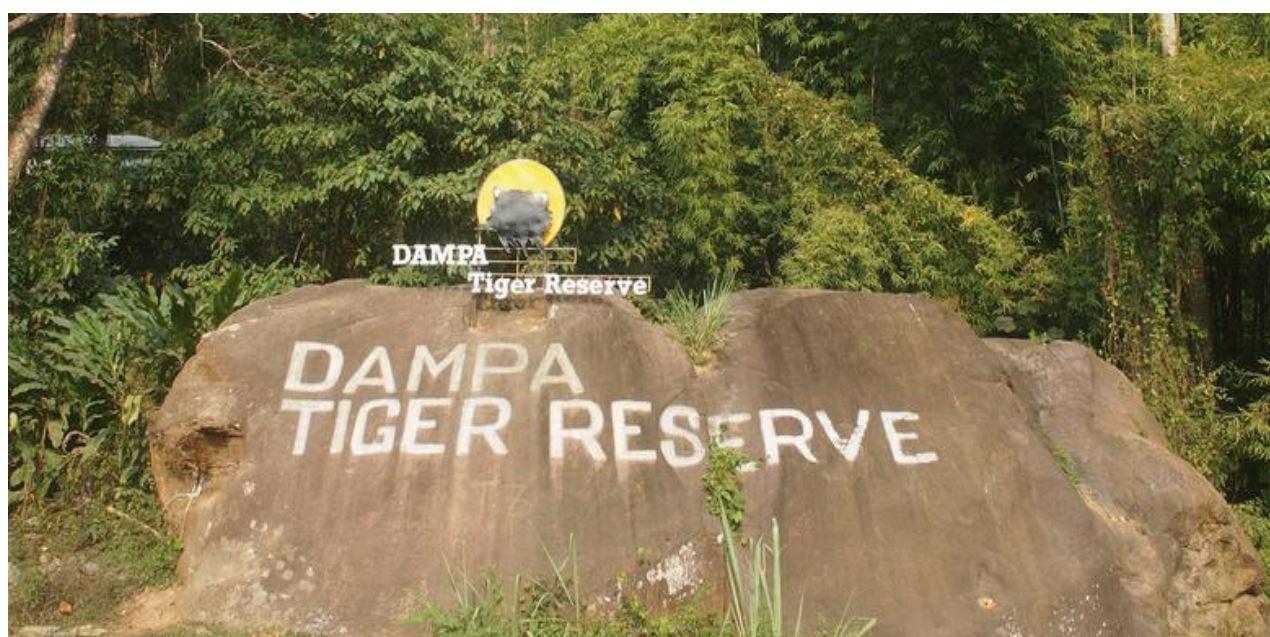


“WILDLIFE MITIGATION PLAN”

FOR

132 KV WEST PHAILENG-MARPARA TRANSMISSION LINE PASSING
THROUGH BUFFER ZONE OF DAMPA TIGER RESERVE

(UNDER NORTH EASTERN REGION POWER SYSSYTEM IMPROVEMENT PROJECT IN THE STATE OF MIZORAM)



PKG	:- MIZ-SS-02
OWNER	:- POWER AND ELECTRICITY DEPARTMENT MIZORAM
IMPLEMENTING AGENCY	:- Power Grid Corporation of India Limited

CONTENTS

Description	Pages Nos
Chapter-I :- Introduction	
1.0 Project Background	
1.1 Justification & benefit of the project	
1.2 Details of the proposed transmission sub-project	
1.3 Requirement of Wildlife clearance	
Chapter-II :- Description of the protected area & likely impact of project	
2.0 DAMPA Tiger Reserve & buffer zone	
2.1 Major Habitat, Flora & fauna	
2.2 Major activities involved in the T/L project	
2.3 Likely impact of the project on buffer zone	
Chapter-III :- Proposed wildlife mitigation measures	
3.0 Safeguard of wildlife passage at some places	
3.1 Safeguard against bird electrocution/collision	
3.2 Safeguard of accidental fallings of animals in excavated pits for tower foundation	
3.3 132 kV Tower anti-climbing devices	
3.4 General mitigation measures	
Chapter-IV :- Conclusion	
Chapter-V :- Annexures	

SECTION –I: INTRODUCTION

1.0 PROJECT BACKGROUND:-

The North Eastern Region (NER) in India is endowed with rich energy resources but faces significant bottlenecks in electricity access and availability levels. The per capita power consumption in NER is one-third of the national average. No significant generation capacity has been added between 2004 and 2011 as a result of which inadequate power supply remains a critical constraint to sustainable growth and speeding up of private investment and economic competitiveness in the NER.

The road-map for development of power sector specifying the need for strengthening of overall Transmission, Sub-transmission and Distribution system of NER and Sikkim was brought out in the Pasighat Proclamation on Power released during the first Sectoral Summit of North Eastern Council at Pasighat in Arunachal Pradesh in January 2017.

Pursuant to recommendations of Pasighat summit, a Sub-Group was constituted under the Chairmanship of Member (Power System), Central Electricity Authority (CEA) on Transmission, Sub-transmission and Distribution related issues in North Eastern Region. Accordingly, a comprehensive scheme for strengthening of transmission, sub-transmission and distribution system was evolved by CEA in consultation with POWERGRID and States of North Eastern Region and Sikkim.

Under the subject project, implementation of the scheme in 6 states of NER viz. Assam, Meghalaya, Tripura, Mizoram, Manipur and Nagaland was envisaged through funding from World Bank / Govt. of India in three tranches. Accordingly, priority transmission, sub-transmission and distribution schemes to be taken up under tranche-1 of the World Bank fund has been finalized by CEA in consultation with the state and POWERGRID.

1.1 JUSTIFICATION & BENEFIT OF THE PROJECT:-

In order to visualize the infrastructure requirements of the state, it would be appropriate to know about the geo-climatic peculiarity of the state of Mizoram. Being thinnest in its population density of 13 persons per square KM, the area is covered with dense forest and hilly terrain. About 89 % of area of Mizoram is mountainous being criss-crossed by rivers & river systems making the logistic of the state so difficult that providing infrastructure of this state is the single most challenge to the state. The villages, towns and human concentration of the area are scattered over 84000 square KM making the distance between the villages and the towns longest in the country. The yardstick followed elsewhere in the country, therefore, does not fit into the state of Mizoram, because of these peculiarities.

