

**BEFORE THE ODISHA ELECTRICITY REGULATORY COMMISSION,  
BIDYUT NIYAMAK BHAWAN.  
PLOT No-4, CHUNOKOLI, SHAILASHREE VIHAR, BHUBANESWAR-751021**

Case No: \_\_\_\_ of 2023

**IN THE MATTER OF:** Application for approval of Supplementary Capital Investment Plan for the FY 2023-24 for mitigation of low voltage issues in the Licensed Area of TP Central Odisha Distribution Ltd

**And**

**IN THE MATTER OF:** TP Central Odisha Distribution Ltd. ,Corporate Office, Power House, Unit 8, Bhubaneswar- 751 012 represented by its Chief –Regulatory & Government Affairs.

.... *Petitioner*

**IN THE MATTER OF:** M/s GRIDCO, OPTCL, SLDC , Department of Energy, Govt. of Odisha and All Concerned Stakeholders.

.... *Respondents*

**Affidavit**

I, Puneet Munjal, aged about 59 son of late Jagdish Lal Munjal residing at Bhubaneswar do hereby solemnly affirm and say as follows:

1. I am the Chief-Regulatory & Government Affairs of TP Central Odisha Distribution Ltd., the Petitioner in the above matter and I am duly authorized to swear this affidavit on its behalf.
2. The statements made in the submission herein shown to me are based on information provided to me and I believe them to be true.

Bhubaneswar.

Dated: 02.08.2023

Chief-Regulatory & Government Affairs



IDENTIFIED BY ME  
2/8/23  
ADVOCATE, BBSR

Jagyneshwar Acharya  
Notary, Govt. of India  
Odisha, BBSR, Dist-Khurd  
Regd.No.-7791/2009  
Mob:-9861006174



File No TPCODL/Regulatory /2023/ 184/4971

2<sup>nd</sup> August , 2023

Secretary,  
Odisha Electricity Regulatory Commission,  
Bidyut Niyamak Bhawan  
Plot No-4, Chunokoli,  
Shailashree Vihar, Bhubaneswar-751021

**Subject:** Application for approval of Supplementary Capital Investment Plan for the FY 2023-24 for mitigation of low voltage issues in the Licensed Area of TP Central Odisha Distribution Ltd

Dear Sir,

We are through this letter submitting a petition for approval of the Supplementary Capital Investment Plan for FY 2023-24 for mitigation of low voltage issues in the Licensed Area of TP Central Odisha Distribution Ltd.

We trust the Hon'ble Commission shall find our above submission in order.

We shall be glad to provide any other information as may be required in the matter.

Yours faithfully

(Puneet Munjal)

Chief -Regulatory & Government Affairs

**TP CENTRAL ODISHA DISTRIBUTION LIMITED**

( A Tata Power and Odisha Government Joint Venture)

Corporate Office : Power House Square, Unit - 8, Bhubaneswar - 751012

Registered Office : IDCO Towers, 2nd Floor, Janpath, Bhubaneswar - 751022, Tel: 0674 2541575

Web.: [www.tpcentralodisha.com](http://www.tpcentralodisha.com), E-mail : [tpcodl@tpcentralodisha.com](mailto:tpcodl@tpcentralodisha.com), CIN : U40100OR2020PLC032901

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*.... Petitioner*

**IN THE MATTER OF:**   M/s GRIDCO, OPTCL, SLDC ,Department of Energy, Govt. of Odisha and All Concerned Stake Holders.

*.... Respondents*

**1. Background for Submission of the Petition**

In compliance with the directives stipulated in the Vesting Order dated 26.05.2020 as well as the applicable Odisha Electricity Regulatory Commission (Terms and Conditions for Determination of Wheeling Tariff and Retail Supply Tariff) Regulations ,TPCODL had submitted a Capital Investment Plan of Rs. 300 Cr. for FY 2023-24, against which the Hon'ble Commission has accorded approval of Rs. 283.72 Cr vide order dated 21.06.2023 in the matter of Case 98/2022.

It is submitted that based on the Load Flow Study carried out in FY 2022-23 on Asset Base upto Aug'2022 considering peak load of Summer'22 (1764 MW), 148 no's of 33/11 kV PSS with low voltage issues have been identified. Mitigation plan for addressing low voltage issues at these identified PSS are in place under various schemes as depicted in Table below.

**Table-1: Mitigation Plan for PSS with Low Voltage issues under various schemes**

Sl. No	Mitigation proposals under different scheme	Completed (No of PSS)	Work in Progress (No of PSS)	Proposed (No of PSS)	Total (No of PSS)
		A	B	C	D = A+B+C
1	Network NOP Change	6			6
2	Capex Plan FY-22 as approved by the Hon'ble OERC	6			6
3	Capex Plan FY-23 as approved by the Hon'ble OERC	1	17		18
4	Capex Plan FY-24 as approved by the Hon'ble OERC		15		15
5	CMPDP		30		30
6	Deposit Schemes	1	9		10
7	Govt Schemes (DDUGJY, ODSSP PH-II)	2			2
8	By Operating HT Tap of PTRs	26			26
9	ODSSP PH-III	1			1
10	SCRIPS	2			2
11	<b>Supplementary Capex FY 2023-24 as proposed in this filing</b>			<b>32</b>	<b>32</b>
12	<b>Grand Total</b>	<b>45</b>	<b>71</b>	<b>32</b>	<b>148</b>

As can be observed, mitigation plan for 116 number of PSS has already been put in place under various schemes ( Work Completed at 45 PSS and Work in Progress at 71 PSS) out of the identified 148 number of PSS leaving 32 number of PSS for which the present proposal is being submitted.

These 32 number of 33/11 kV PSS have experienced severe low voltage issue during Summer '22 and Summer'23. **TPCODL has analysed the network in view of the increased load growth in Summer'23 and found that construction of 20 numbers of 33kV Lines and 2 numbers of 33 /11 kV PSS with associated lines are required to address low voltage issues in these 32 number of 33/11 kV PSS.** The list of these 32 PSS with existing voltage profile and expected voltage profile after the implementation of the proposed mitigation plan is provided at Annexure-A of the Detailed Project Report (DPR).

These proposed schemes will help in improving the voltage profile at 33 kV level which will further help in addressing the low voltage issues at down the line network and will ensure Quality Power supply to the end users.

The Construction of these proposed 20 numbers of 33kV Lines is expected to be completed in 6-8 months and commissioning of the proposed 2 numbers of PSS will take 10-12 months post receipt of approval from the Hon'ble Commission.

Considering the above commissioning timelines, the construction of these proposed scheme needs to be commenced at the earliest to address the low voltage issues in coming Summer.

In view of the above, we are through this submission seeking supplementary capex of Rs. 177.62 Cr to address the low voltage issues at these 32 number of PSS.

## 2. Summary of the Proposed Mitigation Plan for which Approval is requested under Supplementary Capex FY 2023-24

The detailed project report (DPR) for the mitigation of low voltage issues at the balance 32 number of PSS is provided as **Appendix** to this submission. The Summary of the Capex Scheme is as provided below.

**Table -2: Summary of the Proposed Capex Scheme**

Sl. No.	Name of Circle	Proposal	Total Cost (in Rs. Cr.)
<b>A. New 33/11kV Primary Substations (PSS) along with associated Lines (2 No's)</b>			
1	BBSR-I	Construction of 33/11kV Nageswar Tangi PSS (2X8MVA) along with 33KV & 11KV associated lines	24.13
2	CUTTACK	Construction of 33/11kV Biswanakanhi PSS (2X5MVA) along with 33KV & 11KV associated lines	25.29
<b>A. Sub Total</b>			<b>49.42</b>
<b>B. Proposed 20 No's of 33kV Lines (231.02 CKTKM) to mitigate low voltage issue at 33/11KV PSS</b>			
1	BBSR-I	33kV Line From Satsankha GSS To Mangalpur PSS	4.9
2	BBSR-I	33KV line From Pratapsasan GSS To Trahiachyuta Nagar PSS	4.38
3	BBSR-II	33KV line From Daspalla GSS To Proposed 4-Pole (Daspalla PSS)	14.16
4	BBSR-II	33KV line From Daspalla GSS To Existing 4-Pole (Banigochha PSS)	
5	BBSR-II	33KV line From Daspalla GSS To Proposed 4-Pole (Gania PSS)	
6	BBSR-II	33KV line From Satsankha GSS To Patnayak Chowk (Delang PSS)	5.2
7	BBSR-II	33KV line From Argul GSS To Taraboi point DP (Tirimalla PSS)	7.35
8	BBSR-II	33KV line From Satsankha GSS To Satsankha PSS(Kumareswar PSS)	7.18
9	CUTTACK	33KV line From Bahugram/Atado GSS To Bahugram-2 PSS	5.6
10	CUTTACK	33KV line From Balichandrapur GSS To Balichandrapur PSS	7.65
11	DHENKANAL	33KV line From Gondia GSS To Proposed 4-Pole (College PSS)	2.65
12	DHENKANAL	33KV line From Gondia To Proposed 4-Pole (Joranda PSS)	
13	DHENKANAL	33KV line From Goda GSS To Proposed 4-Pole (Bhuban PSS)	1.35
14	DHENKANAL	33KV line From Chainpal GSS To Parjang PSS	11.15
15	DHENKANAL	33KV line From Kamakhyanagar GSS To Parjang PSS	12.68
16	PARADEEP	33KV line From Rajnagar GSS To Badhi/Babar PSS	11.62
17	PARADEEP	33KV line From Tirtol GSS To Kanakpur PSS	3.93
18	CUTTACK	33KV line From Bahugram/Atado GSS To Nischintakoili	7.04
19	BBSR-I	33KV line From Bangurigaon PSS To Kakatpur PSS	8.47
20	DHENKANAL	33KV line From Khajuriakata GSS To Phulapada PSS	12.9
<b>B. Sub Total</b>			<b>128.2</b>
<b>C = A+B</b>			<b>177.62</b>
<b>Total</b>			<b>177.62</b>

### Prayers

TPCODL prays that the Hon'ble Commission may kindly be pleased to:

1. Approve the Supplementary Capital Investment Plan for FY 2023-24, detailed project report (DPR ) for which is provided as **Appendix** to this submission.
2. Allow Employee Cost and Interest during Construction based on actuals to be capitalised over and above the above Capex (Hard Cost).
3. Allow financing for this Proposed Supplementary Capex in line with the provisions of Odisha Electricity Regulatory Commission (Terms and Conditions for Determination of Wheeling Tariff and Retail Supply Tariff) Regulations,2022.
4. Permit Carry forward of the unspent Capital Expenditure to subsequent years.
5. Permit making additional submission required in this matter.
6. Grant any other relief as deemed fit and proper in the facts and circumstances of the case.
7. Any other direction as the Hon'ble Commission may think appropriate

## APPENDIX

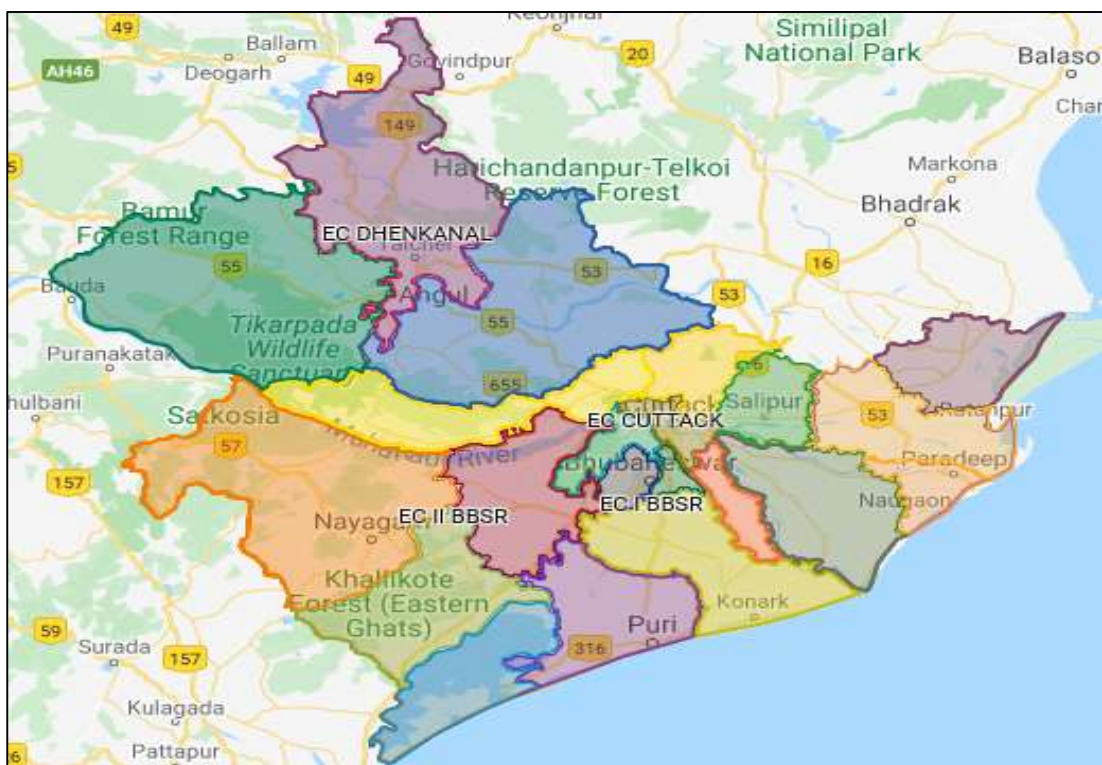


## **DETAILED PROJECT REPORT (DPR) FOR**

**Supplementary CAPEX FY: 2023-24**

**Submitted By**

**TP Central Odisha Distribution Ltd**



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**Supplementary Capex Plan: FY 2023-24**

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## 1. Introduction

TP Central Odisha Distribution Limited (TPCODL) is a joint venture of Tata Power (51%) and Odisha Government (49%) on the Public-Private Partnership (PPP) model. TPCODL was granted the license to distribute electricity in the central part of Odisha, which was earlier served by erstwhile CESU, after being selected through a competitive bidding process. TPCODL's utility business is being governed by the provisions of license issued by Hon'ble OERC for Distribution and Retail Supply of Electricity in Central Odisha. The Hon'ble OERC regulates the working of the entire power sector of Odisha State, including determination of tariff chargeable to end consumers and establishing performance norms (including AT&C loss reduction etc.).

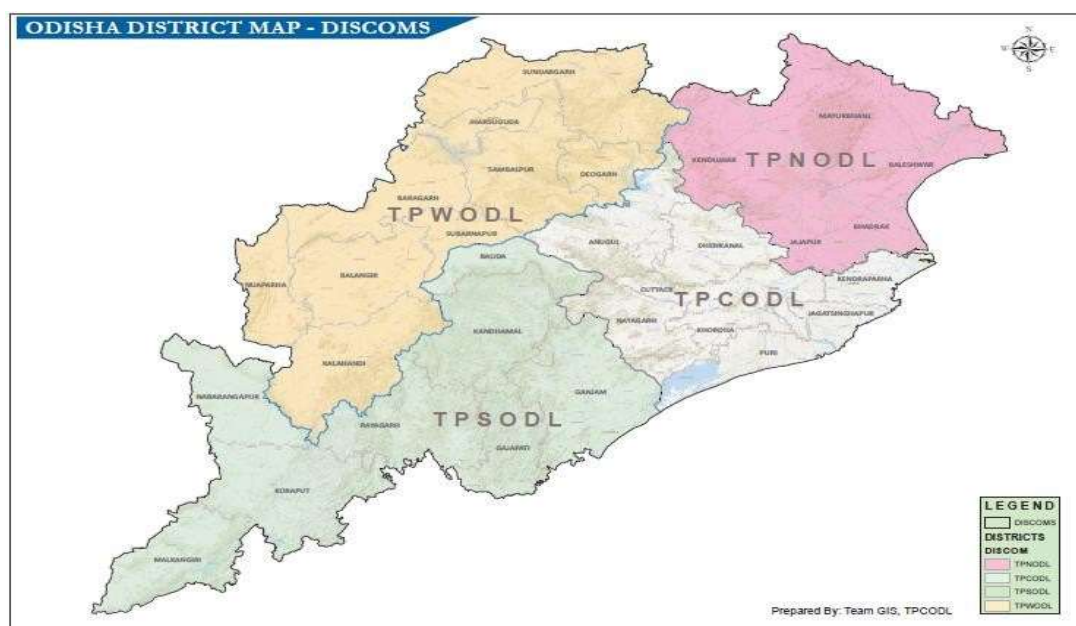
The core business activities of TPCODL is summarized as follows,

1. Operation and Maintenance of distribution network
2. Expansion of distribution network
3. Electricity supply and after sales services
4. Connection of new consumers to the distribution network
5. Meter reading, billing, and revenue collection
6. Customer complaint resolution
7. Restoration of power after interruptions
8. General customer care including provision of information on services
9. Customer sensitization on energy efficiency, energy losses and safety

In FY 2022-23, against the total input energy of 9903 MU, billed energy was 7658 MU .The broad break up the sales (7658 MU) includes: Domestic Consumers (42 %), Commercial (21%), Industrial Consumers (23%) and 14 % Others (i.e. Irrigation, Public Water works, Public Lighting ,Railways etc.). With an objective of providing quality power , TPCODL has come up with a proposal under CAPEX scheme for mitigating the issues of low voltage.

## 2. TPCODL Network Overview & its Challenges

TPCODL license area is spread over a geography of 29354 sq. km and serve the registered consumer base of 3.1 million. TPCODL procures power from GRIDCO which is a state owned company, engaged in the business of purchase of electricity in bulk from various generators located inside Odisha and the state share of power from Central generators for supply in all power distribution utilities, including TPCODL. It receives electrical power at a sub transmission voltage of 33 kV from Odisha Power Transmission Company Limited's (OPTCL) 220/132/33 kV Grid Substations and then distributes the power at 33 kV / 11kV / 440V / 230V depending on the demand of the consumers. For effective operations; license area is divided in 5 circles which is further sub divided in 20 Divisions and 65 Sub-divisions which manages the commercial and O&M activities in order to serve its consumer.



At present, there are 233 numbers of 33 kV feeders with a combined circuit length of approximately 4082 Ckt. KMs supplying power to 369 numbers of 33/11kV Primary Substations. The 33kV supply is stepped down to 11kV level through 816 numbers of 33/11kV power transformers with an installed capacity of 4863 MVA at these primary substations. Further, nearly 1411 numbers of 11 kV feeders emanates from the 33/11 kV primary substations having cumulative length of approximately 39,350 Ckt. KMs and supply power to HT consumers connected at 11 kV level and LT customers connected to 11/0.415 kV & 11/0.230 kV distribution substations. 77549 numbers of distribution transformers are installed in all five circles with an installed capacity of 5702 MVA. The length of the LT network is approximately 50,050 Ckt. KMs. These LT feeders supply power to three-phase and single-phase consumers.

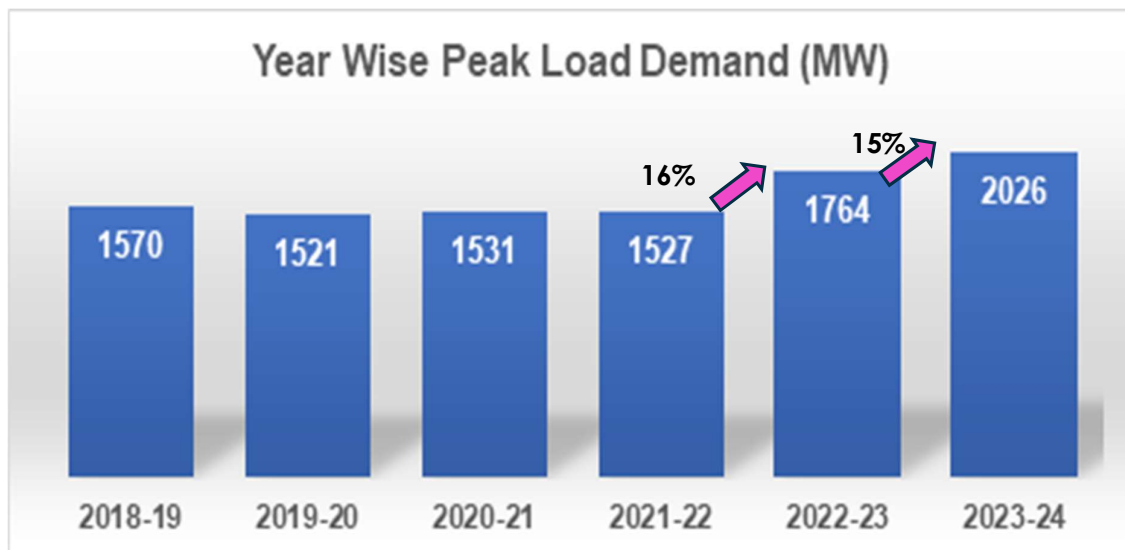
TPCODL receives electrical power at 33kV level from 58 nos. of Grid Substations (GSS). TPCODL distributes the power at 33kV / 11kV / 440V / 230V depending on the demand of the consumers. The existing OPTCL Grid Substation in TPCODL are as provided below. List of Grid Substations (GSS) of OPTCL in TPCODL.

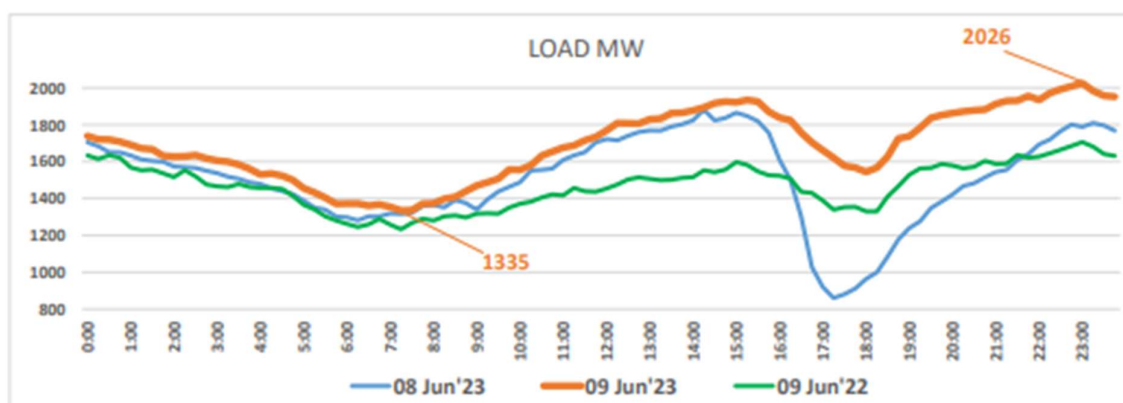
TPCODL peak demand trend for last five years is given in below table.

**Table 2-1 : TPCODL Peak Demand Trend**

DESCRIPTION	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Date of occurrence of annual system peak	June 18	April -19	June - 20	June -21	June - 22	June 23
System peak load in MW	1487	1579	1531	1527	1764	2026

From the Table it clearly indicates TPCODL peak demand is almost constant for last 3 years, however there is sharp increase in the peak demand from last 2years.The peak demand occurred at midnight time during summer due to increase the load demand from domestic consumer.





From the above Table it clearly indicates that TPCODL peak always in the Night Time & in the Month of May & June when the temperature in TPCODL area is Hot & humidity.

TPCODL did the load flow study in FY22-23 considering the asset base up to Aug-22 with peak load of summer 22 (1764MW). Load flow study is often used to investigate other parameters such as overloading feeders & Transformers, Low voltage pockets, system power factors, losses, short circuit analysis and equipment loading. The end objective of the load-flow study is not always to arrive at hard, numerical performance parameters. Often the objective is to gain insight into how the system performs over a range of operating conditions. The outcomes of Network load flow study is given below.

- Technical loss Assessment
- Assessment of feeder & Transformer over loading
- N-1 Assessment
- Voltage Profile Assessment

Most of the network deficiencies like overloading, low voltage are being addressed through ongoing capex & Govt. schemes whereas some of the PSS low voltage issues are not being addressed through ongoing scheme for which the supplementary capex 23-24 is proposed.

### 3. Details of the low Voltage observed at 33/11kV PSS based on load flow study

As per CEA guidelines, Voltage variation limit for 33kV should be within the limit of +6% and -9%. Below are the list category-wise Primary substations where 33kV incoming Side Voltage is Crossing the permissible limit of “-9%”.

**Table 3-1 : PSS with Low Voltage issues**

Circle	Total No. of PSS	No. of PSS having low voltage issue
<b>BBSR-I</b>	72	21
<b>BBSR-II</b>	83	45
<b>Cuttack</b>	72	36
<b>DKL</b>	66	28
<b>PDP</b>	62	18
<b>Total</b>	<b>355*</b>	<b>148</b>

\*Note – 355No's 33/11KV PSS were in service till Aug-22.

**Table 3-2: Circle wise low voltage PSS details with voltage drop on 33kV incoming side**

Circle	% of voltage Drop on 33KV incoming side						Grand Total
	9 ≥ 12	12 ≥ 15	15 ≥ 18	18 ≥ 21	21 ≥ 24	> 24	
<b>BBSR-I</b>	6	5	4	1	3	2	21
<b>BBSR-II</b>	10	12	6	11	4	2	45
<b>CUTTACK</b>	13	9	7	3	4		36
<b>DHENKANAL</b>	12	6	7	3			28
<b>PARADEEP</b>	12	2	2	2			18
<b>Total No. of PSS</b>	<b>53</b>	<b>34</b>	<b>26</b>	<b>20</b>	<b>11</b>	<b>4</b>	<b>148</b>

The reason for this voltage drop

- 1) Due to lengthy 33KV feeders with improper conductor size being used in most of the feeder. 58% feeders' circuit length is more than 10Ckt km.
- 2) Overloading of feeder, lengthy feeders.
- 3) Load centers & PSS are away from the GSS.
- 4) Limited no. of GSS in the TPCODL licensed Area.

Out of these 148 nos. of PSS with low voltage issue , mitigataion plan for some of the PSS are in place under various schems as depicted at Table 4-1 in below paragraph.

## 4. 33/11kV PSS Low Voltage Mitigation proposal details under different scheme

Table 4-1: Low Voltage Mitigation Plan

Sl. No	Mitigation proposals under different scheme	Completed (No of PSS)	Work in Progress (No of PSS)	Proposed (No of PSS)	Total (No of PSS)
		A	B	C	D = A+B+C
1	Network NOP Change	6			6
2	Capex Plan FY-22 as approved by the Hon'ble OERC	6			6
3	Capex Plan FY-23 as approved by the Hon'ble OERC	1	17		18
4	Capex Plan FY-24 as approved by the Hon'ble OERC		15		15
5	CMPDP		30		30
6	Deposit Schemes	1	9		10
7	Govt Schemes (DDUGJY, ODSSP PH-II)	2			2
8	By Operating HT Tap of PTRs	26			26
9	ODSSP PH-III	1			1
10	SCRIPS	2			2
11	<b>Supplementary Capex FY 2023-24 as proposed in this filing</b>			<b>32</b>	<b>32</b>
12	<b>Grand Total</b>	<b>45</b>	<b>71</b>	<b>32</b>	<b>148</b>

As can be observed, mitigation plan for 116 number of PSS has already been put in place under various schemes ( Work Completed at 45 PSS and Work in Progress at 71 PSS) out of the identified 148 number of PSS leaving 32 number of PSS for which the present proposal is being submitted.

**5. Proposed Plan for Mitigating low voltage issue at 33/11kV PSS & other needy 11kV Network under Supplementary Capex 23-24**

It is observed that many areas in TPCODL jurisdiction are facing low voltage issues due lengthy 33kV network along with overloading. In order to address the issues, proposals have been identified which will improve the voltage profile and mitigate low voltage issues along with overloading issues.

These 32 number of 33/11 kV PSS have experienced severe low voltage issue during Summer '22 and Summer'23. **TPCODL has analysed the network in view of the increased load growth in Summer'23 and found that construction of 20 numbers of 33kV Lines and 2 numbers of 33 /11 kV PSS are required to address low voltage issues in these 32 number of 33/11 kV PSS.** The list of these 32 PSS with existing voltage profile and expected voltage profile after the implementation of the proposed mitigation plan is provided as Annexure-A to this submission.

These proposed schemes will help in improving the voltage profile at 33 kV level which will further help in addressing the low voltage issues at down the line network and will ensure Quality Power supply to the end users.

The Construction of these proposed 20 numbers of 33kV Lines is expected to be completed in 6-8 months and commissioning of the proposed 2 numbers of PSS will take 10-12 months post receipt of approval from the Hon'ble Commission.

Considering the above commissioning timelines, the construction of these proposed scheme needs to be commenced at the earliest to address the low voltage issues in coming Summer.

In view of the above, we are through this submission seeking supplementary capex of Rs. 177.62 Cr to address the low voltage issues at these 32 number of PSS.

**Summary of the DPR (Detailed Project Report)**

The DPR consists of following major heads.

1. New 33/11kV Primary Substations (PSS) to address low voltage issue in 11KV network.
2. New 33kV Lines from nearby GSS to mitigate low voltage issue at 33/11KV PSS.

The details of Projects mentioned in below table:

**Table 5-1: Major Heads of proposed DPR**

Sl. No.	Proposal	UOM	Quantity	(Amount in Rs. Cr.)
A	Proposed 33/11kV substations along with associated lines	No's	2	49.42
B	Proposed 33kV Lines ( 20 No's)	CKT.KM	231.02	128.20
Total cost in Rs. Cr				177.62

Table 5-2: Proposed 33/11 kV PSS and 33 kV Lines

Sl. No.	Name of Circle	Proposal	Total Cost (in Rs. Cr.)	Annexure No.
<b>A. Proposed 33/11kV PSS to mitigate low voltage issue in 11kV network</b>				
1	BBSR-1	Construction of 33/11kV Nageswar Tangi PSS (2X8MVA) along with 33KV & 11KV associated lines	24.13	Annexure-1
2	CUTTACK	Construction of 33/11kV Biswanakanhi PSS (2X5MVA) along with 33KV & 11KV associated lines	25.29	Annexure-2
<b>A.Total Cost of 2 New PSS with associated Lines (in Rs. Cr.)</b>			<b>49.42</b>	
<b>B.Proposed 33kV Lines to mitigate low voltage issue at 33/11KV PSS</b>				
1	BBSR-I	33kV Line From Satsankha GSS To Mangalpur PSS	4.90	Annexure-3
2	BBSR-I	33KV line From Pratapsasan GSS To Trahiachyuta Nagar PSS	4.38	Annexure-4
3	BBSR-II	33KV line From Daspalla GSS To Proposed 4-Pole (Daspalla PSS)	14.16	Annexure-5
4	BBSR-II	33KV line From Daspalla GSS To Existing 4-Pole (Banigochha PSS)		
5	BBSR-II	33KV line From Daspalla GSS To Proposed 4-Pole (Gania PSS)		
6	BBSR-II	33KV line From Satsankha GSS To Patnayak Chowk (Delang PSS)	5.20	Annexure-6
7	BBSR-II	33KV line From Argul GSS To Taraboi point DP (Tirimalla PSS)	7.35	Annexure-7
8	BBSR-II	33KV line From Satsankha GSS To Satsankha PSS(Kumareswar PSS)	7.18	Annexure-8
9	CUTTACK	33KV line From Bahugram/Atado GSS To Bahugram-2 PSS	5.60	Annexure-9

# Supplementary Capex Plan: FY 2023-24

10	CUTTACK	33KV line From Balichandrapur GSS To Balichandrapur PSS	7.65	Annexure-10
11	DHENKANAL	33KV line From Gondia GSS To Proposed 4-Pole (College PSS)	2.65	Annexure-11
12	DHENKANAL	33KV line From Gondia To Proposed 4-Pole (Joranda PSS)		
13	DHENKANAL	33KV line From Goda GSS To Proposed 4-Pole (Bhuban PSS)	1.35	Annexure-12
14	DHENKANAL	33KV line From Chainpal GSS To Parjang PSS	11.15	Annexure-13
15	DHENKANAL	33KV line From Kamakhyanagar GSS To Parjang PSS	12.68	Annexure-14
16	PARADEEP	33KV line From Rajnagar GSS To Badhi/Babar PSS	11.62	Annexure-15
17	PARADEEP	33KV line From Tirtol GSS To Kanakpur PSS	3.93	Annexure-16
18	CUTTACK	33KV line From Bahugram/Atado GSS To Nischintakoili	7.04	Annexure-17
19	BBSR-I	33KV line From Bangurigaon PSS To Kakatpur PSS	8.47	Annexure-18
20	DHENKANAL	33KV line From Khajuriakata GSS To Phulapada PSS	12.90	Annexure-19
<b>B. Total cost (in Rs Cr.) for 20 nos. of 33kV line</b>			<b>128.20</b>	
<b>C= A+B Total cost of Project (33/11kV PSS + 33kV Lines) (in cr.)</b>			<b>177.62</b>	

## 6. Part-A: New 33/11kV substations in Low Voltage areas

Table 6-1: New 33/11 kV Substation in Low Voltage Area

Sl. No.	Proposal	(Amount in Rs.Cr.)
1	33/11kV Nageswar Tangi PSS (2X8MVA) with associated lines	24.13
2	33/11kV Biswanakanhi PSS (2X5MVA) with associated lines	25.29
Total cost in crore		49.42

### 6.1 Proposed 33/11kV Nageswar Tangi PSS (2X8MVA) to address low voltage issue in Old Town Area

#### **Proposal:**

Construction of 33/11kV Primary Substation with 2X8MVA power transformer with construction of 33kV incoming line from proposed 132/33kV Badagada Grid and 33/11kV Mulapadia PSS at Nageswar Tangi along with construction of 4nos. 11kV feeders and conductor augmentation of existing 11kV Badagada Lingaraj, Gautam Nagar, Mauima and Rajarani feeders.

#### **Objective:**

To ensure reliable power supply to the consumers for mitigating low voltage issues as well as to meet the increasing load demand due to prospective loads. The main thrust is laid on improvement of voltage profile, to minimize interruption of power supply to the consumers, availability of alternate power supply and socio-economic development of the inhabitants.

#### **Existing Scenario (summer'22):**

Presently the area namely Nageswar Tangi area is getting power supply from existing 33/11kV Badagada substation through 11kV Mausima, Badagada Lingaraj, Gautam Nagar and Rajarani feeders.

11kV Badagada Lingaraj feeder of 33/11kV Badagada PSS having length 7.5 Ckm (trunk and spur lines) carries 5MVA at its peak load. This feeder caters power supply to areas mainly BJB Nagar, Kedargouri Nagar, Garage Chhak, Old town area, Lingaraj area, etc feeding 3259no. of consumers.

11kV Gautam Nagar feeder of 33/11kV Badagada PSS having length 3.9 Ckm (trunk and spur lines) carries 4.15MVA at its peak load. This feeder caters power supply to areas mainly Gautam nagar area feeding 1500no. of consumers.

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11kV Mausima feeder of 33/11kV Badagada PSS having length 3.24 Ckm (trunk and spur lines) carries 3MVA at its peak load. This feeder caters power supply to areas mainly BJB Nagar, Vivekananda Marg, Ratha road area, etc feeding 3191no. of consumers.

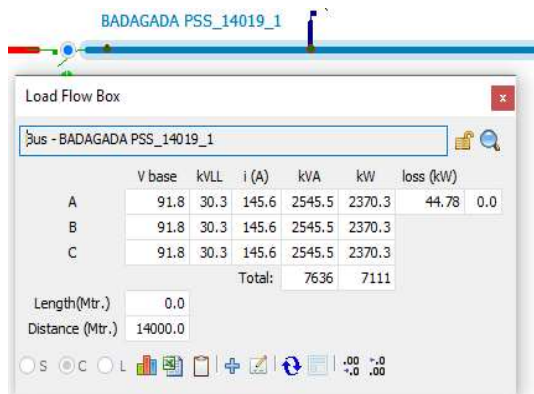
11kV Rajarani feeder of 33/11kV Badagada PSS having length 6.3 Ckm (trunk and spur lines) carries 4.3MVA at its peak load. This feeder caters power supply to areas mainly BJB Nagar, Louise road, etc feeding 3266no. of consumers.

The consumers in these areas are facing low voltage problem and frequent breakdowns due to lower size conductor and overloading.

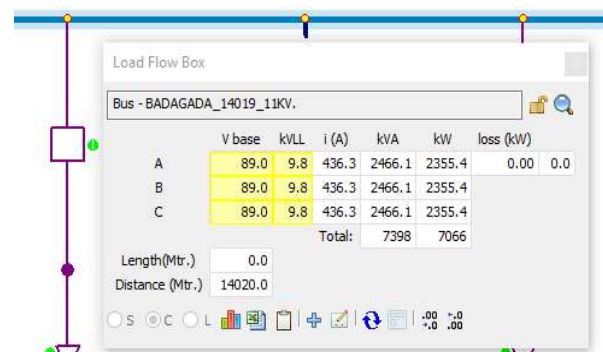
Name of Grid	Name of 33kV Feeder	Fdr Capacity (MVA)	Load of 33kV Feeder (MVA)	% Loading	Name of 33/11kV PSS	33kV PSS Bus Voltage (kV)	11kV Bus Voltage at PSS (kV)
Ransinghpur	Badagada	26.6	20.5	77%	Badagada	30.3	9.8

PSS Name	11kV Feeder Name	Fdr Capacity (MVA)	Size of conductor	11kV Feeder Load (MVA)	% Loading	11kV Feeder Length (in km)	Existing 11kV Feeder Tail End Voltage (kV)
Badagada	Badagada Lingaraj	5.2	100, 55sqmm	5	97%	7.5	9.03
	Gautam Nagar	5.2	100, 55sqmm	4.15	80%	3.9	9.24
	Mausima	4.5	80, 55sqmm	3	66%	3.24	9.27
	Rajarani	5.2	100, 55sqmm	4.3	83%	6.3	9.11

### Snapshot from Cyme Software (Existing Scenario)

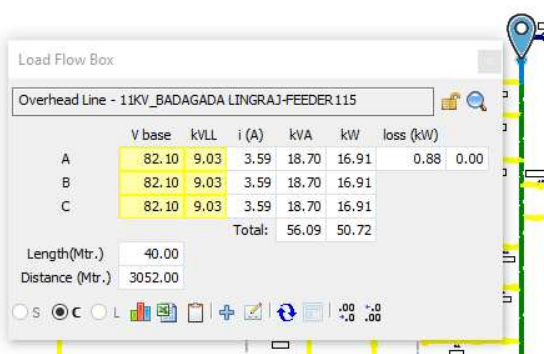


**Badagada PSS**

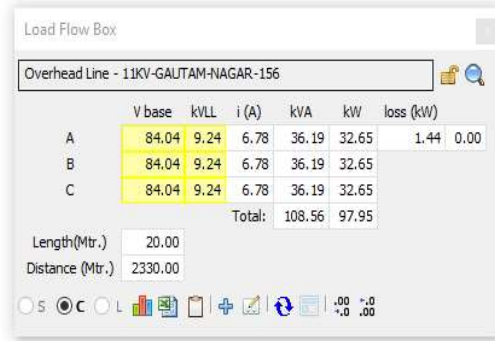


**Badagada PSS 11kV Bus**

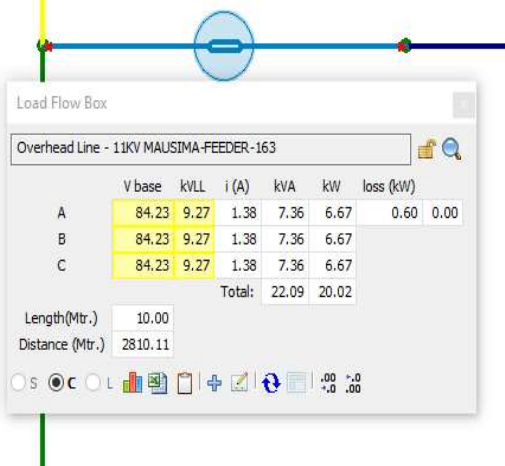
## Supplementary Capex Plan: FY 2023-24



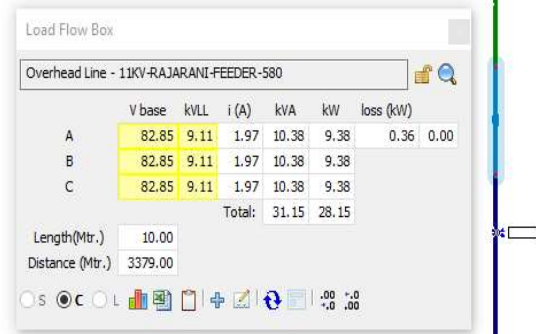
**11kV Badagada Lingaraj Feeder Tail End**



**11kV Gautam Nagar Feeder Tail End**

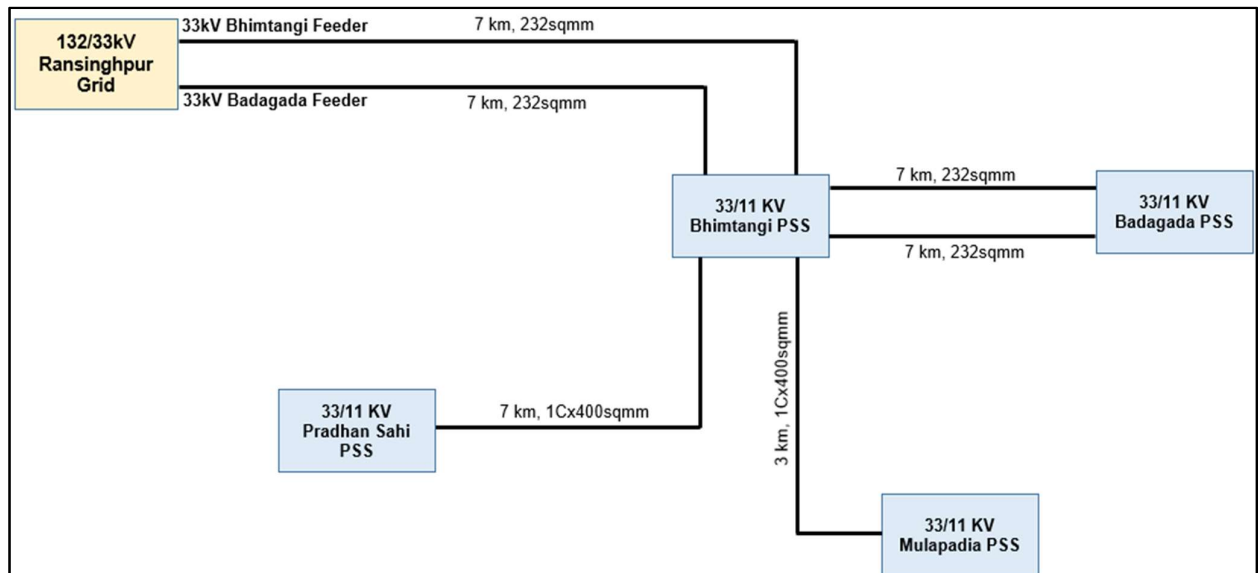


**11kV Mausima Feeder Tail End**



**11kV Rajarani Feeder Tail End**

### Existing SLD:



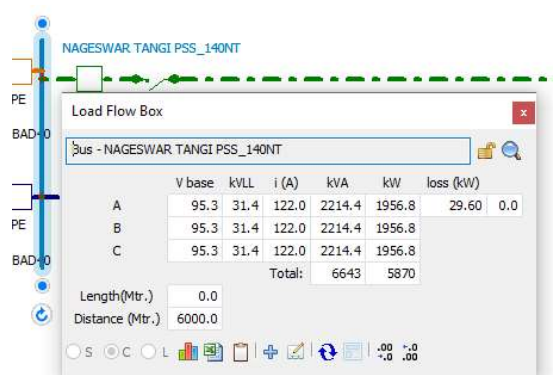
**Proposed Scenario with commissioning of 33/11kV Nageswar Tangi PSS (Summer'24):**

The proposed 33/11kV Nageswar Tangi PSS is proposed to be connected from proposed Badagada Grid at 3Ckm (33kV Nageswar Tangi feeder) and from 33/11kV Mulapadia PSS at 3Ckm along with construction of 4nos. 11kV feeders with 3Cx400sqmm cable of total 6Ckm and conductor augmentation of existing 11kV Badagada Lingaraj, Gautam Nagar, Mausima and Rajarani feeders from 34/55/80 sqmm to 100sqmm of length 10Ckm. The voltage profile will be improved in the area as shown below.

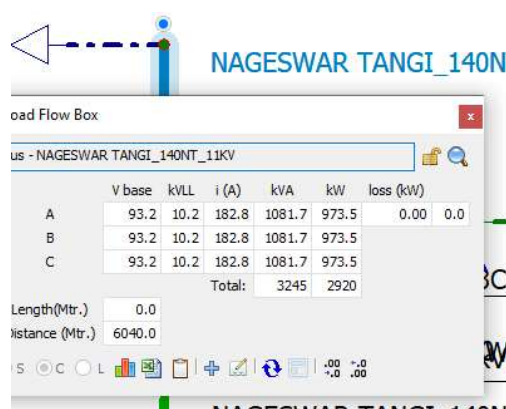
Name of Grid	Name of 33kV Feeder	Load of 33kV Feeder (MVA)	Name of 33/11kV PSS	33kV PSS Bus Voltage (kV)	11kV Bus Voltage at PSS (kV)
Badagada	Badagada	16		32.6	10.7
	Proposed NageswarTangi	9	Proposed NageswarTangi	31.4	10.2

PSS Name	11kV Feeder Name	11kV Feeder Length (in kM)	11kV Feeder Load (MVA)	11kV Feeder Tail End Voltage (kV)
Badagada	Badagada Lingaraj	4	2.2	10.4
	Gautam Nagar	2	3	10.3
	Mausima	1.2	2.5	10.4
	Rajarani	3	1.6	10.4
Proposed Biswanahakani	Gauri Nagar Feeder	3.9	3.5	10.4
	New Gautam Nagar Feeder	3	1.6	10.4
	Nageswar Tangi feeder	2.5	3	10.3
	Lewis Road Feeder	3	1.6	10.1

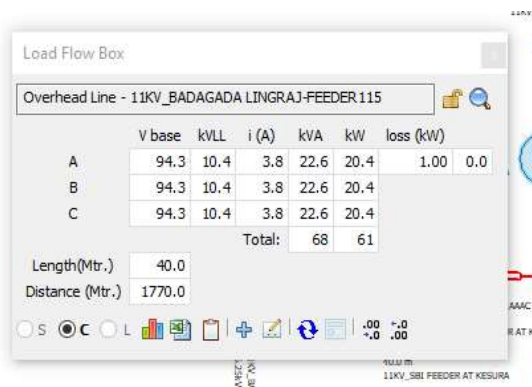
**Snapshot from Cyme Software (Proposed Scenario)**



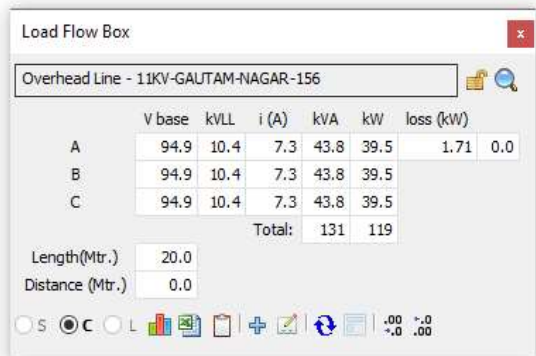
**Nageswar Tangi PSS**



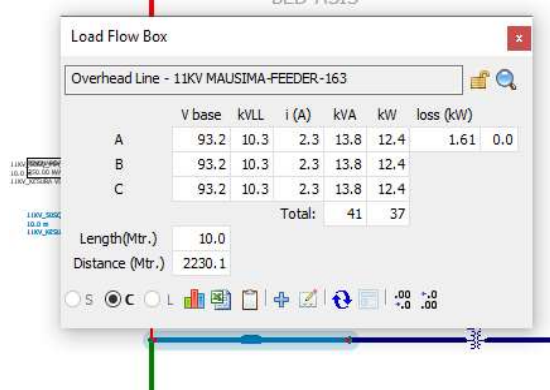
**Nageswar Tangi PSS 11kV Bus**

**Supplementary Capex Plan: FY 2023-24**

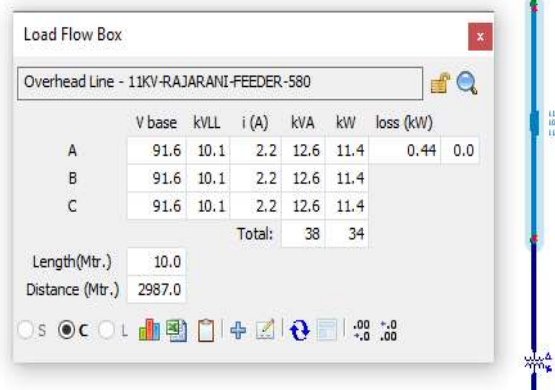
### 11kV Badagada Lingaraj Feeder Tail End



### 11kV Gautam Nagar Feeder Tail End

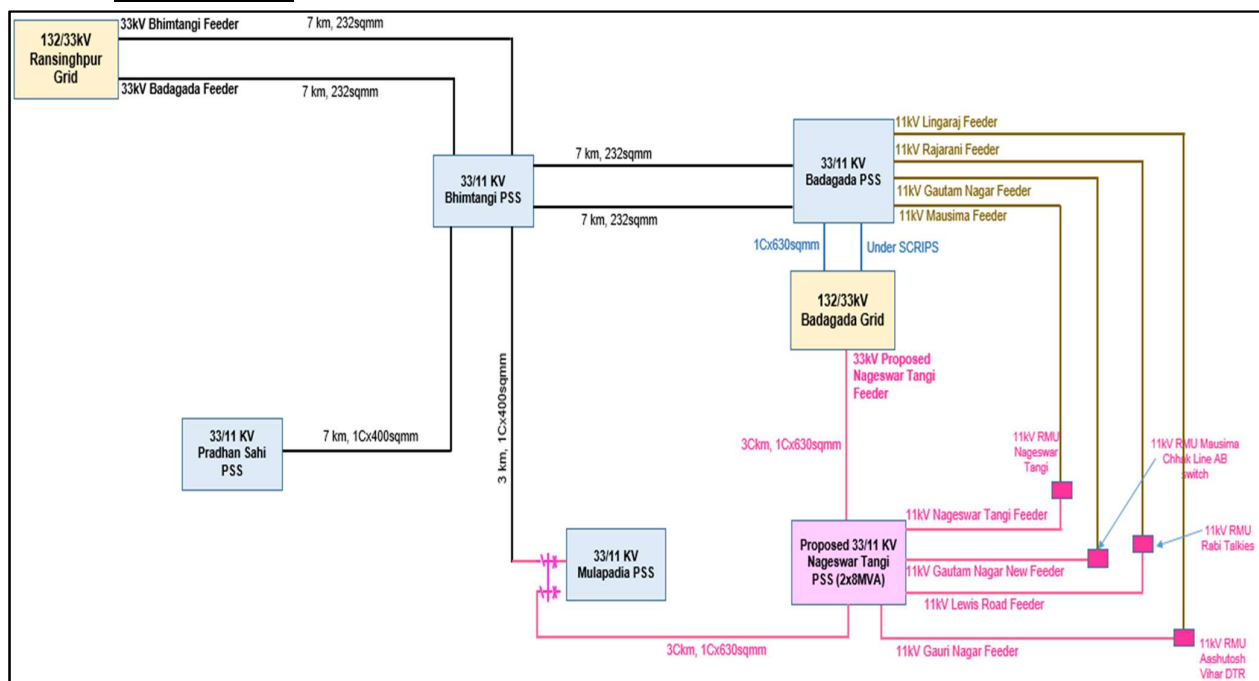


### 11kV Mausima Feeder Tail End



### 11kV Rajarani Feeder Tail End

**Proposed SLD:**



**Detailed Scope of Work:**

- i. Construction of 33/11kV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work. Construction of 33/11kV Primary Substation with 2X8MVA power transformer, including complete Control Room Building and all equipments for Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work.
- ii. Construction of 6Ckm 33kV, 3runs 1CX630sqmm line from Badagada Grid to Proposed 33/11kV Nageswar Tangi PSS and interlinking line from Mulapadia PSS.
- iii. Construction of 11kV O/H line of 6CkM using 100 sq.mm, AAAC for 4 nos. of proposed 11kV associated feeders.
- iv. Installation of 1no. 33kV 4W RMU at 33/11kV Mulapadia PSS.
- v. Augmentation of existing 11kV line from 34/55/80 sqmm to 100sqmm AAAC of length 10Ckm.

