খবকসিনা য়ারিবমখৈ মীয়ামগী মহৈ-মরোং, উ-ব্রা অমদি অতৈ মরল-মখুম শোকহনবীদ্রগদী মীয়ামদা হকখেংননা খুদোংচাবা,কান্নবা ফংহলগনি হায়বা পুন্না ভাব তামিন্নখি। (MSPCL)

হকখেংননা নত্রগা নাকোইননা মরি লৈন্নবা মওই খুদিংমক্কি খাজবা মাংহন্দনা হায়রিবা খবকশীং অসি পায়খংকনি হায়বা ব্রাফম খল্লদুনা Dy. General Manager সব-স্তেশন (MSPCL) না তিল্লিবা মীয়াম্বু খাগংপা ফোংদোন্নগা লোইননা মীয়ামগা খল্ল-লৈন্নবগী খৌন্নম অদু লোইশিনখি।

MANIPUR STATE POWER COMPANY LIMITED (MSPCL):

MAPS

132/33 kV Imphal (PG) Substation (Extension)

33/11 kV Mongsangei Substation (Extension)

33/11 kV Nambol Substation (Augmentation)

33/11 kV Hiyanthang Substation (New)

33/11 kV Leimapokpam Substation (New)

33/11 kV Khwairakpam Substation (Augmentation)

132/33 kV Ningthoukhong Substation (Extension)

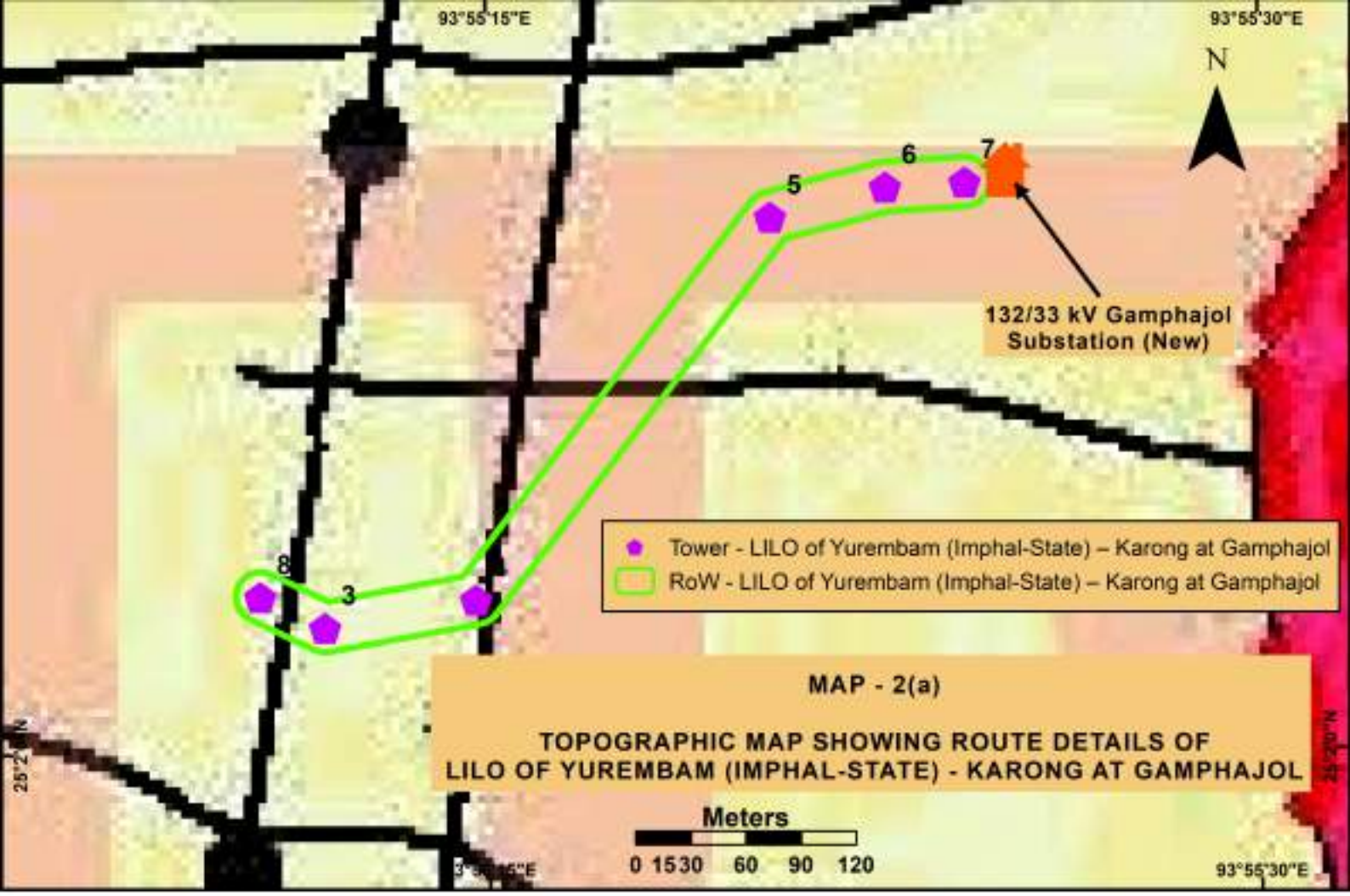
33/11 kV Ningthoukhong Substation (Augmentation)