After conceiving the idea of strengthening the Transmission and Sub-Transmission systems in the region, new developments have taken place Under RGGVY scheme, extensive and intensive electrification has been carried out electrifying virgin villages extending the distribution systems to every nook and corner of the state. Moreover, some sub-transmissions projects also were taken up by the state in the last 5-6 years. Therefore, implementation of this project will create a reliable state power grid and improve its connectivity to the upcoming load centers, and thus extend the benefits of the grid connected power to all the consumers. The project would also provide the required grid connectivity to such villages and towns of the States, where development of distribution system at the downstream level has been taking place under Govt. of India sponsored RGGVY/APDRP/R-APDRP schemes. This project is a major step towards meeting the national objective of affordable 24 X 7 "Power to All" through enhancement in access of consumers to grid connected power supply through improving its availability and reliability, thereby facilitating inclusive growth. This shall also increase the per capita power consumption of these States, which is lagging behind the average national consumption and shall contribute to the economic development of the North-Eastern Region.

The project will give impetus to the inclusive growth by enhancing the consumers' access to reliable and affordable grid and also this ***project further supplies power to the Indo- Bangladesh border fencing project and other security related works which are involved in building up national security and it has national importance.*** The project will also facilitate in development of small scale/cottage industries/tourism in the region and boost economic growth by enabling supply of quality power.

Further, this project will give impetus to integration of upcoming Hydro Power Generating Plants in Mizoram with the National Grid and will facilitate lying of optical fiber on existing lines to help extending communication facility to the existing substations, small towns/villages and also improves the power system performance.

1.2 DETAILS OF THE PROPOSED TRANSMISSION SUB-PROJECT:-

The **proposed 132kV S/C (on D/C tower) West Phaileng to Marpara Transmission line** is a sub-project conceived under the banner of “NERPSIP for Strengthening of Transmission & Distribution System in Mizoram ” located in Mamit district of the State. A route map showing the proposed transmission Line in SOI Topo sheet is enclosed as **Annexure-I**

The proposed transmission line will connect two (2) Sub-stations namely 132/33 kV West Phaileng and 132/33 kV Marpara. Power supply is going to be utilized for **Indo-Bangladesh border fencing and other security utilities in around Marpara which are important for the national security and shall not be compromised.** Therefore upon construction of the proposed line, major power flow will be from 132 kV West Phaileng S/s to Marpara S/s as the West Phaileng is connected with hydroelectric power stations through some other lines and therefore the proposed transmission sub-project will cater the power demand in Marpara and West Phaileng area in near future.

1.3 REQUIREMENT OF WILDLIFE CLEARANCE:-

In order to minimize impact on forest and wildlife, the route of the 132 kV West Phaileng – Marpara T/L is proposed along the road from West Phaileng to Phuldungsei and last at the Tower location at AP 129/0. This will enable transportation of construction equipment/tower materials through the road and also facilitate the operation and maintenance of the line in future. The proposed route is the shortest and the most feasible route from all aspects which has been selected among all the alternatives routes explored during detail survey.

However, a portion of the route has to pass through **Buffer zone of DAMPA Tiger Reserve**(i.e. part of DTR) since both the connecting 132 kV Sub-stations are located on either side of the buffer zone. The avoidance of the buffer zone is entirely not possible due to the physical & complex terrain of the area.

Since, development projects in Tiger reserve area attract provisions of Wildlife Conservation Act, 1972 and require prior wildlife clearance, therefore, it is mooted to apply for wildlife clearance for the proposed 132 kV West Phaileng - Marpara transmission Line as per the provision of the Act. The technical details of the proposed route & status of forest/wildlife clearances are states as below:

Name of project for which WL clearance is required	Construction of 132 kV S/C (on D/C tower) West Phaileng (DAMPA TIGER RESERVE) to Marpara Transmission line under NERPSIP, MIZORAM.
Total Line Length	50.292 Km
Details of wildlife area involved	Buffer Zone of DAMPA Tiger Reserve (i.e. part of DTR)
Total no of towers to be erected in WL area	129 Nos

Total wildlife area involved	104.77 Ha
Present Status of WL proposal	Presently the proposal is under examination with Director (DAMPA)
Present Status of Forest proposal	Submitted online on 03.04.2019. Presently under process at Nodal Office.
Likely impact of the project on protected area (PA)	The overall impact of the project on protected area (PA) i.e. buffer zone of DAMPA Tiger Reserve is assessed as minimum which can be addressed through proper mitigation measures as recommended.

SECTION-II: DETAILS OF PROTECTED AREA

2.0 DAMPA TIGER RESERVE AND BUFFER ZONE

DAMPA Tiger Reserve is located in the western part of Mizoram, in Mamit District. It is surrounded by Chittorgarh hill tracts of Bangladesh to the west, Tripura State, Mamit and Kawrthah forest divisions to the north, and Mamit Forest division to the south and east. The area lies in the Lushai hills, a series of parallel mountain ranges allied to Arahhan yoma arec. Dampa Tiger Reserve lies between 92°16'08" E to 92°27'41" E and 23°18'27" N to 23°43'50" N. The Tropic of cancer passes through Dampa Tiger Reserve near the range office at Phuldungsei.

The riverine area towards the east and west of DAMPA, along the Khawthland Tuipui (also known as Szalui or the Tui-Iianpui river towards west and the Teirei river towards east) was detected as Reserved Forest in 1952. Beginning in the early 1960s, small hamlets began to be established in DAMPA for intensive cultivation in the lower reaches, which had a detrimental effect on the biodiversity of the area. DAMPA was declared a Wildlife Sanctuary in 1974 and re-notified in 1985 with a view to conserve the fast deteriorating natural wealth. DAMPA was declared as a Tiger Reserve vide Government of Mizoram Gazette notification No. B-11011/14/90-FST, on 7th December 1994, after its approval from the Government of India. The total area of Dampa Tiger Reserve is 988 km² out of which **500 km² area is core zone** or critical tiger habitat **and 488 km² area is buffer zone** is shown in figure which is attached.