**Abstract of Estimate**

<b>Name of the Division :-</b>	<b>BHUBANESWAR ELECTRICAL DIVISION</b>
<b>Name of the Sub-Division :-</b>	TEMPLE
<b>Name of the Section :-</b>	OT-2
<b>Name of the Work :-</b>	Construction of 2X8 MVA, 33/11 KV PSS at Nageswar Tangi along with 33 KV line (U/G) from Badagada Grid and Mulapadia PSS to proposed Nageswar Tangi PSS and 11kV associated outgoing feeders.
<b>Scope of work:-</b>	Construction of 33/11kV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work. Construction of 6Ckm 33kV, 3runs 1CX630sqmm line from Badagada Grid to Proposed 33/11kV Nageswar Tangi PSS and interlinking line from Mulapadia PSS. Construction of 11kV line using 3Cx400sqmm cable of total length 6 Ckm and 1no. 33kV RMU at Mulapadia PSS for interlinking and sectionalisation. Augmentation of existing 11kV feeder from 34/55/80 sqmm to 100sqmm AAAC. Length = 6 km.
<b>Names of Schemes: -</b>	TPCODL CAPEX

<b><u>ABSTRACT OF ESTIMATE</u></b>			
<b>Sl. No.</b>	<b>Part</b>	<b>Description</b>	<b>Amount</b>
1	A	Construction of 33/11kV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work.	₹ 9,85,12,225.31
2	B	Construction of 6Ckm 33kV, 3runs 1CX630sqmm line from Badagada Grid to Proposed 33/11kV Nageswar Tangi PSS and interlinking line from Mulapadia PSS.	₹ 8,68,24,123.27
3	C	Construction of 11kV line using 3Cx400sqmm cable of total length 6 Ckm and 1no. 33kV RMU at Mulapadia PSS for interlinking and sectionalisation.	₹ 4,85,88,057.45
4	D	Augmentation of existing 11kV feeder from 34/55/80 sqmm to 100sqmm AAAC. Length = 6 km.	₹ 73,79,146.94
		<b>Total Amount</b>	<b>₹ 24,13,03,552.98</b>
		<b>Total Amount (In Rs. Cr)</b>	<b>24.13</b>
<b>Total estimated cost is Rs.24.13 Crore.</b>			

Cost Estimate: ₹ 24.13 Cr. (For detailed BoQ refer Annexure-1).

**Benefits:**

- Improvement of voltage profile at the area around Nageswar Tangi.
- Minimization of interruption.
- Reliability of power supply.
- Strengthening of exiting distribution network.
- Providing second 33kV source connectivity to Mulapadia PSS.

## 6.2 Proposed 33/11kV Biswanahakani PSS (2X5MVA)

### **Proposal:**

Construction of 33/11kV Primary Substation with 2X5MVA power transformer with construction of 33kV incoming line from 132/33kV Mania Grid and 33kV Industrial feeder (Mania Grid) at Biswanahakani along with construction of 3nos. 11kV feeders and conductor augmentation of existing 11kV Haripur feeder.

### **Objective:**

To ensure reliable power supply to the consumers for mitigating low voltage issues as well as to meet the increasing load demand due to prospective loads. The main thrust is laid on improvement of voltage profile, to minimize interruption of power supply to the consumers, availability of alternate power supply and socio-economic development of the inhabitants.

### **Existing Scenario (Summer'22):**

Presently the area namely Biswanahakani area is getting power supply from existing 33/11kV Tangi substation through Haripur 11kV feeder.

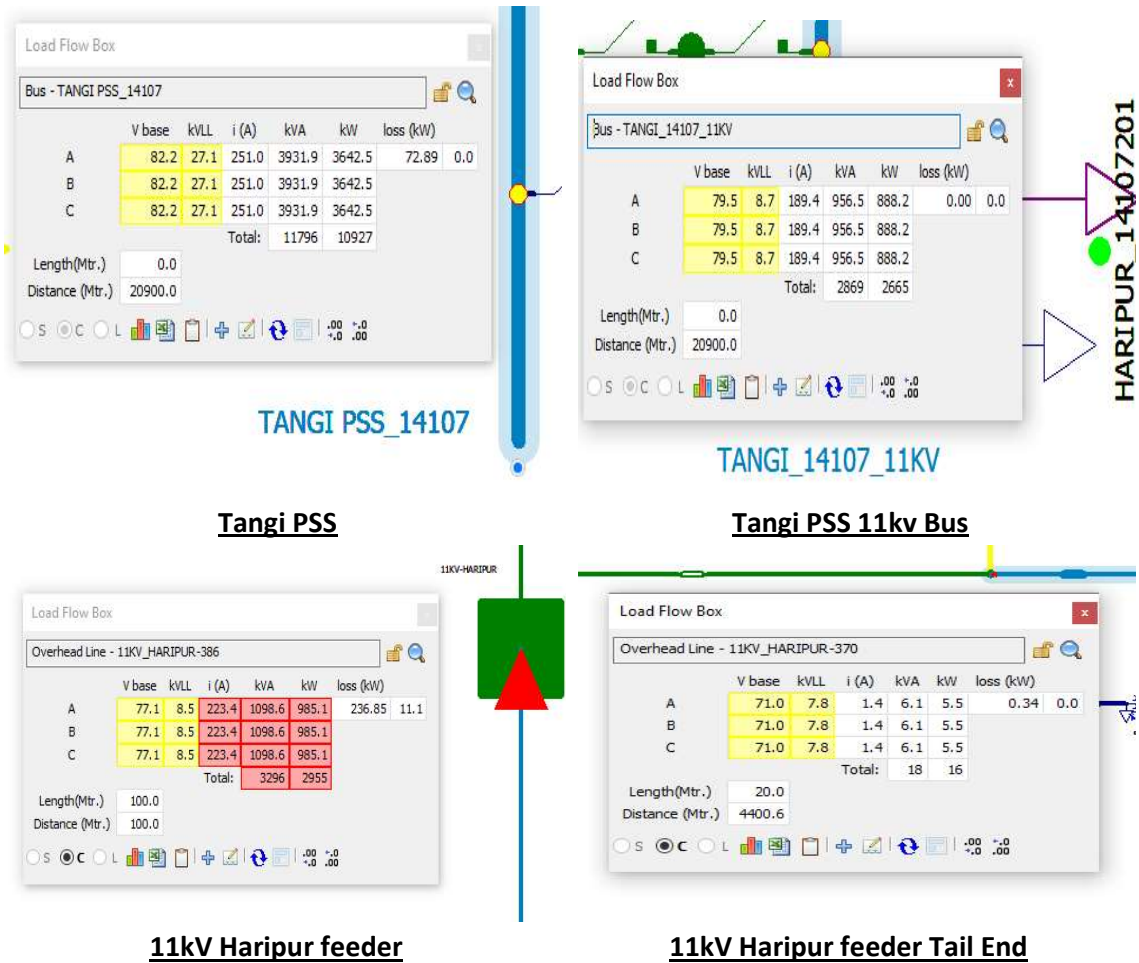
11kV Haripur feeder of 33/11kV Tangi PSS having length 121 Ckm (trunk and spur lines) carries 4MVA at its peak load. This feeder caters power supply to areas mainly Haripur area, Biswanahakani area, Saffa area, etc feeding 6550 nos. of consumers.

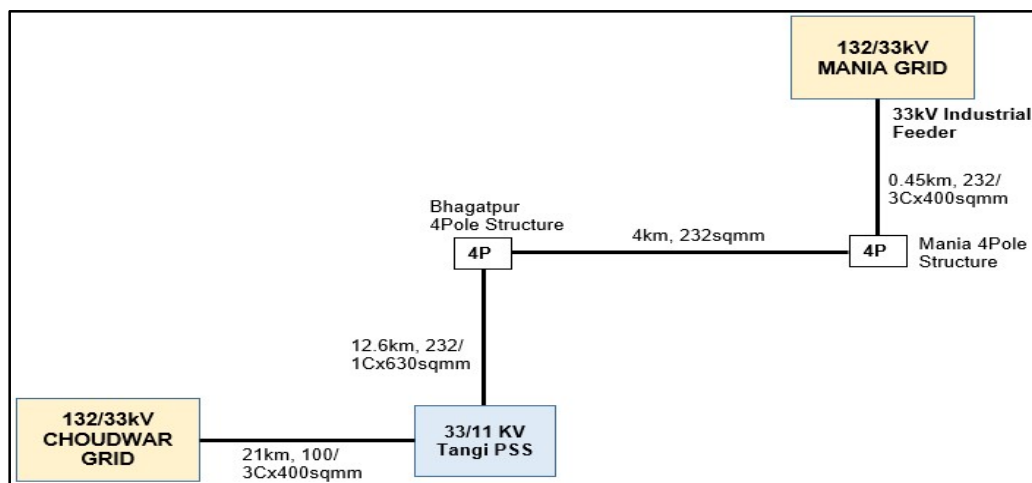
The consumers in these areas are facing low voltage problem and frequent breakdowns due to lengthy line, overloading of feeders and lower size conductor.

Name of Grid	Name of 33kV Feeder	Fdr Capacity (MVA)	Load of 33kV Feeder (MVA)	% Loading	Name of 33/11kV PSS	33kV PSS Bus Voltage (kV)	11kV Bus Voltage at PSS (kV)
Choudwar	Tangi	15.5	15.5	100%	Tangi	27.1	8.7

PSS Name	11kV Feeder Name	Fdr Capacity (MVA)	Size of conductor	11kV Feeder Load (MVA)	% Loading	11kV Feeder Length (in kM)	Existing 11kV Feeder Tail End Voltage (kV)
Tangi	Haripur	3.5	34, 55sqmm	4	113%	121	7.8

**Snapshot from Cyme Software (Existing Scenario)**



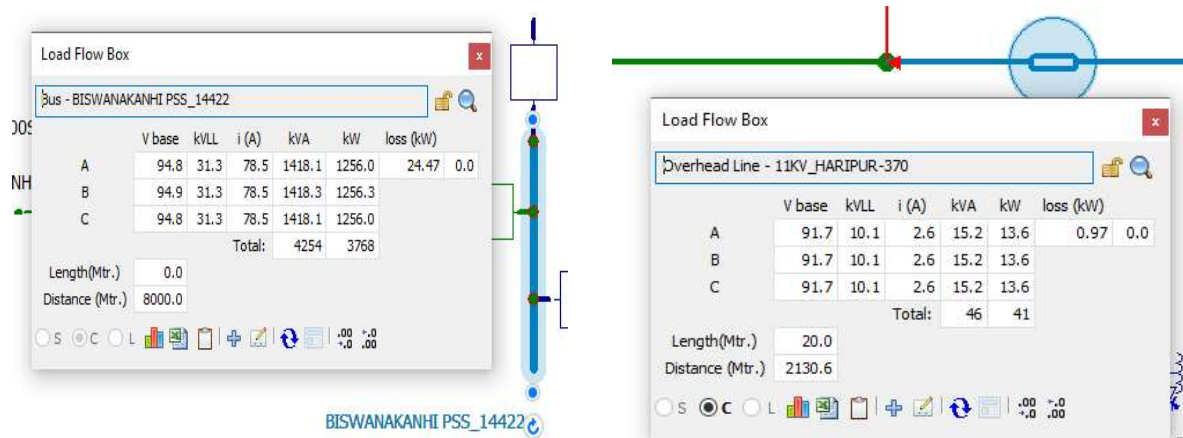
**Existing SLD:****Proposed Scenario with Biswanahakani PSS (Summer'24):**

The proposed 33/11kV Biswanahakani PSS is proposed to be connected from Mania Grid at 10Ckm OH conductor and 2Ckm UG cable (33kV Biswanahakani feeder) and interconnection with 33kV Industrial feeder (Mania Grid) with 33kV RMU provision near 33kV consumer (Som Distelleries) of length 4Ckm UG cable along with construction of 3nos. 11kV feeders with 3Cx400sqmm cable of total 3Ckm and conductor augmentation of existing 11kV Haripur feeder from 34/55/80 sqmm to 100sqmm of length 10Ckm. The voltage profile will be improved in the area as shown below.

Name of Grid	Name of 33kV Feeder	Load of 33kV Feeder (MVA)	Name of 33/11kV PSS	33kV PSS Bus Voltage (kV)	11kV Bus Voltage at PSS (kV)
Mania	Tangi	6	Tangi	30.5	10
	Biswanahakani	5.5	Proposed Biswanahakani	31.3	10.5

PSS Name	11kV Feeder Name	11kV Feeder Length (in kM)	11kV Feeder Load (MVA)	11kV Feeder Tail End Voltage (kV)
Tangi	Haripur	30	1	10.1
Proposed Biswanahakani	Fdr-1	25	1.5	10.1
	Fdr-2	34	1.9	10.2
	Fdr-3	35	2.1	10.1

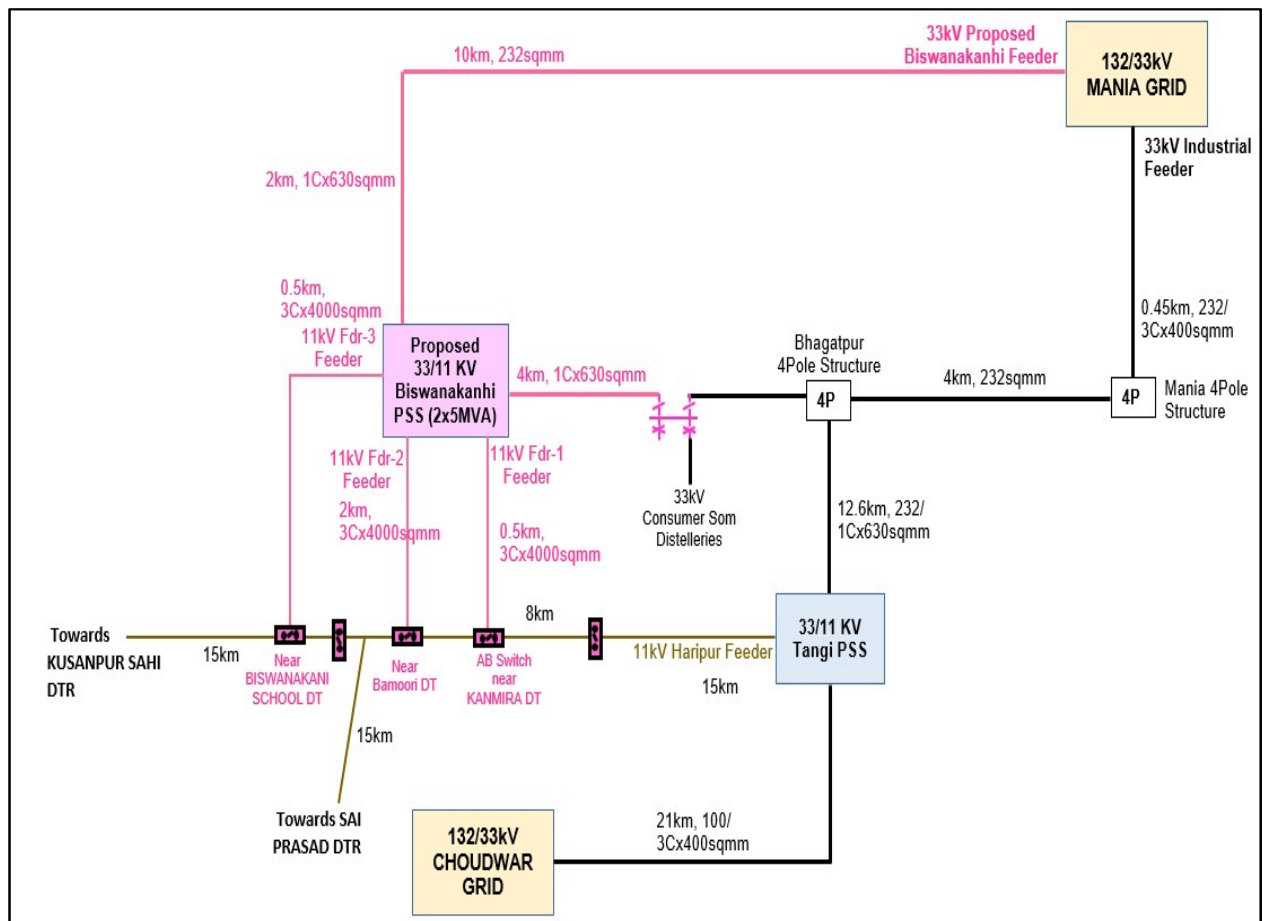
### Snapshot from Cyme Software (Proposed Scenario)



**Biswanakanhi PSS**

**11kV Haripur Feeder Tail End**

### Proposed SLD:



**Detailed Scope of Work:**

- i. Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work. Construction of 33/11kV Primary Substation with 2X5MVA power transformer, including complete Control Room Building and all equipments for Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work.
- ii. Construction of 2Ckm 33kV, 1CX630sqmm line and 33kV O/H Line of 10Ckm with 232sqmm OH conductor from Mania Grid to Proposed Biswanahakani PSS.
- iii. 4Ckm 33kV, 1CX630sqmm line from 33kV consumer -Som Distelleres to Proposed Biswanahakani PSS.
- iv. Construction of 11kV UG line wth 3Cx400sqmm cable of total 3Ckm for 3 nos. of proposed 11kV associated feeders.
- v. Augmentation of existing 11kV line from 34/55/80 sqmm to 100sqmm AAAC of length 10Ckm.

**Abstract of Estimate**

<b>Name of the Division :-</b>	CED
<b>Name of the Sub-Division :-</b>	CHOUDWAR
<b>Name of the Section :-</b>	TANGI
<b>Name of the Work :-</b>	Construction of 2X5 MVA, 33/11kV PSS at Biswanakanhi along with 33 KV line (O/H & U/G) from Mania Grid and connectivity from 33kV Industrial feeder (Mania Grid) to proposed Biswanakanhi PSS and 11kV associated outgoing feeders.
<b>Scope of work:-</b>	Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work. Construction of 2Ckm 33kV, 1CX630sqmm line from Mania Grid to Proposed Biswanahakani PSS and 4Ckm 33kV, 1CX630sqmm line from 33kV consumer -Som Distelleres. Construction of 33kV O/H Line of 10Ckm with 232sqmm OH conductor from Mania Grid to Proposed Biswanahakani PSS. Construction of 11kV U/G Line with 3CX400sqmm Cable- 3Ckm. Augmentation of existing 11kV line from 34/55/80 sqmm to 100sqmm AAAC. of length 10Ckm.
<b>Names of Schemes:-</b>	TPCODL CAPEX

<b><u>ABSTRACT OF ESTIMATE</u></b>			
<b>Sl. No.</b>	<b>Part</b>	<b>Description</b>	<b>Amount (In Cr.)</b>
1	A	Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work.	₹ 9,49,63,176.06
2	B	Construction of 2Ckm 33kV, 1CX630sqmm line from Mania Grid to Proposed Biswanahakani PSS and 4Ckm 33kV, 1CX630sqmm line from 33kV consumer -Som Distelleries.	₹ 8,68,24,123.27
3	C	Construction of 33kV O/H Line of 10Ckm with 232sqmm OH conductor from Mania Grid to Proposed Biswanahakani PSS.	₹ 3,66,31,422.30
4	D	Construction of 11kV U/G Line with 3CX400sqmm Cable-3Ckm.	₹ 2,26,08,437.19
5	E	Augmentation of existing 11kV line from 34/55/80 sqmm to 100sqmm AAAC. of length 10Ckm.	₹ 1,18,48,194.29
		<b>Total Amount</b>	<b>₹ 25,28,75,353.11</b>
		<b>Total Amount (In Rs.Cr)</b>	<b>25.29</b>
<b>Total estimated cost is Rs. 25.29/- Crore.</b>			

Cost Estimate: ₹ 25.29cr. (For detailed BoQ refer Annexure-2).

**Benefits:**

- Improvement of voltage profile at the area around Biswanahakani.
- Mitigation of overloading of feeders.
- Minimization of interruption.
- Reliability of power supply.
- Strengthening of exiting distribution network.

## 7. PART-B: Construction of 33kV New Lines

In TPCODL, 33kV network is the back bone of power supply system and spread across vast area of TPCODL and connected with various 33/11kV PSS from where the power is transformed at 11kV for further distribution. 33kV network is lengthy and radial in nature at most of the places. In such lengthy 33kV feeder low voltage issues have been faced at the far end of the feeder and at PSS level in some cases.

Hence 33kV new lines are proposed to reduce the length of the existing feeder, by which voltage profile will be improved, overloading of 33kV feeders will be mitigated and N-1 reliability can be achieved. In this proposal 20 nos. 33kV new line will be constructed for low voltage mitigation, overloading mitigation and N-1 reliability proposals.

**Table 7-1: List of proposed 33kV New Lines to mitigate low voltage issue at 33/11kV PSS:**

Sl. No.	Name of Circle	From (GSS/ PSS)	To	Cost. (in Rs.cr.)
1	BBSR-I	Satsankha GSS	Mangalpur PSS	4.90
2	BBSR-I	Pratapsasan GSS	Trahiachyuta Nagar PSS	4.38
3	BBSR-II	Daspalla GSS	Proposed 4-Pole (Daspalla PSS)	14.16
4	BBSR-II	Daspalla GSS	Existing 4-Pole (Banigochha PSS)	
5	BBSR-II	Daspalla GSS	Proposed 4-Pole (Gania PSS)	
6	BBSR-II	Satsankha GSS	Patnayak Chowk (Delang)	5.20
7	BBSR-II	Argul GSS	Taraboi point DP (Tiramalla PSS)	7.35
8	BBSR-II	Satsankha GSS	Satsankha/ Kumareswar PSS	7.18
9	CUTTACK	Bahugram/Atado GSS	Bahugram-2 PSS	5.60
10	CUTTACK	Balichandrapur GSS	Balichandrapur PSS	7.65
11	DHENKANAL	Gondia GSS	Proposed 4-Pole (College PSS)	2.65
12	DHENKANAL	Gondia GSS	Proposed 4-Pole (Joranda PSS)	
13	DHENKANAL	Goda GSS	Proposed 4-Pole (Bhuban PSS)	1.35
14	DHENKANAL	Chainpal GSS	Parjang PSS	11.15
15	DHENKANAL	Kamakhyanagar GSS	Parjang PSS	12.68
16	PARADEEP	Rajnagar GSS	Badhi/Babar PSS	11.62
17	PARADEEP	Tirtol GSS	Kanakpur PSS	3.93
18	CUTTACK	Bahugram/Atado GSS	Nischintakoili PSS	7.04
19	BBSR-I	Bangurigaon PSS	Kakatpur PSS	8.47
20	DHENKANAL	Khajuriakata GSS	Phulapada PSS	12.90
<b>TOTAL</b>				<b>128.20</b>

### **7.1 Mitigation of Low Voltage and Overloading issues at 33/11kV Substations fed from 33kV Pipili Feeder (Nimapada Grid):**

#### **Proposal:**

Proposal for laying of 1CX630sqmm UG cable of length 3.5Ckm from 132/33kV Satasankha Grid to proposed 1no. 4Pole structure at 33kV Pipili feeder near Mangalpur PSS.

Proposal for construction of 232sqmm OH conductor feeder of length 7Ckm and laying of 1CX630sqmm UG cable of length 1Ckm from 132/33kV Pratapsasan Grid to 33/11kV Trahiachyutanagar PSS and construction of 1no. 33kV outdoor bay at Trahiachyutanagar PSS.

#### **Objective:**

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from 33/11kV Mangalpur PSS, Pipili PSS, Garadpur PSS and Trahiachyutanagar PSS. Overloading mitigation of 33kV Pipili feeder emanating from Nimapada Grid along with ensuring reliability of power supply by providing N-1 contingency connectivity from 33kV feeders proposed from Satasankha Grid and Pratapsasan Grid during peak loading condition.

#### **Existing Scenario (Summer'22):**

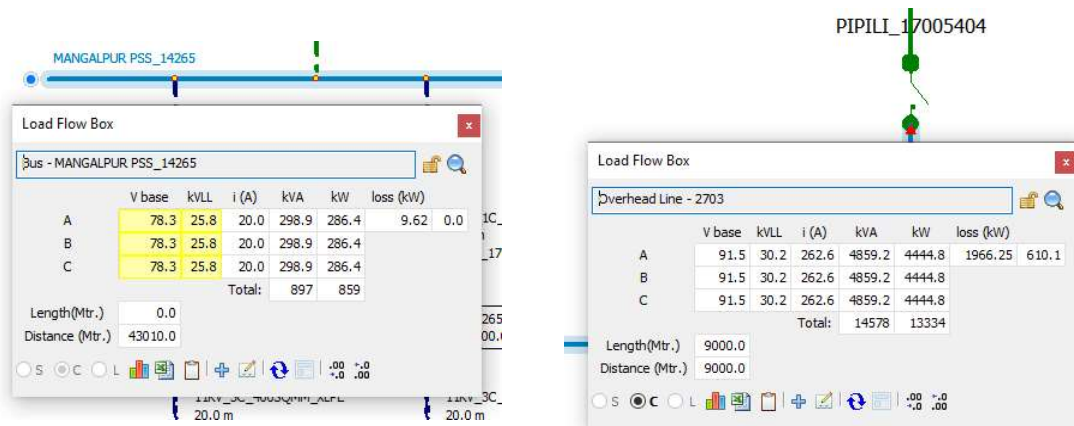
- At present, 33/11kV Garadpur, Trahiachyutanagar, Pipili and Mangalpur PSS are fed from 33kV Pipili feeder emanating from Nimapada Grid, having 100sqmm OH conductor.
- The voltage experienced at 33/11kV Garadpur, Trahiachyutanagar, Pipili and Mangalpur PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The 33kV Pipili feeder feeds power supply to 33/11kV Garadpur, Trahiachyutanagar, Pipili and Mangalpur PSS with a total length of 56.1Ckm. The 33kV Pipili feeder is overloaded up to 97%.
- The low voltage and overloading situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Nimapada	Pipili	15.54	15.00	97%	Overload	18.15	24.16	155%

## Supplementary Capex Plan: FY 2023-24

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Nimapada	Pipili	Garadpur	29
		Pipili	25.8
		Traiachyutnagar	27.3
		Mangalpur	25.8

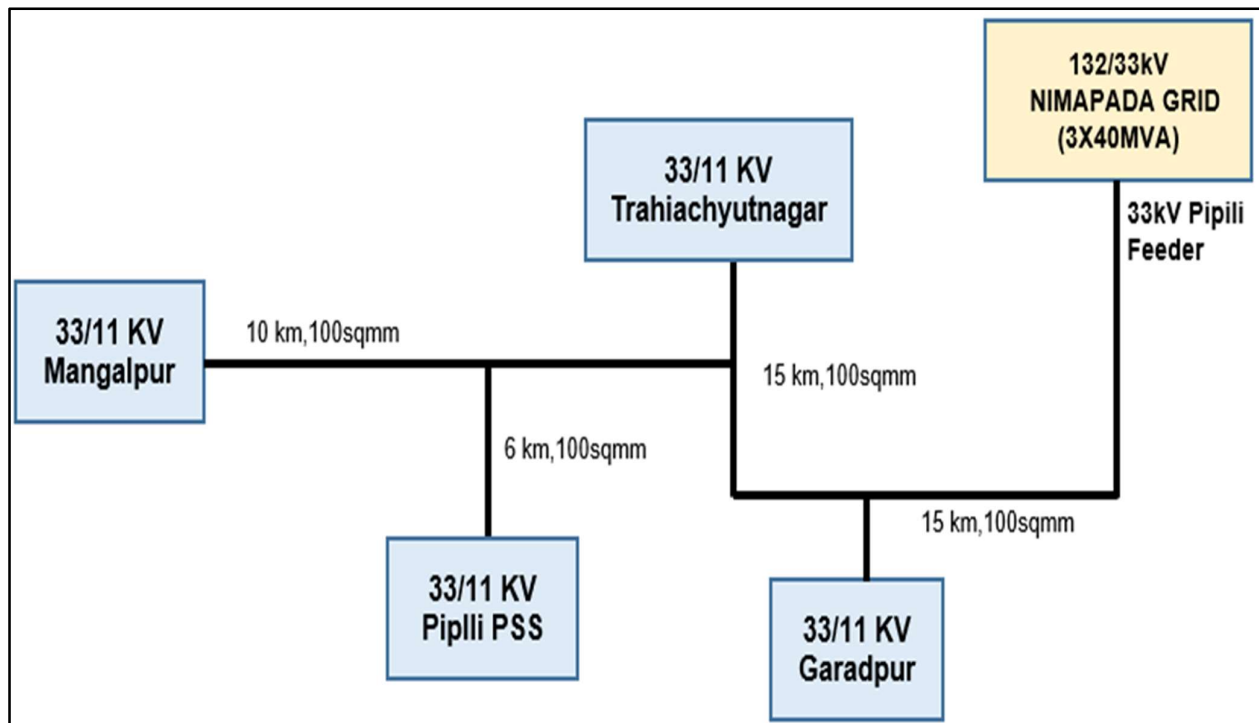
### Snapshot from Cyme Software (Existing Scenario)



### Mangalpur PSS

### 33kV Pipili feeder

### Existing SLD:



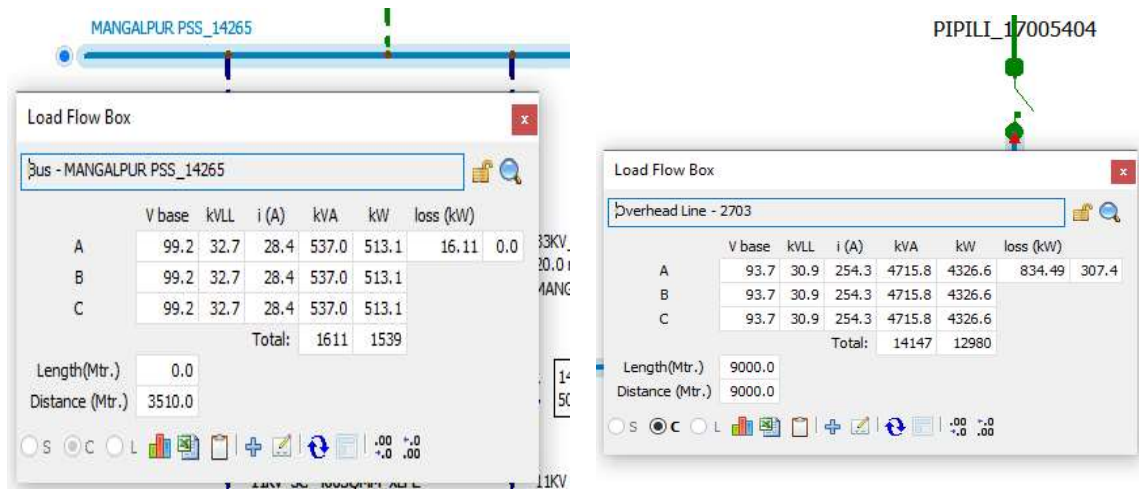
**Proposed Scenario (Summer'24):**

- Laying of 1CX630sqmm UG cable of length 3.5Ckm from 132/33kV Satasankha Grid to proposed 1no. 4Pole structure at 33kV Pipili feeder near Mangalpur PSS.
- Construction of 232sqmm OH conductor of length 7Ckm and laying of 1CX630sqmm UG cable of length 1Ckm from 132/33kV Pratapsasan Grid to 33/11kV Trahiachyutanagar PSS.
- Construction of 1no. 33kV outdoor bay at Trahiachyutanagar PSS.
- After linking new feeders from Satasankha GSS and Pratapsasan GSS, the 33kV proposed Trahiachyutanagar feeder will deliver power supply to Trahiachyutanagar PSS, the 33kV proposed Mangalpur feeder will deliver power supply to Mangalpur PSS and the existing 33kV Pipili feeder will deliver power supply to Garadpur PSS and Pipili PSS during normal operating condition.
- This proposal will mitigate the overloading issue of 33kV Pipili feeder emanating Nimapada Grid and improve voltage profile at 33/11kV Garadpur, Trahiachyutanagar, Pipili and Mangalpur PSS.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Nimapada	Pipili	26.51	13.00	49%	OK	17.30	65%	OK
Pratapsasan	Proposed Trahiachyutanagar	26.51	2.60	10%	OK	3.46	13%	OK
Satasankha	Proposed Mangalpur	26.51	2.70	10%	OK	3.59	14%	OK

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Nimapada	Pipili	Garadpur	30.1
		Pipili	30.05
Pratapsasan	Proposed Trahiachyutanagar	Trahiachyutanagar	31.6
Satasankha	Proposed Mangalpur	Mangalpur	32.7

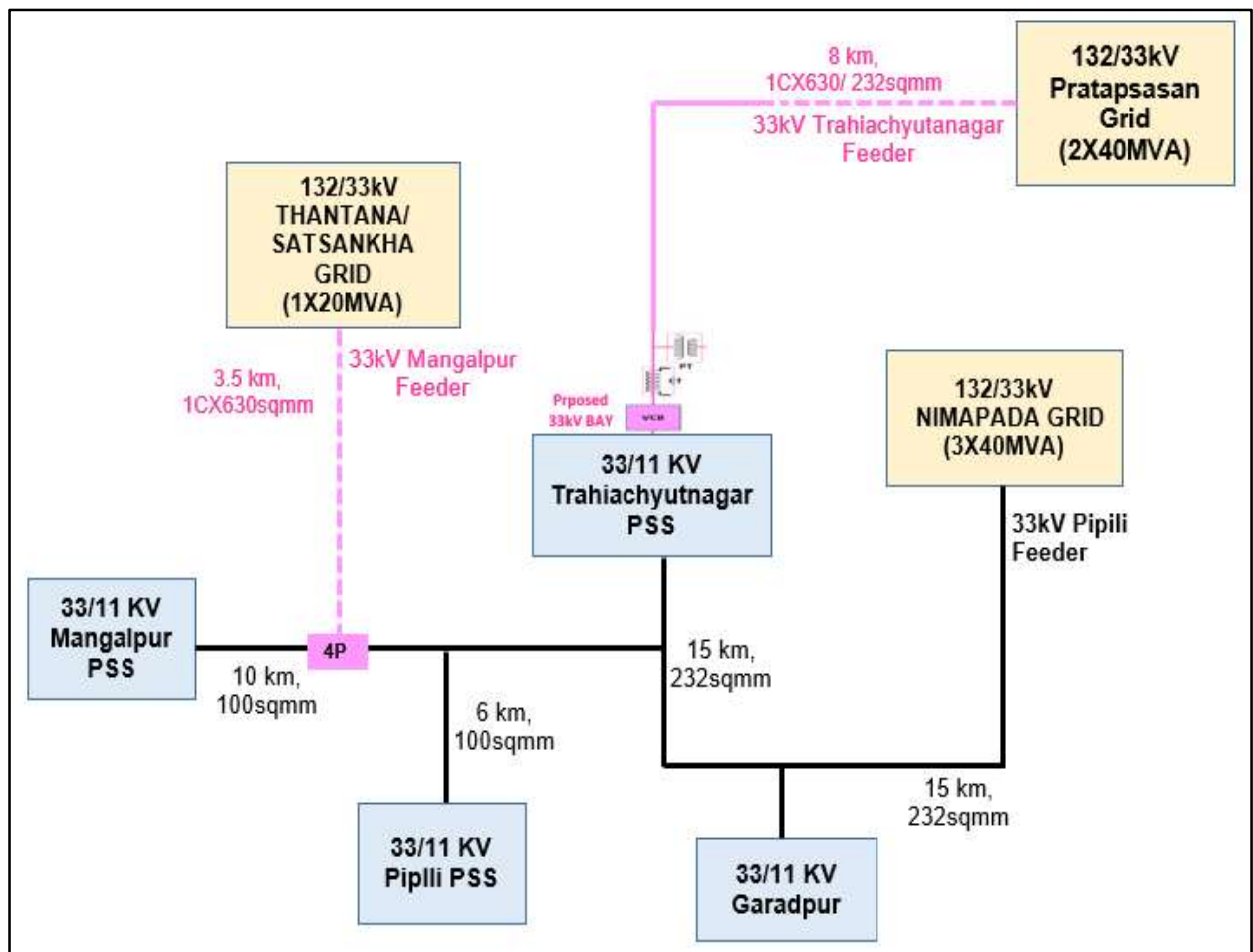
**Snapshot from Cyme Software (Proposed Scenario)**



**Mangalpur PSS**

**33kV Pipili feeder**

**Proposed SLD:**



**Detailed Scope of Work:**

**33kV Proposed Mangalpur Feeder (Satasankha Grid):**

Laying of 1CX630sqmm UG cable of length 3.5Ckm & construction of 1no. 4Pole structure.

**Abstract of Estimate**

Name of the Division :-	PURI ELECTRICAL DIVISION, PURI		
Name of the Sub-Division :-	Sakhigopal		
Name of the Section :-	Satasankha, Puri		
Name of the Work :-	33kV New Line from Satasankha Grid (33kV Proposed Mangalpur Feeder)		
Scope of work:-	Laying of 33kV underground cable with 3R, 1CX630sqmm Cable- 3.5Ckm. Construction of 33kV 4 Pole with Isolator- 1 No.		
Names of Schemes: -	TPCODL CAPEX		
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Laying of 33kV underground cable with 3R, 1CX630sqmm Cable- 3.5Ckm.	₹ 4,80,61,167.38
2	B	Construction of 33kV 4 Pole with Isolator- 1 No.	₹ 9,78,548.67
Total Amount			₹ 4,90,39,716.04
Total Amount (In Rs. Cr)			4.90
Total estimated cost is Rs.4.9 Crore.			

Cost Estimate: ₹ 4.90cr. (For detailed BoQ refer Annexure-3).

33kV Proposed Trahiachyutanagar Feeder (Pratapsasan Grid):

Construction of 232sqmm OH conductor of length 7Ckm and laying of 1CX630sqmm UG cable of length 1Ckm from 132/33kV Pratapsasan Grid to 33/11kV Trahiachyutanagar PSS along with construction of 1no. 33kV outdoor bay at Trahiachyutanagar PSS.

**Abstract of Estimate**

Name of the Division :-		NED, Nimapada	
Name of the Sub-Division : -		Pipili	
Name of the Section : -		Pipili No.-1	
Name of the Work :-		33kV New Line from Pratapsasan Grid (33kV Proposed Trahiachyutanagar Feeder)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor, considering span length of 40mtr.- 7Ckm.Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm. Construction for 1 no. of 33kV Outdoor Bay at Trahiachyuta Nagar PSS.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor, considering span length of 40mtr.- 7Ckm.	₹ 2,61,36,726.20
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm.	₹ 1,40,53,343.76
3	C	Construction for 1 no. of 33kV Outdoor Bay at Trahiachyuta Nagar PSS.	₹ 36,39,033.16
		Total Amount	₹ 4,38,29,103.13
		Total Amount (In Rs. Cr)	₹ 4.38
Total estimated cost is Rs.4.38 Crore.			

Cost Estimate: ₹ 4.38cr. (For detailed BoQ refer Annexure-4).

**Benefits:**

- ❖ Mitigation of overloading issue of 33kV Pipili feeder.
- ❖ Improving low voltage issues at 33/11kV Garadpur, Trahiachyutanagar, Pipili and Mangalpur PSS.
- ❖ Ensuring reliable power supply to the consumers by providing N-1 contingency connectivity to 33kV Pipili feeder.

## 7.2 Mitigation of Low Voltage issues at 33/11kV Substations fed from 33kV Daspalla Feeder (Nayagarh Grid):

### Proposal:

Proposal for construction of 241sqmm OH covered conductor feeder of length 0.35Ckm from proposed 220/33kV Daspalla Grid to proposed 1no. 4Pole structure at 33kV Daspalla feeder, construction of 241sqmm OH covered conductor feeder of length 0.37Ckm from proposed 220/33kV Daspalla Grid to existing 4Pole structure at 33kV Daspalla feeder, construction of 241sqmm OH covered conductor line of length 32Ckm and laying of 1CX630sqmm UG cable of length 1Ckm from 220/33kV Daspalla Grid to proposed 4Pole structure 33kV line between Nuagaon PSS and Gania PSS.

### Objective:

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from 33/11kV Daspalla PSS, Banigochha PSS, Gania PSS, Chamundia PSS, Kirialanji PSS, Mahipur PSS and Nuagaon PSS during peak loading condition. Ensuring reliability of power supply by providing N-1 contingency connectivity from 33kV feeders proposed from Daspalla Grid during peak loading condition.

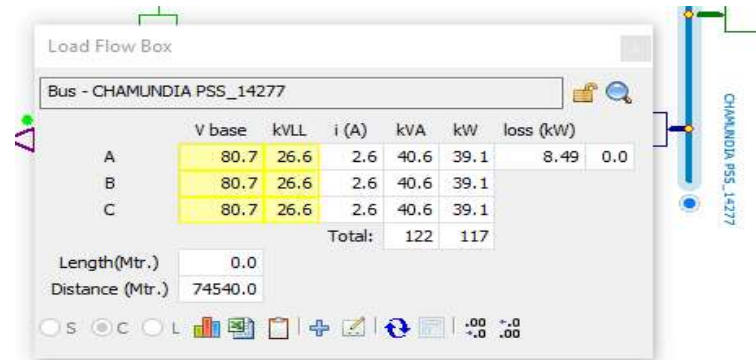
### Existing Scenario (Summer'22):

- At present, 33/11kV Daspalla PSS, Banigochha PSS, Gania PSS, Chamundia PSS, Kirialanji PSS, Mahipur PSS and Nuagaon PSS are fed from 33kV Daspalla feeder emanating from Rajpatna (Nayagarh) Grid, having mixed type OH conductor and UG cable.
- The voltage experienced at 33/11kV Daspalla PSS, Banigochha PSS, Gania PSS, Chamundia PSS, Kirialanji PSS, Mahipur PSS and Nuagaon PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The low voltage situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Nayagarh	Daspalla	26.51	12.60	48%	Ok	15.25	20.29	77%

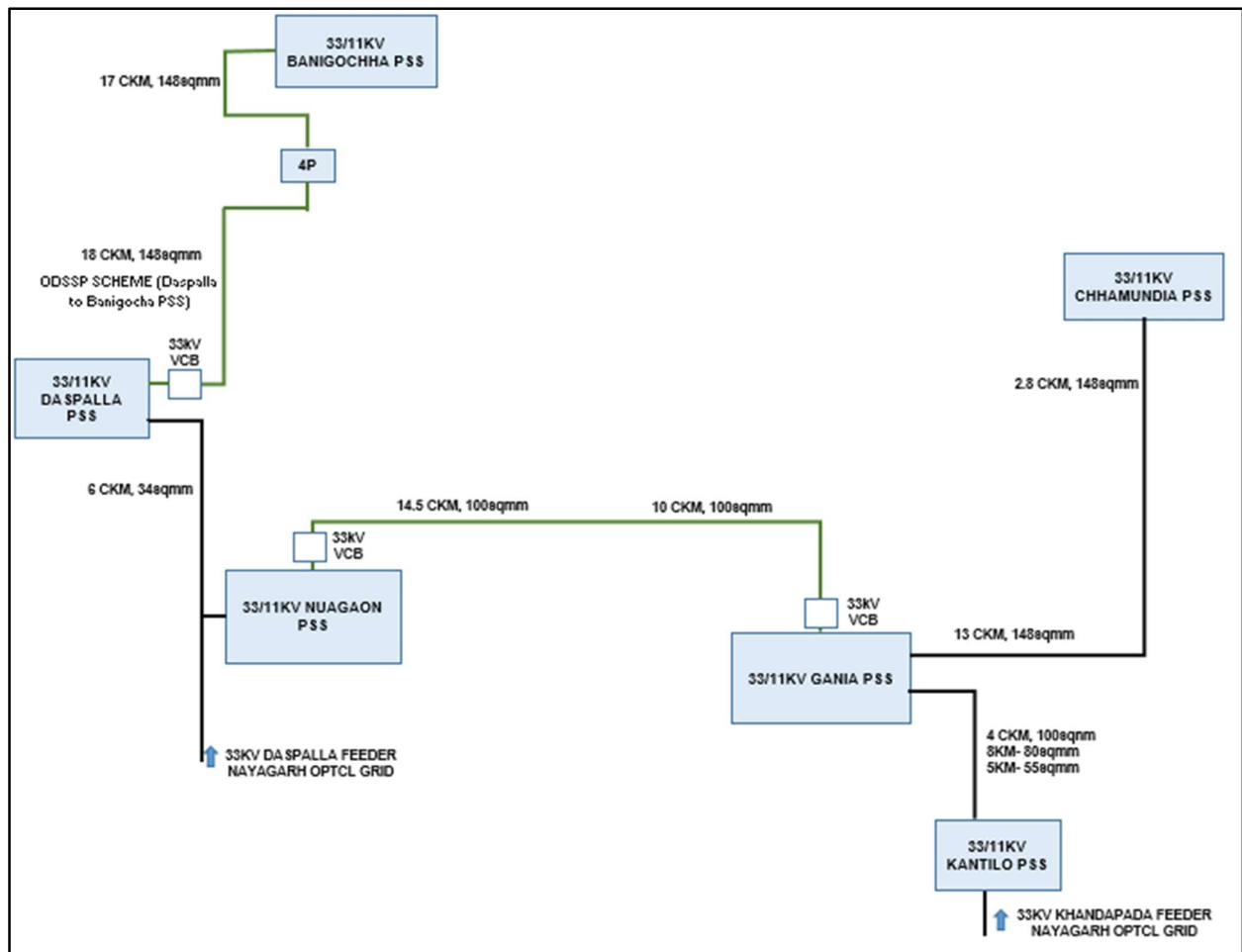
Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Nayagarh	Daspalla	Kirialanji	29.6
		Mahipur	29
		Nuagaon	27.4
		Daspalla	24.3
		Gania	26.6
		Chamundia	26.6

### Snapshot from Cyme Software (Existing Scenario)



### Chamundia PSS

#### Existing SLD:



**Proposed Scenario (Summer'24):**

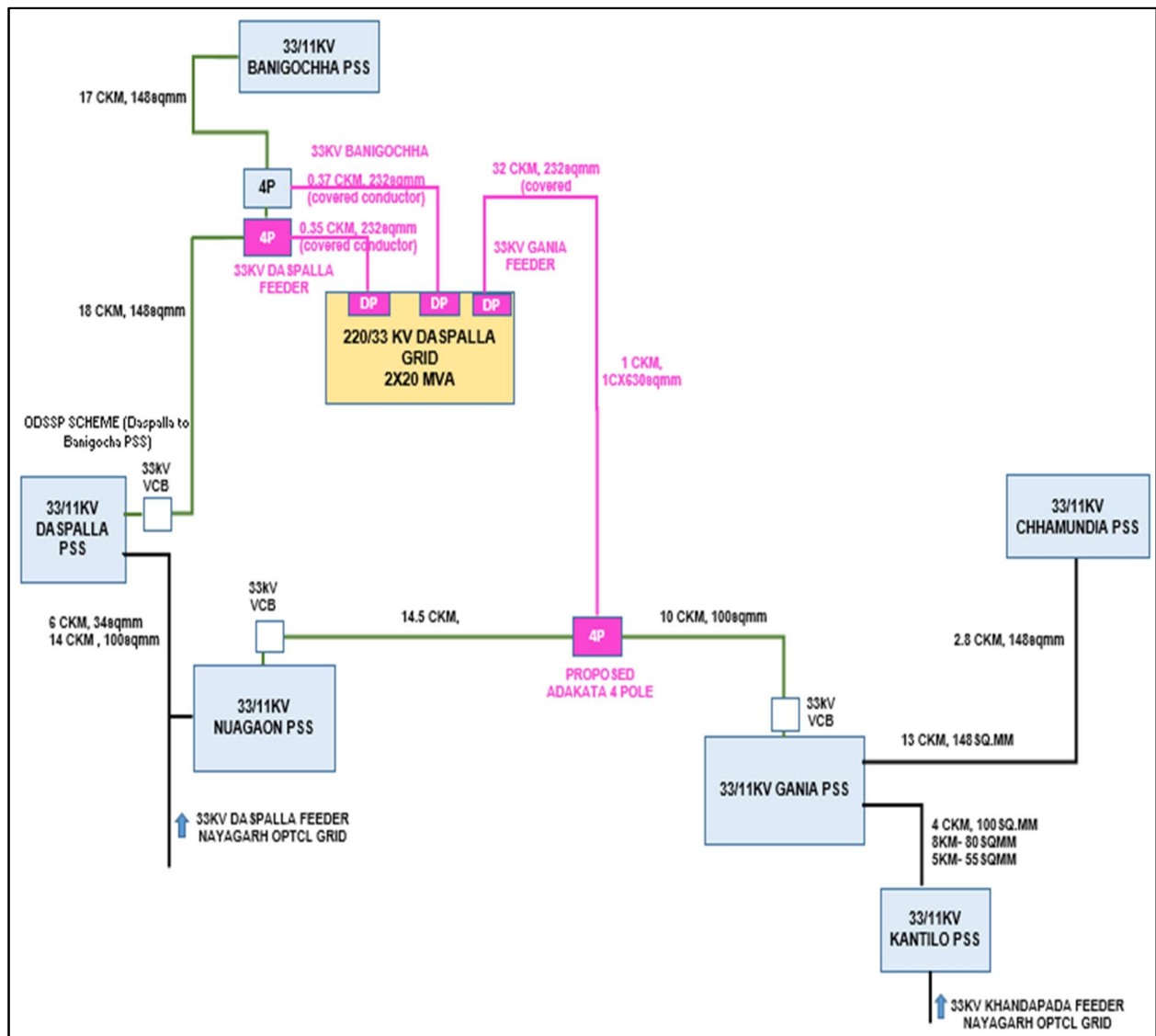
- Construction of 241sqmm OH covered conductor of length 0.35Ckm from 220/33kV Daspalla Grid to proposed 1no. 4Pole structure at 33kV Daspalla feeder.
- Construction of 241sqmm OH covered conductor of length 0.37Ckm from 220/33kV Daspalla Grid to existing 4Pole structure at 33kV Daspalla feeder.
- Construcion of 241sqmm OH covered conductor of length 32Ckm and laying of 1CX630sqmm UG cable of lenth 1Ckm from 220/33kV Daspalla Grid to proposed 4Pole structure 33kV line between Nuagaon PSS and Gania PSS.
- After linking new feeders from proposed Daspalla GSS, the new feeder namely 33kV Proposed Daspalla feeder will deliver power supply to Daspalla PSS, 33kV Proposed Banigochha feeder will deliver power supply to Banigochha PSS and 33kV Proposed Gania feeder will deliver power supply to Gania and Chamundia PSS and existing 33kV Daspalla feeder will deliver power supply to Kirialiaji PSS, Mahipur PSS and Nuagaon PSS during normal operating condition.
- This proposal will improve the voltage at 33/11kV Daspalla PSS, Banigochha PSS, Gania PSS, Chamundia PSS, Kirialanji PSS, Mahipur PSS and Nuagaon PSS.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Overloading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Overloading Status
Nayagarh	Daspalla	26.51	3.90	15%	OK	5.19	20%	OK
Daspalla	Proposed Daspalla	26.51	6.50	25%	OK	8.65	33%	OK
	Proposed Gania	26.51	3.00	11%	OK	3.99	15%	OK
	Proposed Banigocha	26.51	3.00	11%	OK	3.99	15%	OK

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Nayagarh	Daspalla	Kirialanji	30.7
		Mahipur	30.6
		Nuagaon	30.3
Daspalla	Proposed Daspalla	Daspalla	30.9
	Proposed Gania	Gania	31.1
		Chamundia	31.1
	Proposed Banigocha	Banigocha	31.4

**Snapshot from Cyme Software (Proposed Scenario)****Chamundia PSS**

**Proposed SLD:**



**Detailed Scope of Work:**

Construction of 241sqmm OH covered conductor feeder of length 0.35Ckm from proposed 220/33kV Daspalla Grid to proposed 1no. 4Pole structure at 33kV Daspalla feeder, construction of 241sqmm OH covered conductor feeder of length 0.37Ckm from proposed 220/33kV Daspalla Grid to existing 4Pole structure at 33kV Daspalla feeder, construction of 241sqmm OH covered conductor line of length 32Ckm and laying of 1CX630sqmm UG cable of length 1Ckm from 220/33kV Daspalla Grid to proposed 4Pole structure 33kV line between Nuagaon PSS and Gania PSS.