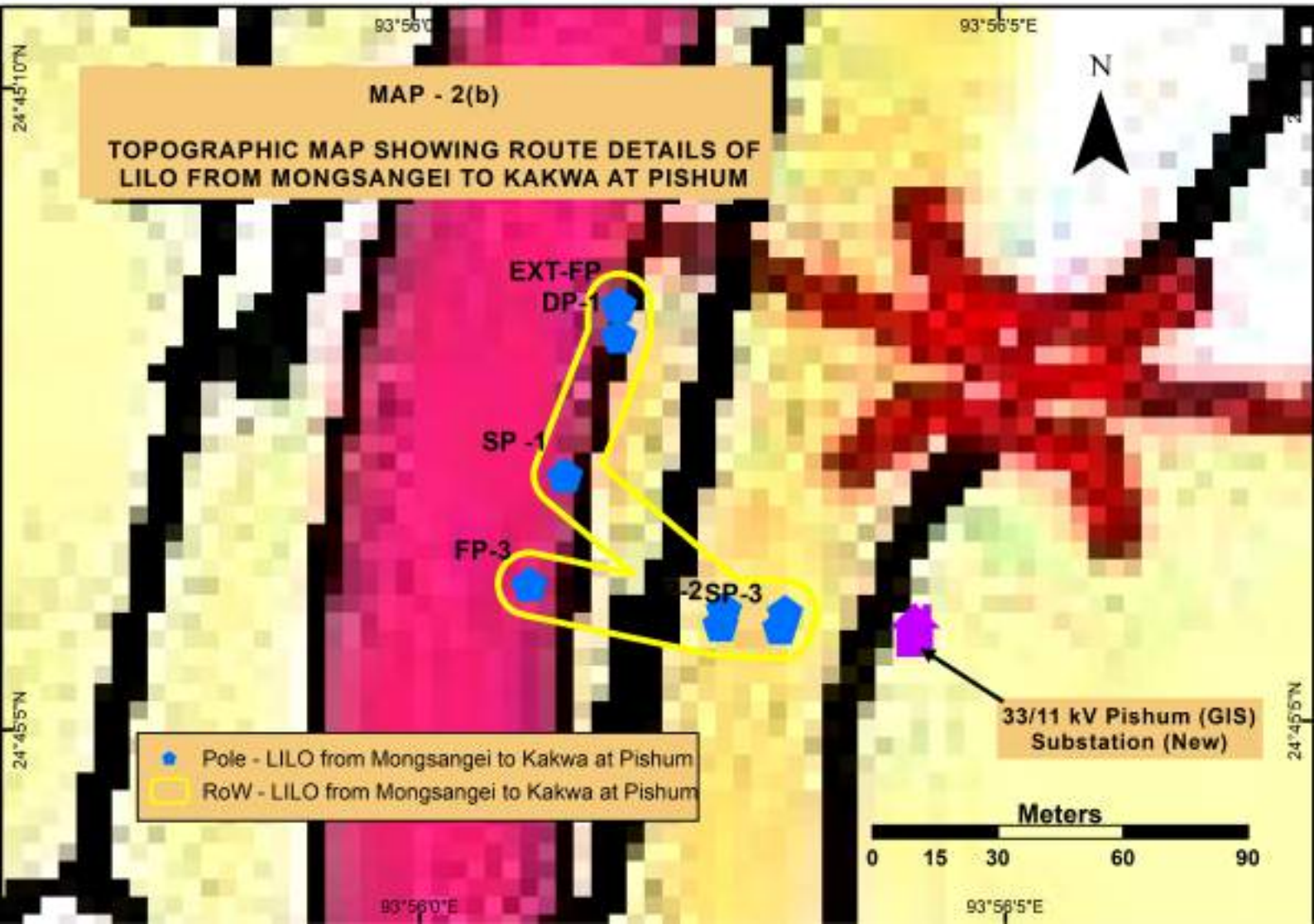
MAP - 1

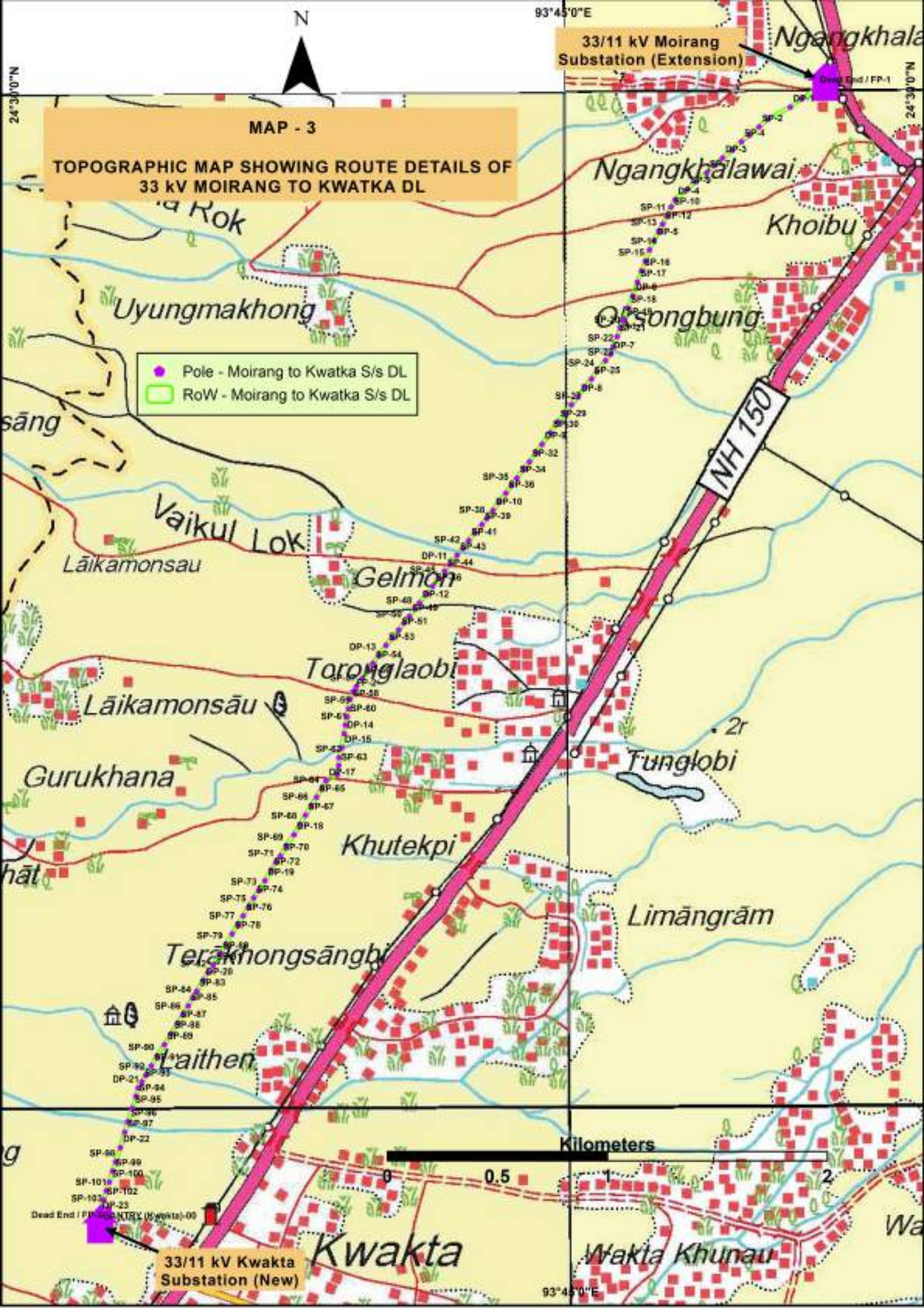
TOPOGRAPHIC MAP SHOWING ROUTE DETAILS OF 132 kV D/C IMPHAL(PG) - NINGTHOUKHONG TL 33 kV MONGSANGEI - HIYANTHANG DL AND 33 kV NAMBOL - LEIMAPOKPAM DL