Major fauna that are found in the reserve include Tiger, Leopard, Clouded Leopard, Wild Dog, Sambar, Barking Dear, Gaur, Sloth Bear, Hoolock Gibbon, Bunturon, Procupine, Slow Loris, Jungle Cat, Pangolin, Black Bear, Giant Squirrel, Common Langur, Rhesus Macaque, Wild pig and Otter. There are no records of direct sighting of tigers in the Dampa Tiger Reserve. However, there are collateral evidences such as pugmarks and scats that indicate presence of Tiger in the area. Furthermore, there is a prey-base available for the Tiger in the reserve that supports possibilities of surviving tiger population.

The main flora consists of vegetation such as *Dipterocarpus turbinatus*, *D.macrocarpus*, *Artrocarpus chalpasa*, *Adina cordinofolia*, *Duabanga sonneratiodes*, *Chukrasia tabularis*, *Amoora wallichii*, *syzygium cumini* and *Toona ciliate*. Bamboo *Bombax ceiba* and cane is also found.

Based on Champion and Seth Classification, the vegetation of Dampa Tiger Reserve can be categorized into the following forest types:

1. Tropical Evergreen and Semi Evergreen Forests
2. Tropical Moist Deciduous forests
3. Sub- Montane Type

The details of DAMPA Tiger Reserve is as below:

Date of notification as DAMPA TIGER RESERVE : 7th December 1994
Date of notification of buffer zone : 16th March 2011.

Area of the tiger reserve

Core/critical tiger habitat : 500 Sq. Km
Buffer/Peripheral area : 488 Sq. Km.
Total : **988 Sq. Km**

Location

Latitudes : 23⁰ 18' 27'' N to 23⁰ 43' 50'' N
Longitudes : 92⁰ 16' 08'' E to 92⁰ 27' 41'' E

A map showing the area of DAMPA Tiger Reserve is placed below. Map showing the proposed 132 kV West Phaileng – Marpara Transmission line passing through the buffer zone of DAMPA Tiger Reserve is also enclosed as **Annexure-II**.

2.1 MAJOR HABITAT, FLORA AND FAUNA:-

Flora:

The main vegetation type of the entire tract is Assam Valley tropical semi-evergreen forest. At places, evergreen and semi-evergreen vegetation types merge. The forests are multi-storied and rich in epiphytic flora and woody lianas. The vegetation is dense, with a high diversity and density of woody lianas and climbers. The forest has a typical layered structure and the major emergent species are *Tetrameles nudiflora*, *Ailanthus grandis* and *Altingia excelsa*. The forest types include tropical semi-evergreen forests along the lower plains and foothills dominated by *Polyalthiasimiarum*, *Pterospermum acerifolium*, *Sterculia alata*, *Stereospermum chelonoides*, *Ailanthus grandis* and *Duabang grandiflor*. The tropical semi-evergreen forests are scattered along the lower plains and foothills, dominated by *Altingia excelsa*, *Mesua ferrea*, *Dysoxylum binectariferum*, *Beilschmiedia* sp. and other middle story trees belonging to the Lauraceae and Myrtaceae. Sub-tropical broadleaved forests of the Fagaceae and Lauraceae dominate the hilltops and higher reaches. Hill slopes here are dominated by *Mesua ferrea* and *Castanopsis* spp. Moist areas near streams have a profuse growth of bamboo, cane and palms. About eight species of bamboo occur in the area. Seven commercially important cane species grow in moist areas, along with *Livistona jenkinsiana*. Along the larger perennial streams, there are shingle beds with patches of tall grassland, which give way to lowland moist forests with *Dillenia indica* and *Talauma hodgsonii*. Along the larger rivers, isolated trees of *Bombax ceiba* and two species of *Albizia* are common.

Fauna

The faunal diversity is immense and around 59 mammal species have been recorded so far out of which 16 threatened species (6 endangered and 10 vulnerable). Tiger is the charismatic mammals, besides a large array of co-predators like Leopard, Clouded leopard, Wild dog, and many more small carnivores, ungulates like Gaur, Sambar, barking deer, wild boar and other species. 296 birds species have been documented, 31 species of amphibians and 30 species of fishes have been recorded. Three large cats - the Bengal tiger, Indian leopard and clouded leopard share space with two canids – the wild dog and Asiatic jackal. Among the herbivore species, barking deer, gaur, and sambar are most commonly encountered. The commonest monkeys are the Rhesus macaque, Assamese macaque and the capped langur. In addition, DTR is home to as many as sixteen species of viverrids, weasels and mongooses. Commonly seen in pairs is the yellow-throated marten.

Notable mammals in the Dampa Tiger Reserve are: tiger, leopard, clouded leopard, jungle cat, wild dog, jackal, Himalayan black bear, binturong, gaur, sambar, hog deer, barking deer, wild boar, yellow-throated marten, Malayan giant squirrel, flying squirrel, squirrel, capped langur, rhesus macaque, Assamese macaque, gaur. The presence of stump tailed macaques has been reported by one researcher.