**Abstract of Estimate**

<b>Name of the Division :-</b>	<b>NAYAGARH ELECTRICAL DIVISION, NAYAGARH</b>
<b>Name of the Sub-Division :-</b>	Daspalla
<b>Name of the Section :-</b>	Daspalla, Nayagarh
<b>Name of the Work :-</b>	33kV New Lines from Daspalla Grid (33kV Proposed Daspalla, Banigochha & Gania Feeders)
<b>Scope of work:-</b>	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 0.35Ckm. Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 0.37Ckm. Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 32Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm. Construction of 33kV 4 Pole structure with Isolator- 2nos.
<b>Names of Schemes:-</b>	TPCODL CAPEX

**ABSTRACT OF ESTIMATE**

<b>Sl. No.</b>	<b>Part</b>	<b>Description</b>	<b>Gross Total</b>
1	A	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 0.35Ckm.	₹ 12,97,797.24
2	B	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 0.37Ckm.	₹ 13,33,614.81
3	C	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 32Ckm.	₹ 12,23,63,262.25
4	D	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm.	₹ 1,44,82,689.32
5	E	Construction of 33kV 4 Pole structure with Isolator- 2nos.	₹ 20,90,891.18
		<b>Total Estimated Cost</b>	<b>₹ 14,15,68,254.81</b>
		<b>Total Estimated Cost (in Rs. Cr)</b>	<b>14.16</b>

**Total estimated cost is Rs.14.16 Crore.**

Cost Estimate: ₹ 14.16 Cr. (For detailed BoQ refer Annexure-5).

**Benefits:**

- ❖ Improving low voltage issues at 33/11kV Daspalla PSS, Banigochha PSS, Gania PSS, Chamundia PSS, Kirialanji PSS, Mahipur PSS and Nuagaon PSS.
- ❖ Ensuring reliable power supply to the consumers by providing N-1 contingency connectivity to 33kV Daspalla feeder.

### **7.3 Mitigation of Low Voltage and Overloading issues at 33/11kV Substations fed from 33kV Delang Feeder (Khordha Grid):**

#### **Proposal:**

Proposal for construction of 232sqmm OH conductor feeder of length 8Ckm and laying of 1CX630sqmm UG cable of length 1.5Ckm from 132/33kV Satasankha Grid to Pattanayaka Chowk and construction of 1no. 4Pole structure at Pattanayaka Chowk.

Proposal for construction of 232sqmm OH conductor feeder of length 13Ckm and laying of 1CX630sqmm UG cable of length 3.5Ckm from 132/33kV Argul Grid to proposed 4Pole structure at existing 33kV Delang feeder (Khordha GSS to Tirimalla PSS line).

#### **Objective:**

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from 33/11kV Tirimalla PSS, Delang PSS, Kalyanpur PSS and Kanas PSS during peak loading condition. Overloading mitigation of 33kV Delang feeder emanating from Khordha Grid along with ensuring reliability of power supply by providing N-1 contingency connectivity from 33kV feeders proposed from Satasankha Grid and Argul Grid during peak loading condition.

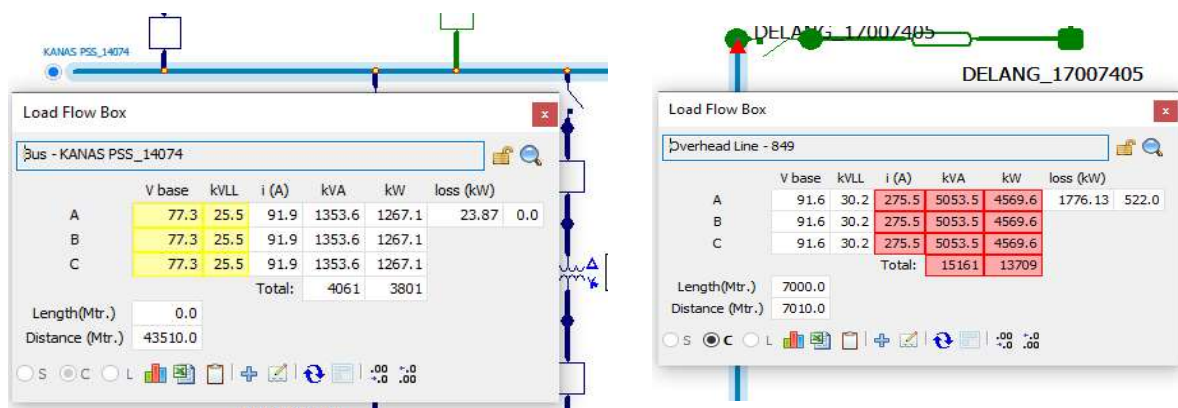
#### **Existing Scenario (Summer'22):**

- At present, 33/11kV Delang PSS, Tirimalla PSS, Kalyanpur PSS and Kanas PSS are fed from 33kV Delang feeder emanating from Khordha Grid, having 100sqmm OH conductor.
- The voltage experienced at 33/11kV Tirimalla PSS, Delang PSS, Kalyanpur PSS and Kanas PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The 33kV Delang feeder feeds 33/11kV Tirimalla PSS, Delang PSS, Kalyanpur PSS and Kanas PSS with a total length of 46.5Ckm. The 33kV Delang feeder is overloaded up to 97%.
- The low voltage and overloading situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Khordha	Delang	15.54	15.00	97%	Overload	18.15	24.16	155%

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Khordha	Delang	Tirimalla	28.5
		Delang	26.7
		Kalyanpur	26
		Kanas	25.5

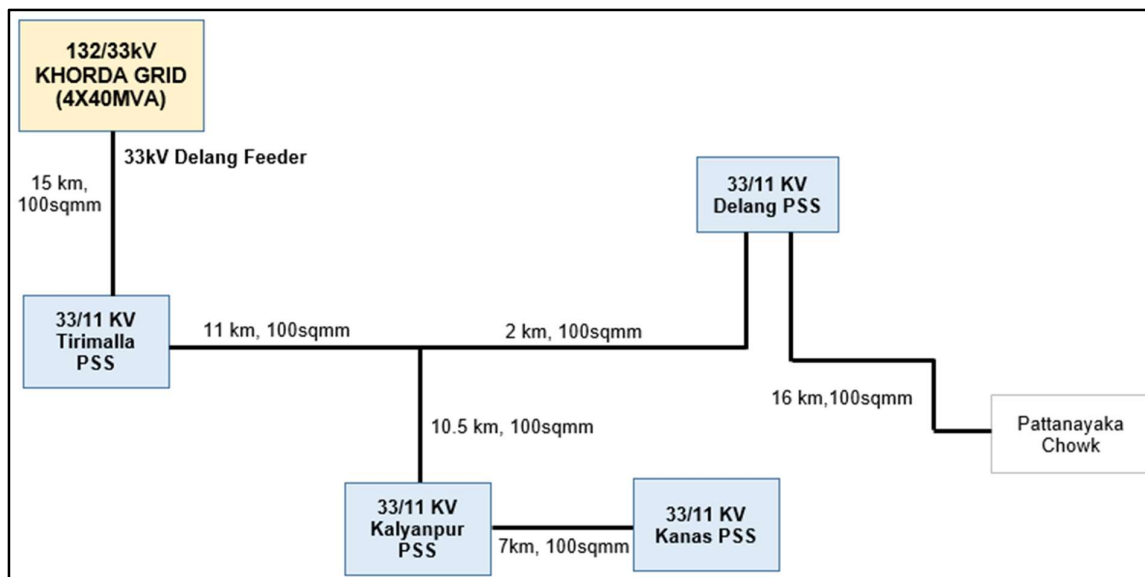
### Snapshot from Cyme Software (Existing Scenario)



**Kanas PSS**

**33kV Delang Feeder**

### Existing SLD:



### Proposed Scenario (Summer'24):

- Construction of 232sqmm OH conductor feeder of length 8Ckm and laying of 1CX630sqmm UG cable of length 1.5Ckm from 132/33kV Satasankha Grid to Pattanayaka Chowk.
- Construction of 1no. 4Pole structure at Pattanayaka Chowk.
- Construction of 232sqmm OH conductor feeder of length 13Ckm and laying of 1CX630sqmm UG cable of length 3.5Ckm from 132/33kV Argul Grid to proposed 4Pole structure at existing 33kV Delang feeder (Khordha GSS to Tirimalla PSS line).
- Construction of 1no. 4Pole structure at existing 33kV Delang feeder (Khordha GSS to Tirimalla PSS line).
- After linking new feeders from Satasankha GSS and Argul GSS, the proposed Satasankha-2 feeder will deliver power supply to Delang PSS, the proposed Delang New

## Supplementary Capex Plan: FY 2023-24

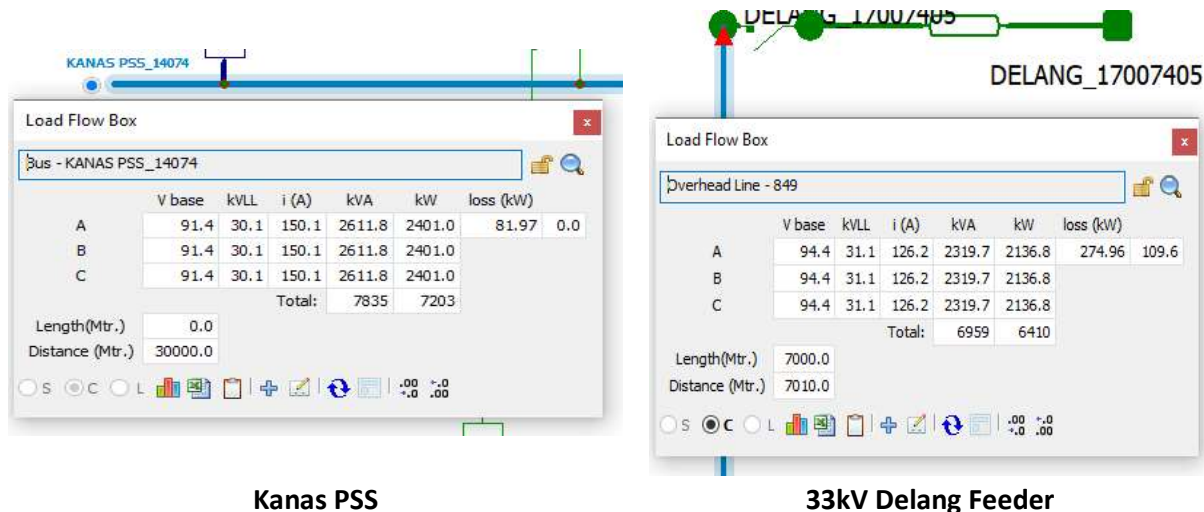
feeder will deliver power supply to Kalyanpur PSS, the proposed Kanas feeder (proposal under CMPDP scheme) will deliver power supply to Kanas PSS and existing 33kV Delang feeder will deliver power supply to Tirimalla PSS during normal operating condition.

- This proposal will mitigate the overloading issue of 33kV Delang feeder and improve voltage at 33/11kV Tirimalla PSS, Delang PSS, Kalyanpur PSS and Kanas PSS.

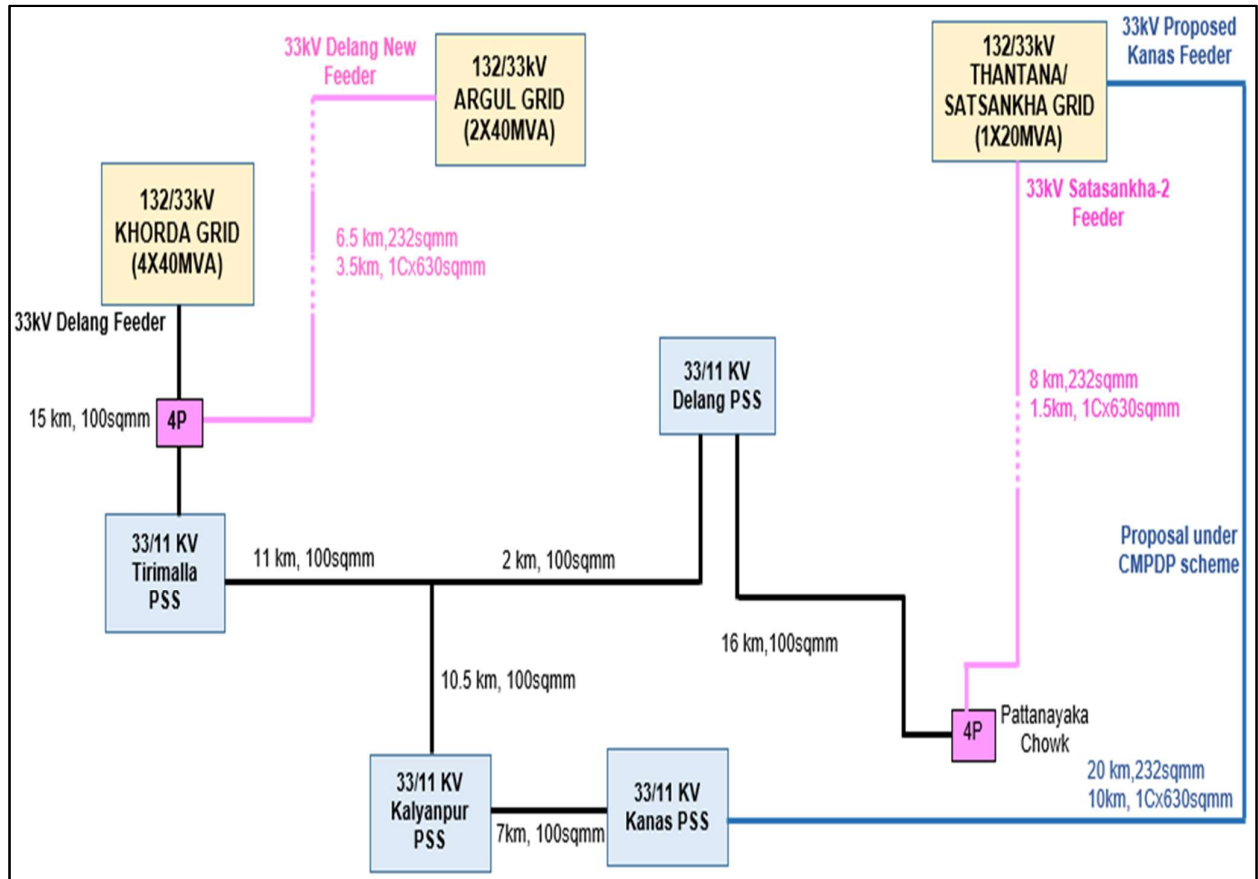
Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Khurdha	Delang	15.54	5.00	32%	OK	6.66	43%	OK
Satsankha	Proposed Satsankha-2	15.54	4.50	29%	OK	5.99	39%	OK
Argul	Proposed Delang New	15.54	4.00	26%	OK	5.32	34%	OK
Satsankha	Proposed Kanas (CMPDP)	26.51	6.40	24%	OK	8.52	32%	OK

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Khurdha	Delang	Tirimalla	30.4
Satsankha	Proposed Satsankha-2	Delang	30.9
Argul	Proposed Delang New	Kalyanpur	30.7
Satsankha	Proposed Kanas (CMPDP)	Kanas	30.1

### Snapshot from Cyme Software (Proposed Scenario)



**Proposed SLD:**



**Detailed Scope of Work:****33kV Proposed Satasankha-2 Feeder (Satasankha Grid):**

Construction of 232sqmm OH conductor feeder of length 8Ckm and laying of 1CX630sqmm UG cable of length 1.5Ckm from 132/33kV Satasankha Grid to Pattanayaka Chowk and construction of 1no. 4Pole structure at Pattanayaka Chowk.

**Abstract of Estimate**

Name of the Division :-		PURI ELECTRICAL DIVISION, PURI	
Name of the Sub-Division : -		Sakhigopal	
Name of the Section : -		Satasankha, Puri	
Name of the Work :-		33kV New Line from Satasankha Grid (33kV Proposed Satasankha-2 Feeder)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 8Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm cable- 1.5Ckm. Construction of 33kV 4 Pole structure with Isolator- 1 No.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 8Ckm.	₹ 2,97,35,347.05
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm cable- 1.5Ckm.	₹ 2,12,80,956.31
3	C	Construction of 33kV 4 Pole structure with Isolator- 1 No.	₹ 9,78,548.67
		Total Amount	₹ 5,19,94,852.03
		Total Amount (In Rs. Cr)	5.20
Total estimated cost is Rs.5.20 Crore.			

Cost Estimate: ₹ 5.20 Cr. (For detailed BoQ refer Annexure-6).

33kV Proposed Delang New Feeder (Argul Grid):

Construction of 232sqmm OH conductor feeder of length 13Ckm and laying of 1CX630sqmm UG cable of length 3.5Ckm from 132/33kV Argul Grid to proposed 4Pole structure at existing 33kV Delang feeder (Khordha GSS to Tirimalla PSS line).

**Abstract of Estimate**

Name of the Division :-	KHORDHA ELECTRICAL DIVISION, KHORDHA		
Name of the Sub-Division :-	KHORDHA ,KHD, Khordha		
Name of the Section :-	Khordha III, Khordha		
Name of the Work :-	33kV New Line from Argul Grid (33kV Proposed Delang New Feeder)		
Scope of work:-	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 6.5Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 3.5Ckm. Construction of 33kV 4 Pole structure with Isolator- 1 No.		
Names of Schemes: -	TPCODL CAPEX		
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 6.5Ckm.	₹ 2,43,62,298.52
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 3.5Ckm.	₹ 4,81,18,624.20
3	C	Construction of 33kV 4 Pole structure with Isolator- 1 No.	₹ 9,78,548.67
		Total Amount	₹ 7,34,59,471.39
		Total Amount (In Rs. Cr)	7.35
Total estimated cost is Rs.7.35 Crore.			

Cost Estimate: ₹ 7.35 Cr. (For detailed BoQ refer Annexure-7).

**Benefits:**

- ❖ Mitigation of overloading issue of 33kV Delang feeder.
- ❖ Improving low voltage issues at 33/11kV Tirimalla PSS, Delang PSS, Kalyanpur PSS and Kanas PSS.
- ❖ Ensuring reliable power supply to the consumers by providing N-1 contingency connectivity to 33kV Delang feeder.

#### **7.4 Mitigation of Low Voltage and Overloading issues at 33/11kV Substations fed from 33kV Sakhigopal Feeder (Puri Grid):**

##### **Proposal:**

Proposal for construction of 232sqmm OH conductor feeder of length 6Ckm and laying of 1CX630sqmm UG cable of length 3.5Ckm from 132/33kV Satasankha Grid to 33/11kV Satasankha PSS and construction of 2nos. 4Pole structure.

##### **Objective:**

To provide reliable power supply to the consumers improve low voltage issues of areas fed from 33/11kV Chandanpur PSS, Satasankha PSS and Sakhigopal PSS during peak loading condition. Overloading mitigation of 33kV Sakhigopal feeder emanating from Puri Grid along with ensuring reliability of power supply by providing N-1 contingency connectivity from 33kV feeder proposed from Satasankha Grid during peak loading condition.

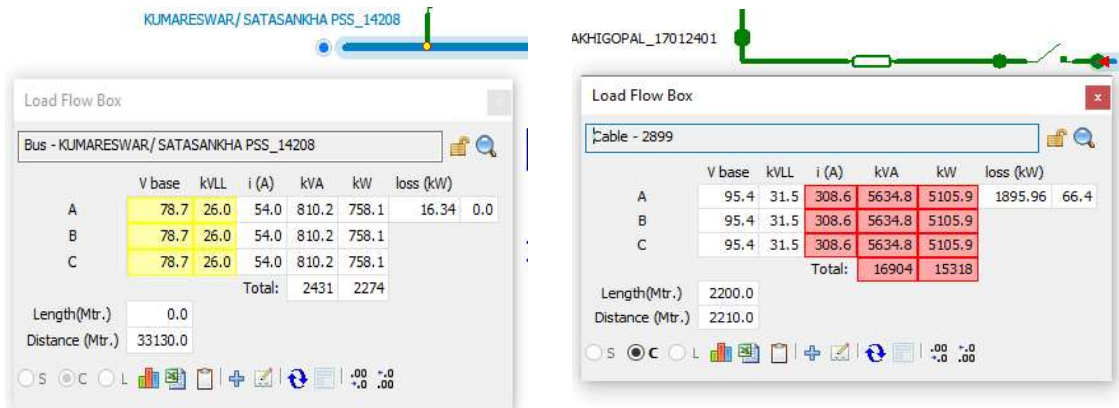
##### **Existing Scenario (Summer'22):**

- At present, 33/11kV Chandanpur PSS, Satasankha PSS and Sakhigopal PSS are fed from 33kV Sakhigopal feeder emanating from Puri Grid, having 100sqmm OH conductor.
- The voltage experienced at 33/11kV Satasankha PSS and Sakhigopal PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The 33kV Sakhigopal feeder feeds power supply to 33/11kV Garadpur, Trahiachyutanagar, Pipili and Mangalpur PSS with a total length of 33.2Ckm. The 33kV Sakhigopal feeder is overloaded up to 113%.
- The low voltage and overloading situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Puri	Sakhigopal	15.54	17.50	113%	Overload	21.18	28.18	181%

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Puri	Sakhigopal	Chandanpur	28.1
		Sakhigopal	26.4
		Satasankha/ Kumareswar	26.0

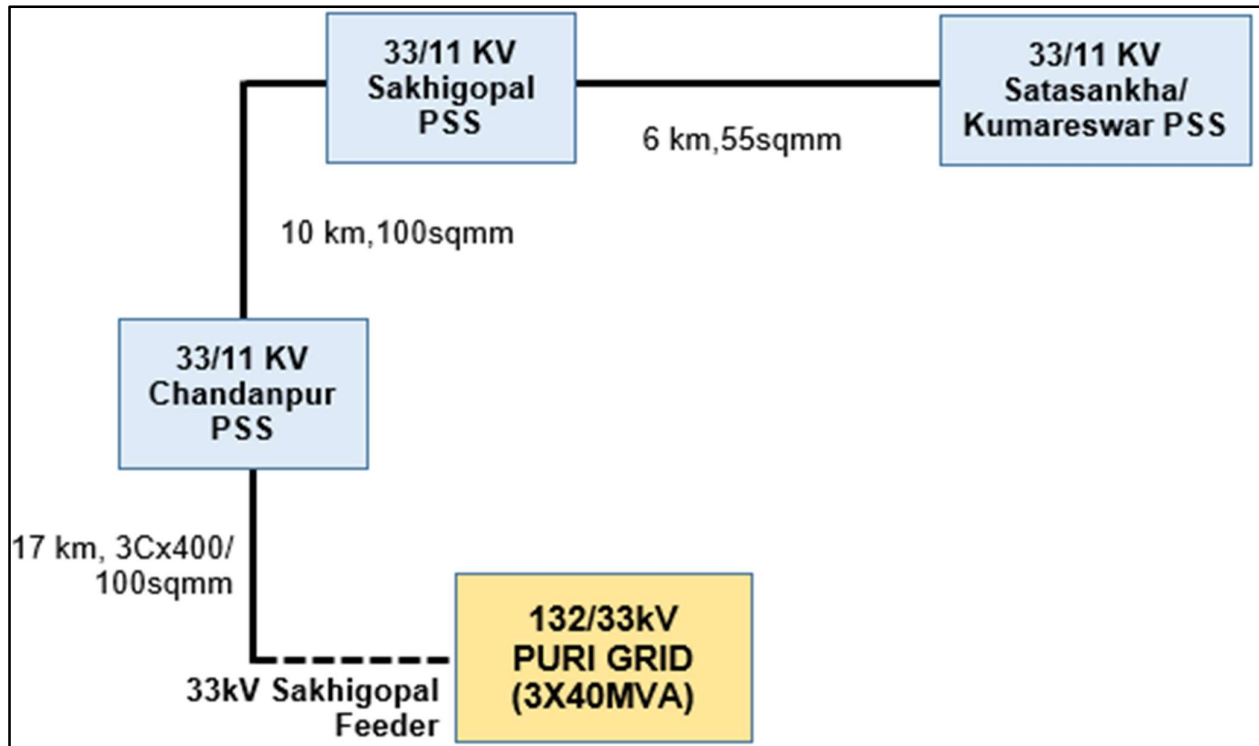
**Snapshot from Cyme Software (Existing Scenario)**



**Satasankha/ Kumareswar PSS**

**33kV Sakhigopal Feeder**

**Existing SLD:**



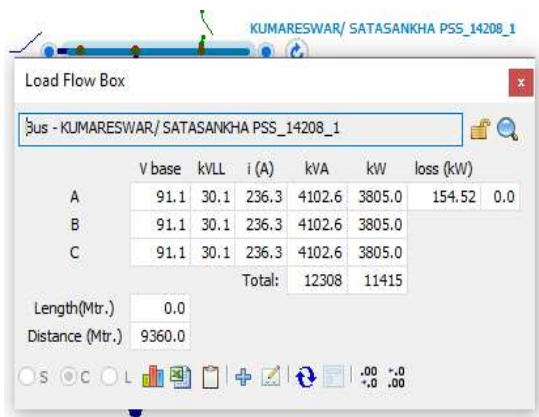
**Proposed Scenario (Summer'24):**

- Construction of 232sqmm OH conductor feeder of length 6Ckm and laying of 1CX630sqmm UG cable of length 3.5Ckm from 132/33kV Satasankha Grid to 33/11kV Satasankha PSS.
- Construction of 2nos. 4Pole structure for the proposed 33kV Satasankha-1 feeder.
- After linking new feeder from Satasankha GSS the proposed Satasankha-1 feeder will deliver power supply to 33/11kV Satasankha PSS and Sakhigopal PSS and existing 33kV Sakhigopal feeder will deliver power supply to 33/11kV Chandanpur PSS during normal operating condition.
- This proposal will mitigate the overloading issue of 33kV Sakhigopal feeder emanating Puri Grid and improve the voltage profile at 33/11kV Chandanpur PSS, Satasankha PSS and Sakhigopal PSS.

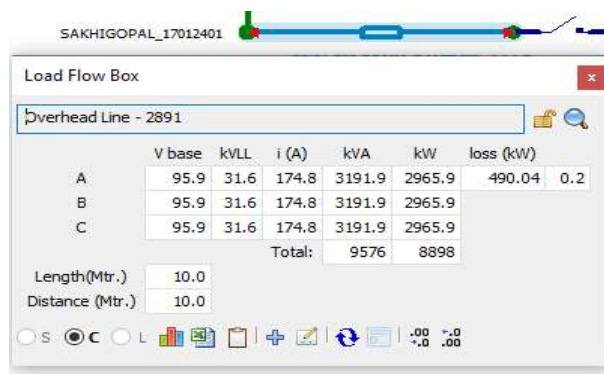
Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Overloading Status
Puri	Sakhigopal	15.54	10.00	64%	OK	13.31	86%	OK
Satasankha	Proposed Satasankha-1	26.51	12.00	45%	OK	15.97	60%	OK

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Puri	Sakhigopal	Chandanpur	30.04
Satasankha	Proposed Satasankha-1	Sakhigopal	30.03
		Satasankha/ Kumareswar	30.1

**Snapshot from Cyme Software (Proposed Scenario)**

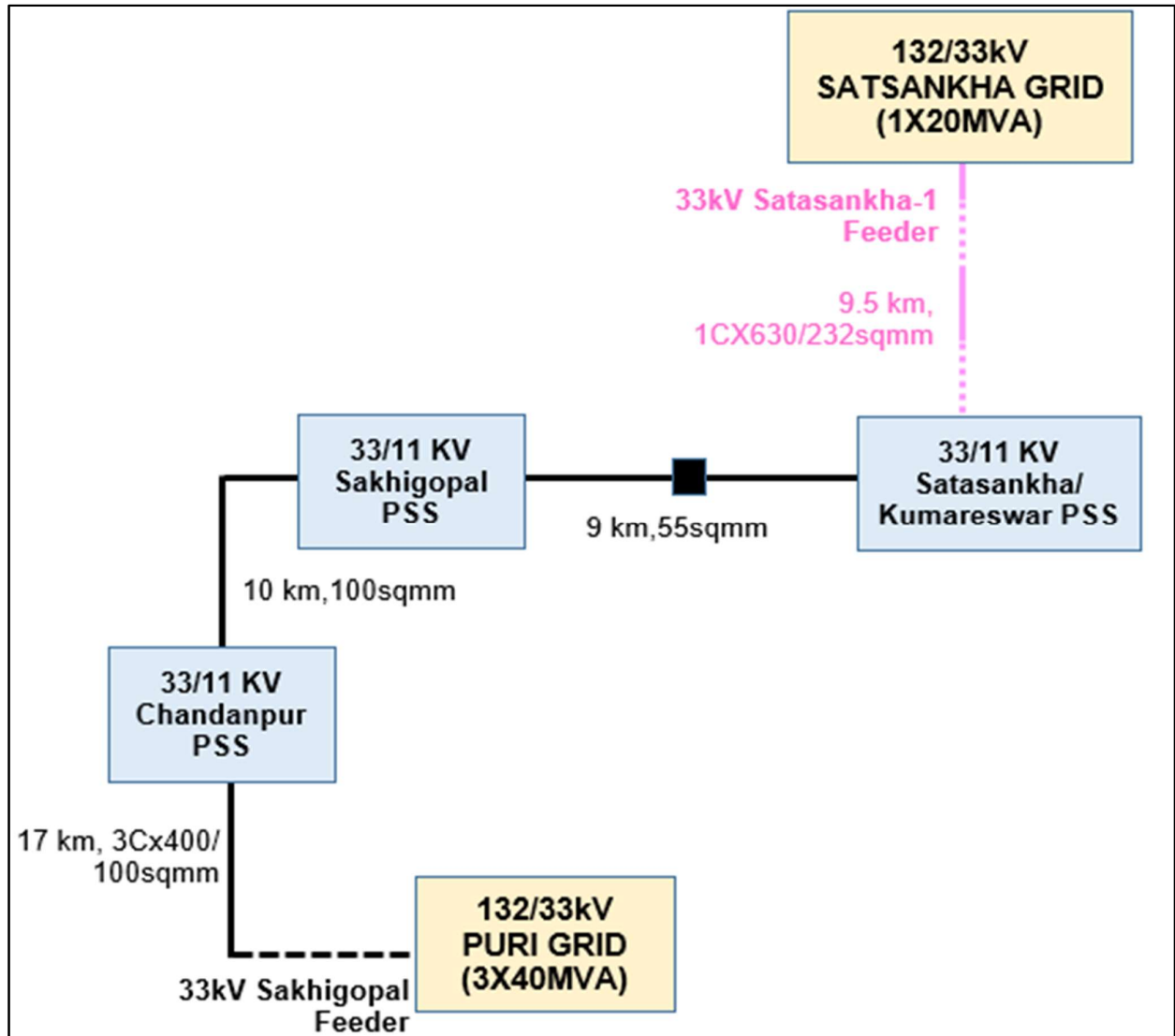


**Satasankha/ Kumareswar PSS**



**33kV Sakhigopal Feeder**

**Proposed SLD:**



**Detailed Scope of Work:**

Construction for construction of 232sqmm OH conductor feeder of length 6Ckm and laying of 1CX630sqmm UG cable of length 3.5Ckm from 132/33kV Satasankha Grid to 33/11kV Satasankha PSS and construction of 2nos. 4Pole structure.

**Abstract of Estimate**

Name of the Division :-		PURI ELECTRICAL DIVISION, PURI	
Name of the Sub-Division : -		Sakhigopal, Puri	
Name of the Section : -		Satasankha, Puri	
Name of the Work :-		33kV New Line from Satasankha Grid (33kV Proposed Satasankha-1 Feeder)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 6Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 3.5Ckm.Construction of 33kV 4 Pole structure with Isolator- 2 Nos.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 6Ckm.	₹ 2,19,30,088.90
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 3.5Ckm.	₹ 4,80,60,417.38
3	C	Construction of 33kV 4 Pole structure with Isolator- 2 Nos.	₹ 17,88,268.61
		Total Amount	₹ 7,17,78,774.88
		Total Amount (In Rs. Cr)	7.18
Total estimated cost is Rs.7.18 Crore.			

Cost Estimate: ₹ 7.18 Cr. (For detailed BoQ refer Annexure-8).

**Benefits:**

- ❖ Mitigation of overloading issue of 33kV Sakhigopal feeder.
- ❖ Improving low voltage issues at 33/11kV Chandanpur, Satasankha and Sakhigopal PSS.
- ❖ Ensuring reliable power supply to the consumers by providing N-1 contingency connectivity to 33kV Sakhigopal feeder.

### **7.5 Mitigation of Low Voltage issues at 33/11kV Substations fed from 33kV Bahugram-2 Feeder (Choudwar Grid):**

#### **Proposal:**

Proposal for construction of 33kV D/C OH feeders (33kV Bahugram-1 & Bahugram-2 feeder) with 232sqmm OH conductor of length 7Ckm and laying of 1CX630sqmm UG cable of length 0.5Ckm along with 1no. 33kV 4W RMU from 220/33kV Bahugram Grid to 33/11kV Bahugram PSS and interconnection with 33kV Bahugram-2 feeder (Balua Grid) along with installation of 1no. 33kV 4W RMU. Construction of 9nos. 4Pole structures along proposed 33kV Bahugram-1 New and Bahugram-2 New feeders and 2nos. 33kV outdoor bay at 33/11kV Bahugram-2 PSS.

#### **Objective:**

To provide reliable power supply to the consumers improve low voltage issues of areas fed from Bahugram-2 PSS and Bahugram-1 PSS during peak loading condition.

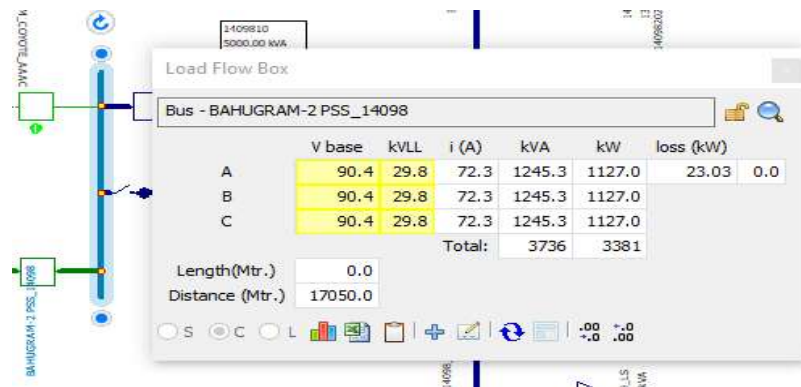
#### **Existing Scenario (Summer'22):**

- At present, 33/11kV Bahugram-1 and Bahugram-2 PSS are fed from 33kV Bahugram-2 feeder emanating from Choudwar Grid, having 100sqmm OH conductor.
- The voltage experienced at Bahugram-1 PSS and Bahugram-2 PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The low voltage situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Choudwar	Bahugram	15.54	8.30	53%	Ok	10.04	13.37	86%

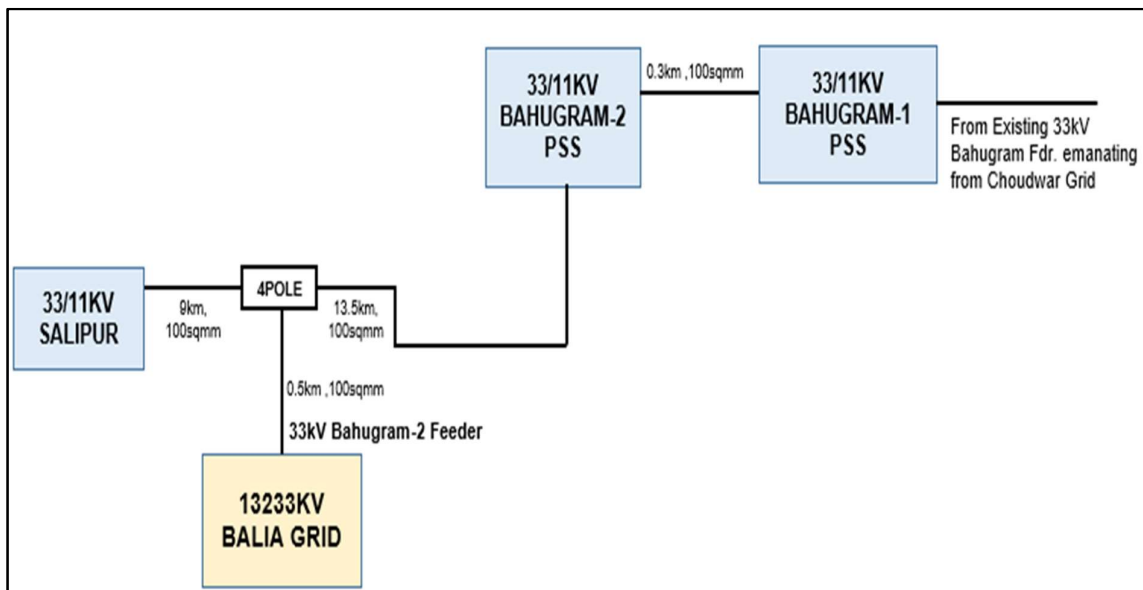
Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Choudwar	Bahugram	Bahugram-I	29.9
		Bahugram-II	29.8

### Snapshot from Cyme Software (Existing Scenario)



**Bahugram-2 PSS**

### Existing SLD:



### Proposed Scenario (Summer'24):

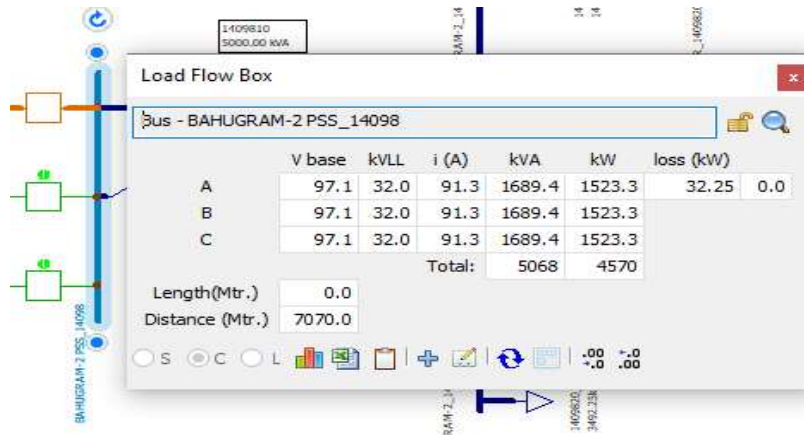
- Construction of 33kV D/C 232sqmm OH conductor 2nos. 33kV feeders of length 7Ckm and laying of 1CX630sqmm UG cable of length 0.5Ckm along with 1no. 33kV 4W RMU from 220/33kV Bahugram Grid to 33/11kV Bahugram PSS and interconnection with 33kV Bahugram-2 feeder along with installation of 1no. 33kV 4W RMU.
- Construction of 9nos. 4Pole structures along proposed 33kV Bahugram-1 New and Bahugram-2 New feeders.
- Construction of 2nos. 33kV outdoor bay at 33/11kV Bahugram-2 PSS.
- After linking new feeders from Bahugram GSS the new feeders will deliver power supply to Bahugram-1 PSS and Bahugram-2 PSS during normal operating condition.
- This proposal will improve Bahugram-1 PSS and Bahugram-2 PSS voltage.

### Supplementary Capex Plan: FY 2023-24

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Overloading Status
Bahugram	Proposed Bahugram-I	26.51	5.2	20%	OK	6.92	26%	OK
	Proposed Bahugram-II	26.51	5.8	22%	OK	7.72	29%	OK

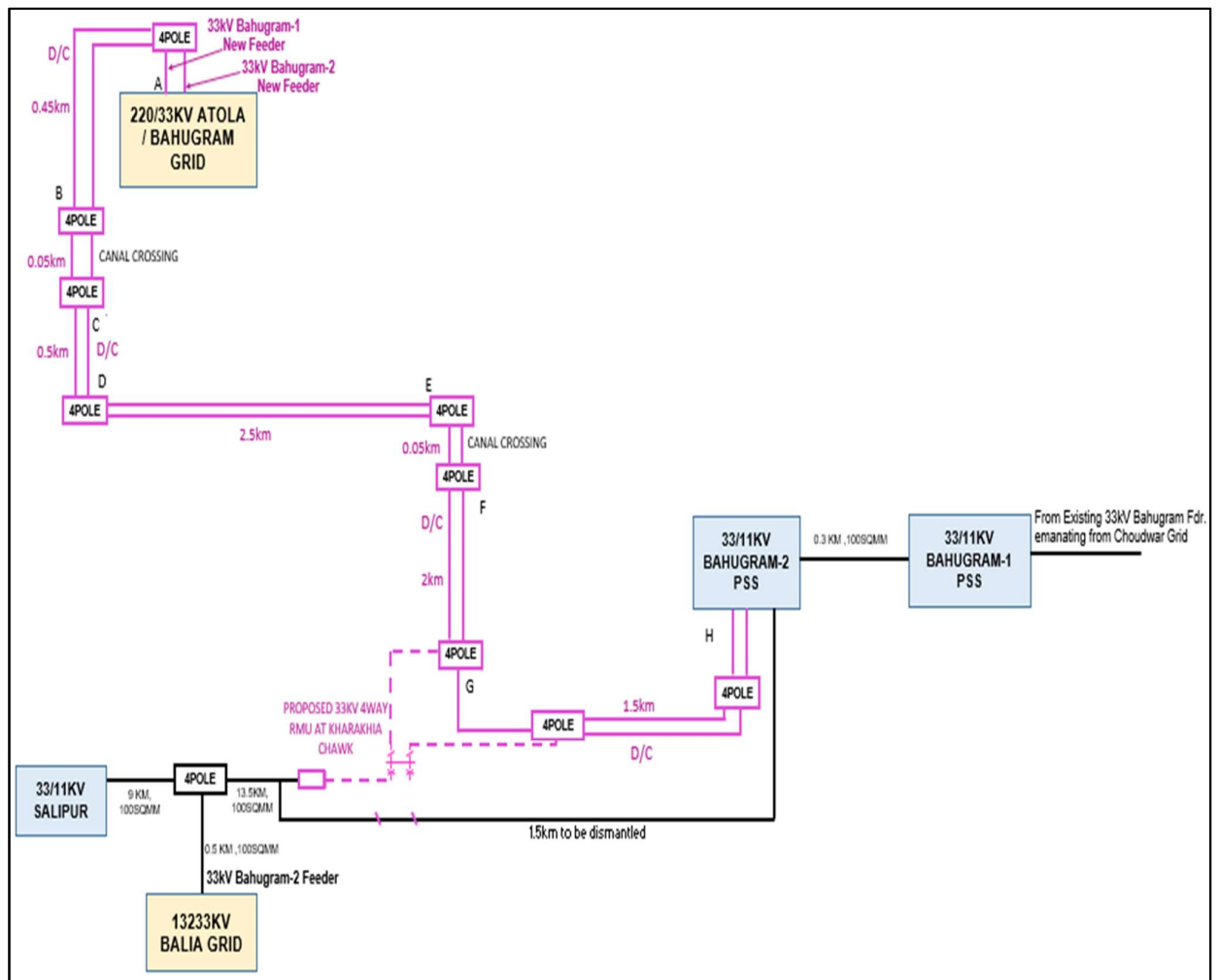
Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Bahugram	Proposed Bahugram-I	Bahugram-I	31.9
	Proposed Bahugram-II	Bahugram-II	32

### Snapshot from Cyme Software (Proposed Scenario)



### Bahugram-2 PSS

**Proposed SLD:**



**Detailed Scope of Work:**

Construction of 33kV D/C Feeders with 232sqmm OH conductor feeder of length 7Ckm and laying of 1CX630sqmm UG cable of length 0.5Ckm along with 1no. 33kV 4W RMU from 220/33kV Bahugram Grid to 33/11kV Bahugram PSS and interconnection with 33kV Bahugram-2 feeder along with installation of 1no. 33kV 4W RMU. Construction of 9nos. 4Pole structures along proposed 33kV Bahugram-1 New and Bahugram-2 New feeders and 2nos. 33kV outdoor bay at 33/11kV Bahugram-2 PSS.

**Abstract of Estimate**

<b>Name of the Division :-</b>	<b>SED</b>
<b>Name of the Sub-Division :-</b>	Salepur
<b>Name of the Section :-</b>	Bahugram
<b>Name of the Work :-</b>	33kV New Lines from Bahugram Grid (33kV Proposed Bahugram-1 and Bahugram-2 Feeders)
<b>Scope of work:-</b>	Construction of 33kV Double Ckt. O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 7Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 0.5Ckm along with 1no. 33kV 4W RMU. Construction of 33kV 4 Pole structure with Isolator- 9nos. Construction for 2 nos. of 33kV Outdoor Bay at Bahugram-2 PSS.
<b>Names of Schemes: -</b>	TPCODL CAPEX

**ABSTRACT OF ESTIMATE**

<b>Sl. No.</b>	<b>Part</b>	<b>Description</b>	<b>Amount</b>
1	A	Construction of 33kV Double Ckt. O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 7Ckm.	₹ 3,35,63,373.53
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 0.5Ckm along with 1no. 33kV 4W RMU.	₹ 1,09,14,996.89
3	C	Construction of 33kV 4 Pole structure with Isolator- 9nos.	₹ 45,86,219.94
4	D	Construction for 2 nos. of 33kV Outdoor Bay at Bahugram-2 PSS.	₹ 69,51,884.40
5		<b>Total Amount</b>	<b>₹ 5,60,16,474.76</b>
		<b>Total Amount (In Rs.Cr)</b>	<b>5.60</b>

**Total estimated cost is Rs.5.60 Crore.**

Cost Estimate: ₹ 5.60 Cr. (For detailed BoQ refer Annexure-9).

**Benefits:**

- ❖ Ensuring reliable power supply to the consumers and improving low voltage issues at 33/11kV Bahugram-1 and Bahugram-2 PSS.