- Poles 33 kV Nambol to Leimapokpam DL
- Poles 33 kV Mongsangei to Hiyanthang DL
- Tower 132 kV Imphal (PG) – Ningthoukhong TL
- RoW 33 kV Nambol to Leimapokpam DL
- RoW - 33 kV Mongsangei to Hiyanthang DL
- RoW - 132 kV Imphal (PG) – Ningthoukhong TL

Kilometers 0 1 2 4 6


93°55'15"E
93°55'30"E
N
6
7
5
132/33 kV Gamphajol Substation (New)
8
3
Tower - LILO of Yurembam (Imphal-State) – Karong at Gamphajol
RoW - LILO of Yurembam (Imphal-State) – Karong at Gamphajol
MAP - 2(a)
TOPOGRAPHIC MAP SHOWING ROUTE DETAILS OF LILO OF YUREMBAM (IMPHAL-STATE) - KARONG AT GAMPHAJOL
Meters
0 15 30 60 90 120
93°55'30"E


93°56'0"E
93°56'5"E
N
MAP - 2(b)
TOPOGRAPHIC MAP SHOWING ROUTE DETAILS OF LILO FROM MONGSANGEI TO KAKWA AT PISHUM
EXT-FP
DP-1
SP -1
FP-3
-2SP-3
33/11 kV Pishum (GIS) Substation (New)
Pole - LILO from Mongsangei to Kakwa at Pishum
RoW - LILO from Mongsangei to Kakwa at Pishum
Meters
0 15 30 60 90
93°56'0"E
93°56'5"E


N
MAP - 3
TOPOGRAPHIC MAP SHOWING ROUTE DETAILS OF
33 kV MOIRANG TO KWATKA DL
33/11 kV Moirang
Substation (Extension)
33/11 kV Kwakta
Substation (New)
Pole - Moirang to Kwatka S/s DL
RoW - Moirang to Kwatka S/s DL
NH 150
Ngangkhalawai
Khoibu
Oksongbung
Uyungmakhong
Vaikul Lok
Lāikamonsau
Gelmon
Toronglaobi
Lāikamonsāu
Gurukhana
Khutekpi
Tunglobi
Limāngrām
Laithen
Kwakta
Wakta Khunau
Kilometers
0
0.5
1
2
93°45'0"E
24°30'0"N