DAMPA Wildlife Sanctuary (i.e. the core area of DAMPA Tiger reserve) is also recognized as one of the **Important Bird areas (IBA)** in India. At least 296 bird species have been recorded from DAMPA Tiger Reserve including the globally **endangered white-winged wood duck**, the unique Ibisbill, and the rare Oriental bay owl. DTR is a good place to see **hornbills**. Roost sites of wreathed hornbills and great hornbill can be observed on the river banks. Birds seen in DAMPA Tiger Reserve include: great hornbill, wreathed hornbill, oriental pied hornbill, scarlet-backed flowerpecker, Kalij pheasant, grey peacock-pheasant, speckled piculet and white-browed piculet, bay woodpecker, greater yellowthroat, greater flameback, great barbet, blue-throated barbet, red-headed trogon, Indian cuckoo, Asian barred owl, green imperial pigeon, mountain imperial pigeon, emerald dove, crested serpent eagle, Malayan night heron, long-tailed broadbill, Asian fairy bluebird, blue-winged leafbird, golden-fronted leafbird, orange-bellied leafbird, scarlet minivet, maroon oriole, greater racket-tailed drongo, Indian paradise-flycatcher, pale-chinned blue flycatcher, blue-throated flycatcher, black-naped monarch, grey-headed canary flycatcher, white-rumped shama, slaty-backed forktail, spotted forktail, chestnut-bellied nuthatch, velvet-fronted nuthatch, black bulbul, black-crested bulbul, ashy bulbul, white-throated bulbul, slaty-bellied tesia and striated yuhina. Of the over 1500 butterfly species found in India, it is estimated that DAMPA Tiger Reserve could be home to at least 500 species.

A total of 36 reptile species and 30 amphibian species have been reported in DAMPA Tiger Reserve. The Assam roofed turtle, a highly endangered species, is commonly sighted. The king cobra is sometimes seen on the fringes of villages and is not uncommon within the park. The pied warty frog, resembling bird droppings, is also found here.

Tiger Status

As per the status of tigers in India 2016 report there is no Tiger were found in **DAMPA tiger reserve** .

Core area

In the core area, wildlife protection and management are given priority. The Forest Department provides livelihood alternatives and eco-development activities in the buffer in order to wean people away from depending on resources in the core.

Buffer area

The buffer area has been classified into two (2) zones:

1. **Eco Development Zone** which consists of human settlement areas, agriculture land, horticulture, fisheries and jhum land. The eco-development activities are implemented through participatory village level micro plans for reducing resource dependency of people living around the park. The local community ensures reciprocal commitment through respective eco-development committee. Rural development activities shall be integrated with wildlife conservation concerns.
2. **The Forested zone** consists of the 04(Four) Zones (Western Boundary, Northern Boundary, Eastern Boundary & Southern Boundary). This zone is protected with the participation of local people. Collection of timber and Non-timber forest products (NTFPs) are regulated. Human-wildlife conflict is mitigated by ensuring timely payment of ex-gratia for loss of life, livestock and crop depredation.

Corridor

The boundary starts from the point where Sailui meets Sazalui. It thence follows Sazalui upstream till it meets Belkhailui in the Western part of DAMPA Tiger Reserve. The Northern Boundary starts from the point where Belkhailui meets Sazalui till it meets Tut river in Daplui downstream. The Eastern Boundary starts from the point where Daplui meets Tut river and follows thence marlui downstream till it meets Lunghrelui. The Southern Boundary starts from the point where Lunghrelui meets Marlui till it meets Sazalui/Tuilianpui.

2.2 MAJOR ACTIVITIES INVOLVED IN THE TRANSMISSION PROJECT:-

The major construction activity envisages in the proposed transmission project are as follows:-

- ❖ Construction of Tower Foundation (An average of 7 M x 7 M tower base and activities involves excavation of soil and concreting)
- ❖ Erection of transmission towers (involves joining of tower members/lattice structure)
- ❖ Stringing of electrical conductor wires between adjacent towers.

The above activities will be carried out by engaging suitable Contractor. For tower foundation works, local gangs/manpower are usually engaged as petty Contractor and temporary makeshift camps are set nearby the construction site till completion of work. For hill areas construction of new approach road generally not encouraged & the existing village tract or jungle tract are used for head loading of tower materials. Tower erection and stringing of conductor is generally carried out by specialized gangs and temporary construction camps are also required to be set up for this purpose.

TOWER FOUNDATION:

Foundation of a transmission tower is the basic structure to support the tower in its position. It plays an important role in safety and satisfactory performance of the structure as it transmits mechanical loads of the electrical transmission system to earth. The foundations in various types of soils have to be designed to suit the soil conditions of particular type. In addition to foundations of normal towers, there are situations where considering techno-economical aspect for special towers required or river crossing which may be located either on the bank of the river or in the mid stream or both, pile foundation may be provided. The various activities involved in the foundation work are illustrated below:-



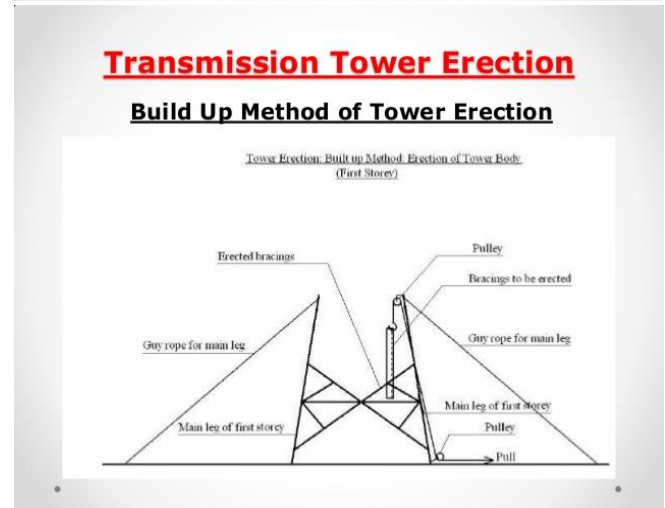
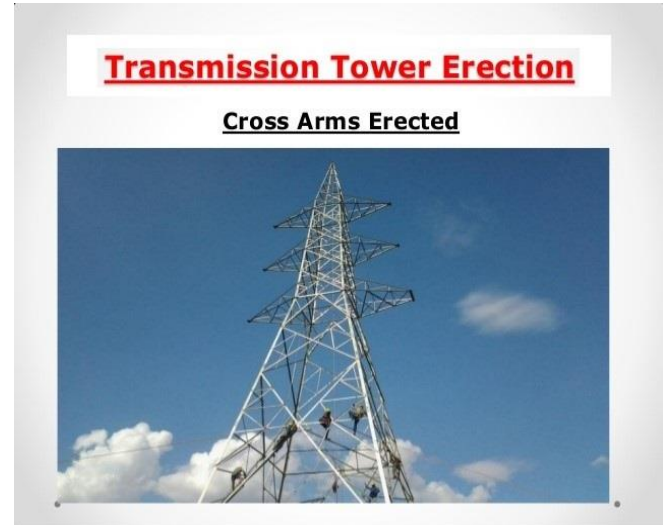
TOWER ERECTION:

There are four main methods of erection of steel transmission towers which are as below:

- ❖ Build-up method or Piecemeal method
- ❖ Section method
- ❖ Ground assembly method.
- ❖ Helicopter method.