### **7.6 Mitigation of Low Voltage and Overloading issues at 33/11kV Substations fed from 33kV Mahanga Feeder (Balia Grid):**

#### **Proposal:**

Proposal for construction of 232sqmm D/C OH conductor feeder of length 2Ckm, construction of 232sqmm OH conductor feeder of length 10Ckm and laying of 1CX630sqmm UG cable of length 1Ckm along with 2nos. 33kV 4W RMU from 132/33kV Bahugram Grid to 33/11kV Balichandrapur PSS and connectivity with 33kV Kundal feeder emanating from Chandikhol Grid.

#### **Objective:**

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from Balichandrapur PSS, Mahanga PSS, Erkana PSS, Kothapada PSS and Raisugunda PSS. Overloading mitigation of 33kV Mahanga feeder emanating from Balia Grid along with ensuring reliability of power supply by providing N-1 contingency connectivity from 33kV feeders proposed from Balichandrapur Grid during peak loading condition.

#### **Existing Scenario (Summer'22):**

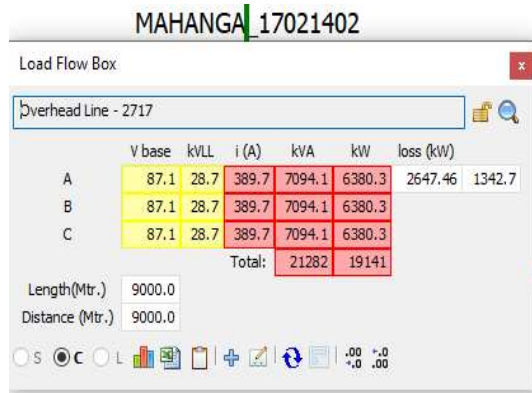
- At present, 33/11kV Balichandrapur PSS, Mahanga PSS, Erkana PSS, Kothapada PSS and Raisugunda PSS are fed from 33kV Mahanga feeder emanating from Balia Grid, having 100sqmm OH conductor.
- The voltage experienced at 33/11kV Balichandrapur PSS Mahanga PSS Erkana PSS, Kothapada PSS and Raisugunda PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The 33kV Mahanga feeds 33/11kV Balichandrapur PSS, Mahanga PSS, Erkana PSS, Kothapada PSS and Raisugunda PSS with a total length of 47.5Ckm. The 33kV Mahanga feeder is overloaded up to 135%.
- The low voltage and overloading situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Balia	Mahanga	15.54	21.00	135%	Overload	25.41	33.82	218%

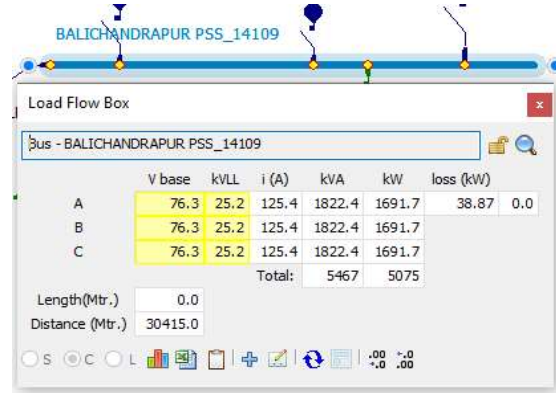
## Supplementary Capex Plan: FY 2023-24

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Balía	Mahanga	Raisugunda	28.6
		Mahanga	26.3
		Kothapada	26.1
		Erakana	25.9
		Balichandrapur	25.2

### Snapshot from Cyme Software (Existing Scenario)

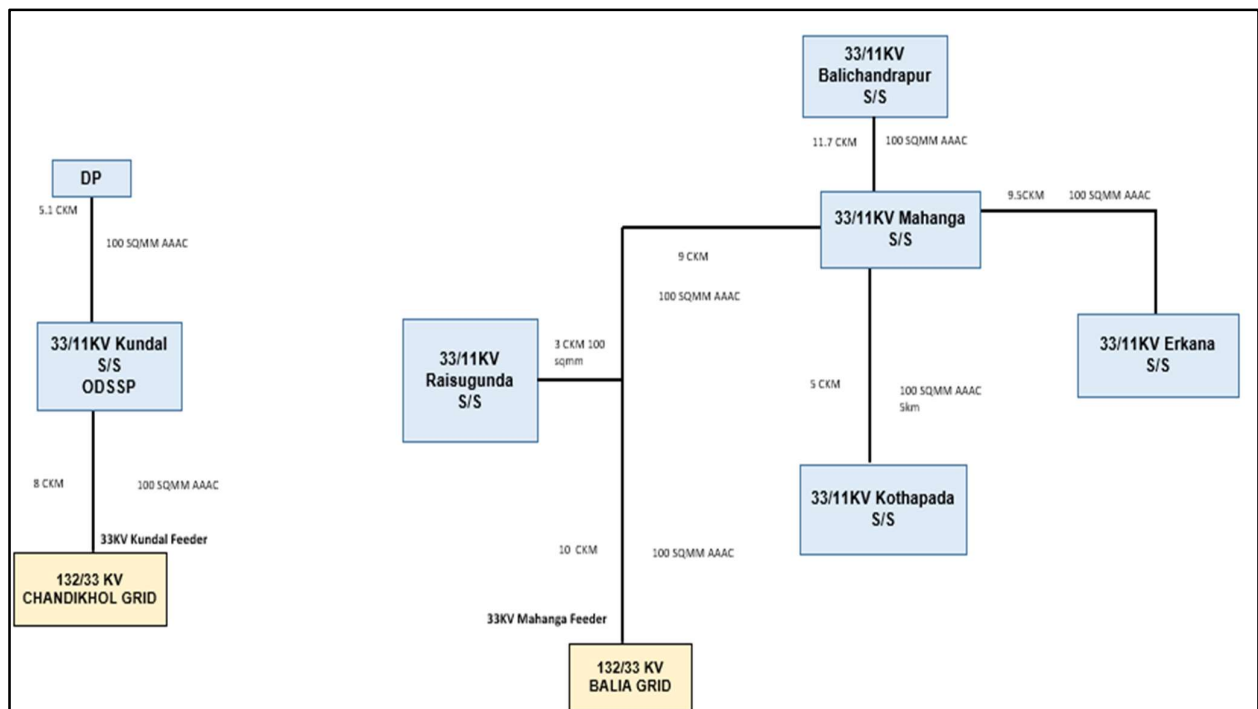


**33kV Mahanga Feeder**



**33/11kV Balichandrapur PSS**

### Existing SLD:



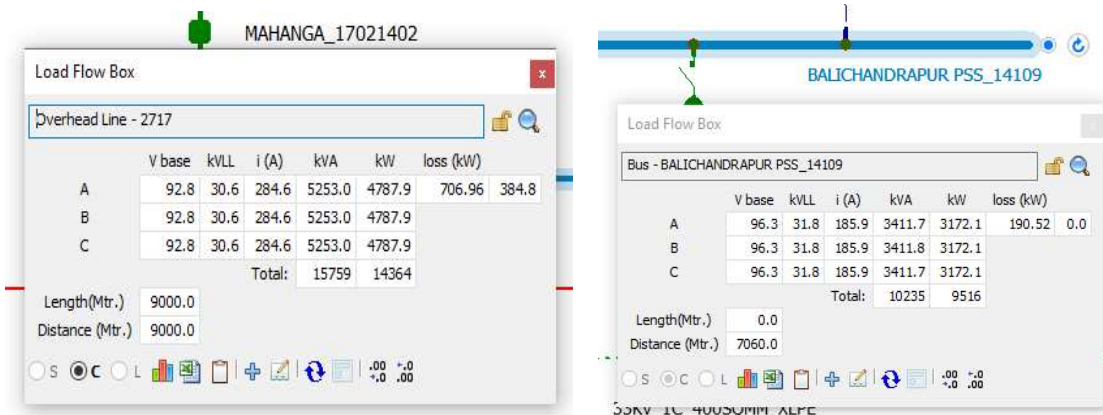
**Proposed Scenario (Summer'24):**

- Construction of 232sqmm D/C OH conductor feeder of length 2Ckm, construction of 232sqmm S/C OH conductor feeder of length 10Ckm and laying of 1CX630sqmm UG cable of length 1Ckm along with 2nos. 33kV 4W RMU from 132/33kV Bahugram Grid to 33/11kV Balichandrapur PSS and connectivity with 33kV Kundal feeder emanating from Chandikhol Grid.
- After linking new feeder from Balichandrapur GSS the proposed Balichandrapur-1 feeder will deliver power supply to Kothapada PSS during normal operating condition, the proposed Balichandrapur-2 feeder will deliver power supply to Balichandrapur PSS during normal operating condition and existing 33kV Mahanga feeder will deliver power supply to Raisugunda, Mahanga and Erkana PSS.
- This proposal will mitigate the 33kV Mahanga feeder overloading issue and improve voltage at 33/11kV Balichandrapur PSS, Mahanga PSS, Erkana PSS, Kothapada PSS and Raisugunda PSS.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Balia	Mahanga	26.51	12.00	45%	OK	15.97	60%	OK
Bali chandrapur	Proposed Bali chandrapur-1	26.51	10.00	38%	OK	13.31	50%	OK
	Proposed Bali chandrapur-2	26.51	4.00	15%	OK	5.32	20%	OK

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Balia	Mahanga	Raisugunda	30.7
		Mahanga	30.3
		Erakana	30.04
Balichandrapur	Proposed Balichandrapur-1	Kothapada	30.03
	Proposed Balichandrapur-2	Balichandrapur	31.8

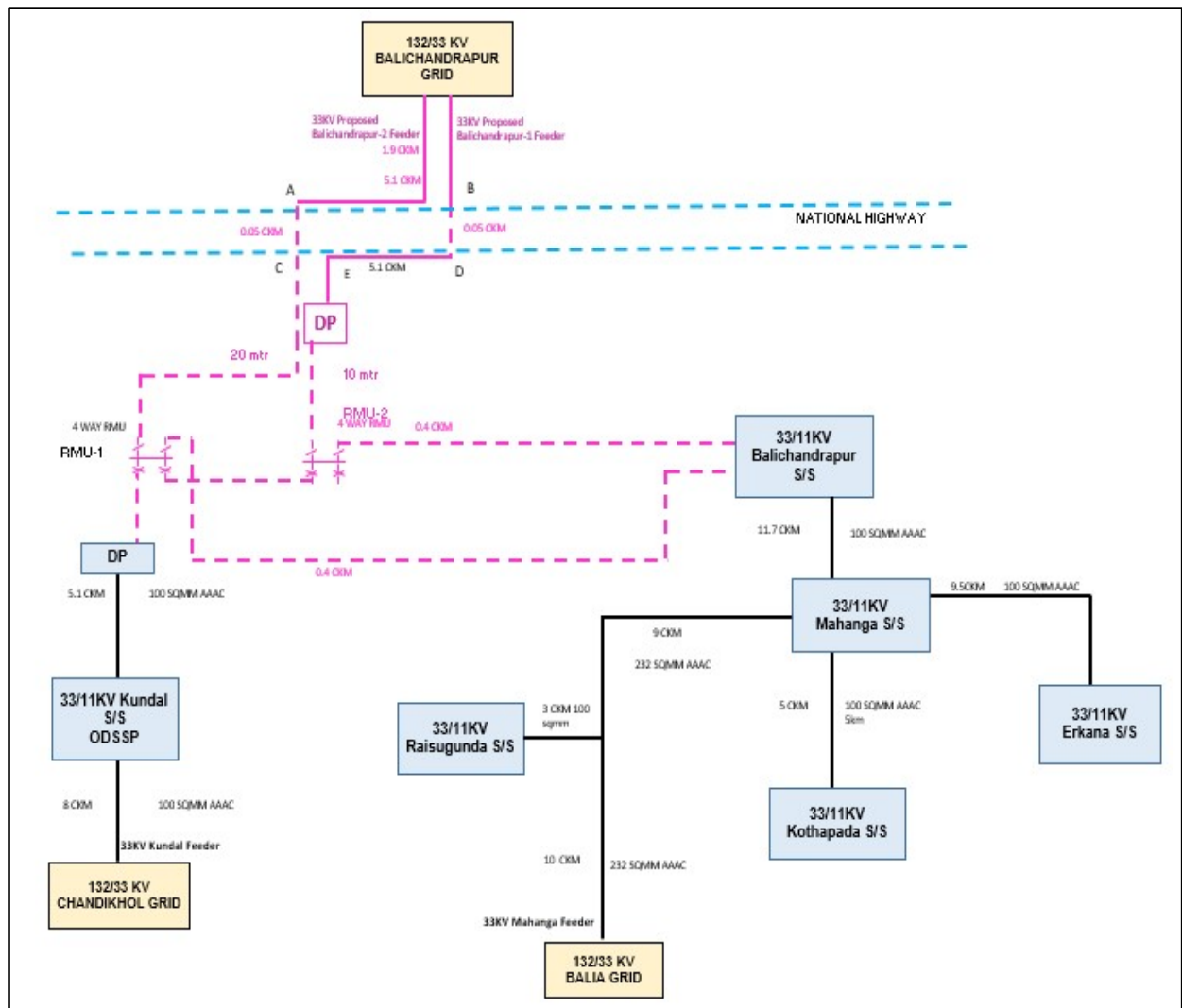
### Snapshot from Cyme Software (Proposed Scenario)



### 33kV Mahanga Feeder

### 33/11kV Balichandrapur PSS

### Proposed SLD:



**Detailed Scope of Work:**

Construction of 232sqmm D/C OH conductor feeder of length 2Ckm, construction of 232sqmm S/C OH conductor feeder of length 10Ckm and laying of 1CX630sqmm UG cable of length 1Ckm along with 2nos. 33kV 4W RMU from 132/33kV Bahugram Grid to 33/11kV Balichandrapur PSS and connectivity with 33kV Kundal feeder emanating from Chandikhol Grid.

**Abstract of Estimate**

Name of the Division :-	CED		
Name of the Sub-Division :-	Badachana		
Name of the Section :-	Balichandrapur		
Name of the Work :-	33kV New Line from Balichandrapur Grid (33kV Proposed Balchandrapur-1 and Balichandrapur-2 Feeders)		
Scope of work:-	Construction of 33kV Double Ckt. O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 2 Ckm. Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 10 Ckm.Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1 Ckm along with 2nos. 33kV 4W RMU.Construction for 2nos. of 33kV Outdoor Bay at Balichandrapur PSS.		
Names of Schemes: -	TPCODL CAPEX		
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV Double Ckt. O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 2 Ckm.	₹ 95,90,606.72
2	B	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 10 Ckm.	₹ 3,71,86,161.18
3	C	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1 Ckm along with 2nos. 33kV 4W RMU.	₹ 2,27,35,918.32
4	D	Construction for 2nos. of 33kV Outdoor Bay at Balichandrapur PSS.	₹ 69,51,884.40
		Total Amount	₹ 7,64,64,570.62
		Total Amount (In Rs. Cr)	7.65
Total estimated cost is Rs.7.65 Crore.			

Cost Estimate: ₹ 7.65 Cr. (For detailed BoQ refer Annexure-10).

**Benefits:**

- ❖ Mitigation of overloading issue of 33kV Mahanga feeder.
- ❖ Improving low voltage issues at 33/11kV Balichandrapur PSS, Mahanga PSS, Erkana PSS, Kothapada PSS and Raisugunda PSS.
- ❖ Ensuring reliable power supply to the consumers by providing N-1 contingency connectivity to 33kV Mahanga feeder.

### **7.7 Mitigation of Low Voltage and Overloading issues at 33/11kV Substations fed from 33kV Dhenkanal, Gondia & Banasingh Feeder (Gundichapada Grid):**

#### **Proposal:**

Proposal for construction of 33kV OH line 241sqmm OH covered conductor feeder of length 2.5Ckm from 132/33kV Gondia Grid to proposed 4Pole structure at 33kV line from College PSS to Gondia PSS and construction of 33kV OH line 241sqmm OH covered conductor feeder of length 4Ckm from 132/33kV Gondia Grid to proposed 4Pole structure at 33kV line from Joranda PSS to Gondia PSS.

#### **Objective:**

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from 33/11kV College PSS, Bhapur PSS, Gondia PSS, Sadangi PSS, Nihalprasad PSS, Banasingh PSS and Joranda PSS. Overloading mitigation of 33kV Dhenkanal feeder emanating from Gundichapada Grid during peak loading condition.

#### **Existing Scenario (Summer'22):**

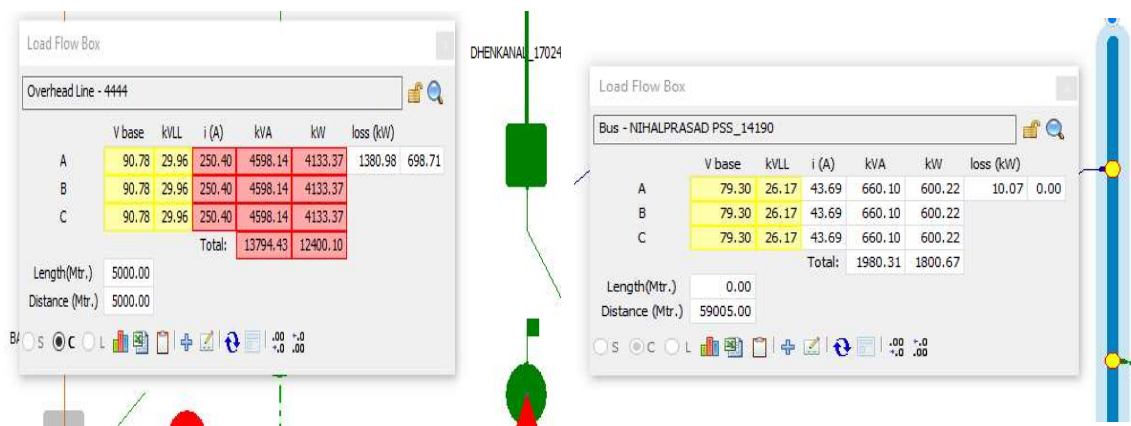
- At present, 33/11kV College PSS is fed from 33kV Dhenkanal feeder emanating from Gundichapada Grid, having 80/100sqmm OH conductor. 33/11kV Joranda PSS and Banasingh PSS are fed from 33kV Banasingh feeder emanating from Gundichapada Grid, having 100sqmm OH conductor. 33/11kV Bhapur PSS, Sadangi PSS, Gondia PSS and Nihalprasad PSS are fed from 33kV Gondia feeder emanating from Gundichapada Grid, having 100sqmm OH conductor.
- The voltage experienced at 33/11kV College PSS, Bhapur PSS, Gondia PSS, Sadangi PSS, Nihalprasad PSS, Banasingh PSS and Joranda PSS are below the permissible limit of - 9% of 33kV i.e; 30.03kV.
- The 33kV Dhenkanal feeder feeds power supply to 33/11kV College PSS. The 33kV Dhenkanal feeder is overloaded up to 102%.
- The low voltage situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Gundichapada	Dhenkanal	13.5	13.8	102%	OK	16.7	22.2	164%
	Gondia	15.5	11.0	71%	OK	13.3	17.7	114%
	Banasingh	15.5	4.5	29%	OK	5.4	7.2	47%

## Supplementary Capex Plan: FY 2023-24

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Gundichapada	Dhenkanal	College	28.2
	Gondia	Bhapur	29.7
		Gondia	26.9
		Sadangi	26.6
		Nihalprasad	26.2
	Banasingh	Banasingh	30
		Joranda	29.48

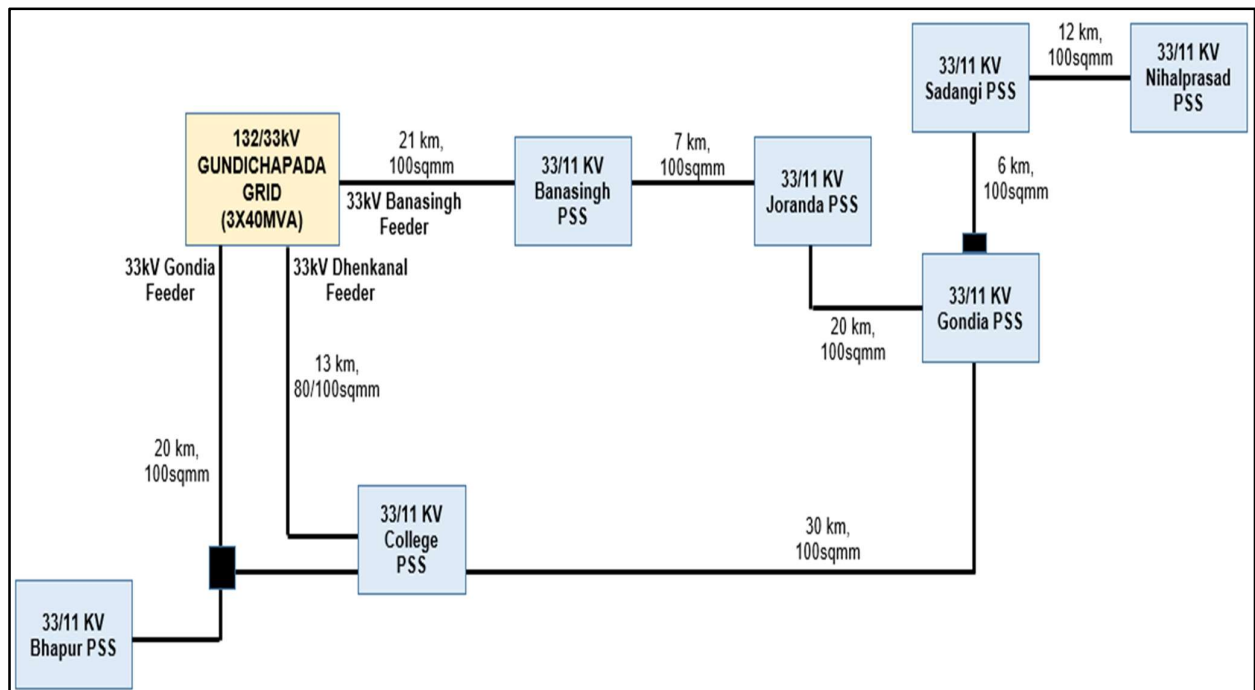
### Snapshot from Cyme Software (Existing Scenario)



### 33kV Dhenkanal Feeder

### Nihalprasad PSS

### Existing SLD:



**Proposed Scenario:**

- Construction of 33kV OH line 241sqmm OH covered conductor feeder of length 2.5Ckm from 132/33kV Gondia Grid to proposed 4Pole structure at 33kV line from College PSS to Gondia PSS
- Construction of 33kV OH line 241sqmm OH covered conductor feeder of length 4Ckm from 132/33kV Gondia Grid to proposed 4Pole structure at 33kV line from Joranda PSS to Gondia PSS.
- After linking new feeders from Gondia GSS, the proposed College feeder from Gondia Grid and existing 33kV College feeder from Gundichapada Grid will deliver power supply to College during normal operating condition.
- The proposed Joranda feeder will deliver power supply to 33/11kV Joranda PSS during normal operating condition.
- The proposed Gondia (under deposit work) will deliver power supply to 33/11kV Gondia PSS, Sadangi PSS and Nihalprasad PSS during normal operating condition.
- The existing 33kV Gondia feeder will deliver power supply to 33/11kV Bhapur PSS during normal operating condition.
- The existing 33kV Banasingh feeder will deliver power supply to 33/11kV Banasingh PSS.
- This proposal will improve the voltage profile of 33/11kV College PSS, Bhapur PSS, Gondia PSS, Sadangi PSS, Nihalprasad PSS, Banasingh PSS and Joranda PSS.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Gundichapada	College	20.00	11.00	55%	OK	14.64	73%	OK
Gondia	Proposed College	15.54	5.00	32%	OK	6.66	43%	OK
Gundichapada	Gondia	15.54	5.40	35%	OK	7.19	46%	OK
	Banasingh	15.54	1.50	10%	OK	2.00	13%	OK
Gondia	Proposed Gondia (Deposit Scheme)	20.00	10.00	50%	OK	13.31	67%	OK
	Proposed Joranda	26.51	4.00	15%	OK	5.32	20%	OK



**Detailed Scope of Work:**

Construction of 33kV OH line 241sqmm OH covered conductor feeder of length 2.5Ckm from 132/33kV Gondia Grid to proposed 4Pole structure at 33kV line from College PSS to Gondia PSS and construction of 33kV OH line 241sqmm OH covered conductor feeder of length 4Ckm from 132/33kV Gondia Grid to proposed 4Pole structure at 33kV line from Joranda PSS to Gondia PSS.

**Abstract of Estimate**

Name of the Division :-	DHENKANAL ELECTRIC DIVISION (DED)		
Name of the Sub-Division : -	Gondia		
Name of the Section :-	Gondia		
Name of the Work :-	33kV New Lines from Gondia Grid (33kV Proposed Joranda and College Feeder)		
Scope of work:-	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 2.5Ckm. Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 4Ckm. Construction of 33kV 4 Pole structure with Isolator- 2nos.		
Names of Schemes: -	TPCODL CAPEX		
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 2.5Ckm.	₹ 94,97,340.19
2	B	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 4Ckm.	₹ 1,48,49,691.06
4	C	Construction of 33kV 4 Pole structure with Isolator- 2nos.	₹ 21,25,926.06
		Total Amount	₹ 2,64,72,957.30
		Total Amount (In Rs. Cr)	2.65
Total estimated cost is Rs.2.65 Crore.			

Cost Estimate: ₹ 2.65 Cr. (For detailed BoQ refer Annexure-11).

**Benefits:**

- ❖ Mitigation of overloading issue of 33kV Dhenkanal feeder.
- ❖ Ensuring reliable power supply to the consumers by improving low voltage issues at 33/11kV College PSS, Bhapur PSS, Gondia PSS, Sadangi PSS, Nihalprasad PSS, Banasingh PSS and Joranda PSS.

### 7.8 Mitigation of Low Voltage issues at 33/11kV Substations fed from 33kV Goda Feeder (Goda Grid):

#### **Proposal:**

Proposal for construction of 33kV OH line 241sqmm OH covered conductor feeder of length 3.2Ckm from 132/33kV Goda Grid to proposed 4Pole structure at 33kV line from Dahanbil PSS tapping point to Bhuban PSS.

#### **Objective:**

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from 33/11kV Bhuban PSS and Mahulpal PSS during peak loading condition.

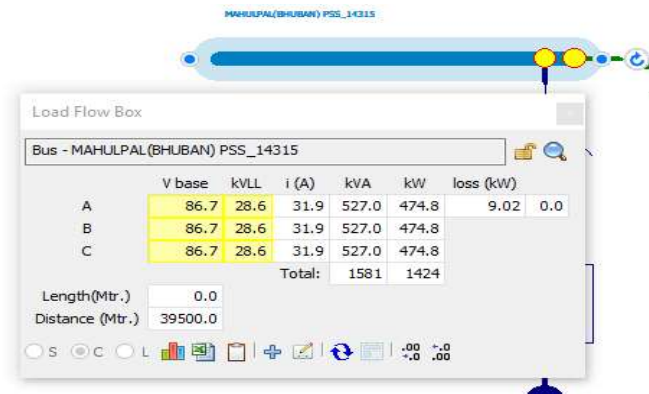
#### **Existing Scenario (Summer'22):**

- At present, 33/11kV Bhuban PSS, Goda PSS, Dahanbil PSS and Mahulpal PSS are fed from 33kV Goda feeder emanating from Goda Grid, having mixed type conductor 55/100sqmm OH conductor.
- The voltage experienced at 33/11kV Bhuban PSS and Mahulpal PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The low voltage situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Goda	Goda	15.54	9.00	58%	OK	10.89	14.49	93%

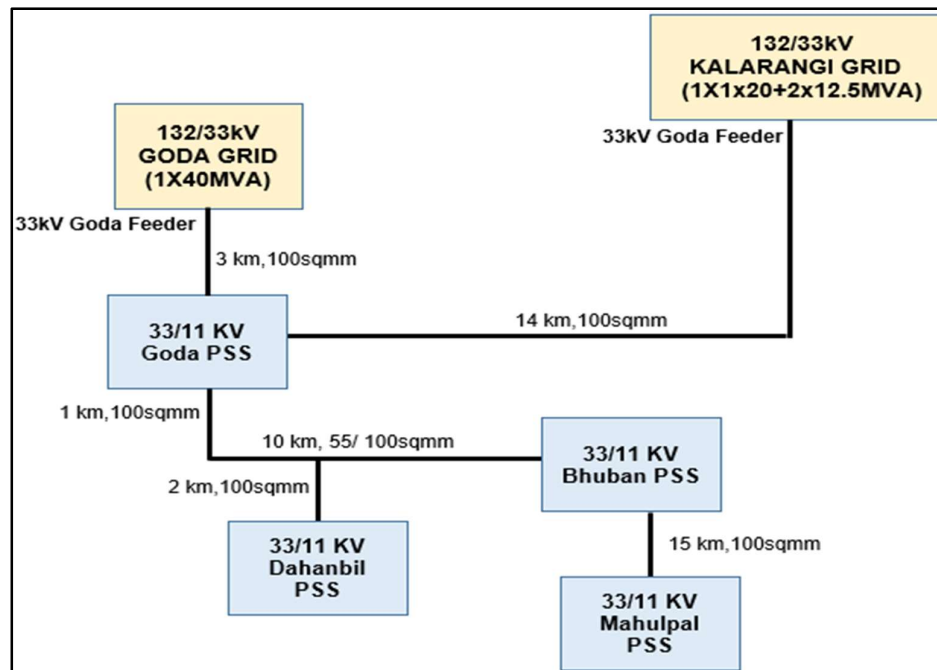
Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Goda	Goda	Goda	31
		Dahanbil	30.5
		Bhuban	29
		Mahulpal	28.6

### Snapshot from Cyme Software (Existing Scenario)



### Mahulpal PSS

### Existing SLD:



### Proposed Scenario (Summer'24):

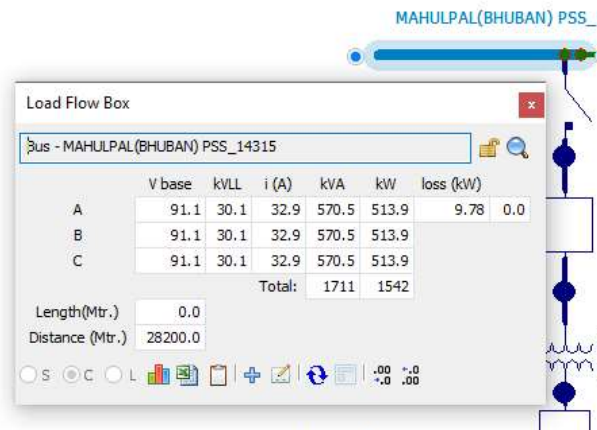
- Construction of 33kV OH line 241sqmm OH covered conductor feeder of length 3.2Ckm from 132/33kV Goda Grid to proposed 4Pole structure at 33kV line from Dahanbil PSS tapping point to Bhuban PSS.
- After linking new feeder from Goda GSS, the proposed Bhuban feeder will deliver power supply to 33/11kV Bhuban PSS and Mahulpal and existing 33kV Goda feeder will deliver power supply o 33/11kV Goda PSS and Dahanbil PSS during normal operating condition.
- This proposal will improve the voltage profile of 33/11kV Bhuban PSS and Mahulpal PSS.

## Supplementary Capex Plan: FY 2023-24

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Goda	Goda	15.54	3.00	19%	OK	3.99	26%	OK
	Proposed Bhuban	26.51	8.00	30%	OK	10.65	40%	OK

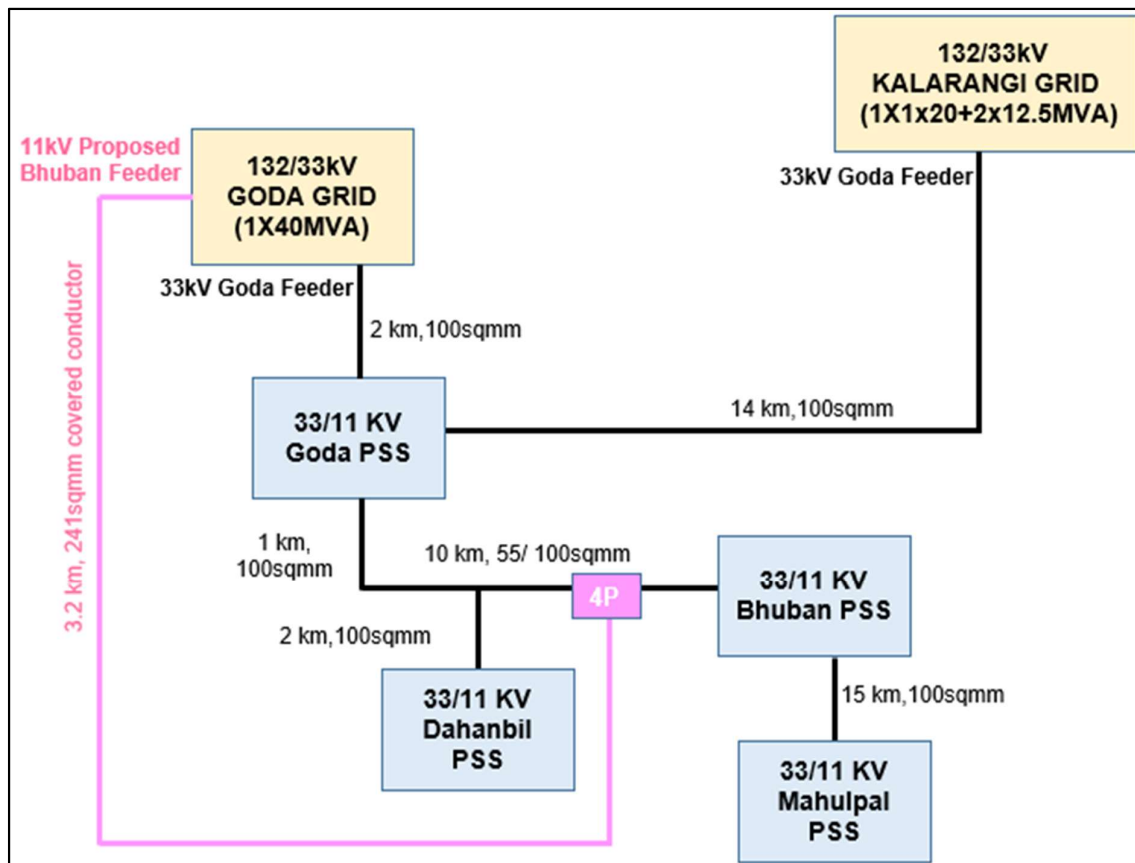
Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Goda	Goda	Goda	32.4
		Dahanbil	32.4
	Proposed Bhuban	Bhuban	30.2
		Mahulpal	30.05

### Snapshot from Cyme Software (Proposed Scenario)



### Mahulpal PSS

**Proposed SLD:**



**Detailed Scope of Work:**

Construction of 33kV OH line 241sqmm OH covered conductor feeder of length 3.2Ckm from 132/33kV Goda Grid to proposed 4Pole structure at 33kV line from Dahanbil PSS tapping point to Bhuban PSS.

**Abstract of Estimate**

Name of the Division :-	DHENKANAL ELECTRIC DIVISION (DED)		
Name of the Sub-Division : -	KAMAKHAYANAGAR		
Name of the Section : -	Bhuban		
Name of the Work :-	33kV New Line from Goda Grid (33kV Proposed Bhuban Feeder)		
Scope of work:-	Construction of 33kV O/H line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 3.2Ckm. Construction of 33kV 4 Pole structure with Isolator- 1 No.		
Names of Schemes: -	TPCODL CAPEX		
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 3.2Ckm.	₹ 1,20,52,317.77
2	B	Construction of 33kV 4 Pole structure with Isolator- 1 No.	₹ 14,50,611.17
		Total Amount	₹ 1,35,02,928.94
		Total Amount (In Rs. Cr)	1.35
Total estimated cost is Rs.1.35 Crore.			

Cost Estimate: ₹ 1.35 Cr. (For detailed BoQ refer Annexure-12).

**Benefits:**

- ❖ Ensuring reliable power supply to the consumers by improving low voltage issues at 33/11kV Bhuban PSS and Mahulpal PSS.

### 7.9 Mitigation of Low Voltage issues at 33/11kV Substations fed from 33kV Parjang Feeder (Chainpal Grid):

#### Proposal:

Proposal for construction of 33kV OH line 241sqmm OH covered conductor feeder of length 21Ckm along with 1Cx630sqmm UG cable of length 1Ckm from 132/33kV Chainpal Grid to 33/11kV Parjang PSS. Construction of 1no. 4Pole structure, 2nos. PC+6 towers (for river crossing) and 1no. 33kV outdoor bay at Parjang PSS.

Proposal for construction of 33kV OH line 241sqmm OH covered conductor feeder of length 25Ckm along with 1Cx630sqmm UG cable of length 1Ckm from 132/33kV Kamakhyanagar Grid to 33/11kV Parjang PSS. Construction of 1no. 4Pole structure, 2nos. PC+6 towers (for river crossing) and 1no. 33kV outdoor bay at Parjang PSS.

#### Objective:

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from 33/11kV Sarang PSS, New Banarpal PSS, Mahavir Road PSS, New Sarang PSS, Parjang PSS and Saanda PSS. Ensuring reliability of power supply by providing N-1 contingency connectivity from 33kV feeders proposed from Chainpal Grid and Kamakhyanagar Grid during peak loading condition.

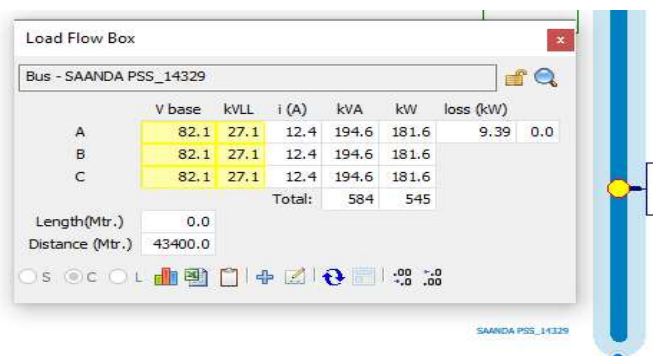
#### Existing Scenario:

- At present, 33/11kV Sarang PSS, New Banarpal PSS, Mahavir Road PSS, New Sarang PSS, Parjang PSS and Saanda PSS are fed from 33kV Parjang feeder emanating from Chainpal Grid, having conductor 100/ 148sqmm OH conductor.
- The voltage experienced at 33/11kV Sarang PSS, New Banarpal PSS, Mahavir Road PSS, New Sarang PSS, Parjang PSS and Saanda PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The low voltage situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Chainpal	Parjang	20.00	15.00	75%	OK	18.15	24.16	121%

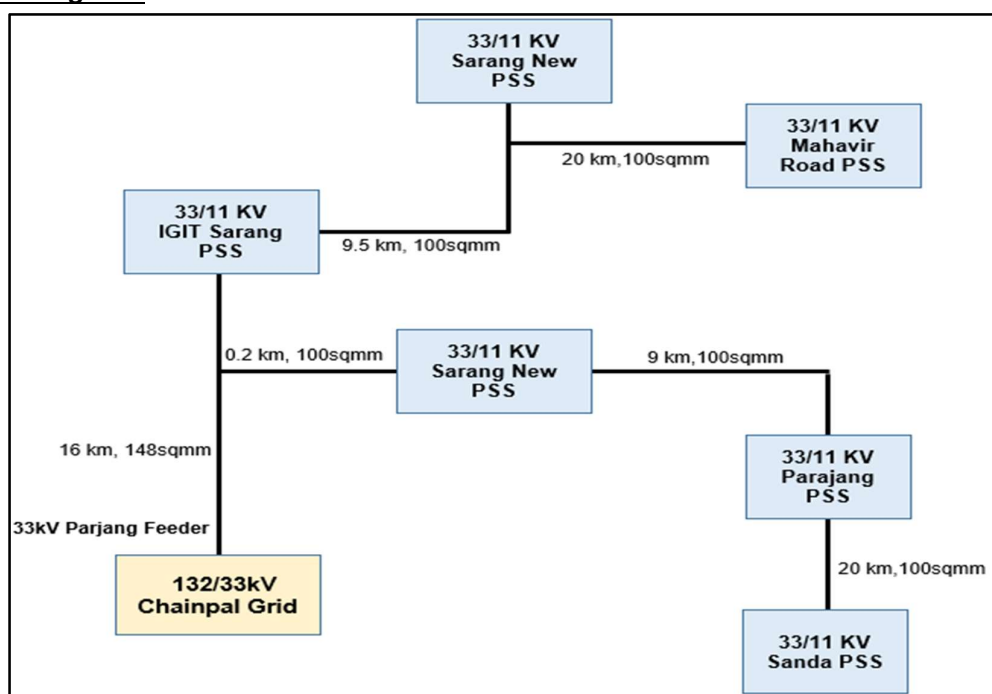
Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Chainpal	Parjang	Sarang	28.5
		New Banarpal	28
		Mahavir Road	27.7
		New Sarang	28.5
		Parjang	27.3
		Saanda	27.1

### Snapshot from Cyme Software (Existing Scenario)



### Saanda PSS

#### Existing SLD:



#### Proposed Scenario:

- Construction of 33kV OH line 241sqmm OH covered conductor feeder of length 21Ckm along with 1Cx630sqmm UG cable of length 1Ckm from 132/33kV Chainpal Grid to 33/11kV Parjang PSS. Construction of 1no. 4Pole structure, 2nos. PC+6 towers (for river crossing) and 1no. 33kV outdoor bay at Parjang PSS.
- Construction of 33kV OH line 241sqmm OH covered conductor feeder of length 25Ckm along with 1Cx630sqmm UG cable of length 1Ckm from 132/33kV Kamakhyanagar Grid to 33/11kV Parjang PSS. Construction of 1no. 4Pole structure, 2nos. PC+6 towers (for river crossing) and 1no. 33kV outdoor bay at Parjang PSS.
- After linking new feeders from Chainpal GSS and Kamakhyanagar Grid, the proposed Saanda feeder will deliver power supply to 33/11kV Sanda PSS, the proposed Parjang

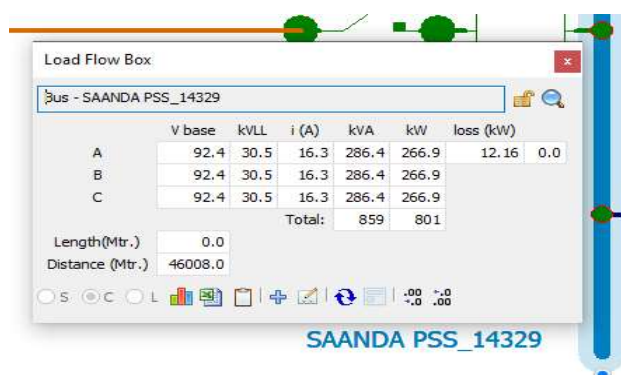
feeder will deliver power supply to 33/11kV Panjang PSS and existing 33kV Parjang feeder will deliver power supply to 33/11kV Sarang PSS, New Banarpal PSS, Mahavir Road PSS and N Sarang PSS during normal operating condition.

- This proposal will improve the voltage profile of 33/11kV Sarang PSS, New Banarpal PSS, Mahavir Road PSS, New Sarang PSS, Parjang PSS and Saanda PSS.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Chainpal	Parjang	20.00	6.00	30%	OK	7.99	40%	OK
	Poposed Parjang	26.51	8.00	30%	OK	10.65	40%	OK
Kamakhyanagar	Proposed Saanda	26.51	4.00	15%	OK	5.32	20%	OK

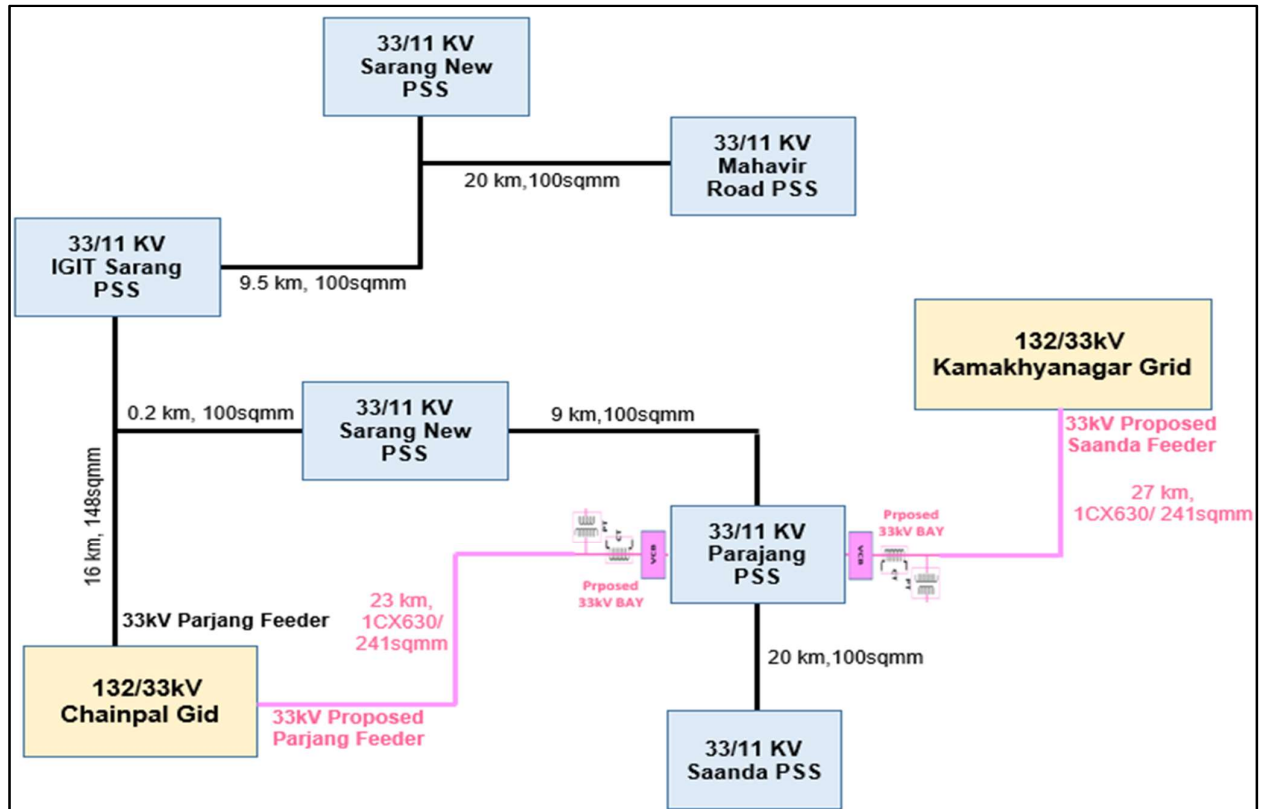
Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Chainpal	Parjang	Sarang	30.3
		New Banarpal	30.1
		Mahavir Road	30.03
		New Sarang	30.3
	Poposed Parjang	Parjang	30.08
Kamakhyanagar	Proposed Saanda	Saanda	30.5

### Snapshot from Cyme Software (Proposed Scenario)



### Saanda PSS

**Proposed SLD:**



**Detailed Scope of Work:**

**33kV Proposed Parjang Feeder (Chainpal Grid):**

Construction of 33kV OH line 241sqmm OH covered conductor feeder of length 21Ckm along with 1Cx630sqmm UG cable of length 1Ckm from 132/33kV Chainpal Grid to 33/11kV Parajang PSS. Construction of 1no. 4Pole structure, 2nos. PC+6 towers (for river crossing) and 1no. 33kV outdoor bay at Parajang PSS.

**Abstract of Estimate**

<b>Name of the Division :-</b>	<b>TALCHER ELECTRIC DIVISION (TED)</b>
<b>Name of the Sub-Division : -</b>	Parjang
<b>Name of the Section : -</b>	Parjang-1
<b>Name of the Work :-</b>	33kV New Line from Chainpal Grid (33kV Proposed Parjang Feeder)
<b>Scope of work:-</b>	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC OH covered conductor- 21Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm. Construction of 33kV 4 Pole structure with Isolator- 1no. Construction of 2 nos. 'PC+6' EHT Tower for river crossing (300mtr. span).Construction for 1 no. of 33kV Outdoor Bay at Parajang PSS.
<b>Names of Schemes: -</b>	TPCODL CAPEX

<b><u>ABSTRACT OF ESTIMATE</u></b>			
<b>Sl. No.</b>	<b>Part</b>	<b>Description</b>	<b>Amount</b>
1	A	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC OH covered conductor- 21Ckm.	₹ 8,10,89,787.45
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm.	₹ 1,40,53,343.76
3	C	Construction of 33kV 4 Pole structure with Isolator- 1no.	₹ 9,78,548.67
4	C	Construction of 2 nos. 'PC+6' EHT Tower for river crossing (300mtr. span).	₹ 1,17,58,371.00
5	D	Construction for 1 no. of 33kV Outdoor Bay at Parjang PSS.	₹ 36,39,033.16
		<b>Total Amount</b>	<b>₹ 11,15,19,084.04</b>
		<b>Total Amount (In Rs. Cr)</b>	<b>11.15</b>
<b>Total estimated cost is Rs.11.15 Crore.</b>			

Cost Estimate: ₹ 11.15 Cr. (For detailed BoQ refer Annexure-13).

**33kV Proposed Saanda Feeder (Kamakhyanagar Grid):**

Construction of 33kV OH line 241sqmm OH covered conductor feeder of length 25Ckm along with 1Cx630sqmm UG cable of length 1Ckm from 132/33kV Kamakhyanagar Grid to 33/11kV Parjang PSS. Construction of 1no. 4Pole structure, 2nos. PC+6 towers (for river crossing) and 1no. 33kV outdoor bay at Parjang PSS.

**Abstract of Estimate**

<b>Name of the Division :-</b>	<b>TALCHER ELECTRIC DIVISION (TED)</b>
<b>Name of the Sub-Division :-</b>	Parjang
<b>Name of the Section :-</b>	Parjang-1
<b>Name of the Work :-</b>	33kV New Line from Kamakhyanagar Grid (33kV Proposed Saanda Feeder)
<b>Scope of work:-</b>	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 25Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm cable- 1CkmConstruction of 33kV 4 Pole struture with Isolator- 1no.
<b>Names of Schemes: -</b>	TPCODL CAPEX

<b><u>ABSTRACT OF ESTIMATE</u></b>			
<b>Sl. No.</b>	<b>Part</b>	<b>Description</b>	<b>Amount</b>
1	A	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 25Ckm.	₹ 9,64,03,619.02
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm cable- 1Ckm	₹ 1,40,53,343.76
3	C	Construction of 33kV 4 Pole struture with Isolator- 1no.	₹ 9,78,548.67
4	D	Construction of 2 nos. 'PC+6' EHT Tower for river crossing (300mtr. span).	₹ 1,17,58,371.00
5	E	Construction for 1 no. of 33kV Outdoor Bay at Parajang PSS.	₹ 36,39,033.16
		<b>Total Amount</b>	<b>₹ 12,68,32,915.61</b>
		<b>Total Amount (In Rs. Cr)</b>	<b>12.68</b>
<b>Total estimated cost is Rs.12.68 Crore.</b>			

Cost Estimate: ₹ 12.68 Cr. (For detailed BoQ refer Annexure-14).

**Benefits:**

- ❖ Improving low voltage issues at 33/11kV Sarang PSS, New Banarpal PSS, Mahavir Road PSS, New Sarang PSS, Parjang PSS and Saanda PSS.
- ❖ Ensuring reliable power supply to the consumers by providing N-1 contingency connectivity to 33kV Parjang feeder.

### 7.10 Mitigation of Low Voltage and Overloading issues at 33/11kV Substations fed from 33kV Mahakalpada Feeder (Marsaghai Grid):

#### **Proposal:**

Proposal for construction of 33kV OH line 232sqmm conductor feeder of length 20Ckm along with 1Cx630sqmm UG cable of length 1Ckm from 132/33kV Rajnagar Grid to 33/11kV Badhi PSS. Construction of 1no. 4Pole structure, 4nos. PC+6 towers (for 2nos. river crossing) and 1no. 33kV outdoor bay at Badhi PSS.

#### **Objective:**

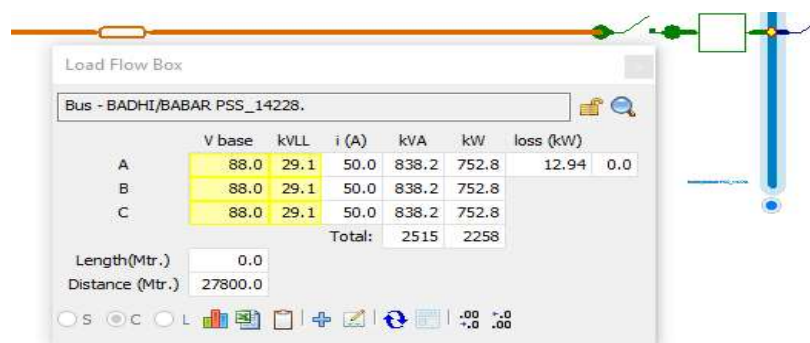
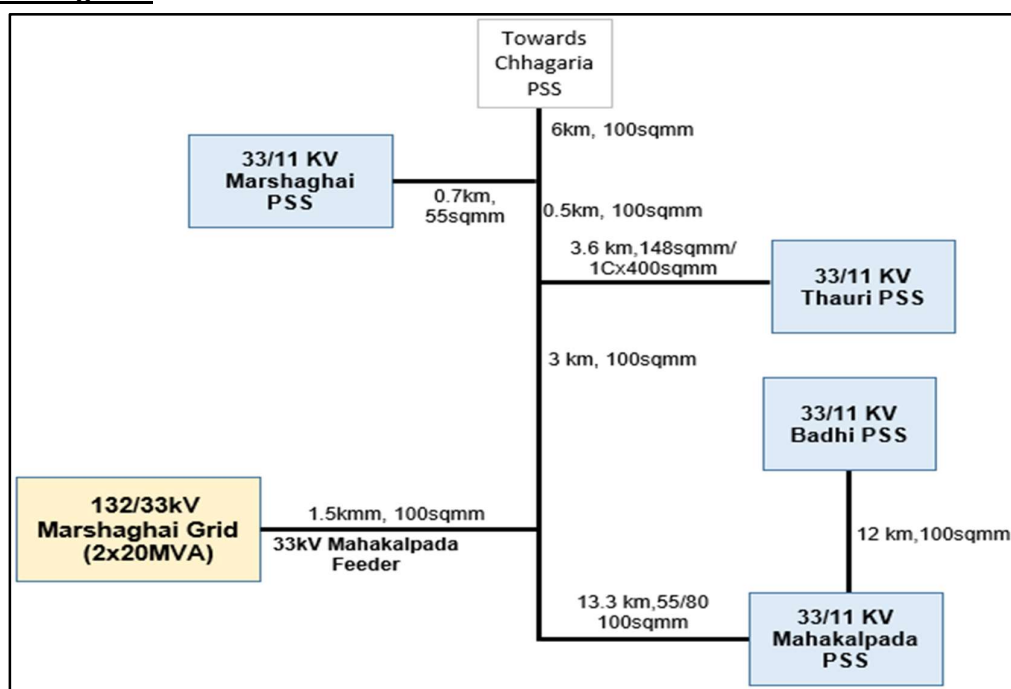
To provide reliable power supply to the consumers, improve low voltage issues of areas fed from Mahakalpada PSS and Badhi PSS during peak loading condition.

#### **Existing Scenario (Summer'22):**

- At present, 33/11kV Marsaghai PSS, Mahakalpada PSS, Thauri PSS and Badhi PSS are fed from 33kV Mahakalpada feeder emanating from Marsaghai Grid, having mixed type conductor 55/80/100sqmm OH conductor.
- The voltage experienced at 33/11kV Mahakalpada PSS and Badhi PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The low voltage situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Marsaghai	Mahakalpada	15.54	11.00	71%	OK	13.31	17.72	114%

Sl. No.	Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
1	Marsaghai	Mahakalpada	Thauri	31.5
			Marsaghai	31.5
			Mahakalpada	29.5
			Badhi	29.1

**Snapshot from Cyme Software (Existing Scenario)****Badhi PSS****Existing SLD:****Proposed Scenario (Summer'24):**

- Construction of 33kV OH line 232sqmm conductor feeder of length 20Ckm along with 1Cx630sqmm UG cable of length 1Ckm from 132/33kV Rajnagar Grid to 33/11kV Badhi PSS.
- Construction of 1no. 4Pole structure, 4nos. PC+6 towers (for 2nos. river crossing) and 1no. 33kV outdoor bay at Badhi PSS
- After linking new feeder from Rajnagar GSS, the proposed Badhi feeder will deliver power supply to Badhi PSS and existing 33kV Mahakalpada feeder will deliver power supply to 33/11kV Marsaghai PSS, hauri PSS and Mahakalpada PSS during normal operating condition.
- This proposal will improve the voltage profile of 33/11kV Badhi and Mahakalpada PSS.



**Detailed Scope of Work:**

Construction of 33kV OH line 232sqmm conductor feeder of length 20Ckm along with 1Cx630sqmm UG cable of length 1Ckm from 132/33kV Rajnagar Grid to 33/11kV Badhi PSS. Construction of 1no. 4Pole structure, 4nos. PC+6 towers (for 2nos. river crossing) and 1no. 33kV outdoor bay at Badhi PSS.

**Abstract of Estimate**

Name of the Division :-		KED-II	
Name of the Sub-Division : -		Mahakalpada	
Name of the Section : -		Babar	
Name of the Work :-		33kV New Line from Rajnagar Grid (33kV Proposed Badhi Feeder)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 20Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm. Construction of 33kV 4 Pole structure with Isolator- 1 No. Construction of 4 nos. 'PC+6' EHT Tower for river crossing (300mtr. span). Construction for 1 no. of 33kV Outdoor Bay at Badhi PSS.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 20Ckm.	₹ 7,39,74,732.65
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm.	₹ 1,40,53,343.76
3	C	Construction of 33kV 4 Pole structure with Isolator- 1 No.	₹ 9,78,548.67
4	D	Construction of 4 nos. 'PC+6' EHT Tower for river crossing (300mtr. span).	₹ 2,35,16,743.00
5	E	Construction for 1 no. of 33kV Outdoor Bay at Badhi PSS.	₹ 36,39,033.16
		Total Amount	₹ 11,61,62,401.25
		Total Amount (In Rs. Cr)	11.62
Total estimated cost is Rs.11.62 Crore.			

Cost Estimate: ₹ 11.62 Cr. (For detailed BoQ refer Annexure-15).

**Benefits:**

- ❖ Ensuring reliable power supply to the consumers and improving low voltage issues at 33/11kV Badhi and Mahakalpada PSS.
- ❖ Mitigating the radial connectivity to 33/11KV Badhi & Mahakalapada PSS.

### 7.11 Mitigation of Low Voltage issues at 33/11kV Substations fed from 33kV Tirtol Feeder (Jagatsinghpur Grid):

#### **Proposal:**

Proposal for construction of 33kV OH line 232sqmm conductor feeder of length 10Ckm from 132/33kV Tirtol Grid to 33/11kV Kanakpur PSS. Construction of 1no. 33kV outdoor bay at Kanakpur PSS.

#### **Objective:**

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from 33/11kV Chikinia PSS, Nuapada PSS and Kanakpur PSS.

#### **Existing Scenario (Summer'22):**

- At present, 33/11kV Chikinia PSS, Nuapada PSS and Kanakpur PSS are fed from 33kV Tirtol feeder emanating from Jagatsinghpur Grid, having mixed type conductor 55/80/100/148sqmm OH conductor.
- The voltage experienced at 33/11kV Chikinia PSS, Nuapada PSS and Kanakpur PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The low voltage situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Jagatsinghpur	Tirtol	15.54	11.00	71%	OK	13.31	17.72	114%

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Jagatsinghpur	Tirtol	Chikinia	29.6
		Nuapada	29.8
		Kanakpur	28.9

### Snapshot from Cyme Software (Existing Scenario)

Load Flow Box

Bus - KANAKPUR PSS\_14341

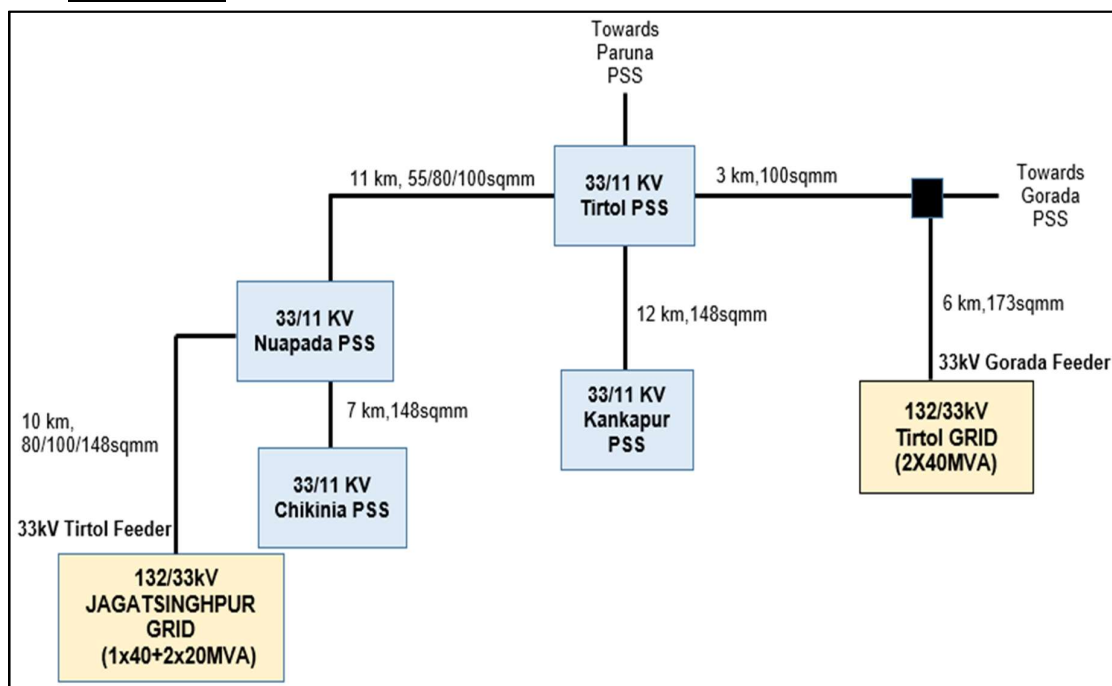
	V base	kVLL	i (A)	kVA	kW	loss (kW)	
A	87.5	28.9	42.5	708.1	636.3	12.06	0.0
B	87.5	28.9	42.5	708.1	636.3		
C	87.5	28.9	42.5	708.1	636.3		
Total:				2124	1909		

Length(Mtr.) 0.0  
Distance (Mtr.) 37000.0

Buttons: S, C, L, and various icons for load flow analysis.

### Kanakpur PSS

### Existing SLD:



### Proposed Scenario (Summer'24):

- Construction of of 33kV OH line 232sqmm conductor feeder of length 10Ckm from 132/33kV Tirtol Grid to 33/11kV Kanakpur PSS.
- Construction of 1no. 33kV outdoor bay at 33/11kV Kanakpur PSS
- After linking new feeder from Tirtol GSS, the proposed Kanakpur feeder will deliver power supply to 33/11kV Kanakpur PSS and existing 33kV Tirtol feeder will deliver power supply to 33/11kV Chikinia PSS and Nuapada PSS during normal operating condition.
- This proposal will improve the voltage profile at 33/11kV Chikinia PSS, Nuapada PSS and Kanakpur PSS.

## Supplementary Capex Plan: FY 2023-24

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Jagatsinghpur	Tirtol	15.54	8.00	51%	OK	10.65	69%	OK
Tirtol	Proposed Kanakpur	26.51	5.00	19%	OK	6.66	25%	OK

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Jagatsinghpur	Tirtol	Chikinia	30.3
		Nuapada	30.5
Tirtol	Proposed Kanakpur	Kanakpur	31.7

### Snapshot from Cyme Software (Existing Scenario)

Load Flow Box

Bus - KANAKPUR PSS\_14341

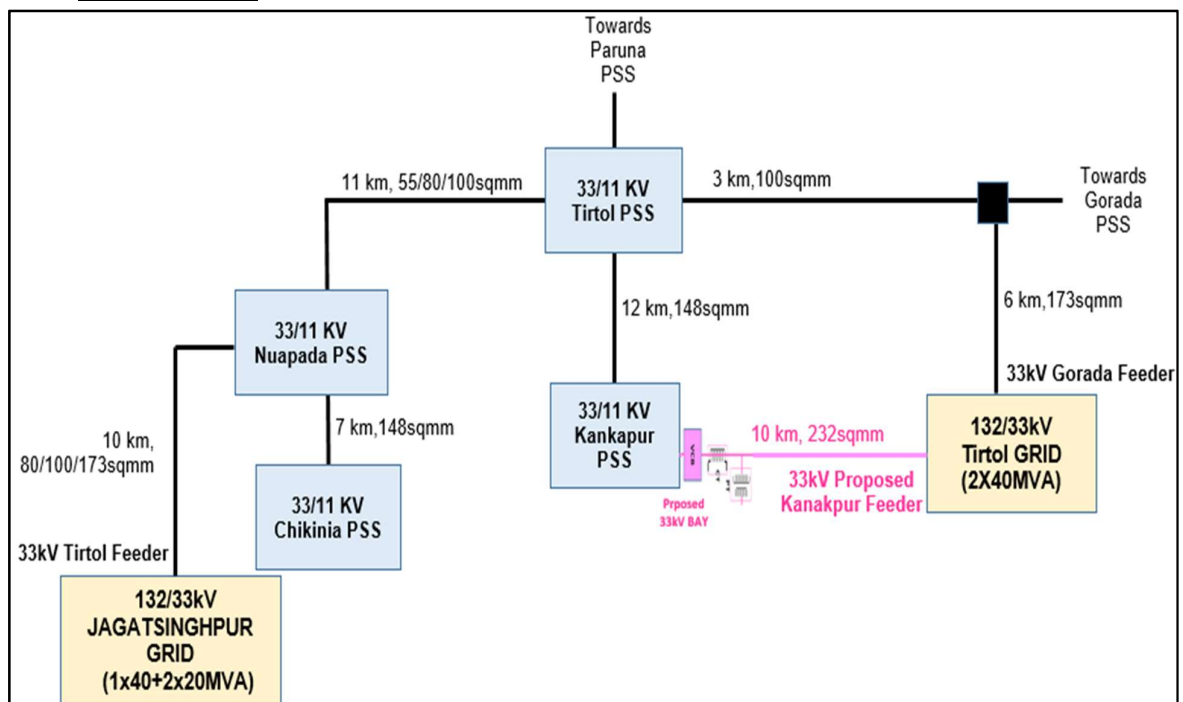
	V base	kVLL	i (A)	kVA	kW	loss (kW)
A	96.1	31.7	79.1	1448.6	1320.1	65.61
B	96.1	31.7	79.1	1448.6	1320.1	0.0
C	96.1	31.7	79.1	1448.6	1320.1	0.0
Total:				4346	3960	

Length(Mtr.) 0.0  
Distance (Mtr.) 10000.0

Buttons: S, C, L, [Icons], [Icons], [Icons], [Icons], [Icons], [Icons]

### Kanakpur PSS

#### Proposed SLD:



**Detailed Scope of Work:**

Construction of 33kV OH line 232sqmm conductor feeder of length 10Ckm. Construction of 1no. 33kV outdoor bay at 33/11kV Kanakpur PSS.

**Abstract of Estimate**

Name of the Division :-	Paradeep		
Name of the Sub-Division : -	Tirtol		
Name of the Section : -	Tirtol		
Name of the Work :-	33kV New Line from Tirtol Grid (33kV Proposed Kanakpur Feeder)		
Scope of work:-	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 10Ckm. Construction of 01 no 33kV outdoor line bay at 33/11kV Kanakpur PSS		
Names of Schemes: -	TPCODL CAPEX		
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 10Ckm.	₹ 3,56,13,221.93
2	B	Construction of 01 no 33kV outdoor line bay at 33/11kV Kanakpur PSS	₹ 36,39,033.16
		Total Amount	₹ 3,92,52,255.09
		Total Amount (In Rs. Cr)	3.93
Total estimated cost is Rs.3.93 Crore.			

Cost Estimate: ₹ 3.93 Cr. (For detailed BoQ refer Annexure-16).

**Benefits:**

- ❖ Ensuring reliable power supply to the consumers and improving low voltage issues at 33/11kV Chikinia PSS, Nuapada PSS and Kanakpur PSS.
- ❖ Mitigating the 33KV radial connectivity to 33/11KV Kanakpur PSS.

### 7.12 Mitigation of Low Voltage and Overloading issues at 33/11kV Substations fed from 33kV Salipur Feeder (Balía Grid):

#### **Proposal:**

Proposal for construction of 33kV OH line 232sqmm conductor feeder of length 11Ckm along with 1Cx630sqmm UG cable of length 1Ckm from Bahugram Grid to 33/11kV Nischintakoili PSS. Construction of 2nos. PC+6 towers (for canal crossing) and 1no. 33kV outdoor bay at 33/11kV Nischintakoili PSS.

#### **Objective:**

To provide reliable power supply to the consumers, mitigate overloading of 33kV Salipur feeder emanating from Balía Grid and improve low voltage issues of areas fed from 33/11kV Salipur, Nischintakoili, Paldhupadia and Salipur PSS during peak loading condition.

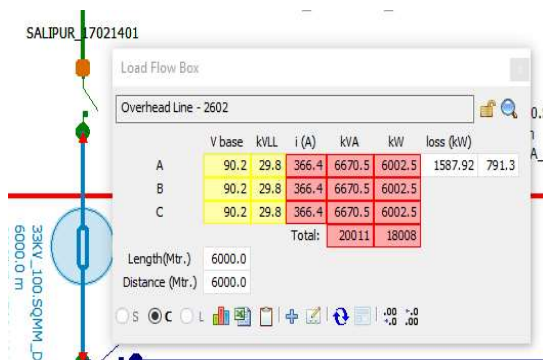
#### **Existing Scenario (Summer'22):**

- At present, 33/11kV Salipur, Nischintakoili, Paldhupadia and Salipur PSS is fed from 33kV Salipur feeder emanating from Balía Grid, having 100sqmm OH conductor.
- The 33kV Salipur feeds 33/11kV Salipur, Nischintakoili, Paldhupadia and Oríkanta PSS with a total length of 33Ckm. The 33kV Salipur feeder is overloaded up to 129%.
- The voltage experienced at 33/11kV Salipur, Nischintakoili, Paldhupadia and Oríkanta PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The overloading and low voltage situation will increase with load growth (10%) for each year.

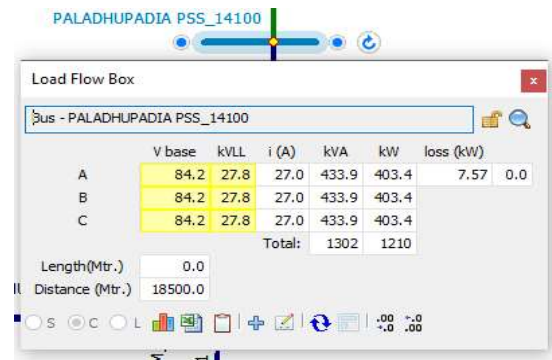
Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Balia	Salipur	15.54	20.00	129%	Overload	24.20	32.21	207%

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Balía	Salipur	Salipur	29.7
		Nischintakoili	27.8
		Oríkanta	27.1
		Paldhupadia	27.8

### Snapshot from Cyme Software (Existing Scenario)

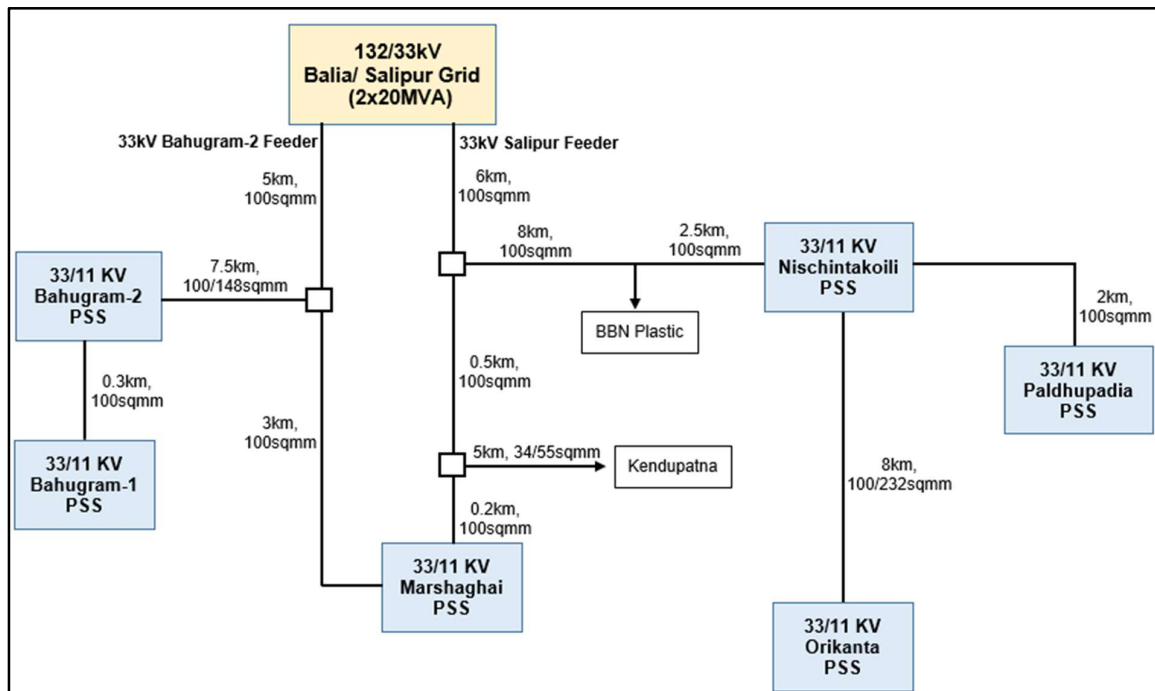


**33kV Salipur Feeder**



**33/11kV Paldhupadia PSS**

### Existing SLD:



### Proposed Scenario (Summer'24):

- Construction of 33kV OH line 232sqmm conductor feeder of length 11Ckm along with 1Cx630sqmm UG cable of length 1Ckm from Bahugram Grid to 33/11kV Nischintakoili PSS.
- Construction of 2nos. PC+6 towers (for canal crossing) and 1no. 33kV outdoor bay at Nischintakoili PSS.
- After linking new feeder from Bahugram GSS the proposed 33kV Nischintakoili feeder will deliver power supply to 33/11kV Nischintakoili PSS and 33/11kV Orikanta PSS during normal operating condition.

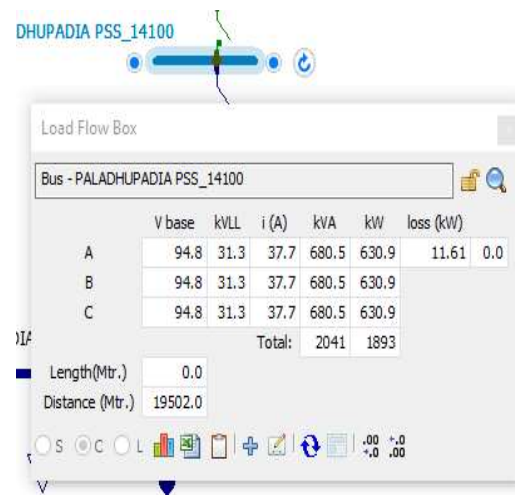
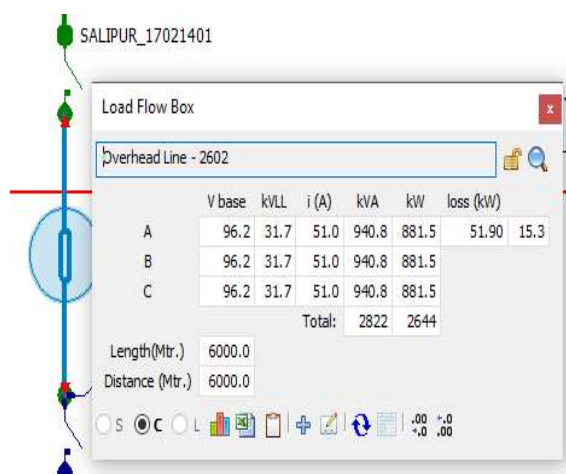
## Supplementary Capex Plan: FY 2023-24

- The existing 33kV Bahugram-2 feeder will deliver power supply to 33/11kV Salipur PSS during normal operating condition.
- The existing 33kV Salipur feeder will deliver power supply to 33/11kV Paldhupadia PSS during normal operating condition.
- This proposal will mitigate the overloading of 33kV Salipur feeder and improve the voltage at 33/11kV Salipur, Nischintakoili, Paldhupadia and Orikanta PSS.

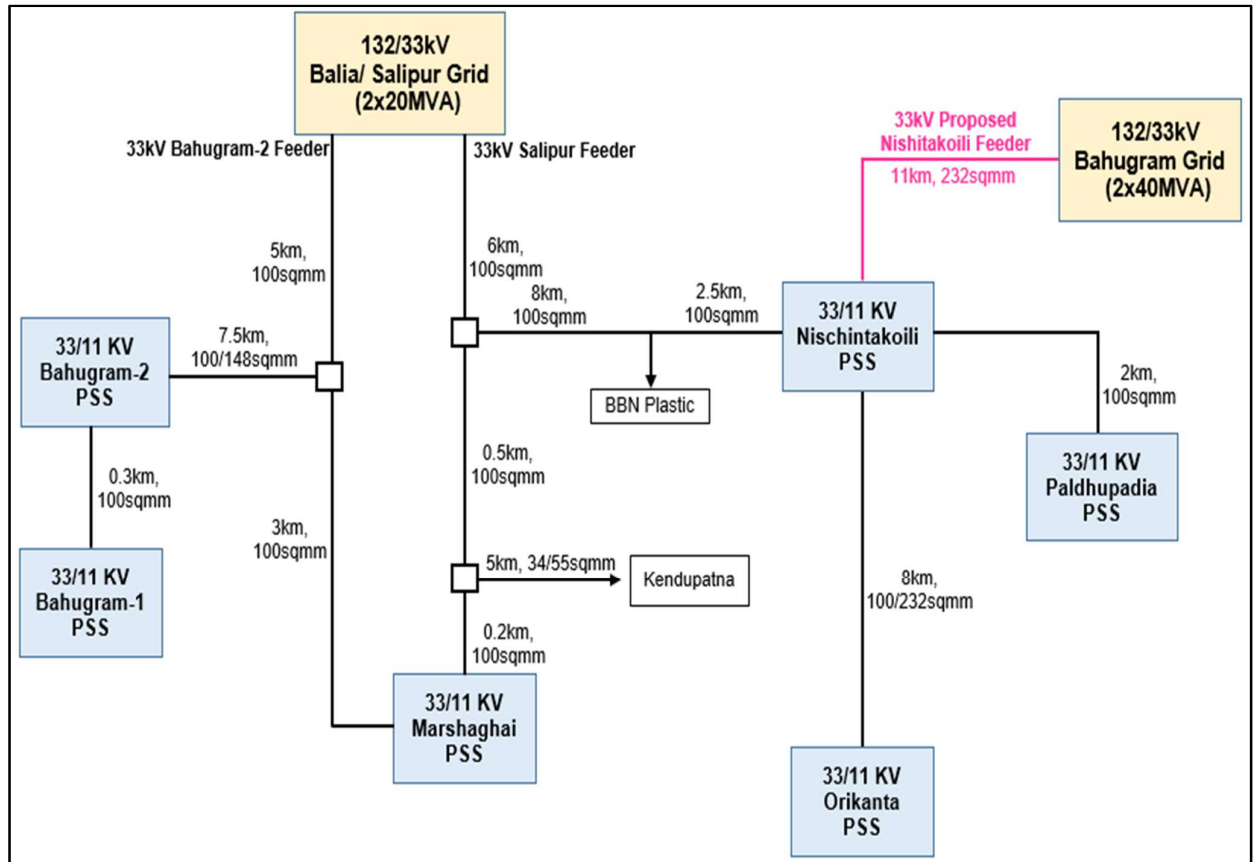
Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Balia	Bahugram-2	15.54	9.7	62%	OK	12.91	83%	OK
Bahugram	Proposed Nischintakoili	26.51	13	49%	OK	17.30	65%	OK
Balia	Salipur	15.54	2.8	18%	OK	3.73	24%	OK

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Balia	Bahugram-2	Salipur	30.9
Bahugram	Proposed Nischintakoili	Nischintakoili	31.2
		Orikanta	30.5
Balia	Salipur	Paldhupadia	31.3

### Snapshot from Cyme Software (Proposed Scenario)



**Proposed SLD:**



**Detailed Scope of Work:**

Construction of 33kV OH line 232sqmm conductor feeder of length 11Ckm along with 1Cx630sqmm UG cable of length 1Ckm from Bahugram Grid to 33/11kV Nischintakoili PSS. Construction of 2nos. PC+6 towers (for canal crossing) and 1no. 33kV outdoor bay at Nischintakoili PSS.

**Abstract of Estimate**

<b>Name of the Division :-</b>	SED
<b>Name of the Sub-Division :-</b>	NISCHINTKOILI
<b>Name of the Section :-</b>	ORIKANTA
<b>Name of the Work :-</b>	33kV New Line from Bahugram Grid (33kV Proposed Nischintakoili Feeder)
<b>Scope of work:-</b>	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor.- 11Ckm. Construction for 1 no. of 33kV Outdoor Bay at Nischintkoili PSS. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm. Construction of 2 nos. 'PC+6' EHT Tower for river crossing (300mtr. span)
<b>Names of Schemes: -</b>	TPCODL CAPEX

<b><u>ABSTRACT OF ESTIMATE</u></b>			
<b>Sl. No.</b>	<b>Part</b>	<b>Description</b>	<b>Amount (In Cr.)</b>
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor.- 11Ckm.	₹ 4,09,23,600.97
2	B	Construction for 1 no. of 33kV Outdoor Bay at Nischintkoili PSS.	₹ 36,39,033.16
5	C	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm.	₹ 1,40,53,343.76
6	D	Construction of 2 nos. 'PC+6' EHT Tower for river crossing (300mtr. span)	₹ 1,17,58,371.00
		<b>Total Amount</b>	<b>₹ 7,03,74,348.90</b>
		<b>Total Amount (In Rs. Cr)</b>	<b>7.04</b>
<b>Total estimated cost is Rs.7.04 Crore.</b>			

Cost Estimate: ₹ 7.04 Cr. (For detailed BoQ refer Annexure-17).

**Benefits:**

- ❖ Mitigation of overloading issue of 33kV Salipur feeder.
- ❖ Ensuring reliable power supply to the consumers by improving low voltage issues at 33/11kV Salipur, Nischintakoili, Paldhupadia and Orikanta PSS.

### 7.13 Mitigation of Low Voltage and Overloading issues at 33/11kV Substations fed from 33kV Kakatpur Feeder (Nimapada Grid):

#### **Proposal:**

Proposal for construction of 33kV OH line 232sqmm conductor feeder of length 10Ckm along with 1Cx630sqmm UG cable of length 2Ckm from Bangurigaon PSS to Kakatpur PSS. Construction of 2nos. PC+6 towers (for river crossing), 1no. 33kV 4W RMU at 33/11kV Kakatpur PSS and 1no. 33kV outdoor bay at 33/11kV Bangurigaon PSS.

#### **Objective:**

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from 33/11kV Charichaka PSS, Jogeswarpur PSS, Kakatpur PSS, Astaranga PSS and Patalda PSS. Overloading mitigation of 33kV Kakatpur feeder emanating from Nimapada Grid along with ensuring reliability of power supply by providing N-1 contingency connectivity from 33kV Bangurigaon feeder during peak loading condition.

#### **Existing Scenario (Summer'22):**

- At present, 33/11kV Charichaka PSS, Jogeswarpur PSS, Kakatpur PSS, Astaranga PSS and Patalda PSS are fed from 33kV Kakatpur feeder emanating from Nimapada Grid, having 100sqmm OH conductor.
- The 33kV Kakatpur feeds 33/11kV Charichaka PSS, Jogeswarpur PSS, Kakatpur PSS, Astaranga PSS and Patalda PSS with a total length of 42.2Ckm. The 33kV Kakatpur feeder is overloaded up to 105%.
- The voltage experienced at 33/11kV Charichaka PSS, Jogeswarpur PSS, Kakatpur PSS, Astaranga PSS and Patalda PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The overloading and low voltage situation will increase with load growth (10%) for each year.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Nimapada	Kakatpur	20.00	21.00	105%	Overload	25.41	33.82	169%

## Supplementary Capex Plan: FY 2023-24

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Nimapada	Kakatpur	Charichaka	29
		Jogeshwarpur	27
		Kakatpur	25.6
		Astarang	24.6
		Patalda	24.4

### Snapshot from Cyme Software (Existing Scenario)

PATALADA (KAKATPUR)\_17005402

Load Flow Box

Overhead Line - 3057

	V base	kVLL	i (A)	kVA	kW	loss (kW)
A	92.8	30.6	381.1	7050.1	6445.4	2988.83
B	92.8	30.6	381.1	7050.1	6445.4	633.4
C	92.8	30.6	381.1	7050.1	6445.4	
Total:			21150	19336		

Length(Mtr.) 5300.0  
Distance (Mtr.) 5300.0

PATALADA PSS\_14256

Load Flow Box

Bus - PATALADA PSS\_14256

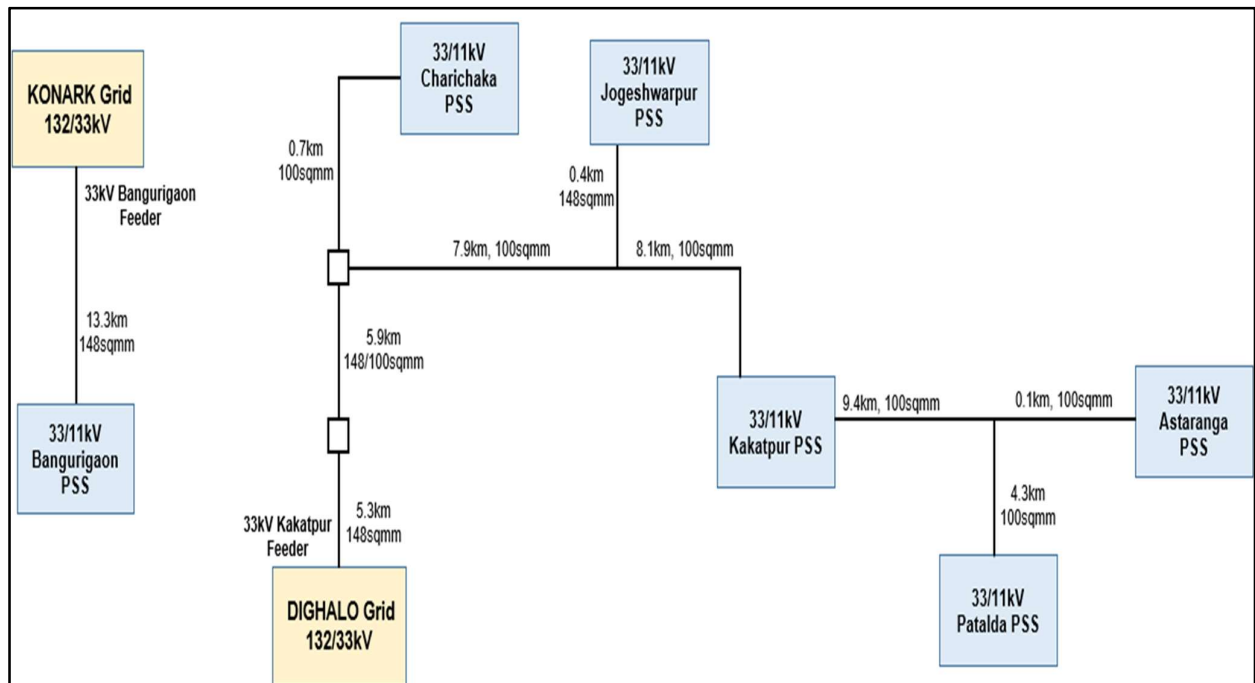
	V base	kVLL	i (A)	kVA	kW	loss (kW)
A	73.9	24.4	66.7	939.9	904.6	16.29
B	73.9	24.4	66.7	939.9	904.6	0.0
C	73.9	24.4	66.7	939.9	904.6	
Total:			2820	2714		

Length(Mtr.) 0.0  
Distance (Mtr.) 40890.0

### 33kV Kakatpur Feeder

### 33/11kV Patalda PSS

### Existing SLD:



**Proposed Scenario (Summer'24):**

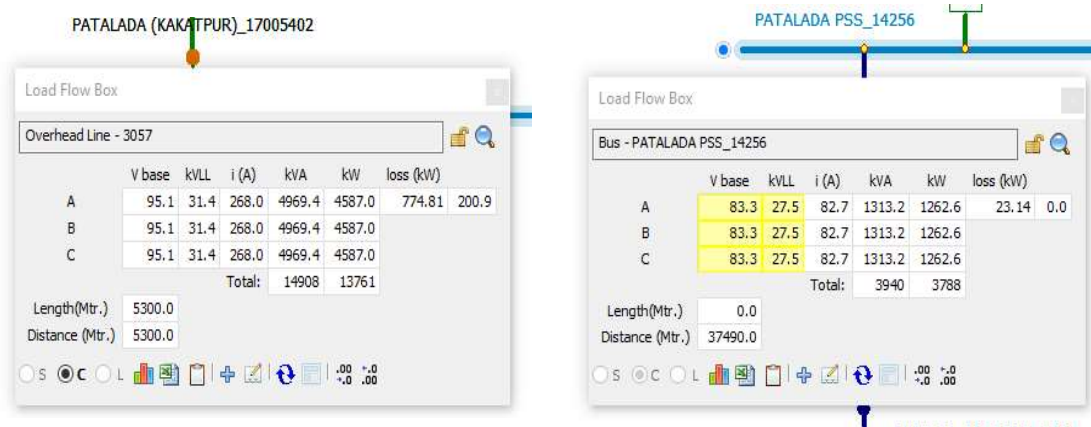
- Construction of 33kV OH line 232sqmm conductor feeder of length 10Ckm along with 1Cx630sqmm UG cable of length 2Ckm from 33/11kV Bangurigaon PSS to 33/11kV Kakatpur PSS.
- Construction of 2nos. PC+6 towers (for canal crossing), 1no. 33kV 4W RMU at 33/11kV Kakatpur PSS and 1no. 33kV outdoor bay at 33/11kV Bangurigaon PSS.
- After the 33kV line linking, 33kV Bangurigaon feeder from Konark GSS will deliver power supply to 33/11kV Astaranga PSS, Patalda PSS and Bangurigaon PSS and 33kV Kakatpur feeder will deliver power supply to 33/11kV Charichaka PSS, Jogeswarpur PSS and Kakatpur PSS during normal operating condition.
- This proposal will mitigate the overloading of 33kV Kakatpur feeder, improve the voltage at 33/11kV Salipur, Nischintakoili, Paldhupadia and Orikanta PSS. The 33kV Kakatpur feeder will be provided with N-1 contingency connectivity from 33kV Bangurigaon feeder.

Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Nimapada	Kakatpur	26.51	16.00	60%	OK	21.30	80%	OK
Konark	Bangurigaon	15.54	10.00	64%	OK	13.31	86%	OK

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Nimapada	Kakatpur	Charichaka	30.5
		Jogeswarpur	29.6
		Kakatpur	29.2
Konark	Bangurigaon	Astarang	27.7
		Patalda	27.5
		Bangurigaon	30.03

*Note: The voltage at 33/11kV Charichaka PSS, Jogeswarpur PSS and Kakatpur PSS will be improved and further maintained by PTR tap at 11kV side. However for 33/11kV Astarang PSS and Patalada PSS, voltage can be improved but cannot be maintained within the permissible limit. TPCODL has already raised the issue of low voltage at PSS with OPTCL and asked for a new GSS at New Betanda with new 33kV interlinking feeders, same has been considered and approved by OPTCL and in process for further initiation. After charging the proposed GSS, low voltage issue will be mitigated and reliability of power supply will be further improved.*

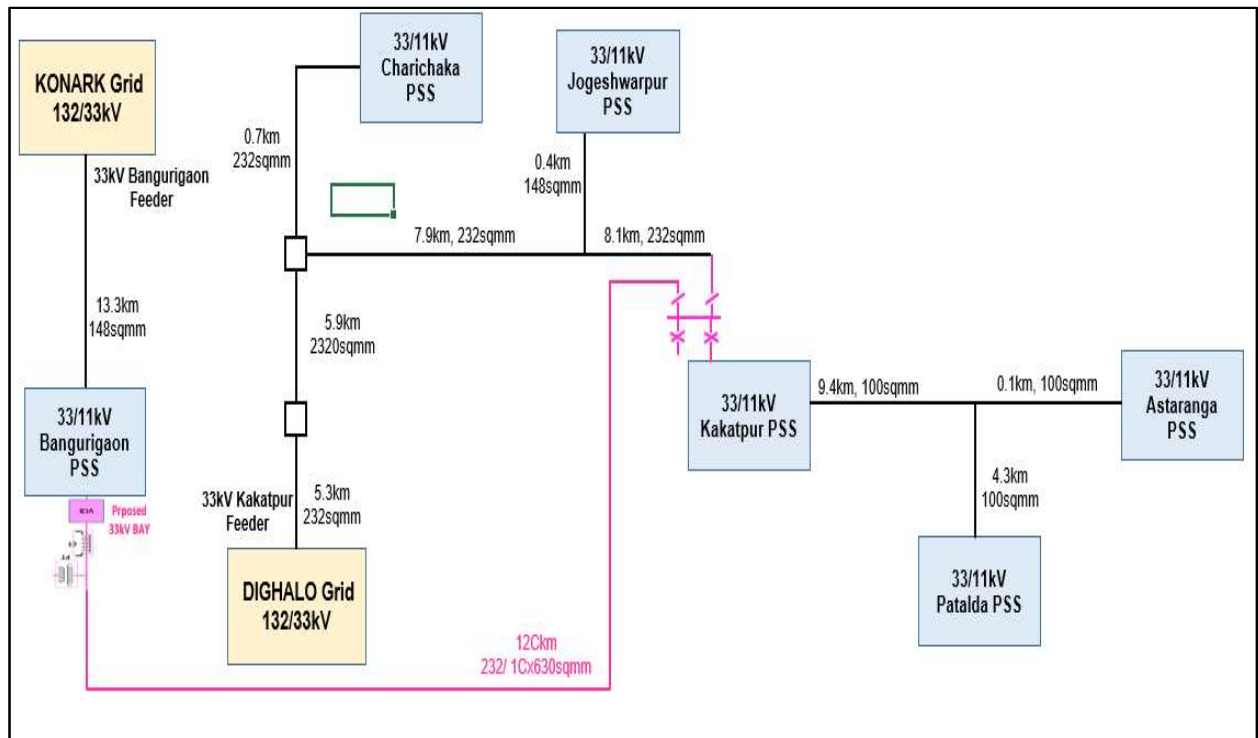
### Snapshot from Cyme Software (Proposed Scenario)



### 33kV Kakatpur Feeder

### 33/11kV Patalda PSS

### Proposed SLD:



### Detailed Scope of Work:

Construction of 33kV OH line 232sqmm conductor feeder of length 10Ckm along with 1Cx630sqmm UG cable of length 2Ckm from Bangurigaon PSS to Kakatpur PSS. Construction of 2nos. PC+6 towers (for river crossing), 1no. 33kV 4W RMU at 33/11kV Kakatpur PSS and 1no. 33kV outdoor bay at 33/11kV Bangurigaon PSS.

**Abstract of Estimate**

<b>Name of the Division :-</b>	<b>NIMAPADA ELECTRIC DIVISION</b>
<b>Name of the Sub-Division :-</b>	KAKATPUR
<b>Name of the Section :-</b>	Gada Amarprasad
<b>Name of the Work :-</b>	33kV line from Bangurigaon PSS to Kakatpur PSS.
<b>Scope of work:-</b>	Construction for 1no. of 33kV Outdoor Bay at Bangurigaon PSS. Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 10Ckm. Construction of 2 nos. 'PC+6' EHT Tower for river crossing (300mtr. span). Laying of 33kV U/G cable with 3R, 1CX630sqmm Cable- 2Ckm and 1 no. 33kV 4W RMU at Kakatpur PSS for 33kV incomer line.
<b>Names of Schemes: -</b>	TPCODL CAPEX

**ABSTRACT OF ESTIMATE**

Sl. No.	Part	Description	Amount
1	A	Construction for 1no. of 33kV Outdoor Bay at Bangurigaon PSS.	₹ 36,39,033.16
2	B	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 10Ckm.	₹ 3,72,83,334.44
3	C	Construction of 2 nos. 'PC+6' EHT Tower for river crossing (300mtr. span).	₹ 1,17,58,371.00
4	D	Laying of 33kV U/G cable with 3R, 1CX630sqmm Cable- 2Ckm and 1 no. 33kV 4W RMU at Kakatpur PSS for 33kV incomer line.	₹ 3,20,35,117.72
		<b>Total Amount</b>	<b>₹ 8,47,15,856.33</b>
		<b>Total Amount (In Rs. Cr)</b>	<b>8.47</b>

**Total estimated cost is Rs.8.47 Crore.**

Cost Estimate: ₹ 8.47 Cr. (For detailed BoQ refer Annexure-18).

**Benefits:**

- ❖ Mitigation of overloading issue of 33kV Kakatpur feeder.
- ❖ Improving low voltage issues at 33/11kV Charichaka PSS, Jogeswarpur PSS, Kakatpur PSS, Astaranga PSS and Patalda PSS.
- ❖ Ensuring reliable power supply to the consumers by providing N-1 contingency connectivity to 33kV Kakatpur feeder.

#### 7.14 Mitigation of Low Voltage and Overloading issues at 33/11kV Substations fed from 33kV Angul-2 Feeder (Angul Grid):

##### **Proposal:**

Proposal for construction of 33kV OH line 241sqmm covered conductor feeder of length 16Ckm and 1Cx630sqmm UG cable of length 4Ckm from Khajuriakata GSS to Phulpada PSS along with 1no. 33kV 4W RMU at 33/11kV Pada PSS. Construction of 2nos. 33kV outdoor bay each at 33/11kV Pada PSS and 33/11kV Phulpada PSS.

##### **Objective:**

To provide reliable power supply to the consumers, improve low voltage issues of areas fed from 33/11kV Badakera PSS, Bantala PSS and Phulpada PSS. Overloading mitigation of 33kV Angul-2 feeder emanating from Angul Grid along with ensuring reliability of power supply by providing N-1 contingency connectivity from 33kV feeder proposed from Khajuriakata Grid during peak loading condition.

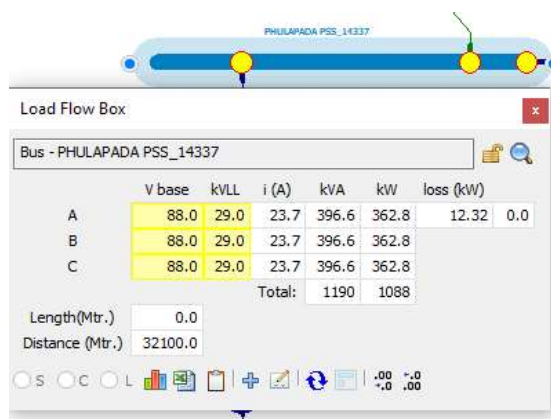
##### **Existing Scenario (Summer'22):**

- At present, 33/11kV Industrial PSS, Badakera PSS, Bantala PSS and Phulpada PSS are fed from 33kV Angul-2 feeder emanating from Angul Grid, having 100/148/232sqmm OH conductor.
- The 33kV Angul-2 feeder feeds 33/11kV Industrial PSS, Badakera PSS, Bantala PSS and Phulpada PSS with a total length of 67Ckm. The 33kV Angul-2 feeder is loaded up to 95%.
- The voltage experienced at 33/11kV Badakera PSS, Bantala PSS and Phulpada PSS are below the permissible limit of -9% of 33kV i.e; 30.03kV.
- The overloading and low voltage situation will increase with load growth (10%) for each year.