Build Up Method of Tower Erection

- ❖ This method is most commonly used in India for the erection of 66kV, 220 kV and 400 kV transmission line towers. This method consists of erecting the towers, member by member. The tower members are kept ground serially according to erection sequence to avoid search or time loss. The erection progresses from the bottom upwards. The four main corner leg members of the first section of the tower are first erected and bolted with the stub.



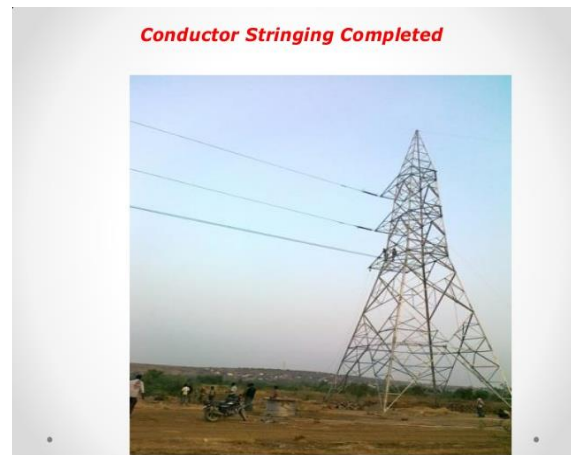
TOWER STRINGING:

- ❖ Stringing of Transmission line a process of joining and fixing of the electrical conductor wires from tower to tower and various other assemblies for transmission of electricity.
- ❖ Stringing overhead conductors in transmission is a very specialized type of construction requiring years of experience as well as equipment and tools that have been designed, tried and proven to do the work.

Steps of stringing

- Proper guying

- Insulator Hoisting
- Paying out of pilot wire & conductor
- Rough sagging of conductor
- Clipping & spacing
- Finishing activities
- Jumpering
- Final checking



2.3 LIKELY IMPACT OF THE PROJECT ON BUFFER ZONE OF DAMPA TIGER RESERVE:-

The impact on the forest and wildlife associated with power transmission project with specific reference to the proposed 132 kV Transmission Line from West Phaileng to Marpara on the buffer zone of DAMPA Tiger reserve is summarized as below:

- **HABITAT LOSS AND FRAGMENTATION:-**

Powerlines or specially powerline corridors, are known to affect many different animal groups, predominantly birds. These impacts are largely associated with fragmentation & degradation of wildlife habitats along the powerline corridor i.e. Right of Way. In case of 132 kV West Phaileng to Marpara Transmission line the RoW is considered as 27 meter,

wherein the standing trees are required to be either felled, looped/pruned as necessary for casting of tower foundation, tower erection & electrical conductor stringing. The large scale felling of trees along the line corridor might impact the nesting sites of birds as well as habitat and movement of other arboreal species like monkeys, primates etc. available in that areas.



- **ELECTROCUTION & ACCIDENTAL COLLISION OF BIRDS.**

As per available/listed data risk of electrocution of birds are mostly related to distribution/transmission lines up to 110 kV due to dimensions and spacing between two conductors, electrocution of Bird/Raptor by EHV lines of 132 kV & above is quite rare. Moreover, collision of birds are mostly reported during landing and takeoff in area close to water bodies, designated bird areas/ sanctuary having large congregation of birds or line intersecting identified bird fly or migratory paths hence bird diverter even if placed on EHV line can only be effective if it is installed in the fly path of birds. POWEGRID following its cardinal principle of avoidance take utmost care to avoid such areas while selecting the optimum line route of new transmission line.

- **INDUCED IMPACT ON WILDLIFE FROM CONSTRUCTION WORKERS.**

Construction manpower will be required for execution of the project and makeshift construction camps and will be set up at the tower foundation/erection sites as per site requirement. Generally for tower foundation works, local manpower/workers will be engaged. However, for specialized works like tower erection and stringing, migrant labourers are usually engaged. The induced impact on the wildlife of DAMPA Tiger Reserve from such construction workers is the likelihood of involvement in hunting/trafficking of wild animals and other unlawful activity during the execution of the project.

SECTION-III: PROPOSED MITIGATION MEASURES

3.0 SAFEGUARD OF WILDLIFE PASSAGE AT SOME PLACES BETWEEN AP 51 to AP 59 (Near to Saithah village):-

As per the field inspection of Director (DAMPA) at the wildlife passages & wild life area , there are 03 (three) nos. wildlife passages within Dampa Tiger Reserve buffer zone are available and at the same passages there are 09 (Nine) nos.132KV Power line towers from **AP-51 to AP-59** (near to Saithah village) are falling for which minimum ground clearance kept at tower as 13.3 mtrs but as per the advise of the director DAMPA, another 03 mtrs further clearance insisted and kept as 16.3 mtrs for safe passage of wild animals and other mammals in DAMPA WLS & Tiger Reserve. it is intimated that section of the transmission line following mitigation measures are proposed to be adopted by POWERGRID during execution of the project.

- ❖ As per Indian Electricity rule, the minimum ground clearance for 132 kV Transmission line is **6.1** meter i.e. the lower most electrical conductor wire between two adjacent towers will be stringed in such a way that the minimum height from actual ground level is always more than 6.1 meter which is sufficient for safe passage of animals and others mammals **In addition to the above, it is proposed to maintain additional clearance 3 meter over and above minimum clearance above ground from the lowest conductor of transmission line for the areas specified above .**

3.1 SAFEGUARD OF BIRDS FROM ELECTROCUTION AND ACCIDENTAL COLLISION:-

Since DAMPA Wildlife Sanctuary (i.e. the core area of DAMPA Tiger Reserve) is recognized as one of the **Important Bird areas (IBA)** in India, a having a significant population of birds including the *Arborophile atrogularis*, *Treron phayei* and *Buceros bicornis* were found in the near threatened category. Therefore, the following mitigation measures are proposed for safeguard of birds:-

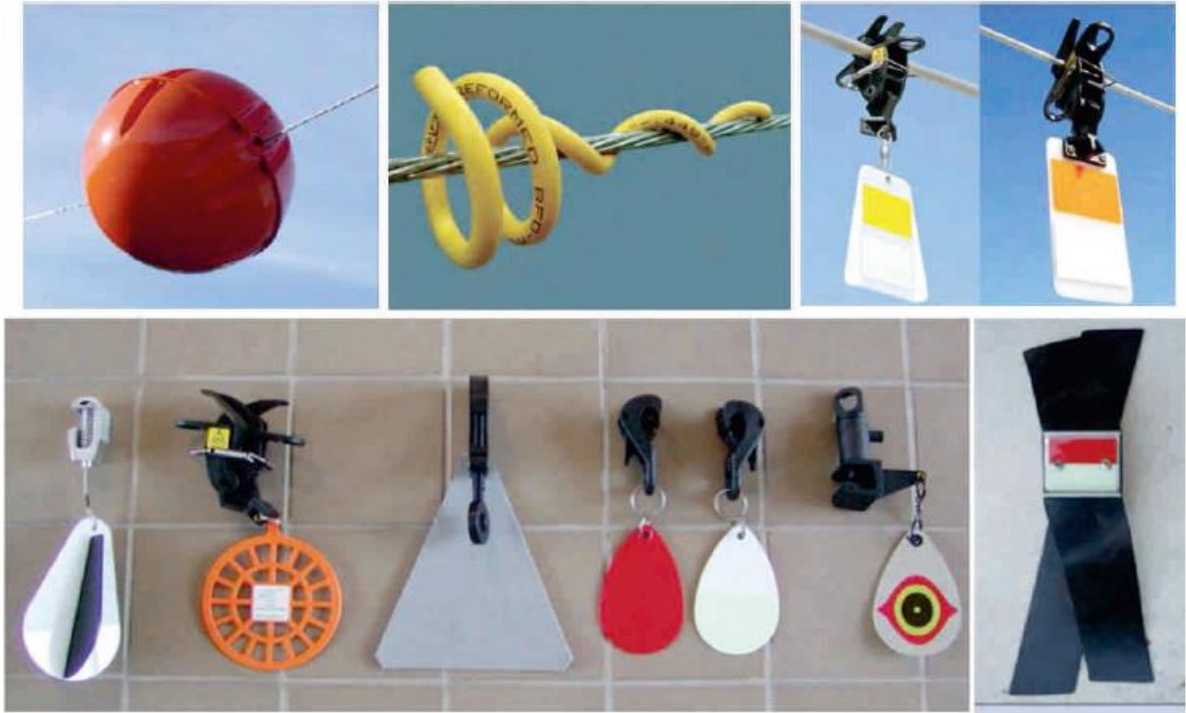
- ❖ The Stringing of conductor for the transmission line shall be carried out maintaining a separation between energized conductors as follows:

Vertical distance between two conductors : **4 m** (appx.)

The above arrangement, will nullify the likelihood of electrocution of large winged birds like hornbill, because the distance between energized conductors will be always more than the maximum wing span of the bird. *A figure showing the above arrangement is shown in Annexure-II*

- ❖ To prevent accidental collision of birds with the conductor **bird diverter/colored/contrast marker devices** will be installed on the earth wire to make it visible to birds from long distance as shown in the photographs as below **from AP 37 to AP 72 (In between Lallen to Phulbial)** where the birds are flying and taking water from water bodies/small ponds which are available in the above vicinity.

- ❖ **Bird Guard** will be provided on towers as per requirement to prevent birds from sitting in the insulator strings which may result in puncture of insulator due to defecation by birds.



3.2 SAFEGUARD OF ACCIDENTAL FALLINGS OF ANIMALS IN EXCAVATED PITS FOR TOWER FOUNDATION:-

The excavated pits shall be properly barricaded and fenced so as to prevent accidental falling of mammals in the vicinity of the construction sites

3.3 132 kV TOWER ANTI-CLIMBING DEVICES:-

❖ Many different designs of tower exist for 132 kV lines with standardisation becoming more focused in recent years. Anti- Climbing Devices (ACD's) are being used at tower four corners gates with two opening and two non-opening fenced by using barbed wire and accessories.



132kV TOWER ANTI-CLIMBING DEVICES



132kV TOWER ACD's



BARBED WIRE AND ACCESSORIES

- Line markers should be as large as possible. The spacing between them should not be more than 5 to 10 m. Marker devices should be chosen to contrast as much as possible with the background colours (Figure 12.8), and, importantly, should be visible at night: most bird collisions are said to occur at night.