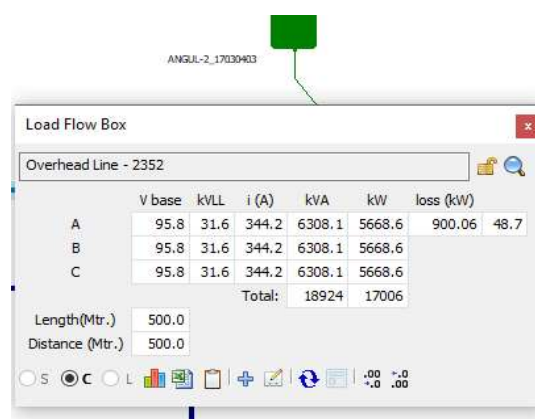
Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Over loading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading
Angul	Angul-2	20.00	19.00	95%	Overload	22.99	30.60	153%

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Angul	Angul-2	Industrial	30.8
		Badakera	29.2
		Bantala	29.4
		Phulpada	29

### Snapshot from Cyme Software (Existing Scenario)

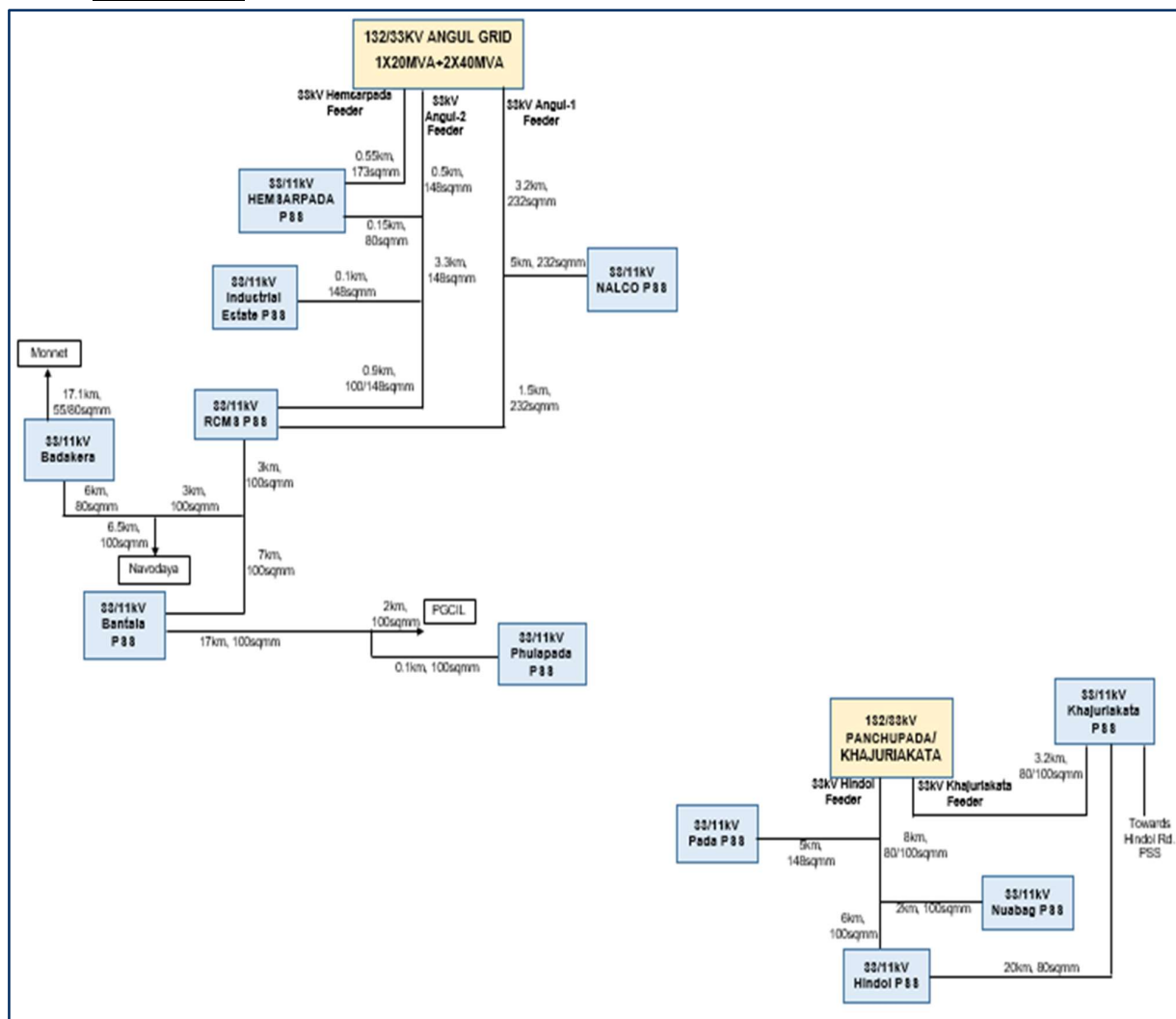


### 33/11kV Phulpada PSS



### 33kV Angul-2 Feeder

**Existing SLD:**



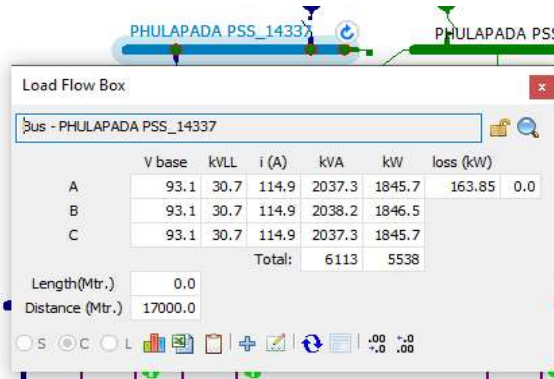
**Proposed Scenario (Summer'24):**

- Construction of 33kV OH line 241sqmm covered conductor feeder of length 16Ckm and 1Cx630sqmm UG cable of length 4Ckm from Khajuriakata GSS to Phulpada PSS along with 1no. 33kV 4W RMU at 33/11kV Pada PSS.
- Construction of 2nos. 33kV outdoor bay each at 33/11kV Pada PSS and 33/11kV Phulpada PSS.
- After linking new feeder from Khajuriakata GSS the proposed 33kV Pada feeder will deliver power supply to 33/11kV Phulpada PSS and 33/11kV Pada PSS and existing 33kV Angul-2 feeder will deliver power supply to 33/11kV Industrial PSS, Badakera PSS and Bantala PSS during normal operating condition.
- This proposal will mitigate the overloading of 33kV Angul-2 feeder and improve the voltage at 33/11kV Badekera PSS, Bantala PSS and Phulpada PSS.

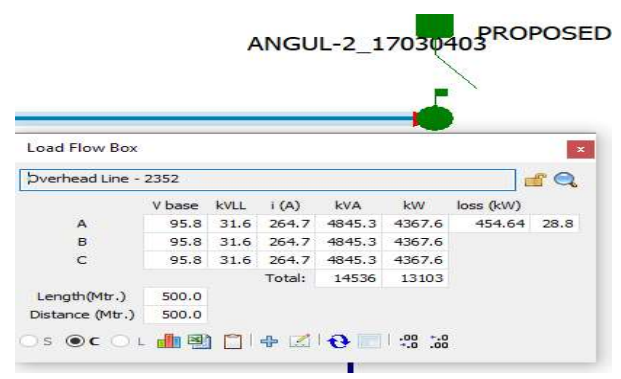
Name of Grid	Name of 33kV Feeder	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	% Loading	Feeder Over loading Status	Projected load FY' 27-28 (MVA)	% Loading	Feeder Over loading Status
Angul	Angul-2	20.00	14.50	73%	OK	19.30	96%	OK
Khajuriakata	Proposed Pada	26.51	7.00	26%	OK	9.32	35%	OK

Name of Grid	Name of 33kV Feeder	Name of 33/11kV PSS	Voltage (in kV)
Angul	Angul-2	Industrial	31
		Badakera	30.04
		Bantala	30.03
Khajuriakata	Proposed Pada	Phulpada	30.7
		Pada	31.4

### Snapshot from Cyme Software (Proposed Scenario)

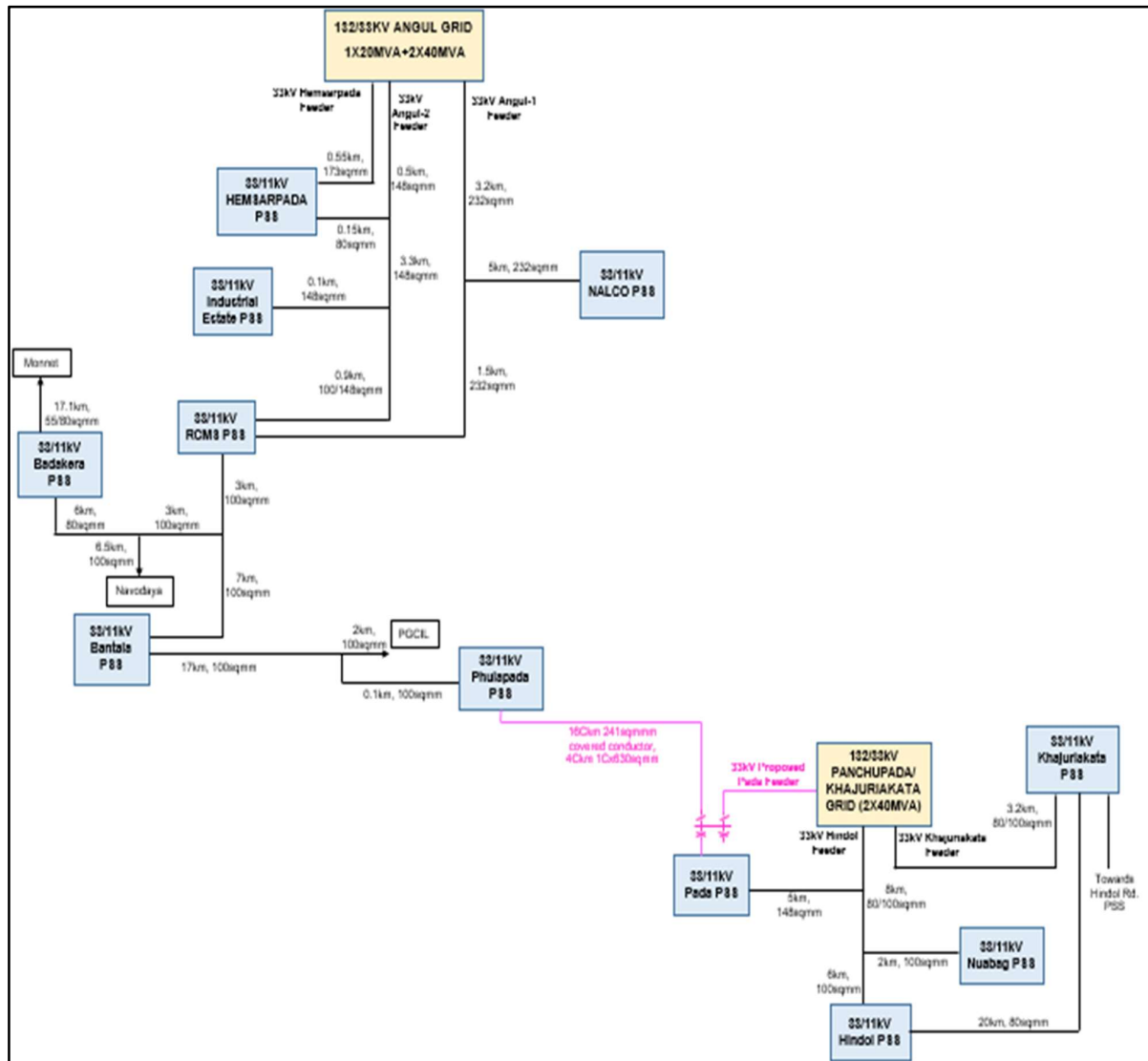


**33/11kV Phulpada PSS**



**33kV Angul-2 Feeder**

### Proposed SLD:



**Detailed Scope of Work:**

Construction of 33kV OH line 241sqmm covered conductor feeder of length 16Ckm and 1Cx630sqmm UG cable of length 4Ckm from Khajuriakata GSS to Phulpada PSS along with 1no. 33kV 4W RMU at 33/11kV Pada PSS. Construction of 2nos. 33kV outdoor bay each at 33/11kV Pada PSS and 33/11kV Phulpada PSS.

**Abstract of Estimate**

Name of the Division :-		AnED	
Name of the Sub-Division : -		ANGUL	
Name of the Section : -		BANTALA	
Name of the Work :-		33kV Line from Khajuriakata GSS to Phulpada PSS.	
Scope of work:-		Construction for 1 no. of 33kV Outdoor Bay at Pada PSS. Construction for 1 no. of 33kV Outdoor Bay at Phulapada PSS. Construction of 33kV O/H Line using 13mtr WPB Pole & 241qmm AAAC covered conductor- 16Ckm. Laying of 33kV U/G Line with 3R, 1CX630sqmm Cable- 4Ckm along with 1no. 33kV 4W RMU at Pada PSS.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount (In Cr.)
1	A	Construction for 1 no. of 33kV Outdoor Bay at Pada PSS.	₹ 36,39,033.16
2	B	Construction for 1 no. of 33kV Outdoor Bay at Phulapada PSS.	₹ 36,39,033.16
3	C	Construction of 33kV O/H Line using 13mtr WPB Pole & 241qmm AAAC covered conductor- 16Ckm.	₹ 6,18,05,273.46
4	D	Laying of 33kV U/G Line with 3R, 1CX630sqmm Cable- 4Ckm along with 1no. 33kV 4W RMU at Pada PSS.	₹ 5,99,56,848.08
		Total Amount	₹ 12,90,40,187.86
		Total Amount (In Rs. Cr)	12.90
Total estimated cost is Rs12.90 Crore.			

Cost Estimate: ₹ 12.90 Cr. (For detailed BoQ refer Annexure-19).

**Benefits:**

- ❖ Mitigation of overloading & low voltage issue of 33kV Angul-2 feeder.
- ❖ Ensuring reliable power supply to the consumers by improving low voltage issues at 33/11kV Badakera PSS, Bantala PSS and Phulpada PSS.

## 8. Commissioning Schedule

The Construction of these proposed 20 numbers of 33kV Lines is expected to be completed in 6-8 months and commissioning of the proposed 2 numbers of PSS will take 10-12 months post receipt of approval from the Hon'ble Commission and accordingly the phasing of expenditure will effect.

Sl. No.	Proposal	UOM	Quantity	(Amount in Rs. Cr.)	Commissioning Timeline
1	Proposed 33/11kV substations along with associated lines	No's	2	<b>49.42</b>	10-12 months post receipt of Approval
2	Proposed 33kV Lines	CKT.KM	231.02	<b>128.20</b>	6 -8 months post receipt of Approval
<b>Total cost in Rs. Cr</b>				<b>177.62</b>	

# ANNEXURES

**Annexure- A (List of 32 PSS with existing Volatge Profile and expected Volatge Profile after Implementation of Mitigation Plan**

Sl. No.	Name of Circle	Div	District	33kV New Line	From (GSS/ PSS)	To	PSS Benefited	No of PSS Benefited	Existing Voltage Profile (kV)	Expected Voltage after implementation of Mitigation Plan (kV)
1	BBSR-I	NED	Puri	33kV Line From Satsankha GSS To Mangalpur PSS	Satsankha GSS	Mangalpur PSS	1. Mangalpur	1	25.8	32.7
2	BBSR-I	NED	Puri	33kV Line From Pratapsasan GSS To Trahiachyuta Nagar PSS	Pratapsasan GSS	Trahiachyuta Nagar PSS	1. Trahiachyuta Nagar	1	27.3	31.6
3	BBSR-II	NYED	Nayagarha	33kV Line From Daspalla GSS To Proposed 4-Pole (Daspalla PSS)	Daspalla GSS	Proposed 4-Pole (Daspalla PSS)	1. Nuagaon	1	27.4	30.3
4	BBSR-II	NYED	Nayagarha	33kV Line From Daspalla GSS To Existing 4-Pole (Banigochha PSS)	Daspalla GSS	Existing 4-Pole (Banigochha PSS)	1. Daspalla	1	24.3	30.9
5	BBSR-II	NYED	Nayagarha	33kV Line From Daspalla GSS To Proposed 4-Pole(Gania PSS)	Daspalla GSS	Proposed 4-Pole (Gania PSS)	1. Gania 2. Chamundia 3. Kantilo	3	1. 26.6 2. 26.5 3. 26.5	1. 31.1 2. 31.1 3. 31.0
6	BBSR-II	PED	Khurda	33kV Line From Satsankha GSS To Patnayak Chowk (Delang)	Satsankha GSS	Patnayak Chowk (Delang)	1. Delang	1	26.7	30.9
7	BBSR-II	KHD	Khurda	33kV Line From Argul GSS To Taraboi point DP (Tirimalla PSS)	Argul GSS	Taraboi point DP (Tirimalla PSS)	1. Tirimalla	1	28.5	30.4
8	BBSR-II	PED	Puri	33kV Line From Satsankha GSS To Satsankha PSS (Kumareswar)	Satsankha GSS	Satsankha PSS(Kumareswar)	1. Satsankha 2. Sakhigopla 3. Chandanpur	3	1. 26.0 2. 26.4 3. 28.1	1. 30.10 2. 30.03 3. 30.04
9	CUTTACK	SED	Cuttack	33kV Line From Bahugram/Atado GSS To Bahugram-2 PSS	Bahugram/Atado GSS	Bahugram-2 PSS	1. Bahugram-1	1	29.8	32
10	CUTTACK	SED	Cuttack	33kV Line From Balichandrapur GSS To Balichandrapur PSS	Balichandrapur GSS	Balichandrapur PSS	1. Balichandrapur 2. Mahanga 3. Erkana 4. Kothapada	4	1. 25.2 2. 26.3 3. 25.9 4. 26.1	1. 31.80 2. 30.30 3. 30.04 4. 30.03
11	DHENKANAL	DED	Dhenkanal	33kV Line From Gondia GSS To Proposed 4-Pole (College PSS)	Gondia GSS	Proposed 4-Pole	1. College	1	28.2	30.1
12	DHENKANAL	DED	Dhenkanal	33kV Line From Gondia To Proposed 4-Pole (Joranda PSS)	Gondia GSS	Proposed 4-Pole	1. Joranda	1	29.48	31
13	DHENKANAL	DED	Dhenkanal	33kV Line From Goda GSS To Proposed 4-Pole (Bhuban PSS)	Goda GSS	Proposed 4-Pole	1. Bhuban	1	29	30.2
14	DHENKANAL	TED	Angul	33kV Line From Chainpal GSS To Parjang PSS	Chainpal GSS	Parjang PSS	1. New Banarpal 2. Mahavir Road 3. Parjang 4. Sanda	4	1. 28.0 2. 27.7 3. 27.3 4. 27.1	1. 30.10 2. 30.03 3. 30.08 4. 30.50
15	DHENKANAL	TED	Angul	33kV Line From Kamakhyanagar GSS To Parjang PSS	Kamakhyanagar GSS	Parjang PSS				
16	PARADEEP	KED-II	Kendrapada	33kV Line From Rajnagar GSS To Badhi/Babar PSS	Rajnagar GSS	Badhi/Babar PSS	1. Badhi/Babar	1	29.1	31.7
17	PARADEEP	JED	Jagatsinghpur	33kV Line From Tirtol GSS To Kanakpur PSS	Tirtol GSS	Kanakpur PSS	1. Kanakpur	1	28.9	31.7

**Annexure- A (List of 32 PSS with existing Volatge Profile and expected Volatge Profile after Implementation of Mitigation Plan**

Sl. No.	Name of Circle	Div	District	33kV New Line	From (GSS/ PSS)	To	PSS Benefited	No of PSS Benefited	Existing Voltage Profile (kV)	Expected Voltage after implementation of Mitigation Plan (kV)
18	CUTTACK	SED	Cuttack	33kV Line From Bahugram/Atado GSS To Nischintakoili PSS	Bahugram/Atado GSS	Nischintakoili PSS	1. Nischintakoili 2. Orikanta 3. Paldhupadia	3	1. 27.8 2. 27.1 3. 27.8	1. 31.2 2. 30.5 3. 31.3
19	BBSR-I	NED	Puri	33kV Line From Bangurigaon PSS To Kakatpur PSS	Bangurigaon PSS	Kakatpur PSS	1. Jogeswarpur 2. Kakatpur	2	1. 27.0 2. 25.6	1. 29.6 2. 29.2
20	DHENKANAL	ANED	Angul	33kV Line From Khajuriakata GSS To Phulapada PSS	Khajuriakata GSS	Phulapada PSS	1. Phulpada	1	29	30.7
<b>TOTAL</b>								<b>32</b>		

Annexure-1			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BHUBANESWAR ELECTRICAL DIVISION	
Name of the Sub-Division : -		TEMPLE	
Name of the Section : -		OT-2	
Name of the Work :-		Construction of 2X8 MVA, 33/11 KV PSS at Nageswar Tangi along with 33 KV line (U/G) from Badagada Grid and Mulapadia PSS to proposed Nageswar Tangi PSS and 11kV associated outgoing feeders.	
Scope of work:-		Construction of 33/11kV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work. Construction of 6Ckm 33kV, 3runs 1CX630sqmm line from Badagada Grid to Proposed 33/11kV Nageswar Tangi PSS and interlinking line from Mulapadia PSS. Construction of 11kV line using 3Cx400sqmm cable of total length 6 Ckm and 1no. 33kV RMU at Mulapadia PSS for interlinking and sectionalisation. Augmentation of existing 11kV feeder from 34/55/80 sqmm to 100sqmm AAAC. Length = 6 km.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33/11kV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work.	₹ 9,85,12,225.31
2	B	Construction of 6Ckm 33kV, 3runs 1CX630sqmm line from Badagada Grid to Proposed 33/11kV Nageswar Tangi PSS and interlinking line from Mulapadia PSS.	₹ 8,68,24,123.27
3	C	Construction of 11kV line using 3Cx400sqmm cable of total length 6 Ckm and 1no. 33kV RMU at Mulapadia PSS for interlinking and sectionalisation.	₹ 4,85,88,057.45
4	D	Augmentation of existing 11kV feeder from 34/55/80 sqmm to 100sqmm AAAC. Length = 6 km.	₹ 73,79,146.94
		Total Amount	₹ 24,13,03,552.98
		Total Amount (In Cr)	₹ 24.13
Total estimated cost is Rs.24.13 Crore.			

Annexure-1					
Construction of 33/11 KV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
Sl. No.	DESCRIPTION OF ITEMS	UNITS	Total Quantity	Basic Unit price ( In Rs.)	Total
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
<b>33kV Equipment (Indoor Type)</b>				1000.00	
1	<b>36kV Indoor AIS Equipment and accessories for 33/11kV AIS Substation as detailed below</b>				
1.1	33kV Incoming Line Feeder Indoor AIS Panel consisting of 36kV VCB Breaker (2 no.s), Transformer Indoor AIS Panel ( 2no.s), 33kV Bus coupler Indoor AIS Panel (1 no.s) and 2 no PT panel - Total 7No's Switch panel board . CTR 800-400/5-5 for Incoming & Bus-coupler, 600-300/5-5-5 for Transformer . Bus Bar size 1250Amp. Each Breaker Rating is 1250Amp & Draw out type.The module shall be provided with complete Feeder & Transformer Feeder protection system to suit for SCADA ( BCPU, Numerical Differential Relay having inbuilt of REF protection, Multi-function Meter & other provisions as per tech spec).Energy meter shall be provided on each Incoming & outgoing breaker.	Set	1	91,75,000.00	91,75,000.00
2	30kV, 10kA, Metal Oxide, Class-2 (Station Class), Surge Arrester (for 33kV Incoming Line, HT side of 2nos. Power Transformers and 33/0.433kV Station Transformer) - Outdoor Type with Surge Counter	Nos.	9	13,455.00	1,21,095.00
3	12kV, 10kA, Metal Oxide, Class-2 (Station Class), Surge Arrester with out surge counter( For Transformers - Outdoor type	Nos.	6	4,615.00	27,690.00
<b>11kV Equipment (Indoor Type)</b>					
4	11kV Indoor Air Insulated switchgear Panel consisting of Breaker-1250A, Busbar-12500A(Copper) & CT (600-1200/5-5-5A) of 2 Nos. for Transformer Protection, Air Insulated switchgear Panel consisting of Breaker-630A Busbar-1250A (Copper) CT (300-600/5-5A) of 6 Nos. for Feeder protection, 1 No. of 11kV Bus-Coupler Indoor AIS Panel consisting of Breaker-1250A, Bus-bar-1250A (Copper), Relay, CT (600-1200/5-5A), 2 Nos. 11kV, 2 Core, Single Phase, IVT (11/√3 kV / 110/√3-110/√3V), 3nos in a set, in a separate draw out chamber with Digital Voltmeter inside Control Room separately for Bus-1 & Bus-2 plug in type with disconnector. Relays to be installed on the panel, Multi-function Meter to be installed above the panel, Energy meter to be installed on the panel, as per technical specification and scope of work.	No	1	68,00,000.00	68,00,000.00
<b>SCADA</b>					
8	SITC for SCADA FOR Primary Substation	Set	1	10,77,965.01	10,77,965.01
<b>Transformer and Accessories</b>					
9	8 MVA, 33/11kV Power Transformer DYN11 (Outdoor Installation) with Accessories including NIDS System	No.	2	1,18,90,900.00	2,37,81,800.00
10	100 KVA 33/0.433kV Energy efficient Station Transformer with HV & LV BOX	No	1	4,24,320.00	4,24,320.00
11	SITC OF TMU	No	2	3,00,000.00	6,00,000.00
12	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	1	17,87,101.00	17,87,101.00
13	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	No.s	1	3,71,530.24	3,71,530.24
<b>Substation Earthing System GI</b>					
12	Earthing Conductor 75X10 mm (5.89 Kg/Mtr.) GI Flat for laying (spacing maximum 2m both ways)	Kg	5301.00	97.50	5,16,847.50
13	Earthing Conductor: 50X6 mm (2.4Kg./Mtr.) GI Flat for Raiser from the burial earth mat to equipment, structure etc.)	Kg	720.00	97.50	70,200.00
14	Earthing Device & Associated Accessories (Heavy duty GI Perforated Pipe of ID=40mm & OD=50mm with 3000mm long for treated Earth Pit) as per Drawing	No	40.00	1,365.00	54,600.00
<b>33, 11 and Station Trf Structure</b>					
15	(125x70x5) mm RS GI Joist 5Mtr (13.3kg / Mtr) (04 nos for one Power Transformer) for supporting of 33kV Cable & 11kV cable (Unit Wt=0.0665 MT) & 10 mm thick MS plate size 250X250 mm at the bottom of the RS Joist duly welded & the MS plate to be suitably grouted to the floor for the rigidity.	Kg	532.00	97.50	51,870.00
16	(100 x 50 x5) mm GI Channel (9.56kg / Mtr) (2Mtr - 06 nos for one Power Transformer) for supporting of 33kV & 11kV power Cable (Unit Wt=0.01912 MT)	Kg	229.44	76.00	17,437.44
17	GI Nuts & Bolts etc. for column and beam & Equipment Structures	Kg	500.00	101.40	50,700.00
18	Supply & Erection of GI Pipe of dia. 150mm, Class-B	Mtr.	200.00	1,463.40	2,92,680.00
19	High Density Polyethylene (HDPE) pipe 160 mm diameter.	KM	0.01	7,75,400.00	7,75.40
20	LTDB for 100KVA, 33/0.433kV Station Transformer	Nos	1.00	31,744.70	31,744.70
21	Supply and installation of 8way LDB with accessories	Nos.	2.00	11,648.00	23,296.00
<b>33 and 11 kv Power and Control, XLPE cables</b>					
22	1C X 400 sqmm, 33 KV, XLPE, Power cable Armored, aluminium conductor, stranded, including their termination materials like glands, lugs, tagging etc. as required as per technical specifications and scope of the works. (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	KM	1.20	10,17,900.00	12,21,480.00
22.1	33 KV 1C X 400 sq.mm. Heat Shrink In Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	6,802.90	1,08,846.40
22.2	33 KV 1C X 400 sq.mm. Heat Shrink Out Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	8,929.70	1,42,875.20
22.3	Supply of 33kV, 3Core, 95sqmm Aluminium, XLPE insulation UG Cable with spare (SC rating of cable in kA- 9kA and SC rating of Armour in kA- 9kA) For Station Trf	Mtr.	100.00	1,331.20	1,33,120.00
22.4	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 3Core, 95sqmm, HT UG Cable kits For Station Trf	Set	2.00	25,199.20	50,398.40
22.5	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 3Core, 95sqmm, HT UG Cable kits For Station Trf	Set	2.00	15,545.40	31,090.80
23	3C X 400 sqmm, 11 KV, XLPE, 3 phase Power cable Armored, aluminium conductor, stranded, including their termination materials like glands, lugs, tagging etc. as required as per technical specifications and scope of the works.	KM	1.50	19,50,000.00	29,25,000.00
24	11 KV, 3C X 400 sqmm Heat Shrink In Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	20.00	12,456.60	2,49,132.00
25	11 KV, 3C X 400 sqmm Heat Shrink Out Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	18,075.20	2,89,203.20
<b>Control Cables (Copper Armoured)</b>					
26.1	4 Core x 2.5 mm <sup>2</sup>	Km	0.70	1,17,800.00	82,460.00
26.2	7 Core x 2.5 mm <sup>2</sup>	Km	0.70	1,84,240.00	1,28,968.00
26.3	10 Core x 2.5 mm <sup>2</sup>	Km	0.50	4,29,000.00	2,14,500.00
26.4	12 Core x 2.5 mm <sup>2</sup>	Km	0.50	3,95,000.00	1,97,500.00
26.5	1 Core x 16 mm <sup>2</sup> Aluminium cable from Battery to Battery Charger & Battery Charger to DCDB	Km	0.30	1,66,815.82	50,044.75
<b>1.1 kV XLPE Power Cables</b>					
27.1	3 1/2 Core x 120 mm <sup>2</sup> (for Station Transformer output )	Km	0.15	4,77,085.48	71,562.82
27.2	3 1/2 Core x 95 mm <sup>2</sup> (for Oil Filtration Machine Connection )	Km	0.10	3,81,281.47	38,128.15
27.3	3 1/2 Core x 25 mm <sup>2</sup> ( for Switchyard Lighting )	Km	0.30	1,32,740.13	39,822.04
27.4	4 Core 16 mm <sup>2</sup> (for Switchyard Lighting )	Km	0.30	1,54,222.40	46,266.72
27.5	2 Core 16 mm <sup>2</sup> (for Switchyard Lighting )	Km	0.30	1,34,337.02	40,301.11
<b>Battery &amp; Battery Charger</b>					
28	48 V, 150 AH, maintenance free VRLA Battery (Set. 4 Nos of 12V Battery with 150AH)	Set	1.00	74,945.00	74,945.00
29	48V, Float cum Boost Battery Charger (15 A float charging, 20 A boost charging)	No	1.00	1,87,356.00	1,87,356.00

## Annexure-1

**Construction of 33/11 KV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work**

Sub-station Lighting And Fire Fighting System					
30	Sub-Station Switchyard Lighting , Control Room Lighting (it includes supply of fixtures & Lamps (LED) with switch gear, GI Conduit etc.(120Wx4 sets and 100Wx6 sets out side the control room, 18 Watt LED tube inside control room .Control Room wiring to be done with Copper wires as per the requirement (Lighting fixtures are to be fixed rigidly on the Column at a suitable height with GI tubular pole so that the required lux as per the technical specification is maintained). (Minimum requirement will be - GI Tubular pole -10No's., 2x18watt-27No's., 1x18watt-18No's, 120Wx 4 sets and 100Wx6 ) ,	Lot	1.00	4,00,000.00	4,00,000.00
31	1.5 Ton capacity Split Air Conditioning units with Remote control facility: Including supply of split Air conditioner 5 Star rated, voltage stabiliser, control boxes (25Amp MCCB & 25Amp switch ), Remote etc. for completing the A.C scheme of control room. Each AC will have its own control through respective switch, as per technical specification and scope of work.	No	4.00	53,750.00	2,15,000.00
32	1400 mm sweep 250Volt A/C Ceiling Fan	No	5.00	3,125.00	15,625.00
33	300 mm sweep 70W A/C Exhaust Fan ( for Battery room and Toilet )	No	4.00	2,500.00	10,000.00
Fire Detection Alarm System					
33.1	Main Fire ALARM Control Panel (UI /FM /ULC/Vds Approved), Intelligent Addressable Modular Fire Alarm Control Panel based on 32 bit microprocessors including the following as per specification, A. Battery charger, B. SMF Batteries for 72 Hrs. back-up, C. Enclosure, D. min.240 character LCD display, (Other specification as mentioned), E. The panel should be modular, decentralized, with CPU /master control unit, loop cards, relay and interface card by means of duplicated electronics means hardware redundancy with full functionality, F. The panel must provide MODBUS/ RS485 port for integration with SCADA, G. The loop should be capable to have at least 50 elements / devices., as per technical specification and scope of work.	EA	1	3,09,921.34	309921.337
33.2	Intelligent Addressable multi sensor Detector- (Smoke + Fixed Tempt. + Rate of rise tempt.) For ceiling (UL /FM /ULC/Vds Approved) inclusive base and other installation accessories. (must have inbuilt short circuit isolator), as per technical specification and scope of work.	EA	6	7,944.91	47,669.47
33.3	Intelligent Addressable multi sensor Detector- (Smoke + Fixed Tempt. + Rate of rise tempt.) For trench (UL /FM /ULC/Vds Approved) inclusive base and other installation accessories. (must have inbuilt short circuit isolator), as per technical specification and scope of work.	EA	2	7,944.91	15,889.82
33.4	Response Indicator (Twin LED transparent type), as per technical specification and scope of work.	EA	2	81.73	163.45
33.5	Addressable manual Call Point (must have inbuilt short circuit isolator,) (UL /FM /ULC/Vds Approved), as per technical specification and scope of work.	EA	1	8,699.15	8,699.15
33.6	Electronic Hooter/Multi tone sounder (must have inbuilt short circuit isolator,) (UL /FM /ULC/Vds Approved) Indoor type, as per technical specification and scope of work.	EA	1	7,652.85	7,652.85
33.7	2 Core X 1.5 sq.mm copper conductor, armored, RED colour FRLS PVC sheathed signal Cable, as per technical specification and scope of work.	M	150	143.67	21,550.01
33.8	4C X 2.5sqmm copper armoured FRLS cable with accessories (Gland, lug, saddle, etc.), as per technical specification and scope of work.	M	15	251.20	3,768.03
33.9	Steel wire reinforced flexible conduct pipe (16MM) with all accessories, as per technical specification and scope of work.	M	15	163.45	2,451.80
33.1	Surge Arrester for fire Alarm system, as per technical specification and scope of work.	EA	1	5,814.42	5,814.42
33.11	Lightning Rod in Top of PSS Building, as per technical specification and scope of work.	EA	1	5,129.42	5,129.42
34	<b>Fire Fighting System (portable and wheel mounted sets for control room)</b>				
34.1	Foam type- 9 Ltrs	No	2.00	3,978.80	7,957.59
34.2	CO <sub>2</sub> - 4.5 Kgs	No	2.00	9,678.15	19,356.30
34.3	Dry powder 4.5 Kg	No	2.00	3,494.89	6,989.78
34.4	Fire Bucket with GI Stand with GI Canopy arrangement (4nos. in one Stand=1 Set)	Set	1.00	4,516.47	4,516.47
AC & DC System for Auxiliary supply					
35	<b>AC System</b>				
35.1	ACDB (as per specification)	Lot	1	1,20,375.00	1,20,375.00
35.2	Main Lighting Distribution Board (as per specification)	Lot	1	45,000.00	45,000.00
35.3	Indoor Lighting Distribution Board as per specification	Lot	1	42,500.00	42,500.00
35.4	Receptable Panel near Power Transformer	No	1	32,000.00	32,000.00
36	<b>DC System</b>				
36.1	48 V DC Distribution Board as per specification .	No	2	82,500.00	1,65,000.00
37	Water Cooler with water purifier system as per Technical Specification	No	1	14,459.81	14,459.81
37.1	Wall mounted water purifier system	No	1	51,997.00	51,997.00
38	Maintenance Testing Equipment as per Technical Specification	Lot	1	4,97,500.00	4,97,500.00
39	Tools and Plants (T&P's) Requirement as per Technical Specification	Lot	1	62,500.00	62,500.00
40	Office Furniture as per Technical Specification	Lot	1	2,50,000.00	2,50,000.00
41	<b>Supply of Materials for Installation of Power Transformer on Plinth (as per Drawing)</b>				
41.1	90 lb Rail 5.4 mts ( 2.7x2) 44.62 kg per mtr / Transformer each (Unit Wt=0.240 MT)	Nos	2	21,246.48	42,492.96
41.2	Supply including Fabrication works ( Cutting, welding& Supply in position etc) (300x300x10) mm GI plate each (Unit Wt=0.007065MT)	No.s	24	1,990.00	47,760.00
41.3	(65x65x5) mm GI angle of 5.4 mts length.4.9 kg/mtr. / Transformer each (Unit Wt=0.026 MT)	Nos	6	2,778.30	16,669.80
41.4	Supply of GI Chequered plate 1000X300X5.6mm thick for Cable Trench in side Control Room	Nos	2	100.00	200.00
42	GI Spikes with cone and GI (2 nos).	Kg	640.00	1,537.50	9,84,000.00
	<b>Sub-Total for SUPPLY OF EQUIPMENT &amp; MATERIALS (In Rs.)</b>				<b>5,50,87,240.94</b>
	<b>Total Cost in Cr.</b>				<b>5.51</b>
ERECTION, TESTING & COMMISSIONING WORKS OF FOLLOWING EQUIPMENT (As per Technical Specification)					
33kV Equipment (Indoor Type)					
1	<b>Erection, Commissioning, Testing of 33kV Equipment for (INDOOR Sub-Station )</b>				
1.1	33kV Incoming Line Feeder Indoor AIS Panel consisting of 36kV VCB Breaker (2 no.s), Transformer Indoor AIS Panel ( 2no.s), 33kV Bus coupler Indoor AIS Panel (1 no.s) and 2 no PT panel - Total 7No's Switch panel board . CTR 800-400/5-5 for Incoming & Bus-coupler, 600-300/5-5-5 for Transformer . Bus Bar size 1250Amp. Each Breaker Rating is 1250Amp & Draw out type.The module shall be provided with complete Feeder & Transformer Feeder protection system to suit for SCADA ( BCPU, Numerical Differential Relay having inbuilt of REF protection, Multi-function Meter & other provisions as per tech spec).Energy meter shall be provided on each Incoming & outgoing breaker.	Set	1.00	94,500.00	94,500.00
Erection, Commissioning, Testing of 11kV Equipment (Indoor Type)					
2	30kV, 10kA, Metal Oxide, Class-2 (Station Class), Surge Arrester (for 33kV Incoming Line, HT side of 2nos. Power Transformers and 33/0.433kV Station Transformer) - Outdoor Type with Surge Counter	Nos.	9.00	675.00	6,075.00
3	12kV, 10kA, Metal Oxide, Class-2 (Station Class), Surge Arrester with out surge counter( For Transformers & Out Going Feeders) - Outdoor type	Nos.	6.00	337.50	2,025.00
4	11kv 1250A VCB 13 panel board Switchgear ( 2 incoming, 8 Outgoing, 1 Bus coupler, 2 Bus PT	No	2.00	9,85,595.00	19,71,190.00
Erection, Commissioning, Testing of SCADA					
8	SCADA FOR Primary Substation	Set	1.00	0.00	0.00
Erection, Commissioning, Testing of Transformer and RMU					
9	8 MVA, 33/11kV Power Transformer DYn11 (Outdoor Installation) with Accessories	No.	2.00	1,61,700.00	3,23,400.00
10	100 KVA 33/0.433kV Energy efficient Transformer along with HT & LT cable connection	No	1.00	6,750.00	6,750.00
11	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	No	1.00	8,000.00	8,000.00

Annexure-1					
Construction of 33/11 KV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
12	Services of FRTU Panel, Communication and Other Supplied System	NO	1.00	16,000.00	16,000.00
13	Erection, Testing & Commissioning of Transformer Monitoring Unit, as per technical specification and scope of work.	NO	2.00	27,000.00	54,000.00
<b>Erection, Laying of Substation Earthing System GI</b>					
12	Earthing Conductor 75X10 mm (5.89 Kg/Mtr.) GI Flat for laying (spacing maximum 2m both ways)	Kg	5301.00	13.50	71,563.50
13	Earthing Conductor: 50X6 mm (2.4Kg./Mtr.) GI Flat for Raiser from the burial earth mat to equipment, structure etc.)	Kg	720.00	13.50	9,720.00
14	Earthing Device & Associated Accessories (Heavy duty GI Perforated Pipe of ID=40mm & OD=50mm with 3000mm long for treated Earth Pit) as per Drawing	No	40.00	2,025.00	81,000.00
<b>Erection of System GI 33, 11 and Station Trf Structure</b>					
15	(125x70x5) mm RS GI Joist 5Mtr (13.3kg / Mtr) (04 nos for one Power Transformer) for supporting of 33kV Cable & 11kV cable (Unit Wt=0.0665 MT) & 10 mm thick MS plate size 250X250 mm at the bottom of the RS Joist duly welded & the MS plate to be suitably grouted to the floor for the rigidity.	Kg	532.00	13.50	7,182.00
16	(100 x 50 x5) mm GI Channel (9.56kg / Mtr) (2Mtr - 06 nos for one Power Transformer) for supporting of 33kV & 11kV power Cable (Unit Wt=0.01912 MT)	Kg	229.44	13.50	3,097.44
17	GI Nuts & Bolts etc. for column and beam & Equipment Structures	Kg	500.00	13.50	6,750.00
18	GI Pipe of dia. 150mm, Class-B for Cable rising, as per technical specification and scope of work.	Kg	200.00	67.50	13,500.00
19	High Density Polyethylene (HDPE) pipe 160 mm diameter.	KM	0.01	1,16,137.80	1,161.38
20	LTDB for 100KVA, 33/0.433kV Station Transformer along with all cable connection & fixing	Nos	1.00	2,025.00	2,025.00
<b>Laying of 11kV 33 and 11 kv Power and Control cables</b>					
21	1C X 400 sqmm, 33 KV, XLPE, Power cable Armored, aluminium conductor, stranded, including their termination materials like glands, lugs, tagging etc. as required as per technical specifications and scope of the works.	KM	1.20	2,02,500.00	2,43,000.00
22.1	33 KV 1C X 400 sq.mm. Heat Shrink In Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	3,375.00	54,000.00
22.2	33 KV 1C X 400 sq.mm. Heat Shrink Out Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	3,375.00	54,000.00
22.3	Laying, Commissioning & Testing of 33kV, 3Core, 1Run, 95sqmm, XLPE insulation (extruded type) UG cable with spare by open trench method.	Mtr.	100.00	94.50	9,450.00
22.5	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 3Core, 95sqmm, HT UG cable kits	Set	2.00	1,900.80	3,801.60
22.6	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 3Core, 95sqmm, HT UG cable kits	Set	2.00	1,900.80	3,801.60
23	3C X 400 sqmm, 11 KV, XLPE, 3 phase Power cable Armored, aluminium conductor, stranded, including their termination materials like glands, lugs, tagging etc. as required as per technical specifications and scope of the works.	KM	1.50	2,02,500.00	3,03,750.00
24.1	11 KV, 3C X 400 sqmm Heat Shrink In Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	20.00	3,375.00	67,500.00
24.2	11 KV, 3C X 400 sqmm Heat Shrink Out Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	3,375.00	54,000.00
25	<b>Control Cables (Copper Armoured)</b>				
25.1	4 Core x 2.5 mm <sup>2</sup>	Km	0.70	15,000.00	10,500.00
25.2	7 Core x 2.5 mm <sup>2</sup>	Km	0.70	17,000.00	11,900.00
25.3	10 Core x 2.5 mm <sup>2</sup>	Km	0.50	19,000.00	9,500.00
25.4	12 Core x 2.5 mm <sup>2</sup>	Km	0.50	20,000.00	10,000.00
25.5	1 Core x 16 mm <sup>2</sup> Aluminium cable from Battery to Battery Charger & Battery Charger to DCDB	Km	0.30	10,000.00	3,000.00
26	<b>Laying of 1.1 kV XLPE Power Cables</b>				
26.1	3 1/2 Core x 120 mm <sup>2</sup> (for Station Transformer output )	Km	0.15	67,500.00	10,125.00
26.2	3 1/2 Core x 95 mm <sup>2</sup> (for Oil Filtration Machine Connection )	Km	0.10	67,500.00	6,750.00
26.3	3 1/2 Core x 25 mm <sup>2</sup> ( for Switchyard Lighting )	Km	0.30	33,750.00	10,125.00
26.4	4 Core 16 mm <sup>2</sup> (for Switchyard Lighting )	Km	0.30	33,750.00	10,125.00
26.5	2 Core 16 mm <sup>2</sup> (for Switchyard Lighting )	Km	0.30	20,250.00	6,075.00
<b>Erection, Commissioning , Wiring &amp; Testing of Battery &amp; Battery Charger</b>					
27	48 V, 100 AH, maintenance free VRLA Battery (Set. 4 Nos of 12V Battery with 150AH)	Set	1.00	3,375.00	3,375.00
28	48V, Float cum Boost Battery Charger (15 A float charging, 25 A boost charging)	No	1.00	4,050.00	4,050.00
<b>Erection, Commissioning , Wiring &amp; Testing of Sub-station Lighting And Fire Fighting System</b>					
29	Sub-Station Switchyard Lighting , Control Room Lighting (it includes supply of fixtures & Lamps (LED) with switch gear, GI Conduit etc.(120Wx4 sets and 100Wx6 sets out side the control room, 20 Watt CFL tube-10 sets inside control room .Control Room wiring to be done with Copper wires as per the requirement (Lighting fixtures are to be fixed rigidly on the Column at a suitable height with GI tubular pole so that the required lux as per the technical specification is maintained).	Lot	1.00	1,01,250.00	1,01,250.00
30	1.5 Ton capacity Split Air Conditioning units with Remote control facility: Including supply of split Air conditioner 5 Star rated, voltage stabiliser, control boxes etc. for completing the A.C scheme. (As per specification) for control room.	No	4.00	3,645.00	14,580.00
31	1400 mm sweep 250Volt A/C Ceiling Fan	No	5.00	675.00	3,375.00
32	300 mm sweep 70W A/C Exhaust Fan ( for Battery room and Toilet )	No	4.00	675.00	2,700.00
<b>Erection, Testing &amp; Commissioning of Fire Detection Alarm System, as per technical specification and scope of work.</b>					
32.1	Main Fire ALARM Control Panel (UL/FM /ULc/Vds Approved), Intelligent Addressable Modular Fire Alarm Control Panel based on 32 bit microprocessors including the following as per specification, A. Battery charger, B. SMF Batteries for 72 Hrs. back-up, C. Enclosure, D. min.240 character LCD display, (Other specification as mentioned), E. The panel should be modular, decentralized, with CPU /master control unit, loop cards, relay and interface card by means of duplicated electronics means hardware redundancy with full functionality, F. The panel must provide MODBUS/ RS485 port for integration with SCADA, G. The loop should be capable to have at least 50 elements / devices., as per technical specification and scope of work.	No's.	1.00	22,646.87	22,646.87
32.2	Intelligent Addressable multi sensor Detector- (Smoke + Fixed Tempt. + Rate of rise tempt.) For ceiling (UL /FM /ULC/Vds Approved) inclusive base and other installation accessories. (must have inbuilt short circuit isolator), as per technical specification and scope of work.	No's.	6.00	377.45	2,264.69
32.3	Intelligent Addressable multi sensor Detector- (Smoke + Fixed Tempt. + Rate of rise tempt.) For trench (UL /FM /ULC/Vds Approved) inclusive base and other installation accessories. (must have inbuilt short circuit isolator), as per technical specification and scope of work.	No's.	2.00	377.45	754.90
32.4	Response Indicator (Twin LED transparent type), as per technical specification and scope of work.	No's.	2.00	377.45	754.90
32.5	Addressable manual Call Point (must have inbuilt short circuit isolator,) (UL /FM /ULC/Vds Approved), as per technical specification and scope of work.	No's.	1.00	377.45	377.45
32.6	Electronic Hooter/Multi tone sounder (must have inbuilt short circuit isolator,) (UL /FM /ULC/Vds Approved) Indoor type, as per technical specification and scope of work.	No's.	1.00	377.45	377.45
32.7	2 Core X 1.5 sq.mm copper conductor, armored, RED colour FRLS PVC sheathed signal Cable, as per technical specification and scope of work.	Mtr.	150.00	58.07	8,710.34
32.8	4C X 2.5sqmm copper armoured FRLS cable with accessories (Gland, lug, saddle, etc.), as per technical specification and scope of work.	Mtr.	15.00	81.30	1,219.45
32.9	Steel wire reinforced flexible conduct pipe (16MM) with all accessories, as per technical specification and scope of work.	Mtr.	15.00	40.65	609.72
32.1	Surge Arrester for fire Alarm system, as per technical specification and scope of work.	No's.	1.00	2,555.03	2,555.03
32.11	Lightning Rod in Top of PSS Building, as per technical specification and scope of work.	No's.	1.00	2,206.62	2,206.62
33	<b>Erection, Commissioning of Fire Fighting System (portable and wheel mounted sets for control room)</b>				
33.1	Foam type- 9 Ltrs	No	2.00	174.21	348.41

## Annexure-1

**Construction of 33/11 KV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work**

33.2	CO <sub>2</sub> - 4.5 Kgs	No	2.00	174.21	348.41
33.3	Dry powder 4.5 Kg	No	2.00	174.21	348.41
33.4	Fire Bucket with Stand (4nos. in each Stand)	Set	1.00	348.41	348.41
<b>Erection, Commissioning , Wiring &amp; Testing of AC &amp; DC System</b>					
34	<b>AC System</b>				
34.1	ACDB (as per specification)	Lot	1.00	2,700.00	2,700.00
34.2	Main Lighting Distribution Board (as per specification)	Lot	1.00	2,700.00	2,700.00
34.3	Indoor Lighting Distribution Board as per specification	Lot	1.00	2,700.00	2,700.00
34.4	Receptable Panel near Power Transformer	No	1.00	2,700.00	2,700.00
35	<b>DC System</b>				
35.1	48 V DC Distribution Board as per specification .	No	2.00	2,700.00	5,400.00
36	<b>Erection, Commissioning of Water Cooler with water Purifier System</b>	No	1.00	2,700.00	2,700.00
36.1	Water Cooler with stainless steel stand	No	1.00	2,025.00	2,025.00
37	<b>Commissioning &amp; Testing of Maintenance Testing Equipment</b>	Lot	1.00	1,35,000.00	1,35,000.00
38	<b>Commissioning Tools and Plants (T&amp;P's) Requirement</b>	Lot	1.00	6,750.00	6,750.00
39	<b>Commissioning Office Furniture</b>	Lot	1.00	13,500.00	13,500.00
<b>Laying of Materials for Installation of Power Transformer on Plinth ( as per Drawing )</b>					
40	90 lb Rail 5.4 mts ( 2.7x2) 44.62 kg per mtr / Transformer each (Unit Wt=0.240 MT)	Nos	2.00	3,484.13	6,968.27
41	(500x500x10) mm GI plate 6 nos / Transformer each (Unit Wt=0.013 MT)	Nos	6.00	2,903.45	17,420.67
42	(65x65x5) mm GI angle of 5.4 mts length.4.9 kg/mtr. / Transformer each (Unit Wt=0.026 MT)	Nos	2.00	1,742.07	3,484.13
43	<b>Construction of Cable Trench :</b> 2 tier 2 rows U-Type RCC Cable trench with M-20 Grade concrete: The internal width 2000 mm, depth 1005 mm, with 75X75X6 mm support angles fixed RCC wall of 175 X 175 mm, Raft of 175mm & with ladder type cable tray (45X45X5)mm two angles at both side having welded flats of 25X5 mm at a gap of 150mm) for Power & control Cable with RCC Trench Cover Slab as per technical Specification, approved drawing and Direction of Engineer Incharge. Complete work including earth work in excavation in all kind of soil & rock and refilling the cavity by selective soil, leveling the surface around the pit with disposal of surplus earth.	Mtr	71.85	16,989.77	12,20,714.95
44	Chequered plate 1000X300X5.6mm thick for Cable Trench in side Control Room 12 Mtr	KG	638.00	11.61	7,409.59
<b>Sub-Total for ERECTION,TESTING &amp; COMMISSIONING WORKS (In Rs.)</b>					<b>51,64,716.19</b>
<b>Total Cost in Cr.</b>					<b>0.52</b>

**Civil Works with supply of all materials like Cement, MS for rod, Brick, Coarse & Fine Aggregrates & Labour,T&P etc.**

1	Contour survey , plotting the contour on graph sheet and marking the finished ground level	Sqr Mtr	2,000.00	81.00	1,62,000.00
2	Cutting for Levelling and disposal of excess earth either in low laying area in sub-station or outside.	Cum	143.00	202.50	28,957.50
3	Filling of S/S area with borrowed earth (rolling & compacting of filled up soil before taking measurement).	Cum	2,320.00	348.41	8,08,319.09
4	<b>OUT DOOR DRAIN to DISCHARGE SWITCHYARD/ WATER FROM WASH BASIN AND CONTROL ROOM ROOF (10 mts</b>				
4.1	Excavation in all type soil (1.35x10x0.7)	Cum	9.45	174.21	1,646.25
4.2	PCC (1:3:6 ) (1.35x10x0.1)	Cum	1.35	5,226.20	7,055.37
4.3	PCC ( 1:2:4 ) (0.3x10x0.05)	Cum	0.15	6,039.17	905.87
4.4	Brick Masonary with cement mortar ( 1:5 ) (0.25x10x0.925+1/2x0.15x0.93x10)+(0.25x10x0.925)	Cum	5.32	6,387.58	33,979.26
4.4	Plastering with Cement mortar(1:6) ( 2x0.25x10+2x0.925x10+1x0.925x10+1x1.0x10 )	Sq. mtr.	42.75	325.19	13,901.69
5	<b>Switch Yard and COMPOUND WALL For PILE Foundation for SBC Upto 10, for Open Cast for SBC more than 10 ( FOR 50x40 MTR AREA), as per technical specification and scope of work.</b>				
5.1	Construction of 2.5Mtr height (Above NGL) Compound-wall (with RCC column & beam with M-20 Grade concrete ) along the property line of the sub-station as per technical specification and instruction of the Engineer in Charge.(the size of the bricks shall be 250mm having 1st class Fly-ash brick having compressive strength with 75kg/cm2). This also includes excavation in all types of soil or rocks, backfilling ,and disposal of excess earth . (Brick works rested on RCC Beam and RCC Column & footings , including Cement Plastering, Cement wash, Wall Painting two coats with weather coat.  Provision of the boundary wall Fencing with GI Grill of 700 mm height (20Kg / Mtr) fixing at the top of the wall. It includes supply of all the materials of the fencing .	Run. Mtr.	180.00	13,704.26	24,66,766.87
5.2	Boring and casting 300 mm dia single under reamed pile of 3.00 m. long with R.C.C. M-20 using 20 mm down graded chips with cost of all materials, Steel Rods, labours, T&P etc. & all other machinaries required for Compound Wall work etc.complete in all respect as per latest specification & direction of the Engineer in charge at a spacing of 3.3m c/c	Run. Mtr.	61.00	4,000.00	2,44,000.00
5.3	Power Transformer with Switch Yard GI Chain Linking Fencing with 2 Mtr Height.	Run. Mtr.	60.00	4,050.00	2,43,000.00
6	<b>Power Transformer Foundation / One (8 MVA)</b>				
6.1	Excavation in all type soil per Tfr.(3X3X1.1 mtr)	Cum	19.80	174.21	3,449.29
6.2	PCC (1:3:6 ) per Tfr.(3X3X0.075 mtr)	Cum	1.35	5,226.20	7,055.37
6.3	RCC ( 1:1.5:3 ) per Tfr. As per drawing	Cum	10.52	11,846.06	1,24,620.50
6.4	RRHG stone grouting with sand per Tfr.	Cum	9.00	2,903.45	26,131.01
6.5	Prefabricated RCC foundation of 33kv RMU	Nos.	1	23,145.30	23,145.30
7	<b>Construction of 100kVA 33/0.4 kV station Trf. Plinth</b>				
7.1	Excavation in all type soil (2.5X2.5X0.750 mtr)	Cum	4.69	174.21	816.59
7.2	PCC (1:3:6 ) (2.5X2.5X0.075 mtr)	Cum	0.47	5,226.20	2,449.78
7.3	RCC ( 1:1.5:3 ) (1.5X1.5X0.1 mtr)	Cum	0.23	11,846.06	2,665.36
7.4	Brick Masonary work (2.5x2.5x.925+2x(1.5x1.5x2.25) (1:5)	Cum	61.19	6,387.58	3,90,839.99
7.5	Cement Plastering (1:6) (1.5x2.25x4)+(1.5x1.5) 20mm thick	Sq Mtr	15.75	325.19	5,121.68
8	<b>Construction of oil sump pit for Transformer (1.6 X 1.6 X 2.3 )</b>				
8.1	Excavation of Earth(2.0x2.0x2.1)	Cum	8.40	174.21	1,463.34
8.2	PCC (1:3:6) 2X2X0.1	Cum	0.40	5,226.20	2,090.48
8.3	RCC(1:1.5:3) 1.6X1.6X0.1 for Top Slab	Cum	0.26	11,846.06	3,032.59
8.4	Brick Masonary work(2x2.1+2x1.6)x0.25x2.3 (1:5)	Cum	4.26	6,387.58	27,179.15
8.5	Cement Plastering (1:6) 2.3 ( 4x2.1+ 4x1.6 )+ 1.6x1.6	Sq.mtr	36.60	325.19	11,901.80
8.6	Drainage for Oil sump pit with 250 dia hume pipe	Mtr	24.00	4,645.51	1,11,492.29
9	<b>ROAD (6 Mtrs wide) Length of the road 20 mtrs</b>				
9.1	Excavation in all type soil 0.5mx1mx5m	Cum	60.00	174.21	10,452.40
9.2	Boulder Packing 0.5mx1mx5m	Cum	60.00	1,742.07	1,04,524.02
9.3	Water base course -I 0.075mx1mx5m	Cum	9.00	2,903.45	26,131.01
9.4	Water base course -II 0.075mx1mx5m	Cum	9.00	2,903.45	26,131.01
9.5	PCC ( 1:2:4 ) 0.1mx1mx5m	Cum	12.00	6,039.17	72,469.99
9.6	Fly ash Brick masonary in cement mortar (1:6) using the bricks of size 10" x 5" x 3" of crushing strength not less than 75 kg / centimetre square with dimensional tolerance 3% after immersing the bricks for 6 hours in water before use including hoisting to required height placing in position scaffolding, splays cutting, circular moulding, corbelling, chamfering and similar such type of work watering and curing etc. including cost, conveyance, royalty, cess, and taxes of all other materials machinaries scaffolding all labour T&P articles required for the work etc. complete in all respect as per the latest specification confirming to relevant IS Specification and direction of the Engineer-in-charge.	Cum	7.20	6,387.58	45,990.57
10	<b>(125x70x5) mm RS GI Joist 5Mtr (STATION)</b>				
10.1	Excavation with back filling L 1m x W 1 x D 2	Cum	8.00	174.21	1,393.65
10.2	PCC (1:3:6)	Cum	0.40	5,226.20	2,090.48
10.3	RCC (1:1.5:3)	Cum	12.00	11,846.06	1,42,152.67
11	<b>Baffle Wall</b>				

## Annexure-1

**Construction of 33/11 KV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work**

11.1	Excavation with back filling 4.2mx0.75mx0.5m	Cum	1.58	174.21	274.38
11.2	PCC 1:3:6 4.2mx0.75mx0.1m	Cum	0.32	5,226.20	1,646.25
11.3	RCC 1:1.5:3 0.75x3.8x0.2+0.5x3.4x0.2+2.5x3x0.15	Cum	5.80	11,846.06	68,647.89
12	PCC (1:4:8) With cement For S/S area(75 mm) per Sq. mts. (8x16x0.075)	Cum	9.60	5,226.20	50,171.53
13	Metal Spreading 100 mm. per Sq. mts. Area of spreading.	Cum	12.80	3,368.00	43,110.35
	<b>Switchgear Cum Control Room (22x10Mts) (column &amp; beam based) (as per specification &amp; Inclusive of doors, windows, collapsible gate, PHD fittings, electrification, inner cable trench, Two nos main doors with concrete pillars, beams) etc. as per Technical specification in Civil section. Layout Drawing</b>				
14	<b>Switchgear Cum Control Room For Pile foundation in FLOOD AREA (with SBC upto 10)</b>				
14.1	Boring and casting 300 mm dia single under reamed pile of 5.00 m. long with R.C.C. M-20 using 20 mm down graded chips with cost of all materials, labours, T&P etc. & all other machinaries required for the work etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Nos	65.00	4,000.00	2,60,000.00
14.2	<b>Earth work in excavation of foundation trenches in all kinds of soil</b> including moorum, stony earth and earth mixed with boulders except sheet rock and boulders requiring blasting including dressing of sides and leveling the bed up to the required depth and depositing the excavated materials away from the work site within initial leads and lifts, including shoring, shuttering & dewatering (if required) with cost of labour, cess, hire & running charges of water pumps sundries, T & P & all other machinaries required for the work etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	150.00	174.21	26,131.01
14.3	<b>Supplying and filling in foundation and plinth with good river sand</b> well watered and rammed in layers not exceeding 23 cm in each layer including all leads and lifts, cost of all materials, labour, cess, sundries, T&P required for the work etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	189.00	929.10	1,75,600.35
14.4	Providing and lying plain <b>cement concrete of proportion (1:3:6)</b> in foundation and plinths using approved quality cement, 40 mm. size black hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	35.52	5,226.20	1,85,634.66
14.5	<b>K.B. Brick</b> masonry in cement mortar (1:6) using the bricks of size 10" x 5" x 3" of crushing strength not less than 100 kg / centimeter square with dimensional tolerance 3% after immersing the bricks for 6 hours in water before use including hoisting to required height placing in position scaffolding, splay cutting, circular moulding, corbelling, chamfering and similar such type of work watering and curing etc. including cost, conveyance, royalty, cess, and taxes of all other materials machinaries scaffolding all labour T&P articles required for the work etc. complete in all respect as per the latest specification confirming to relevant IS Specification and direction of the Engineer-in-charge.			-	-
14.5.1	<b>In Foundation and Plinth</b>	Cum	33.36	6,387.58	2,13,089.64
14.5.2	<b>Ground Floor</b>	Cum	100.44	6,387.58	6,41,568.43
14.6	<b>RCC work M-20</b> grade as per approved designs and drawings having a minimum compressive strength (in work test) 200 Kg./ Sqcm.in 15 cm. cubes at 28 days after mixing and test conducted in accordance with I.S.456 and I.S 516 using 12 mm. to 20 mm. size black hard crusher broken granite stone chips, screened and washed sharp sand for mortar of approved quality from approved quarry, to be mixed in concrete mixture with approved quality cement including hoisting, lowering, laying and compacting concrete by using vibrators, watering and curing for 28 days, centering and shuttering and finishing the exposed surface smooth providing grooves or beads wherever necessary including cost, conveyance, loading, unloading, royalties and taxes and cess of all materials, cost of all labours, sundries, T&P & all other machinaries required for the work but excluding cost and conveyance of M.S. or Tor steel and binding wires etc. Complete in all respect as per latest specification & direction of the Engineer in charge.		-	-	-
14.6.1	Pile cap & Grade beam	Cum	32.76	10,452.40	3,42,420.69
14.6.2	R.C.C. wall	Cum	3.36	10,452.40	35,120.07
14.6.3	Plinth Beam	Cum	9.72	10,452.40	1,01,597.35
14.6.4	Column & Beam- Ground Floor	Cum	33.60	10,452.40	3,51,200.71
14.6.5	Lintel-Ground Floor	Cum	3.96	10,452.40	41,391.51
14.6.6	65mm thick R.C.C.Chajja- Ground Floor	Sqm	23.28	987.17	22,981.35
14.6.7	Roof slab - Ground Floor	Cum	29.16	13,936.54	4,06,389.39
14.6.8	Staircase- Ground Floor	Cum	3.48	13,936.54	48,499.15
14.7	Cutting, Straightening coiled or bent up M.S. rods or Tor steel welding or jointing if necessary, bending, binding, tying the grills as required for R.C.C. works, providing fan hooks where necessary and hoisting, lowering and placing in proper position according to approved designs and drawings including cost, conveyance, loading, unloading, taxes of M.S. rods or Tor steel and binding wires of 18 to 20 gauge required for the work and cost of all labour, sundries, T&P and scaffolding complete in all respect as directed by the Engineer in charge (payment will be made according to the actual weight of M.S. rod / Tor steel consumed in the work and no separate payment will be made towards weight of binding wires which is to be borne by the contractor at his own cost etc. complete in all respect as per direction of the Engineer-in-charge.		-	-	-
14.7.1	<b>Ground Floor</b>	MT	16.90	95,233.00	16,09,437.63
14.8	Supplying, fitting and fixing <b>vitrified tile 60x60cm plain Ivory 8 to 10 mm thick</b> in floors of approved make with application of polymer modified cement based water resistant adhesive bed of required thickness of 10mm and filling joints with epoxy grout of approved quality including cost of all materials, takes labour T&P etc. required for the work etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	142.80	801.35	1,14,432.90
14.9	Supplying, fitting and fixing <b>vitrified tile 60x60cm plain Ivory 8 to 10 mm thick</b> in dado of approved make with application of polymer modified cement based water resistant adhesive bed of required thickness of 10mm and filling joints with epoxy grout of approved quality including cost of all materials, takes labour T&P etc. required for the work etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	15.20	801.35	12,180.53
14.10	Supplying, fitting and fixing <b>Floor tile of size 40cmx40 cm / 30cmx30cm in floors</b> on 25mm thick bed of cement mortar 1:1 (1cement : 1sand) jointed with neat cement slurry mixed with pigment to match the shades of the tiles of required thickness of approved quality including cost of all materials, takes labour T&P etc. required for the work.etc complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	19.50	847.81	16,532.22
14.11	Providing fitting fixing <b>Glazed /Ceramic tiles of size 20cmX30cm &amp; 6.5 to 6.7mm thick of size up to 0.10sqm in wall dados skirting and</b> on 12mm thick cement plaster (1:3) jointed with neat cement slurry mixed with pigments to match the shade of the tiles including rubbing and polishing complete including cost of precast tiles etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	24.20	696.83	16,863.21
14.12	Supplying, fitting and fixing 5"x2 1/2" size Dressed seasoned Sal wood chaukaths including cost, conveyance royalty taxes of all materials, labour, all other machinaries, T & P articles required for the work complete in all respect as per the direction of the Engineer-in-Charge.	Cum	0.25	92,910.24	23,227.56
14.13	Supplying, fitting and fixing 30mm/32mm flush door shutter (Non-Sal hard wood frame fixed with 4mm BWR ply on both sides of frame.including cost conveyance royalty taxes of all materials, labour, all other machinaries, T & P articles required for the work complete in all respect as per the direction of the Engineer-in-Charge.	Sqm	10.70	2,903.45	31,066.86
14.14	Providing and fixing of sliding windows of approved make to be fabricated from roll formed sections made of pre-painted steel (base steel as per IS-513 of 0.6 mm thick "D" quality, galvanized as per IS-277 with zinc of 120 Gm/ Sqm.) including cost conveyance royalty taxes of all materials, labour, all other machinaries, T & P articles required for the work complete in all respect as per the direction of the Engineer-in-Charge. DOUBLE SHUTTER SLIDING WINDOW	Sqm	20.80	5,806.89	1,20,783.31

## Annexure-1

Construction of 33/11 KV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
14.15	Providing and fixing of FRP door frame including cost conveyance royalty taxes of all materials. labour, all other machinaries, T & P articles required for the work complete in all respect as per the latest specification and direction of the Engineer-in-Charge.	Mtr	10.20	812.96	8,292.24
14.16	Providing and fixing of FRP door shutter including cost conveyance royalty taxes of all materials. labour, all other machinaries, T & P articles required for the work complete in all respect as per the latest specification and direction of the Engineer-in-Charge.	Sqm	3.80	2,903.45	11,033.09
14.17	Providing <b>16mm. thick cement plaster</b> with cement mortar of mix (1:6) with approved quality cement with screened and washed sharp sand for mortar and finished smooth to the surface <b>over brick work</b> after racking out the joints including watering and curing, rounding of corners etc. complete with cost, conveyance, loading, unloading, royalties, cess, and taxes of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charge	-	-	-	-
14.17.1	<b>Ground Floor</b>	Sqm	685.05	325.19	2,22,768.56
14.18	Providing <b>12mm. thick cement plaster</b> with cement mortar of mix (1:6) with approved quality cement and screened and washed sharp sand for mortar and finished smooth to the surface <b>over brick work</b> after racking out the joints including watering and curing, rounding of corners etc. complete with cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charge in charge	-	-	-	-
14.18.1	<b>Ground Floor</b>	Sqm	541.19	325.19	1,75,987.32
14.19	Providing <b>12mm. thick cement plaster</b> with cement mortar of mix (1:3) with approved quality cement with screened and washed sharp sand for mortar and finished smooth to the surface <b>in ceiling and R.C.C. surface after chipping the surface in all floors</b> including watering and curing, rounding of corners etc. complete with cost, conveyance, loading, unloading, royalties, cess, and taxes of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charge.	-	-	-	-
14.19.1	<b>Ground Floor</b>	Sqm	484.90	325.19	1,57,682.61
14.20	Providing and finishing the wall surface with two coat of <b>cement wash</b> including scaffolding, all labour, cost, conveyance, cess, taxes of all materials, T&P articles, brushes all other machineries required for the work complete in all respect confirming to relevant I.S. Specification and direction of the Engineer-in-Charge	-	-	-	-
14.20.1	<b>Ground Floor</b>	Sqm	1,522.68	104.52	1,59,156.63
14.21	Supplying fitting and fixing of M.S shutter made out of M.S Angle 40mmx40mmx6mm, M.S.Flat 19 mm x 5 mm size, M.S. guide, top hood cover etc. as per design provided including cost, conveyance, royalties of all materials, cost of all labour, T&P articles required for the work etc. complete in all respect confirming to relevant I.S specification and direction of the Engineer-in Charge.	Kg	664.70	127.75	84,916.48
14.22	Supplying fitting and fixing of M.S grill made out of M.S M.S.Flat 19 mm x 5 mm size, as per design provided including cost, conveyance, royalties of all materials, cost of all labour, T&P articles required for the work etc. complete in all respect confirming to relevant I.S specification and direction of the Engineer-in Charge.	Kg	1,134.43	127.75	1,44,925.22
14.23	<b>Wall painting 2 coats with acrylic distemper</b> over one coat of wall primer of approved shade on new work to give an even shade in all floors at all height including scaffolding cost of brushes including cost of paint cost conveyance royalty of all materials labour,T&P articles required for the work etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.	-	-	-	-
14.23.1	<b>Ground Floor</b>	Sqm	876.36	133.56	1,17,045.30
14.24	<b>Painting two coats with weather coat</b> on exterior walls surface of approved quality and approved shade over a coat of primer in all floors at all height of approved quality and shade including cleaning and sand paping the surface and making the surface smooth with cost, conveyance, loading, unloading, and taxes of all materials, cost of all labour, sundries, T&P, scaffolding etc. required for the work complete in all respect as directed by Engineer-in-charge	-	-	-	-
14.24.1	<b>Ground Floor</b>	Sqm	646.44	191.63	1,23,875.60
14.25	<b>Painting two Coats with approved colour synthetic enamel paint</b> on wood / iron work in all floors at all height including scaffolding cost conveyance royalty of all materials labour,T&P articles required for the work etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	105.90	209.05	22,138.19
14.26	Providing <b>cement concrete (1:1.5:3)</b> using 12mm size black hard crusher broken granite stone chips, screened & washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	25.32	5,226.20	1,32,327.41
14.27	Supplying, fitting and fixing of stainless steel of 304 grade in hand railing using 50mm dia of 2mm thick circular pipe with Balustrade of size 32mm x 32mm x 2mm @ 0.90mtr. C/C and stainless square pipe bracing of size 32mm x 32mm x 2mm in 3 rows in stair case as per approved design and specification, buffing, polishing etc. with cost, conveyance, taxes of all materials, labour, T&P etc. required for the complete in all respect.	Mtr	7.50	4,064.82	30,486.17
14.28	Providing and fixing M.S. fan clamp type-I of 16mm dia M.S. bar bent to shape with hooked ends in R.C.C. slab during laying including painting the exposed portion of loop as per standard design complete as directed by the Engineer-in-charge.	Nos	30.00	174.21	5,226.20
14.29	Providing <b>12mm. thick cement plaster</b> in cement mortar of mix (1:4) with neat cement punning with approved quality cement with screened and washed sharp sand for mortar and finished smooth to the surface in ceiling and R.C.C. surface after chipping the surface in septic tank including watering and curing, rounding of corners etc. complete with cost, conveyance, loading, unloading, royalties, cess, and taxes of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charge.	Sqm	9.75	325.19	3,170.56
14.30	Providing neat cement punning with approved quality cement finished smooth to the surface etc. complete with cost, conveyance, loading, unloading, royalties, cess, and taxes of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charge.	Sqm	162.76	278.73	45,366.21
14.31	40 mm thick grading concrete with cement concrete (1:2:4) using 12mm and down graded b.h.g. chips to the roof surface <b>with water proofing cement compound</b> finished smooth over RCC slab including hoisting and laying in position watering and curing for required number of days finished to smooth surface and desired slope including cost conveyance, royalty and taxes of all materials, labour T&P articles required for the work etc. complete in all respect confirming to relevant I.S specification and direction of the Engineer-in-Charge.	Sqm	267.54	243.89	65,250.16
14.32	Providing Fitting, fixing of Aluminium Door with OEL or equivalent anodized AL. door section as vertical member, as top, as bottom and middle member and 8mm plain glass fixed to door to be completed including all cost of labour T&P hire charges of drilling machine , labour charges etc.complete.	Sq. mtr.	14.20	5,806.89	82,457.84
14.33	Supply & Fixing of aluminium Ventilator with 8 mm thick glass as per approved drawing	Sq. mtr.	0.92	5,806.89	5,342.34
14.34	Finishing surface of wall with Acrylic wall Putty(water Based) of approved make and finished smooth and even surface to receive painting including cost of scaffolding staging charges with cost of all materials, taxes, labour, T&P etc. complete.	Sq. mtr.	742.00	127.75	94,791.67
14.35	Septic Tank	-	-	-	-
14.35.1	Earth work in excavation of foundation trenches in all kinds of soil including moorum, stony earth and earth mixed with boulders except sheet rock and boulders requiring blasting including dressing of sides and leveling the bed up to the required depth and depositing the excavated materials away from the work site within initial leads and lifts, including shoring, shuttering & dewatering (if required) with cost of labour,cess, hire & running charges of water pumps sundries , T & P & all other machinaries required for the work etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	10.60	348.41	3,693.18
14.35.2	Supplying and filling in foundation and plinth with good river sand well watered and rammed in layers not exceeding 23 cm in each layer including all leads and lifts, cost of all materials, labour,cess, sundries, T&P required for the work etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	0.95	929.10	882.65

## Annexure-1

**Construction of 33/11 KV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work**

14.35.3	Providing and lying plain cement concrete of proportion (1:3:6) in foundation and plinths using approved quality cement, 40 mm. size black hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc. complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	0.78	5,226.20	4,076.44
14.35.4	RCC work M-20 grade as per approved designs and drawings having a minimum compressive strength (in work test) 200 Kg./ Sqcm. in 15 cm. cubes at 28 days after mixing and test conducted in accordance with I.S.456 and I.S 516 using 12 mm. to 20 mm. size black hard crusher broken granite stone chips, screened and washed sharp sand for mortar of approved quality from approved quarry, to be mixed in concrete mixture with approved quality cement including hoisting, lowering, laying and compacting concrete by using vibrators, watering and curing for 28 days, centering and shuttering and finishing the exposed surface smooth providing grooves or beads wherever necessary including cost, conveyance, loading, unloading, royalties and taxes and cess of all materials, cost of all labours, sundries, T&P & all other machinaries required for the work but excluding cost and conveyance of M.S. or Tor steel and binding wires etc. complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	4.56	11,846.06	54,018.01
15	<b>P.H. Fitting (Internal &amp; External) to Switch-Gear -Cum -Control Room</b>		-	-	-
15.1	Supplying all materials, labours, taxes and tools and plants for fitting and fixing of PVC pipes of following nominal bore conforming to ASTM-D-1785 (Schedule-80) including fittings and laying as per the site requirement etc., all complete including testing as per the direction and specification of Engineer-in-charge		-	-	-
15.1.1	15 mm dia	Mtr	15.00	139.37	2,090.48
15.1.2	20 mm dia	Mtr	20.00	174.21	3,484.13
15.1.3	25 mm dia	Mtr	15.00	197.43	2,961.51
15.1.4	40 mm dia	Mtr	20.00	232.28	4,645.51
15.1.5	50 mm dia	Mtr	20.00	301.96	6,039.17
15.2	Supplying all material, labour, T&P & fitting, fixing the following different water supply fittings of approved make with including supply of all necessary jointing materials etc. all complete as directed by the Engineer-in-charge.		-	-	-
15.2.1	25 mm dia Ball valve	Nos	2.00	290.34	580.69
15.2.2	50 mm dia Ball valve	Nos	2.00	476.16	952.33
15.2.3	25 mm dia F.W. valve	Nos	2.00	174.21	348.41
15.2.4	50 mm dia F.W. valve	Nos	2.00	348.41	696.83
15.3	Supplying all labour T&P and cutting holes in brick masonry wall for taking pipes through and mending good the damages with supply of all required materials etc. complete as per the direction of the Engineer-in-charge		-	-	-
15.3.1	For 15mm to 50mm CPVC pipe to pass in 125mm to 250mm thick wall	Nos	10.00	145.17	1,451.72
15.4	Supplying all labour T&P and materials and making grooves in brick walls vertically and horizontally to the required depth and width for fixing pipes & fittings of sizes 15mm dia to 25mm dia in the grooves, testing the pipe line against leakage, and filling the grooves with cement mortar (1:4) to bring the surface to original level including cost of mortars, curing and conveyance of materials etc. complete as per direction of the Engineer-in-charge.	Mtr	10.00	209.05	2,090.48
15.5	Supplying all materials, labour T&P and fittings of approved quality required for fixing of NP or CP Brass or GM fixtures of following sizes and specification with leak proof threaded joints tightened with spun yarn and white zinc or any tightened with spun yarn and white zinc or any including testing and rectification of detects, after testing complete as per direction of Engineer-in-charge.		-	-	-
15.5.1	Bibcock	Nos	5.00	464.55	2,322.76
15.5.2	Long Body Bibcock	Nos	2.00	493.59	987.17
15.5.3	Pillar cock	Nos	2.00	522.62	1,045.24
15.5.4	Angular stop cock	Nos	4.00	406.48	1,625.93
15.5.5	Soap Holder	Nos	2.00	81.30	162.59
15.5.6	Towel ring	Nos	2.00	139.37	278.73
15.5.7	Toilet paper holder	Nos	2.00	209.05	418.10
15.5.8	Glass self 22"	Nos	2.00	348.41	696.83
15.5.9	Towel rail 24"	Nos	2.00	261.31	522.62
15.5.10	Shower arm 190mm long light	Nos	2.00	185.82	371.64
15.5.11	CP Grating	Nos	2.00	52.26	104.52
15.5.12	Concealed stop cock	Nos	4.00	580.69	2,322.76
15.5.13	Connecting Pipe	Nos	2.00	69.68	139.37
15.5.14	Basin with pedestal	Nos	2.00	3,019.58	6,039.17
15.5.15	Providing and fixing vitreous China water closet (European with seat and lid), of Cerra Cascade "CASINO", CP brass buffers, 10 liter cascade dual flushing cistern hinges & rubber with fittings and brackets, 40 mm flush bend of CP brass, 20 mm overflow pipe with specials & mosquito proof coupling complete, painting on brackets and making good the walls and floors wherever required.	Nos	1.00	4,935.86	4,935.86
15.5.16	Providing and fixing vitreous China water closet Indian type of Orissa pattern size (580mmx440mm) of approved quality with PVC Slimeline (Parryware make) 12.5 ltr capacity low level cistern with hinges & rubber with fittings and brackets, 40 mm flush bend of CP brass, 20 mm overflow pipe with specials & mosquito proof coupling complete, painting on brackets and making good the walls and floors wherever required.	Nos	1.00	4,180.96	4,180.96
15.5.17	Providing and fixing vitreous China water urinal of Cerra/Parry ware with fittings and brackets, flush bend of CP brass, and making good the walls and floors wherever required.	Nos	2.00	2,090.48	4,180.96
15.6	Supply of all materials, labour, T&P, fitting and fixing in all floors fixed type bevelled plate glass mirror of size 600mm x 450mm x 5.5mm thick best Indian make, supply of 13mm thick asbestos backing and CP Brass screw including cost conveyance, taxes of all materials complete as per specification and direction of Engineer-in-charge (Make-Modi Guard/Belgium)	Nos	2.00	1,509.79	3,019.58
15.7	Supply of all materials, joining materials, labour and T&P and laying UPVC SWR PIPES of Standard make with ISI Mark duly approved by the Engineer-in-charge including jointing, earthwork in excavation of trenches in all kind of soil to the required depth and refilling of pipe line trenches in 0.3048 mtrs layers with 300 mm deep sand around cushion duly watered and rammed or fixing to walls, floors with supply of necessary clamps, nails and cutting the pipe to length with wastage including supply of all Clamps, Clips, Endcaps & jointing materials etc., complete as per standard specification and direction of Engineer-in-charge.		-	-	-
15.7.1	100mm dia ( ISI Marked )	Mtr	10.00	313.57	3,135.72
15.7.2	150mm dia ( ISI Marked )	Mtr	25.00	441.32	11,033.09
15.8	Supplying all materials, labour T&P for jointing of the UPVC SWR SEWER pipe fittings of standard make duly approved by the Engineer-in-charge with joining material etc. suitably required for fixing on 100mm dia soil waste pipe complete with requisite testing as directed by Engineer-in-charge.		-	-	-
15.8.1	100mm dia "P" Trap	Nos	2.00	360.03	720.05
15.8.2	100mm dia Bend Plain	Nos	3.00	133.56	400.68
15.8.3	100mm Door Bend	Nos	3.00	174.21	522.62
15.8.4	100 mm dia Single Junction with Door	Nos	3.00	406.48	1,219.45
15.8.5	100 mm dia double Junction with Door	Nos	3.00	522.62	1,567.86
15.8.6	100mm dia Terminal Guard	Nos	2.00	290.34	580.69
15.8.7	100mm dia. Floor trap	Nos	3.00	232.28	696.83
15.9	Supplying all materials, labor T&P for jointing of the UPVC SWR SEWER pipes & fittings of standard make duly approved by the Engineer-in-charge suitably required for fixing on 100mm dia soil waste pipe complete with requisite testing as directed by Engineer-in-charge.		-	-	-
15.9.1	100mm Pipe	Nos	10.00	1,881.43	18,814.32
15.10	Fixing of UPVC vent pipes Including labour & T&P all complete as directed by the Engineer-in-charge.		-	-	-
15.10.1	100mm Pipe	Mtr	4.00	313.57	1,254.29
15.10.2	100mm Vent Cowl	No	2.00	406.48	812.96

## Annexure-1

**Construction of 33/11 KV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work**

15.11	Supplying all materials labour T&P and constructing inspection chamber C.C.(1:4:8) on bed with hard stone metal size 40mm and 250mm K.B.Bricks work having crushing strength 75 Kg to 99 Kg/cm2 in cement mortar (1:4), R.C.C. roof slab with 500mm dia light pattern factory made SFRC M.H cover with frame, moulding and shaping the channel and benching with C.C. 1:2:4 with hard granite chips 12mm size, 12mm thick C.P 1:3 including cement punning inside, Cement plaster (1:3) outside the chamber, earth work in excavation in all kinds of soil and refilling the cavity around the chamber as per detail drawing & design and specification including cost, conveyance, taxes etc. all complete as directed by Engineer-in-charge.		-		-
15.11.1	750mmx 750mm x450mm	No	1.00	6,968.27	6,968.27
15.12	Providing and fixing 2000 litres capacity P.V.C Over head (Sintex make) tank with all piping and valve arrangement with all labour & materials ,including cost, T&P , scaffolding etc., complete as directed by the Engineer-in-charge.		-		-
15.12.1	2000 Ltr Capacity	No	1.00	20,904.80	20,904.80
15.13	Supplying all material, labour, T&P and constructing manhole chamber of size as mentioned below with 250mm nominal size K.B. Brick having crushing strength 75kg to 99kg /cm2 in CM 1:4 over a bed of 150mm thick C.C.(1:4:8) using 40mm size HG metal, plastering with 12mm thick cement mortar (1:3) on internal and external surface, inside finish with neat cement punning, providing & fixing step iron of appropriate quality & size with 3 coats anticorrosive paint, RCC (1:1.5:3) cover slab using 20m & down size graded HG chips along with factory made reinforced concrete cover with frame including breaking of pipe line where ever necessary and earth work in excavation in all kind of soil & rock and refilling the cavity by selective soil, leveling the surface around the chamber with disposal of surplus earth if any to a distance of 50mt as per specification, design & drawing including cost of curing and all taxes , royalty , cost , conveyance etc. all complete as directed by the Engineer-in-charge.	No	1.00	46,455.12	46,455.12
15.14	Supplying all material, labour, T&P and constructing 1.80m dia x 2.60m deep soak way pit with dry brick walling upto 2.00m height and 1st class K.B. Brickwork in cement mortar (1:6) for the remaining 06.60m height at top, 12mm thick cement plaster (1:4) inside and outside , 100mm thick gravel backing in the rear of well staining, 125mm thick RCC cover slab fitted with with iron lifting handles including earth work in excavation in all kind of soil & rock and refilling the cavity by selective soil, leveling the surface around the pit with disposal of surplus earth if any to a distance of 50mt including cost of curing and all taxes , royalty , cost , conveyance etc. all complete as directed by the Engineer-in-charge.	No	1.00	47,616.50	47,616.50
16	Watering system like 150 mm dia, 100 Mtr deep bore well (PVC pipe to be used) 1 HP submersive pump, switch yard water hydrant system for pouring water into the earth pits, tap for garden, including PVC pipes & other accessories required etc.	LS	1.00	2,12,996.73	2,12,996.73
18	RRHG retaining wall with 1:5 cement mortar Considering 0.6 mt height of retaining wall above the existing ground level per Meter as per Drawing TOTAL 74 Mtrs		-	-	-
18.1	Excavation in all type of soil( 0.8 Cum / Mtr)	Cum	105.60	174.21	18,396.23
18.2	PCC (1:4:8) 200 mm thick. With cement ( 0.2 Cum / Mtr)	Cum	26.40	5,226.20	1,37,971.71
18.3	PCC (1:2:4) 50 mm thick With cement ( 0.02 Cum / Mtr)	Cum	1.58	6,039.17	9,566.04
18.4	RRHG Cement Masonary (1:5) With cement ( 0.86 Cum / Mtr)	Cum	63.64	2,903.45	1,84,775.24
18	Laying of cable trench with supply of GI Cable Trench material & all Civil works				
18.1	Laying of 2 tier 2 rows cable trench (internal width 1500 mm,depth 680 mm, with 75X75X6 mm support angles fixed RCC column of 250 X 250 mm & with ladder type cable tray (45X45X5mm two angles at both side having welded flats of 25X5 mm at a gap of 150mm) for Power & control Cable. It includes supply of GI Cable Trench materials, supply of all civil items as per site requirement and as per detail drawing & design and specification including cost, conveyance, taxes etc. all complete as directed by Engineer-in-charge.	Mtr.	40.00	16,989.77	6,79,590.79
18.2	Laying of 2 tier 1 rows cable trench (internal width 750 mm,depth 680 mm, with 65X65X6 mm support angles fixed RCC column of 250 X 250 mm & with ladder type cable tray (45X45X5mm two angles at both side having welded flats of 25X5 mm at a gap of 150mm) for Power & control Cable. It includes supply of GI Cable Trench materials, supply of all civil items as per site requirement and as per detail drawing & design and specification including cost, conveyance, taxes etc. all complete as directed by Engineer-in-charge.	Mtr.	35.00	9,345.81	3,27,103.42
18.3	Laying of 2 tier 1 rows cable trench (internal width 500 mm,depth 580 mm, with 50X50X6 mm support angles fixed RCC column of 250 X 250 mm & with ladder type cable tray (45X45X5mm two angles at both side having welded flats of 25X5 mm at a gap of 150mm) for Power & control Cable. It includes supply of GI Cable Trench materials, supply of all civil items as per site requirement and as per detail drawing & design and specification including cost, conveyance, taxes etc. all complete as directed by Engineer-in-charge.	Mtr.	25.00	8,099.80	2,02,494.96
25	Fixing of stay set with 0.5Cum cement concrete foundation PCC 1:3:6 size ( 900mmx600mmx900mm) using 40mm BHG metal with all labor and material, including excavation and required backfilling, as per technical specification and scope of work.	No's.	16.00	2,438.89	39,022.30
26	Making of earth chamber with 50mm thick RCC Slab (with 8mm rod) cover for earth pit of size 450mmX450mm X600 mm depth as per direction of Engg in Charge.	No's.	56.00	1,742.07	97,555.75
27	Construction of 600mm dia Hume Pipe Single row culvert and approach road for Control room-cum- Swith gear room				-
27.1	Earth work in excavation of foundation trenches in all kinds of soil including moorum, stony earth and earth mixed with boulders except sheet rock and boulders requiring blasting including dressing of sides and leveling the bed up to the required depth and depositing the excavated materials away from the work site within initial leads and lifts, including shoring, shuttering & dewatering (if required) with cost of labour,cess, hire & running charges of water pumps sundries , T & P & all other machinaries required for the work etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	14.90	174.21	2,595.68
27.2	Supplying and filling in foundation and plinth with good river sand well watered and rammed in layers not exceeding 23 cm in each layer including all leads and lifts, cost of all materials, labour,cess, sundries, T&P required for the work etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	1.80	929.10	1,672.38
27.3	Providing and lying plain cement concrete of proportion (1:3:6) in foundation and plinths using approved quality cement , 40 mm. size black hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	1.80	5,226.20	9,407.16
27.4	Providing cement concrete of M-15 grade using 20mm down graded black hard crusher broken granite stone chips, screened & washed sharp sand of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	8.30	12,775.16	1,06,033.81
27.5	Providing,laying and fixing in position R.C.C.hume pipes with collars jointed with cement mortar 1:3 complete with cost of all materials, and cost of all labours, cess, sundries, T&P & all other machinaries required for the work etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Mtr	7.50	4,645.51	34,841.34
27.6	Providing rough stone dry packing for guard walls & retaining walls including cost conveyance of all materials and cost of all labours, cess, sundries, T&P etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	5.30	2,903.45	15,388.26
27.7	Rolling and compacting to sub grade or formation loosening by cutting ordinary earth for 0.15 Mtr. depth including watering and rolling by PRR as per specification and direction of Engineer-in-Charge. (Data for 100sqm x 0.15m= 15 Cum).	Cum	97.50	754.90	73,602.33
27.8	Conveying from the stacks supplying, spreading morrum & sand mixture to proper camber and consolidation with H.R.R.including watering as per specification and direction of Engineer-in-Charge.	Cum	230.00	290.34	66,779.24

## Annexure-1

Construction of 33/11 KV Primary Substation with 2X8 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
27.9	Soling the road surface with soling stones including filling the interstices with moorum and rolling with PRR including cost conveyance of all materials and cost of all labours, cess, sundries, T&P etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	75.00	1,858.20	1,39,365.36
27.1	Supplying and filling in sub base of road with borrowed earth including rolling & compacting all works complete as per specification and instruction of engineer. Payment shall be made for the compacted volume only as per spot levels taken at 2 intervals before start of work and after completion of the filling works.	Cum	780.00	348.41	2,71,762.45
.	<b>Sub-Total for CIVIL WORKS with supply of all materials like Cement, MS tor rod, Brick, Coarse &amp; Fine Agregrates &amp; Labour,T&amp;P etc. (In Rs.)</b>				<b>1,47,52,551.72</b>
-	<b>Total Cost in Cr.</b>				<b>1.48</b>
					<b>All Prices in Cr.</b>
<b>A1</b>	<b>Total Cost for SUPPLY OF EQUIPMENT &amp; MATERIALS (In Cr.)</b>				<b>5.51</b>
B	Stock , Storage & Insurance @ 3 % of A				0.17
C	Sub - Total ( A+B )				5.67
D	Contingency @ 3 % of C				0.17
E	Tools &Plants Charges @ 2% of C (NOT CONSIDERED, As Separate Erection considered for All Supply Material )				-
F	Transportation @ 7.5% of C				0.43
<b>G</b>	<b>Sub - Total ( C+D+E+F )</b>				<b>6.27</b>
H1	Total Cost for ERECTION, TESTING & COMMISSIONING WORKS (In Cr.)				0.52
H2	Total Cost for CIVIL WORKS with supply of all materials like Cement, MS tor rod, Brick, Coarse & Fine Agregrates & Labour,T&P etc. (In Cr.)				1.48
<b>H3</b>	<b>Total Cost for Erection &amp; Civil works (H1+H2)</b>				<b>1.99</b>
<b>J</b>	<b>Total Cost (G+H)</b>				<b>8.26</b>
L	Total Estimated Capital Cost i.e. J+K				<b>8.26</b>
M	GST @ 18% of L				1.49
N	CESS @ 1% of L				0.08
O1	Inspection Charges (As per Gov. Notification)				0.009
O2	GST On Inspection Fees (18% of O1)				0.002
O	Total Inspection fees (O1+O2)				0.010
<b>P</b>	<b>Total Estimate to be deposit in Cr @ L+M+N+O (In Cr.)</b>				<b>9.85</b>

**Annexure-1**

**BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU**

**Supply Portion**

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (aloing with 1core spare cable) with accessories</b>				
<b>a</b>	<b>Length of 33kV 1C, 630sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>5000</b>		
<b>b</b>	<b>Length of 33kV 1C, 630sqmm cable (HDD)</b>	<b>Mtr.</b>	<b>1000</b>		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	18000	1,495.47	2,69,18,460.00
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	54	11,900.00	6,42,600.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	6	6,350.00	38,100.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	9	6,100.00	54,900.00
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	14952.00	357.60	53,46,835.20
<b>2</b>	<b>Supply of 33kV RMU</b>				
<b>a</b>	<b>No. of 33kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 33kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
<b>c</b>	<b>No. of 33kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 33kV 4Way RMU (LLVV)</b>	<b>nos.</b>	<b>1</b>		
<b>e</b>	<b>No. of 33kV 3Way RMU (LLL)</b>	<b>nos.</b>			
<b>f</b>	<b>No. of 33kV 4Way RMU (LLLL)</b>	<b>nos.</b>			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
<b>3</b>	<b>Earthing</b>				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	13.20	97.50	1,287.00
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,365.00	2,730.00
<b>4</b>	<b>FRTU for RMU SCADA Automation</b>				
<b>a</b>	<b>No. of FRTU</b>	<b>nos.</b>	<b>1</b>		
<b>4.1</b>	Pre-Wired FRTU Panel with FRTU	No.	1	1,21,744.00	1,21,744.00
<b>4.2</b>	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	1	1,00,000.00	1,00,000.00
<b>4.3</b>	Networking Accessories	No.	1	72.00	72.00

**Annexure-1**

<b>BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU</b>					
<b>4.4</b>	CMR with Mounting Base for Digital Inputs	Nos.	32	650.00	20,800.00
<b>4.5</b>	Interposing Relay for Digital Output	Nos.	16	467.94	7,487.04
<b>4.6</b>	Battery Charger	Nos.	1	15,385.00	15,385.00
<b>4.7</b>	Battery	Nos.	1	8,333.00	8,333.00
<b>4.8</b>	4G Modem cum Router	Nos.	1	18,500.00	18,500.00
<b>4.9</b>	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	40	204.87	8,194.80
<b>4.10</b>	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	40	305.58	12,223.20
<b>4.11</b>	Twisted Pair Shielded & Over all shielded Instrumentation Cable	Mtr.	40	275.23	11,009.20
<b>4.12</b>	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	20	165.25	3,305.00
<b>4.13</b>	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	10	150.00	1,500.00
<b>4.14</b>	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	20.0	148.43	2,968.60
<b>4.15</b>	Armored CAT6 SFTP Cable	Mtr.	20	45.87	917.40
<b>4.16</b>	Un-Armored CAT6 SFTP Cable	Mtr.	20	89.45	1,789.00
<b>4.17</b>	Multi Function Meter	Nos.	2	18,651.00	37,302.00
<b>Sub Total (Supply Portion) (in Rs.)</b>					<b>3,57,11,706.44</b>
<b>Erection Portion</b>					
<b>Sl. No.</b>	<b>Description of items</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (in Rs.)</b>	<b>Amount (in Rs.)</b>
<b>1</b>	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	15000	94.50	14,17,500.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	54	2,400.00	1,29,600.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with</b> HDPE pipe (110mm dia, PN8 PE80) including suply of HDPE Pipe.	Mtr.	3000	2,300.00	69,00,000.00
1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	14952.00	300.00	44,85,600.00
<b>2</b>	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-

**Annexure-1**

BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	1.0	16,000.00	16,000.00
	Sub Total (Erection Portion) (in Rs.)				1,29,87,925.50
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)- Route Length	Mtr	4984		
1.1.a	Earth work excavation of soil	Cum	4186.56	700.00	29,30,592.00
1.1.b	Earth work excavation of hard rock	Cum	1794.24	1,720.00	30,86,092.80
1.2	Back filling with excavated soil outside and above the trench	Cum	5980.8	202.00	12,08,121.60
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	2492	2,643.67	65,88,027.21
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	1	23,145.30	23,145.30
3	Supply of GI Fencing with Gate around each RMU	sqmtr	20	3,600.00	72,000.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	2	3,700.00	7,400.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	200	1,012.00	2,02,400.00
	Sub Total (Civil Portion) (in Rs.)				1,41,88,022.11
A	Sub Total (Supply Portion)				3,57,11,706.44
B	Stock, Storage & Insurance @ 3 % of A				10,71,351.19
C	Sub Total (A+B)				3,67,83,057.63
D	Contingency @ 3 % of C				11,03,491.73
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				26.51
F	Transportation @ 7.5% of C				27,58,729.32
G	Erection Charges @ 10% of earthing items				132.56

**Annexure-1**

<b>BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU</b>		
<b>H</b>	<b>Total (C+D+E+F+G)</b>	<b>4,06,45,437.76</b>
I	Sub Total (Erection Portion + Civil Portion)	2,71,75,947.61
<b>J</b>	<b>Total Cost (H+I)</b>	<b>6,78,21,385.37</b>
<b>L</b>	<b>Total Estimated Capital Cost i.e. (J+K)</b>	<b>6,78,21,385.37</b>
M	GST @ 18% of L	1,22,07,849.37
M1	CESS @ 1% of L	67,82,138.54
<b>N</b>	<b>Grand Total (L+M)</b>	<b>8,68,11,373.27</b>
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.	3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km	7,500.00
Q	Inspection Fee of RMU - Rs. 1500/ RMU	1,500.00
R	Inspection Fee of Drawing Checking and Approval	750.00
<b>S</b>	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>	<b>8,68,24,123.27</b>