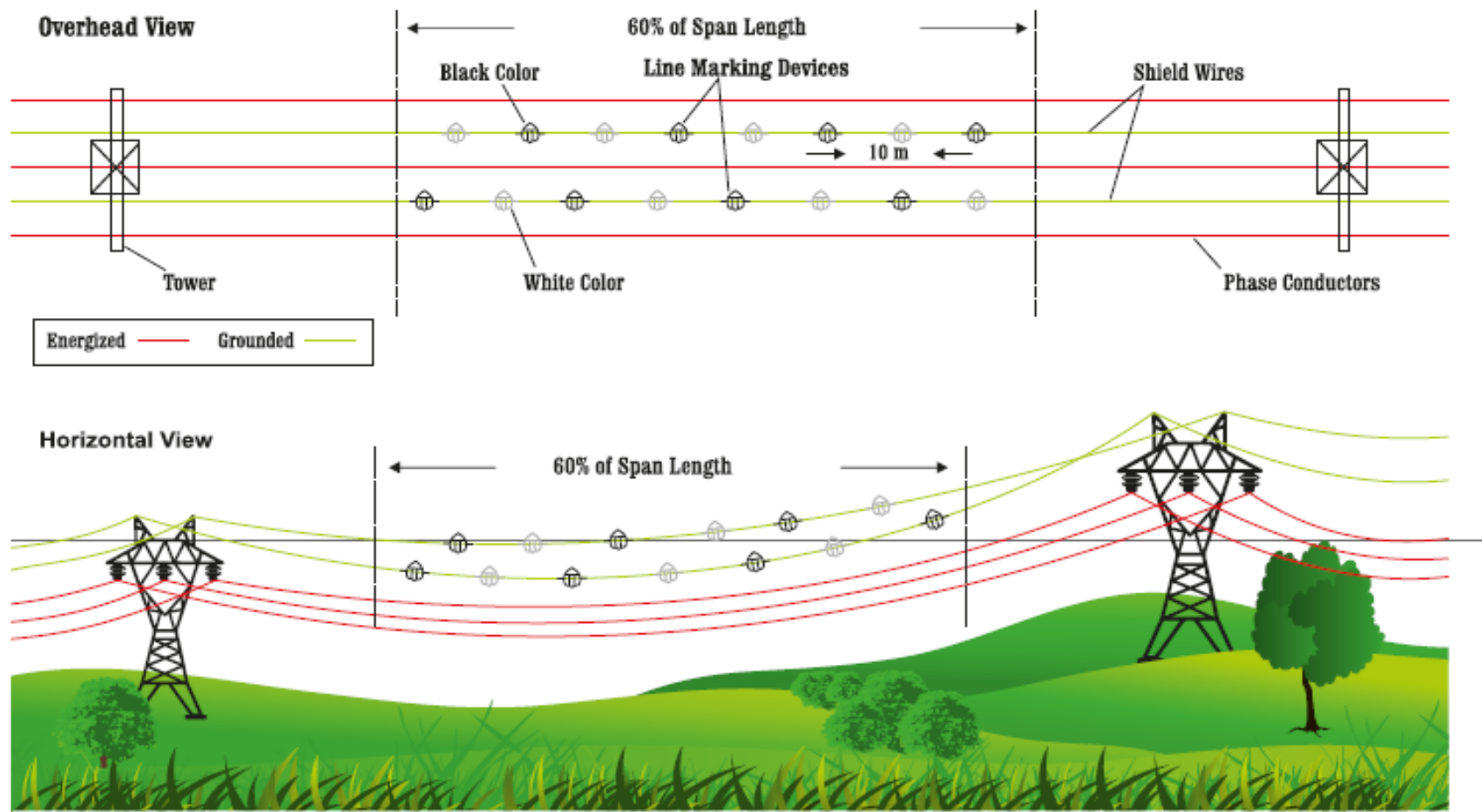


Figure 12.8. Design and configuration of markers to reduce bird collisions (after Eskom Transmission [South Africa] 2009).
 Source: APLIC 2012.

3.4 GENERAL MITIGATION MEASURES FOR PROTECTION OF FOREST AND WILDLIFE :-

In addition to the above specific measures for animals and birds, the following mitigation measures will be adopted by POWERGRID during execution of the project for protection of forest and wildlife of DAMPA tiger reserve.

- ❖ Before start of work in the DAMPA Tiger reserve (Buffer zone) awareness campaign will be taken up by POWERGRID in association with Forest Dept. to create maximum awareness among the construction workers regarding safeguard of forest and wildlife.
- ❖ No work shall be allowed at nights (i.e. between sunset & sunrise) in the forest area.
- ❖ No permanent labour camps will be set up inside the forest area.
- ❖ Tree felling will be minimized along the line corridor and only those trees which are unavoidable for tower foundation & erection will be felled under the supervision of Forest department. The guideline of MoEF dtd. 5th May, 2014 (*copy enclosed*) with regard to “*construction of transmission line in forest area*” will be strictly adhered to during execution of project.
- ❖ The trees on the remaining part of the transmission line corridor will be mostly loped and pruned which are required for stringing of conductor. In case of towers falling in hill top locations where enough ground clearance is available, tree will not be felled. This will minimize the impact on nesting sites of birds as well as habitat of arboreal species. *The tree felling pattern that will be adopted in forest area is shown in Figure -3*
- ❖ The specific and important tree species as identified by the Forest department will be marked separately and protected during the construction of the transmission line.
- ❖ To minimize the disturbance to wildlife, no new approach road will be constructed in the forest area. The existing village tracts/paths will be utilized for carrying of tower materials and also manual excavation of tower foundation will be done.
- ❖ Ecofriendly engineering practices in the construction works and due care be taken properly so as to avoid injury to wildlife.
- ❖ All pollution related aspects and waste management will be duly taken care during the implementation of the project.
- ❖ In addition to above, any other measures as envisaged by the State Board of Wildlife/national Board of Wildlife and as as per provisions of wildlife (Protection) Act, 1972 will be strictly adhered to during execution of the project by POWERGRID.

SECTION –IV: CONCLUSION

The **proposed 132 kV S/C (on D/C tower) West Phaileng to Marpara Transmission line** is a very important sub-project which is conceived by Govt. of India under the ambitious “**NORTH EASTERN REGION POWER SYSYTEM IMPROVEMENT PROJECT IN THE STATE OF MIZORAM**” located in Mamit district of the State. This project is a major step towards meeting power supply to **Indo Bangladesh Boarder fencing** and other security related establishments also the national objective of affordable 24x7 "**Power to All**" through enhancement in access of consumers to grid connected power supply through improving its availability and reliability, thereby facilitating inclusive growth of power sector of the State.

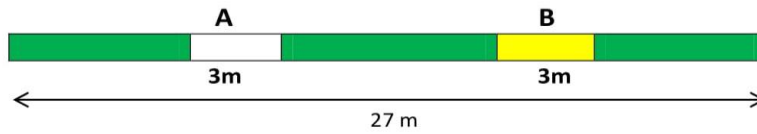
The construction of the above transmission line requires wildlife clearance since, a section of the proposed transmission line has to pass through the **Buffer zone of DAMPA Tiger Reserve** since the avoidance of the buffer zone is entirely not possible due to location of the Sub-stations and due to physical & complex terrain of the area. The EIA and environmental clearance is not required for this project since power transmission lines are kept outside the purview of EIA 2006 as per MoEF notification and considered as green project due to its pollution free nature.

Considering the importance of conservation of biodiversity and the rich wildlife habitat, flora and fauna of DAMPA Tiger reserve, it is found that there will be some temporary and permanent impact from the aforesaid transmission project on the buffer zone area. However, the User Agency and POWERGRID has made a holistic approach towards protection of the buffer zone through the principle of avoidance, minimization and mitigation in their project activity and committed for implementation of various mitigation measures for tigers, birds, monkeys etc. including general measures for overall protection of the forest and wildlife in the buffer zone of DAMPA Tiger Reserve.

Therefore, it is summarized that the overall impact on biodiversity on DAMPA Tiger Reserve (buffer zone) due to the proposed transmission project is assessed as low which can be minimized through proper mitigation measures as per guidelines.

TREE FELLING PATTERN IN FOREST FOR 132 KV S/C (ON D/C) TOWER

DURING CONSTRUCTION



Area where trees are lopped

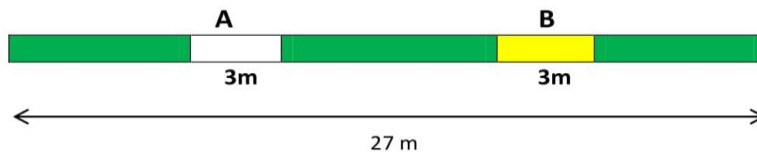


Area where trees are partially felled/ lopped (wherever required)



Future Scope

AFTER CONSTRUCTION



Area where trees are lopped



Area where trees are partially felled/ lopped (wherever required) for O&M purpose



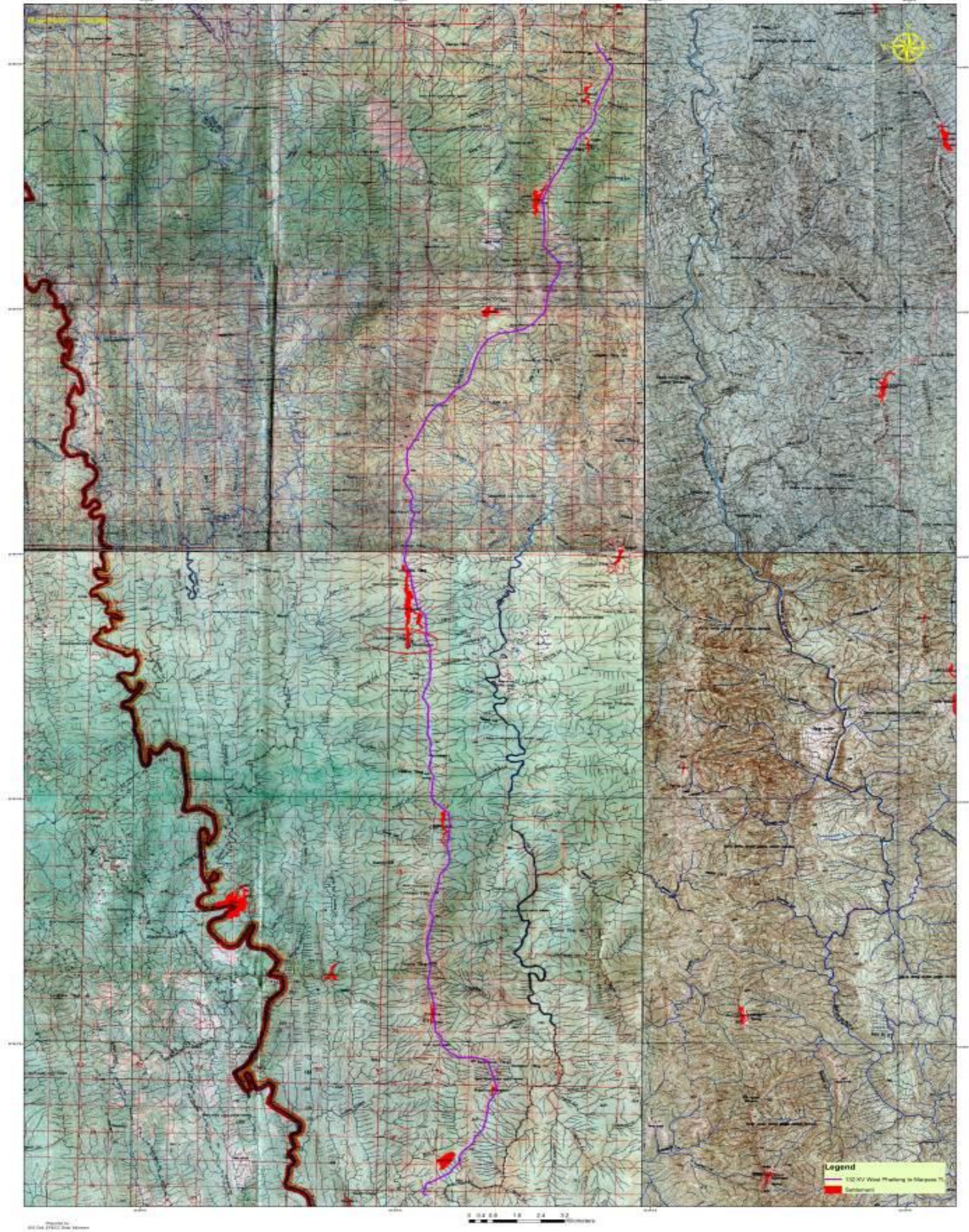
Future Scope

FIGURE-3 : TREE FELLING ARRANGEMENT IN THE PROJECT AS PER GUIDELINE OF MOEF

SECTION -V: ANNEXURES

Annexure-I

MAP SHOWING 132 KV WEST PHALENG TO MARPARA TL



Annexure-II