## Annexure-1

## BoQ and Estimate for 11kV 3C, 400sqmm UG Cable along with 11kV RMU

## Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 11kV, 3Core, 400sqmm, XLPE insulation armoured UG cable with accessories</b>				
<b>a</b>	<b>Length of 11kV 3C, 400sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>5000</b>		
<b>b</b>	<b>Length of 11kV 3C, 400sqmm cable (HDD)</b>	<b>Mtr.</b>	<b>1000</b>		
1.1	Supply of 11kV, 3Core, 400sqmm, XLPE insulation armoured UG cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA- 15kA)	Mtr.	6000.00	1,950.00	1,17,00,000.00
1.2	Supply of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400 sqmm, Aluminium UG cable for 3Core (Set)	Set	18	32,912.10	5,92,417.80
1.3	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400 sqmm, HT UG cable for 3Core (Set)	Set	24	12,456.60	2,98,958.40
1.4	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400 sqmm, HT UG cable for 3Core (Set)	Set	16	18,075.20	2,89,203.20
1.5	Supply of <b>HDPE</b> PE 80-PN8 pipe of <b>160mm</b> diameter (for 400sqmm HT cable laying)	Mtr.	4872.00	775.40	37,77,748.80
<b>2</b>	<b>Supply of 11kV RMU</b>				
<b>a</b>	<b>No. of 11kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 11kV 4Way RMU (LLVV)</b>	<b>nos.</b>	<b>8</b>		
<b>c</b>	<b>No. of 11kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 11kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
2.1	Supply of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	0	4,99,340.00	-
2.2	Supply of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	8	6,97,696.00	55,81,568.00
2.3	Supply of RMU 3W 11kV 630A with metering unit (LLV+M)( <b>CT Ratio to be mentioned</b> )	Nos.	0	5,99,901.00	-
2.4	Supply of RMU 4W 11kV 630A with metering unit (LLVV+M)( <b>CT Ratio to be mentioned</b> )	Nos.	0	8,25,045.00	-
<b>3</b>	<b>Earthing</b>				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	105.60	97.50	10,296.00
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	16	1,365.00	21,840.00
<b>4</b>	<b>FRTU for RMU SCADA Automation</b>				
<b>a</b>	<b>No. of FRTU</b>	<b>nos.</b>	<b>8</b>		
<b>4.1</b>	Pre-Wired FRTU Panel with FRTU	No.	8	1,21,744.00	9,73,952.00
<b>4.2</b>	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	8	1,00,000.00	8,00,000.00
<b>4.3</b>	Networking Accessories	No.	8	72.00	576.00
<b>4.4</b>	CMR with Mounting Base for Digital Inputs	Nos.	256	650.00	1,66,400.00
<b>4.5</b>	Interposing Relay for Digital Output	Nos.	128	467.94	59,896.32
<b>4.6</b>	Battery Charger	Nos.	8	15,385.00	1,23,080.00
<b>4.7</b>	Battery	Nos.	8	8,333.00	66,664.00
<b>4.8</b>	4G Modem cum Router	Nos.	8	18,500.00	1,48,000.00
<b>4.9</b>	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	320	204.87	65,558.40
<b>4.10</b>	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	320	305.58	97,785.60

**Annexure-1**

<b>BoQ and Estimate for 11kV 3C, 400sqmm UG Cable along with 11kV RMU</b>					
<b>4.11</b>	Twisted Pair Shielded & Over all shielded Instrumentation Cable 5 P X 1.0 mm2, Armored for Analog Input	Mtr.	320	275.23	88,073.60
<b>4.12</b>	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	160	165.25	26,440.00
<b>4.13</b>	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	80	150.00	12,000.00
<b>4.14</b>	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	160.0	148.43	23,748.80
<b>4.15</b>	Armored CAT6 SFTP Cable	Mtr.	160	45.87	7,339.20
<b>4.16</b>	Un-Armored CAT6 SFTP Cable	Mtr.	160	89.45	14,312.00
<b>4.17</b>	Multi Function Meter	Nos.	16	18,651.00	2,98,416.00
<b>Sub Total (Supply Portion) (in Rs.)</b>					<b>2,52,44,274.12</b>
<b>Erection Portion</b>					
<b>Sl. No.</b>	<b>Description of items</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (in Rs.)</b>	<b>Amount (in Rs.)</b>
<b>1</b>	<b>Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method and HDD method</b>				
1.1	Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by <b>open trench method</b> .	Mtr.	5000.00	94.50	4,72,500.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	18	2,400.00	43,200.00
1.3	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	24	1,900.80	45,619.20
1.4	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	16	1,900.80	30,412.80
1.5	Installation, Laying, Commissioning & Testing of 11kV, 3Core, 2Runs, 400sqmm, XLPE U/G cable by <b>HDD method with HDPE pipe</b> (160mm dia, PN8 PE80) including supply of HDPE Pipe.	Mtr.	1000	2,800.00	28,00,000.00
1.6	Laying of <b>160mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	4872.00	300.00	14,61,600.00
<b>2</b>	<b>Erection, Commissioning, Wiring and Testing of 11kV RMU</b>				
2.1	Erection of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	0	9,639.00	-
2.2	Erection of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	8	9,639.00	77,112.00
2.3	Erection of RMU 3W 11kV 630A with metering unit (LLV+M)	Nos.	0	15,000.00	-
2.4	Erection of RMU 4W 11kV 630A with metering unit (LLVV+M)	Nos.	0	15,000.00	-
<b>3</b>	<b>FRTU and OFC for RMU SCADA Automation</b>				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	8.0	16,000.00	1,28,000.00
<b>Sub Total (Erection Portion) (in Rs.)</b>					<b>50,58,444.00</b>
<b>Civil Portion</b>					
<b>Sl. No.</b>	<b>Description of items</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (in Rs.)</b>	<b>Amount (in Rs.)</b>
<b>1</b>	<b>Civil works with supply of all materials like cement, MS tor rod, brick, coarse &amp; fine aggregates and labour, T&amp;P, etc for UG Cable Trench</b>				

**Annexure-1**

<b>BoQ and Estimate for 11kV 3C, 400sqmm UG Cable along with 11kV RMU</b>					
1.1	Earth work excavation of soil (1mtr. width X 1mtr. depth) Route Length	Mtr	2436		
1.1.a	Earth work excavation of <b>soil</b>	Cum	1705.2	700.00	11,93,640.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	730.8	1,720.00	12,56,976.00
1.2	Back filling with excavated soil outside and above the trench	Cum	2436	202.00	4,92,072.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	1218	2,643.67	32,19,990.83
<b>2</b>	<b>Civil works for Prefabricated RCC foundation with supply of all materials</b>				
2.1	Prefabricated RCC foundation of 11kV RMU	Nos.	8	23,145.30	1,85,162.40
3	Supply of GI Fencing with Gate around each <b>RMU</b>	sqmtr	160	3,600.00	5,76,000.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	16	3,700.00	59,200.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	128	1,463.40	1,87,315.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	200	1,012.00	2,02,400.00
	<b>Sub Total (Civil Portion) (in Rs.)</b>				<b>73,72,756.43</b>
<b>A</b>	<b>Sub Total (Supply Portion)</b>				<b>2,52,44,274.12</b>
B	Stock, Storage & Insurance @ 3 % of A				7,57,328.22
<b>C</b>	<b>Sub Total (A+B)</b>				<b>2,60,01,602.34</b>
D	Contingency @ 3 % of C				7,80,048.07
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				212.10
F	Transportation @ 7.5% of C				19,50,120.18
G	Erection Charges @ 10% of earthing items				1,060.49
<b>H</b>	<b>Total (C+D+E+F+G)</b>				<b>2,87,33,043.18</b>
I	Sub Total (Erection Portion + Civil Portion)				1,24,31,200.43
<b>J</b>	<b>Total Cost (H+I)</b>				<b>4,11,64,243.60</b>
<b>L</b>	<b>Total Estimated Capital Cost i.e. (J+K)</b>				<b>4,11,64,243.60</b>
M	GST @ 18% of L				74,09,563.85
<b>N</b>	<b>Grand Total (L+M)</b>				<b>4,85,73,807.45</b>
O	Inspection Fee of UG Line (HT) - Rs. 375 upto 1 KM.				375.00
P	Inspection Fee of UG Line (HT) - Rs. 225/ Additional Km				1,125.00
Q	Inspection Fee of RMU - Rs. 1500/ RMU				12,000.00
R	Inspection Fee of Drawing Checking and Approval				750.00
<b>S</b>	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>				<b>4,85,88,057.45</b>

Annexure-1					
11kV Line Length with 40 Mtr. Span using 100 SQ.MM. -AAA Conductor					
No. of DP required Without AB switch (Ref. Drawing No.- TPCODL-MVD-0012)			2		
MATERIALS OF DP Without AB Switch					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No	29,661.00	4	1,18,644.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 2.3 mtr., 2 no's channel required =( 2x9.56x2.3)	KG	76.00	87.952	6,684.35
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	7.9296	773.14
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.66 Mtr., 4 no's channel required =( 7.14x1.66x4)	KG	76.00	94.8192	7,206.26
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 2.671 mtr., 4 nos angle required = (4.5x2.671x4)	KG	76.00	96.156	7,307.86
6	Danger Plate, 2 no's.	No.	104.00	4	416.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	1.2036	117.35
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.551 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	4	650.00
9	H.T. Stay set (Complete )	Set	1,365.00	4	5,460.00
10	H.T. Stay Insulator Type-C	No.	65.00	4	260.00
11	7/10 SWG Stay Wire 15kg /stay	K.g.	97.50	60	5,850.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	2	2,730.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	23.6	2,301.00
14	GI barbed wire anticlimbing device 3 Kg. Per support, 2 no's qty. required =(2x3kg)	Kg	104.00	12	1,248.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	4.8144	469.40
16	11 KV pin insulator polymer	No.	260.00	6	1,560.00
17	H W fitting(B&S) 70KN, 3Bolt	No.	455.00	12	5,460.00
18	Disc insulator (B&S) 70 KN polymer	No.	1,495.00	12	17,940.00
19	PG Clamp for 100 sq.mm AAA conductor	NO.	754.00	12	9,048.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without AB Switch)	K.g.	101.40	24.522	2,486.53
21	Black Paint	Ltr	286.00	2	572.00
22	Yellow Colour Paint for Background	Ltr	216.00	4	864.00
Total Cost of materials					1,98,047.89
Stock, Storage & Insurance i.e 3% of A					5,941.44
Sub Total (A+B)					2,03,989.33
Contingency @ 3% of C					6,119.68
Tools & Plants @ 2% of C					3,771.82
Transportation @ 7.5% of C					15,299.20
Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole					6,110.17
Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)					6,638.75
Erection Charges @ 20% of PSC pole- Not to be used for 33kv					-
Sum of (C to I)					2,41,928.94
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of complete 11KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts BA will do the excvation including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size ( 500mmx500mmx800mm) using 20mm BHG metal with all labour and material as per TPCODL Drawing & Standard.	No.	2,250.00	4	9,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	1.80	11,700.00
3	Couping ratio 1:1.5:3 with dimension (500X5				

Annexure-1				
11kV Line Length with 40 Mtr. Span using 100 SQ.MM. -AAA Conductor				
9	Danger Plate, 2 no's.	No.	104.00	832.00
10	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	234.70
11	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.551 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	1,300.00
12	H.T. Stay set (Complete )	Set	1,365.00	10,920.00
13	H.T. Stay Insulator Type-C	No.	65.00	520.00
14	7/10 SWG Stay Wire 15kg /stay	K.g.	97.50	11,700.00
15	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	10,920.00
16	50x6mm GI Flat for earthing, 2.36kg/mtr., (12.5 Mtr. For L.A, 3 Mtr for AB Switch Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 20.5x2.36	KG	97.50	18,868.20
17	GI barbed wire anticlimbing device 3 Kg. Per support, 2 no's qty. required =(2x3kg)	Kg	104.00	2,496.00
18	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	938.81
19	Lightning Arrester(12KV,10KA) (Station Class,class-2)	EA	4,615.00	55,380.00
20	AB Switch (11KV,400A,3pole,50Hz)	Set	15,405.00	61,620.00
21	11 KV pin insulator polymer	No.	260.00	3,120.00
22	H W fitting(B&S) 70KN, 3Bolt	No.	455.00	10,920.00
23	Disc insulator (B&S) 70 KN polymer	No.	1,495.00	35,880.00
24	PG Clamp for 100 sq.mm AAA conductor	NO.	754.00	18,096.00
25	GI Nut , Bolt & Washer of different sizes (13.718 Kg each DP with AB Switch)	K.g.	101.40	5,564.02
26	Black Paint	Ltr	286.00	1,144.00
27	Yellow Colour Paint for Background	Ltr	216.00	1,728.00
			<b>Total Cost of materials</b>	<b>5,70,512.00</b>
			Stock, Storage & Insurance i.e 3% of A	17,115.36
			<b>Sub Total (A+B)</b>	<b>5,87,627.36</b>
			Contingency @ 3% of C	17,628.82
			Tools & Plants @ 2% of C	11,024.13
			Transportation @ 7.5% of C	44,072.05
			Erection Charges @ 5% on Trf/Breaker/Joist	12,220.33
			Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)	30,679.99
			Erection Charges @ 20% of PSC pole- Not to be used for 33kv	-
			<b>Sum of (C to I)</b>	<b>7,03,252.69</b>
Civil & Services				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Amount
1	Fixing of complete 11KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts BA will do the excvation including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size ( 500mmx500mmx800mm) using 20mm BHG metal with all labour and material as per TPCODL Drawing & Standard.	No.	2,250.00	18,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	23,400.00
3	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	5,850.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	29,600.00
			<b>Total Civil &amp; Services</b>	<b>76,850.00</b>
			<b>Total (J+K)</b>	<b>7,80,102.69</b>
			<b>Sub Total (L+M)</b>	<b>7,80,102.69</b>
			Total GST @ 18% of (N)	1,40,418.48
			Total CESS @ 1% of (N)	7,801.03
			<b>Gross Total Material +Services (N+O+O1) for DP With AB Switch</b>	<b>9,28,322.20</b>
			<b>No. of Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-MVD-0004)</b>	<b>4</b>
MATERIALS FOR 11 KV Cut Point with 180 Degree Angle				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Amount
1	WPB (GI) Pole 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No	29,661.00	1,18,644.00
2	Straight Cross Arm 100X50X6mm, 9.56 KG/Mtr., each channel length 1.2 mtr., 2 no's channel required =( 2x9.56x1.2)	KG	76.00	6,974.98
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	KG	97.50	2,061.70
4	Straight Cross Arm 100X50X6mm, 9.56 KG/Mtr., each channel length 0.306 mtr., 2 no's channel required =(2x9.56x0.306)	KG	76.00	1,778.62
5	Danger Plate, 1 no's.	No.	104.00	416.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	117.35
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	1,248.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	469.40
9	11 KV pin insulator polymer	No.	260.00	3,120.00
10	H W fitting(B&S) 70KN, 3Bolt	No.	455.00	10,920.00
11	Disc insulator (B&S) 70 KN polymer	No.	1,495.00	35,880.00
12	Earthing of Support ( Coil Type )	EA	215.80	863.20
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	102.18
14	PG Clamp for 100 sq.mm AAA conductor	NO.	754.00	18,096.00
15	GI Nut , Bolt & Washer of different sizes (3.55 Kg each Cut Pole)	K.g.	101.40	1,439.88
16	Black Paint	Ltr	286.00	572.00
17	Yellow Colour Paint for Background	Ltr	216.00	1,728.00
			<b>Total Cost of materials</b>	<b>2,04,431.31</b>
			Stock, Storage & Insurance i.e 3% of A	6,132.94
			<b>Sub Total (A+B)</b>	<b>2,10,564.25</b>
			Contingency @ 3% of C	6,316.93
			Tools & Plants @ 2% of C	4,211.28

Annexure-1					
11kV Line Length with 40 Mtr. Span using 100 SQ.MM. -AAA Conductor					
F	Transportation @ 7.5% of C				15,792.32
G	Erection Charges @ 5% on Trf/Breaker/Joist				6,110.17
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				8,836.09
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,51,831.03
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	1.80	11,700.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
K	Total Civil & Services				14,625.00
L	Total (J+K)				2,66,456.03
N	Sub Total (L+M)				2,66,456.03
O	Total GST @ 18% of (N)				47,962.09
O1	Total CESS @ 1% of (N)				2,664.56
P	Gross Total Material +Services (N+O+O1) for 11 KV Cut Point with 180 Degree Angle				3,17,082.68
No. of Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-MVD-0005)		8			
MATERIALS FOR 11 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No	29,661.00	8	2,37,288.00
2	Straight Cross Arm 100X50X6mm, 9.56 KG/Mtr., each channel length 1.2 mtr., 4 no's channel required =( 4x9.56x1.2)	KG	76.00	367.104	27,899.90
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	97.50	84.5824	8,246.78
4	Straight Cross Arm 100X50X6mm, 9.56 KG/Mtr., each channel length 0.306 mtr., 4 no's channel required =( 4x9.56x0.306)	KG	76.00	93.61152	7,114.48
5	Danger Plate, 1 no's.	No.	104.00	8	832.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	2.4072	234.70
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	24	2,496.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	9.6288	938.81
9	11 KV pin insulator polymer	No.	260.00	32	8,320.00
10	H W fitting(B&S) 70KN, 3Bolt	No.	455.00	48	21,840.00
11	Disc insulator (B&S) 70 KN polymer	No.	1,495.00	48	71,760.00
12	Earthing of Support ( Coil Type )	EA	215.80	8	1,726.40
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	2.096	204.36
14	PG Clamp for 100 sq.mm AAA conductor	NO.	754.00	48	36,192.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.551 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	16	2,600.00
16	H.T. Stay set (Complete )	Set	1,365.00	16	21,840.00
17	H.T. Stay Insulator Type-C	No.	65.00	16	1,040.00
18	7/10 SWG Stay Wire 15kg /stay				

Annexure-1					
11kV Line Length with 40 Mtr. Span using 100 SQ.MM. -AAA Conductor					
2	11 KV V cross Arm (10.2 K.g. each )	No.	1,053.00	54	56,862.00
3	Top bracket 100x50X6 mm GI channel (2kg each)	No.	195.00	54	10,530.00
4	Danger Plate, 1 no's. for each pole	No.	104.00	54	5,616.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	16.25	1,584.24
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	162.00	16,848.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	64.99	6,336.95
8	11 KV pin insulator polymer, 3 Nos. required for each support	No.	260.00	162	42,120.00
9	Earthing of Support ( Coil Type )	No.	215.80	54	11,653.20
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	14.15	1,379.43
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	101.40	78.30	7,939.62
12	100 mm2 AAAC	Mtr.	71.50	18540.00	13,25,610.00
13	Crimping type Midspan Compression Joint for 100 sq.mm AAA conductor	EA	175.25	18	3,154.50
14	Black Paint	Ltr	286.00	54.0	15,444.00
15	Yellow Colour Paint for Background	Ltr	216.00	108.0	23,328.00
A	Total Cost of materials				31,30,099.94
B	Stock, Storage & Insurance i.e 3% of A				93,903.00
C	Sub Total (A+B)				32,24,002.94
D	Contingency @ 3% of C				96,720.09
E	Tools & Plants @ 2% of C				64,480.06
F	Transportation @ 7.5% of C				2,41,800.22
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				82,487.24
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				1,57,425.81
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				38,66,916.36
Civil & Services					
1	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	24.30	1,57,950.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	6.08	39,487.50
3	Dismantling of 09/11 Mtr. Joist/WPB Pole- 116X100mm (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within 10km /site store and refilling the pit with loose earth and ramming including removal and disposal of malba at proper location as per instruction of EIC.	EA	1,350.00	30.00	40,500.00
4	Dismantling of ACSR/AAAC 34/ 55/80 mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	Mtr.	6.30	18540.00	1,16,802.00
5	Dismantling of 11kV Pin and Disc Insulator including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90.00	729.00
K	Total Civil & Services				3,55,468.50
L	Total Material+Services (I+K)				42,22,384.86
N	Sub Total (L+M)				42,22,384.86
O	Total GST @ 18% of (N)				7,60,029.28
O1	Total CESS @ 1% of (N)				42,223.85
P	Gross Total Material +Services (N+O+O1) for 11 KV Pin Points With WPB				50,24,637.99
Gross Total Summary					
1	Gross Total Material +Services (N+O+O1) for DP Without AB Switch				3,24,815.19
2	Gross Total Material +Services (N+O+O1) for DP With AB Switch				9,28,322.20
3	Gross Total Material +Services (N+O+O1) for 11 KV Cut Point with 180 Degree Angle				3,17,082.68
4	Gross Total Material +Services (N+O+O1) for 11 KV Cut Point with 90 Degree Angle				7,83,538.89
5	Gross Total Material +Services (N+O+O1) for 11 KV Pin Points With WPB				50,24,637.99
Q	Gross Total Material +Services				73,78,396.94
R	Inspection Fee of Over Head Line (HT) - Rs. 375 up to 1 km.				
S	Inspection Fee of Over Head Line (HT) - Rs. 225/ Additional Km				
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				73,79,146.94

Annexure-2			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CED	
Name of the Sub-Division : -		CHOUDWAR	
Name of the Section : -		TANGI	
Name of the Work :-		Construction of 2X5 MVA, 33/11kV PSS at Biswanakanhi along with 33 KV line (O/H & U/G) from Mania Grid and connectivity from 33kV Industrial feeder (Mania Grid) to proposed Biswanakanhi PSS and 11kV associated outgoing feeders.	
Scope of work:-		Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work. Construction of 2Ckm 33kV, 1CX630sqmm line from Mania Grid to Proposed Biswanahakani PSS and 4Ckm 33kV, 1CX630sqmm line from 33kV consumer -Som Distelleries. Construction of 33kV O/H Line of 10Ckm with 232sqmm OH conductor from Mania Grid to Proposed Biswanahakani PSS. Construction of 11kV U/G Line with 3CX400sqmm Cable- 3Ckm. Augmentation of existing 11kV line from 34/55/80 sqmm to 100sqmm AAAC. of length 10Ckm.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount (In Cr.)
1	A	Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work.	₹ 9,49,63,176.06
2	B	Construction of 2Ckm 33kV, 1CX630sqmm line from Mania Grid to Proposed Biswanahakani PSS and 4Ckm 33kV, 1CX630sqmm line from 33kV consumer -Som Distelleries.	₹ 8,68,24,123.27
3	C	Construction of 33kV O/H Line of 10Ckm with 232sqmm OH conductor from Mania Grid to Proposed Biswanahakani PSS.	₹ 3,66,31,422.30
4	D	Construction of 11kV U/G Line with 3CX400sqmm Cable- 3Ckm.	₹ 2,26,08,437.19
5	E	Augmentation of existing 11kV line from 34/55/80 sqmm to 100sqmm AAAC. of length 10Ckm.	₹ 1,18,48,194.29
		Total Amount	₹ 25,28,75,353.11
		Total Amount (In Cr)	₹ 25.29
Total estimated cost is Rs. 25.29/- Crore.			

Annexure-2					
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
Sl. No.	DESCRIPTION OF ITEMS	UNITS	Total Quantity	Basic Unit price (In Rs.)	Total
<b>SUPPLY OF FOLLOWING EQUIPMENT &amp; MATERIALS</b> (As per Technical Specification)					
<b>33kV Equipment (Indoor Type)</b>					
1	<b>36kV Indoor AIS Equipment and accessories for 33/11kV AIS Substation as detailed below</b>				
1.1	33kV Incoming Line Feeder Indoor AIS Panel consisting of 36kV VCB Breaker (2 no.s), Transformer Indoor AIS Panel ( 2no.s), 33kV Bus coupler Indoor AIS Panel (1 no.s) and 2 no PT panel - Total 7No's Switch panel board . CTR 800-400/5-5 for Incoming & Bus-coupler, 600-300/5-5-5 for Transformer . Bus Bar size 1250Amp. Each Breaker Rating is 1250Amp & Draw out type.The module shall be provided with complete Feeder & Transformer Feeder protection system to suit for SCADA (BCPU, Numerical Differential Relay having inbuilt of REF protection, Multi-function Meter & other provisions as per tech spec).Energy meter shall be provided on each Incoming & outgoing breaker.	Set	1	91,75,000.00	91,75,000.00
2	30kV, 10kA, Metal Oxide, Class-2 (Station Class), Surge Arrester (for 33kV Incoming Line, HT side of 2nos. Power Transformers and 33/0.433kV Station Transformer) - Outdoor Type with Surge Counter	Nos.	9	13,455.00	1,21,095.00
3	12kV, 10kA, Metal Oxide, Class-2 (Station Class), Surge Arrester with out surge counter( For Transformers - Outdoor type	Nos.	6	4,615.00	27,690.00
<b>11kV Equipment (Indoor Type)</b>					
4	11kV Indoor Air Insulated switchgear Panel consisting of Breaker-1250A, Busbar-12500A(Copper) & CT (600-1200/5-5-5A) of 2 Nos. for Transformer Protection, Air Insulated switchgear Panel consisting of Breaker-630A Busbar-1250A (Copper) CT (300-600/5-5A) of 6 Nos. for Feeder protection, 1 No. of 11kV Bus-Coupler Indoor AIS Panel consisting of Breaker-1250A, Bus-bar-1250A (Copper), Relay, CT (600-1200/5-5A), 2 Nos. 11kV, 2 Core, Single Phase, IVT (11/√3 kV / 110/√3-110/√3V), 3nos in a set, in a separate draw out chamber with Digital Voltmeter inside Control Room separately for Bus-1 & Bus-2 plug in type with disconnecter. Relays to be installed on the panel, Multi-function Meter to be installed above the panel, Energy meter to be installed on the panel, as per technical specification and scope of work.	No	1	68,00,000.00	68,00,000.00
<b>SCADA</b>					
8	SITC for SCADA FOR Primary Substation	Set	1	10,77,965.01	10,77,965.01
<b>Transformer and Accessories</b>					
9	5 MVA, 33/11kV Power Transformer DYn11 (Outdoor Installation) with Accessories including NIDS System	No.	2	85,80,229.00	1,71,60,458.00
10	100 KVA 33/0.433kV Energy efficient Station Transformer with HV & LV BOX	No	1	4,24,320.00	4,24,320.00
11	SITC OF TMU	No	2	3,00,000.00	6,00,000.00
12	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	1	17,87,101.00	17,87,101.00
13	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	No.s	1	3,71,530.24	3,71,530.24
<b>Substation Earthing System GI</b>					
12	Earthing Conductor 75X10 mm (5.89 Kg/Mtr.) GI Flat for laying (spacing maximum <b>2m both ways</b> )	Kg	5301.00	97.50	5,16,847.50
13	Earthing Conductor: 50X6 mm (2.4Kg./Mtr.) <b>GI Flat</b> for Raiser from the burial earth mat to equipment, structure etc.)	Kg	720.00	97.50	70,200.00
14	Earthing Device & Associated Accessories (Heavy duty GI Perforated Pipe of ID=40mm & OD=50mm with 3000mm long for treated Earth Pit) as per Drawing	No	40.00	1,365.00	54,600.00
<b>33, 11 and Station Trf Structure</b>					
15	(125x70x5) mm RS GI joist 5Mtr (13.3kg / Mtr) (04 nos for one Power Transformer) for supporting of 33kV Cable & 11kV cable (Unit Wt=0.0665 MT) & 10 mm thick MS plate size 250X250 mm at the bottom of the RS Joist duly welded & the MS plate to be suitably grouted to the floor for the rigidity.	Kg	532.00	97.50	51,870.00
16	(100 x 50 x5) mm GI Channel (9.56kg / Mtr) (2Mtr - 06 nos for one Power Transformer) for supporting of 33kV & 11kV power Cable (Unit Wt=0.01912 MT)	Kg	229.44	76.00	17,437.44
17	GI Nuts & Bolts etc. for column and beam & Equipment Structures	Kg	500.00	101.40	50,700.00
18	Supply & Erection of GI Pipe of dia. 150mm, Class-B	Mtr.	200.00	1,463.40	2,92,680.00
19	High Density Polyethylene (HDPE) pipe 160 mm diameter.	KM	0.01	7,75,400.00	7,754.00
20	LTDB for 100KVA, 33/0.433kV Station Transformer	Nos	1.00	31,744.70	31,744.70
21	Supply and installation of 8way LDB with accessories	Nos.	2.00	11,648.00	23,296.00
<b>33 and 11 kv Power and Control, XLPE cables</b>					
22	1C X 400 sqmm, 33 KV, XLPE, Power cable Armored, aluminium conductor, stranded, including their termination materials like glands, lugs, tagging etc. as required as per technical specifications and scope of the works. (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	KM	1.20	10,17,900.00	12,21,480.00
22.1	33 KV 1C X 400 sq.mm. Heat Shrink <b>In Door cable termination kit</b> complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	6,802.90	1,08,846.40
22.2	33 KV 1C X 400 sq.mm. Heat Shrink <b>Out Door cable termination kit</b> complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	8,929.70	1,42,875.20
22.3	Supply of 33kV, 3Core, 95sqmm Aluminium, XLPE insulation UG Cable with spare (SC rating of cable in kA- 9kA and SC rating of Armour in kA- 9kA) For Station Trf	Mtr.	100.00	1,331.20	1,33,120.00
22.4	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 3Core, 95sqmm, HT UG Cable kits For Station Trf	Set	2.00	25,199.20	50,398.40
22.5	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 3Core, 95sqmm, HT UG Cable kits For Station Trf	Set	2.00	15,545.40	31,090.80
23	3C X 400 sqmm, 11 KV, XLPE, 3 phase Power cable Armored, aluminium conductor, stranded, including their termination materials like glands, lugs, tagging etc. as required as per technical specifications and scope of the works.	KM	1.50	19,50,000.00	29,25,000.00
24	11 KV, 3C X 400 sqmm Heat Shrink In Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	20.00	12,456.60	2,49,132.00
25	11 KV, 3C X 400 sqmm Heat Shrink Out Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	18,075.20	2,89,203.20
26	<b>Control Cables (Copper Armoured)</b>				
26.1	4 Core x 2.5 mm <sup>2</sup>	Km	0.70	1,17,800.00	82,460.00
26.2	7 Core x 2.5 mm <sup>2</sup>	Km	0.70	1,84,240.00	1,28,968.00
26.3	10 Core x 2.5 mm <sup>2</sup>	Km	0.50	4,29,000.00	2,14,500.00
26.4	12 Core x 2.5 mm <sup>2</sup>	Km	0.50	3,95,000.00	1,97,500.00
26.5	1 Core x 16 mm2 Aluminium cable from Battery to Battery Charger & Battery Charger to DCDB	Km	0.30	1,66,815.82	50,044.75
27	<b>1.1 kV XLPE Power Cables</b>				
27.1	3 1/2 Core x 120 mm2 (for Station Transformer output )	Km	0.15	4,77,085.48	71,562.82
27.2	3 1/2 Core x 95 mm2 (for Oil Filtration Machine Connection )	Km	0.10	3,81,281.47	38,128.15
27.3	3 1/2 Core x 25 mm2 ( for Switchyard Lighting )	Km	0.30	1,32,740.13	39,822.04
27.4	4 Core 16 mm2 (for Switchyard Lighting )	Km	0.30	1,54,222.40	46,266.72
27.5	2 Core 16 mm2 (for Switchyard Lighting )	Km	0.30	1,34,337.02	40,301.11
<b>Battery &amp; Battery Charger</b>					
28	48 V, 150 AH, maintenance free VRLA Battery (Set. 4 Nos of 12V Battery with 150AH)	Set	1.00	74,945.00	74,945.00
29	48V, Float cum Boost Battery Charger (15 A float charging, 20 A boost charging)	No	1.00	1,87,356.00	1,87,356.00
<b>Sub-station Lighting And Fire Fighting System</b>					

Annexure-2					
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
30	Sub-Station Switchyard Lighting , Control Room Lighting (it includes supply of fixtures & Lamps (LED) with switch gear, GI Conduit etc.(120Wx 4 sets and 100Wx6 sets out side the control room, 18 Watt LED tube inside control room .Control Room wiring to be done with Copper wires as per the requirement (Lighting fixtures are to be fixed rigidly on the Column at a suitable height with GI tubular pole so that the required lux as per the technical specification is maintained). (Minimum requirement will be - GI Tubular pole -10No's., 2x18watt-27No's., 1x18watt-18No's, 120Wx 4 sets and 100Wx6 ),	Lot	1.00	4,00,000.00	4,00,000.00
31	1.5 Ton capacity Split Air Conditioning units with Remote control facility: Including supply of split Air conditioner 5 Star rated, voltage stabiliser, control boxes (25Amp MCCB & 25Amp switch ), Remote etc. for completing the A.C scheme of control room. Each AC will have its own control through respective switch, as per technical specification and scope of work.	No	4.00	53,750.00	2,15,000.00
32	1400 mm sweep 250Volt A/C Ceiling Fan	No	5.00	3,125.00	15,625.00
33	300 mm sweep 70W A/C Exhaust Fan ( for Battery room and Toilet )	No	4.00	2,500.00	10,000.00
<b>Fire Detection Alarm System</b>					
33.1	Main Fire ALARM Control Panel (UI /FM /ULC/Vds Approved), Intelligent Addressable Modular Fire Alarm Control Panel based on 32 bit microprocessors including the following as per specification, A. Battery charger, B. SMF Batteries for 72 Hrs. back-up, C. Enclosure, D. min.240 character LCD display, (Other specification as mentioned), E. The panel should be modular, decentralized, with CPU /master control unit, loop cards, relay and interface card by means of duplicated electronics means hardware redundancy with full functionality, F. The panel must provide MODBUS/ RS485 port for integration with SCADA, G. The loop should be capable to have at least 50 elements / devices., as per technical specification and scope of work.	EA	1	3,09,921.34	309921.337
33.2	Intelligent Addressable multi sensor Detector- (Smoke + Fixed Tempt. + Rate of rise tempt.) For ceiling (UL /FM /ULC/Vds Approved) inclusive base and other installation accessories. (must have inbuilt short circuit isolator), as per technical specification and scope of work.	EA	6	7,944.91	47,669.47
33.3	Intelligent Addressable multi sensor Detector- (Smoke + Fixed Tempt. + Rate of rise tempt.) For trench (UL /FM /ULC/Vds Approved) inclusive base and other installation accessories. (must have inbuilt short circuit isolator), as per technical specification and scope of work.	EA	2	7,944.91	15,889.82
33.4	Response Indicator (Twin LED transparent type), as per technical specification and scope of work.	EA	2	81.73	163.45
33.5	Addressable manual Call Point (must have inbuilt short circuit isolator,) (UL /FM /ULC/Vds Approved), as per technical specification and scope of work.	EA	1	8,699.15	8,699.15
33.6	Electronic Hooter/Multi tone sounder (must have inbuilt short circuit isolator,) (UL /FM /ULC/Vds Approved) Indoor type, as per technical specification and scope of work.	EA	1	7,652.85	7,652.85
33.7	2 Core X 1.5 sq.mm copper conductor, armored, RED colour FRLS PVC sheathed signal Cable, as per technical specification and scope of work.	M	150	143.67	21,550.01
33.8	4C X 2.5sqmm copper armoured FRLS cable with accessories (Gland, lug, saddle, etc.), as per technical specification and scope of work.	M	15	251.20	3,768.03
33.9	Steel wire reinforced flexible conduct pipe (16MM) with all accessories, as per technical specification and scope of work.	M	15	163.45	2,451.80
33.1	Surge Arrester for fire Alarm system, as per technical specification and scope of work.	EA	1	5,814.42	5,814.42
33.1	Lightning Rod in Top of PSS Building, as per technical specification and scope of work.	EA	1	5,129.42	5,129.42
34	<b>Fire Fighting System (portable and wheel mounted sets for control room)</b>				
34.1	Foam type- 9 Ltrs	No	2.00	3,978.80	7,957.59
34.2	CO <sub>2</sub> - 4.5 Kgs	No	2.00	9,678.15	19,356.30
34.3	Dry powder 4.5 Kg	No	2.00	3,494.89	6,989.78
34.4	Fire Bucket with GI Stand with GI Canopy arrangement (4nos. in one Stand=1 Set)	Set	1.00	4,516.47	4,516.47
<b>AC &amp; DC System for Auxiliary supply</b>					
35	<b>AC System</b>				
35.1	ACDB (as per specification)	Lot	1	1,20,375.00	1,20,375.00
35.2	Main Lighting Distribution Board (as per specification)	Lot	1	45,000.00	45,000.00
35.3	Indoor Lighting Distribution Board as per specification	Lot	1	42,500.00	42,500.00
35.4	Receptable Panel near Power Transformer	No	1	32,000.00	32,000.00
36	<b>DC System</b>				
36.1	48 V DC Distribution Board as per specification .	No	2	82,500.00	1,65,000.00
37	Water Cooler with water purifier system as per Technical Specification	No	1	14,459.81	14,459.81
37.1	Wall mounted water purifier system	No	1	51,997.00	51,997.00
38	Maintenance Testing Equipment as per Technical Specification	Lot	1	4,97,500.00	4,97,500.00
39	Tools and Plants (T&P's) Requirement as per Technical Specification	Lot	1	62,500.00	62,500.00
40	Office Furniture as per Technical Specification	Lot	1	2,50,000.00	2,50,000.00
41	<b>Supply of Materials for Installation of Power Transformer on Plinth (as per Drawing)</b>				
41.1	90 lb Rail 5.4 mts ( 2.7x2) 44.62 kg per mtr / Transformer each (Unit Wt=0.240 MT)	Nos	2	21,246.48	42,492.96
41.2	Supply including Fabrication works ( Cutting, welding& Supply in position etc) (300x300x10) mm GI plate each (Unit Wt=0.007065MT)	No.s	24	1,990.00	47,760.00
41.3	(65x65x5) mm GI angle of 5.4 mts length.4.9 kg/mtr. / Transformer each (Unit Wt=0.026 MT)	Nos	6	2,778.30	16,669.80
41.4	Supply of GI Chequered plate 1000X300X5.6mm thick for Cable Trench in side Control Room	Nos	2	100.00	200.00
42	GI Spikes with cone and GI (2 nos).	Kg	640.00	1,537.50	9,84,000.00
43	<b>33KV Line DP-2No's</b>				
43.1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	4.00	34,322.00	1,37,288.00
43.2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	164.43	76.00	12,496.83
43.3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required =( 6x2.36x0.280)	KG	7.93	97.50	773.14
43.4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	61.40	76.00	4,666.70
43.5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	122.81	76.00	9,333.41
43.6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	245.62	76.00	18,666.82
43.7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required =( 4*4.5*4.927)	KG	177.37	76.00	13,480.27
43.8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	11.42	76.00	868.22
43.9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required =( 1*4.5*0.388)	KG	3.49	76.00	265.39
43.10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required =( 1*4.5*0.340)	KG	3.06	76.00	232.56
43.11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	19.12	76.00	1,453.12
43.12	Danger Plate, 2 no's.	No.	4.00	104.00	416.00
43.13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's =( 2x0.59x0.510)	KG	1.20	97.50	117.35

Annexure-2					
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
43.14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	4.00	162.50	650.00
43.15	H.T. Stay set (Complete )	Set	4.00	1,365.00	5,460.00
43.16	H.T. Stay Insulator Type-C (2 No's.)	No.	8.00	65.00	520.00
43.17	7/8 SWG Stay Wire 15kg /stay	K.g.	60.00	97.50	5,850.00
43.18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	4.00	1,365.00	5,460.00
43.19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	113.28	97.50	11,044.80
43.20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	12.00	104.00	1,248.00
43.21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	4.81	97.50	469.40
43.22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	6.00	13,455.00	80,730.00
43.23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	2.00	1,31,157.00	2,62,314.00
43.24	33KV pin insulator polymer	No.	6.00	624.00	3,744.00
43.25	Non Metallic Ties 33KV (For covered conductor)	No.	6.00	331.00	1,986.00
43.26	241 sq.mm AAA conductor	Mtr.	6180.00	386.00	23,85,480.00
43.27	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	12.00	915.00	10,980.00
43.28	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	8.00	332.00	2,656.00
43.29	H W fitting(B&S)90KN,4 Bolt	No.	12.00	650.00	7,800.00
43.30	Disc insulator (B&S) 90 KN polymer	No.	12.00	1,495.00	17,940.00
43.31	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	44.30	101.40	4,492.02
43.32	Black Paint	Ltr	2.00	286.00	572.00
43.33	Yellow Colour Paint for Background	Ltr	4.00	216.00	864.00
44	11KV Line DP-4No's				-
44.1	WPB 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No	8	29,661.00	2,37,288.00
44.2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3 mtr., 2 no's channel required =( 2x9.56x3)	KG	229.44	76.00	17,437.44
44.3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	15.86	97.50	1,546.27
44.4	Isolator switch Mounting Channel 75X40X4.8mm, 7.14KG/Mtr, each channel length 3 Mtr., 2 no's channel required =( 7.14x3x2)	KG	171.36	76.00	13,023.36
44.5	Isolator Switch Side Support Channel 100X50X6mm,9.56 KG/Mtr., each channel length 0.35 mtr., 2 no's channel required =( 9.56x2x0.35)	KG	26.77	76.00	2,034.37
44.6	Channel Support for down Pipe 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 7.14x0.8x1)	KG	22.85	76.00	1,736.45
44.7	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.66 Mtr., 4 no's channel required =( 7.14x3x4)	KG	342.72	76.00	26,046.72
44.8	50x50x6mm.GI Bracing Angle, 4.5Kg /mtr., each angle length 3.512 mtr., 4 nos angle required = (4.5x3.512x4)	KG	252.86	76.00	19,217.66
44.9	Danger Plate, 2 no's.	No.	8	104.00	832.00
44.10	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	2.41	97.50	234.70
44.1	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.551 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	8	162.50	1,300.00
44.1	H.T. Stay set (Complete )	Set	8	1,365.00	10,920.00
44.1	H.T. Stay Insulator Type-C	No.	8	65.00	520.00
44.1	7/10 SWG Stay Wire 15kg /stay	K.g.	120	97.50	11,700.00
44.2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	8	1,365.00	10,920.00
44.2	50x6mm GI Flat for earthing, 2.36kg/mtr., (12.5 Mtr. For L.A, 3 Mtr for AB Switch Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 20.5x2.36	KG	193.52	97.50	18,868.20
44.2	GI barbed wire anticlimbing device 3 Kg. Per support, 2 no's qty. required =(2x3kg)	Kg	24	104.00	2,496.00
44.2	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	9.63	97.50	938.81
44.2	Lightning Arrester(11KV,10KA) (Station Class,class-2)	EA	12.00	4,615.00	55,380.00
44.20	11KV 400 AMP isolator without earth switch with PI(polymer)	Set	4	47,529.00	1,90,116.00
44.2	11 KV pin insulator polymer	No.	12	260.00	3,120.00
44.2	H W fitting(B&S) 70KN, 3Bolt	No.	24	455.00	10,920.00
44.2	Disc insulator (B&S) 70 KN polymer	No.	24	1,495.00	35,880.00
44.2	PG Clamp for suitable size of AAA conductor	NO.	24	754.00	18,096.00
44.3	GI Nut , Bolt & Washer of different sizes (13.718 Kg each DP with AB Switch)	K.g.	54.87	101.40	5,564.02
44.3	Black Paint	Ltr	4	286.00	1,144.00
44.3	Yellow Colour Paint for Background	Ltr	8	216.00	1,728.00
.	Sub-Total for SUPPLY OF EQUIPMENT & MATERIALS (In Rs.)				5,21,75,224.99
.	Total Cost in Cr.				5.22
<b>ERECTION, TESTING &amp; COMMISSIONING WORKS OF FOLLOWING EQUIPMENT</b>					
<b>(As per Technical Specification)</b>					
<b>33kV Equipment (Indoor Type)</b>					
1	<b>Erection, Commissioning, Testing of 33kV Equipment for (INDOOR Sub-Station )</b>				
1.1	33kV Incoming Line Feeder Indoor AIS Panel consisting of 36kV VCB Breaker (2 no.s), Transformer Indoor AIS Panel ( 2no.s), 33kV Bus coupler Indoor AIS Panel (1 no.s) and 2 no PT panel - Total 7No's Switch panel board . CTR 800-400/5-5 for Incoming & Bus-coupler, 600-300/5-5-5 for Transformer . Bus Bar size 1250Amp. Each Breaker Rating is 1250Amp & Draw out type.The module shall be provided with complete Feeder & Transformer Feeder protection system to suit for SCADA ( BCPu, Numerical Differential Relay having inbuilt of REF protection, Multi-function Meter & other provisions as per tech spec).Energy meter shall be provided on each Incoming & outgoing breaker.	Set	1.00	94,500.00	94,500.00
<b>Erection, Commissioning, Testing of 11kV Equipment (Indoor Type)</b>					
2	30kV, 10kA, Metal Oxide, Class-2 (Station Class), Surge Arrester (for 33kV Incoming Line, HT side of 2nos. Power Transformers and 33/0.433kV Station Transformer) - Outdoor Type with Surge Counter	Nos.	9.00	675.00	6,075.00
3	12kV, 10kA, Metal oxide, Class-2 (Station Class), Surge Arrester with out surge counter( For Transformers & Out Going Feeders) - Outdoor type	Nos.	6.00	337.50	2,025.00
4	11kv 1250A VCB 13 panel board Switchgear ( 2 incoming, 8 Outgoing, 1 Bus coupler, 2 Bus PT	No	2.00	9,85,595.00	19,71,190.00
<b>Erection, Commissioning, Testing of SCADA</b>					
8	SCADA FOR Primary Substation	Set	1.00	0.00	0.00
<b>Erection, Commissioning, Testing of Transformer and RMU</b>					
9	5 MVA, 33/11kV Power Transformer DYn11 (Outdoor Installation) with Accessories	No.	2.00	1,61,700.00	3,23,400.00
10	100 KVA 33/0.433kV Energy efficient Station Transformer along with HT & LT cable connection	No	1.00	6,750.00	6,750.00
11	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	No	1.00	8,000.00	8,000.00
12	Services of FRTU Panel, Communication and Other Supplied System	NO	1.00	16,000.00	16,000.00
13	Erection, Testing & Commissioning of Transformer Monitoring Unit, as per technical specification and scope of work.	NO	2.00	27,000.00	54,000.00
<b>Erection, Laying of Substation Earthing System GI</b>					
12	Earthing Conductor 75X10 mm (5.89 Kg/Mtr.) GI Flat for laying (spacing maximum 2m both ways)	Kg	5301.00	13.50	71,563.50
13	Earthing Conductor: 50X6 mm (2.4Kg./Mtr.) GI Flat for Raiser from the burial earth mat to equipment, structure etc.)	Kg	720.00	13.50	9,720.00
14	Earthing Device & Associated Accessories (Heavy duty GI Perforated Pipe of ID=40mm & OD=50mm with 3000mm long for treated Earth Pit) as per Drawing	No	40.00	2,025.00	81,000.00
<b>Erection of System GI 33, 11 and Station Trf Structure</b>					

Annexure-2					
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
15	(125x70x5) mm RS GI Joist 5Mtr (13.3kg / Mtr) (04 nos for one Power Transformer) for supporting of 33kV Cable & 11kV cable (Unit Wt=0.0665 MT) & 10 mm thick MS plate size 250X250 mm at the bottom of the RS Joist duly welded & the MS plate to be suitably grouted to the floor for the rigidity.	Kg	532.00	13.50	7,182.00
16	(100 x 50 x5) mm GI Channel (9.56kg / Mtr) (2Mtr - 06 nos for one Power Transformer) for supporting of 33kV & 11kV power Cable (Unit Wt=0.01912 MT)	Kg	229.44	13.50	3,097.44
17	GI Nuts & Bolts etc. for column and beam & Equipment Structures	Kg	500.00	13.50	6,750.00
18	GI Pipe of dia. 150mm, Class-B for Cable rising, as per technical specification and scope of work.	Kg	200.00	67.50	13,500.00
19	High Density Polyethylene (HDPE) pipe 160 mm diameter.	KM	0.01	1,16,137.80	1,161.38
20	LTDB for 100KVA, 33/0.433kV Station Transformer along with all cable connection & fixing	Nos	1.00	2,025.00	2,025.00
<b>Laying of 11kV 33 and 11 kv Power and Control cables</b>					
21	1C X 400 sqmm, 33 KV, XLPE, Power cable Armored, aluminium conductor, stranded, including their termination materials like glands, lugs, tagging etc. as required as per technical specifications and scope of the works.	KM	1.20	2,02,500.00	2,43,000.00
22.1	33 KV 1C X 400 sq.mm. Heat Shrink In Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	3,375.00	54,000.00
22.2	33 KV 1C X 400 sq.mm. Heat Shrink Out Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	3,375.00	54,000.00
22.3	Laying, Commissioning & Testing of 33kV, 3Core, 1Run, 95sqmm, XLPE insulation (extruded type) UG cable with spare by open trench method.	Mtr.	100.00	94.50	9,450.00
22.5	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 3Core, 95sqmm, HT UG cable kits	Set	2.00	1,900.80	3,801.60
22.6	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 3Core, 95sqmm, HT UG cable kits	Set	2.00	1,900.80	3,801.60
23	3C X 400 sqmm, 11 KV, XLPE, 3 phase Power cable Armored, aluminium conductor, stranded, including their termination materials like glands, lugs, tagging etc. as required as per technical specifications and scope of the works.	KM	1.50	2,02,500.00	3,03,750.00
24.1	11 KV, 3C X 400 sqmm Heat Shrink In Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	20.00	3,375.00	67,500.00
24.2	11 KV, 3C X 400 sqmm Heat Shrink Out Door cable termination kit complete with all accessories and tagging etc. as per technical specifications and scope of the works.	Set.	16.00	3,375.00	54,000.00
25	<b>Control Cables (Copper Armoured)</b>				
25.1	4 Core x 2.5 mm <sup>2</sup>	Km	0.70	15,000.00	10,500.00
25.2	7 Core x 2.5 mm <sup>2</sup>	Km	0.70	17,000.00	11,900.00
25.3	10 Core x 2.5 mm <sup>2</sup>	Km	0.50	19,000.00	9,500.00
25.4	12 Core x 2.5 mm <sup>2</sup>	Km	0.50	20,000.00	10,000.00
25.5	1 Core x 16 mm <sup>2</sup> Aluminium cable from Battery to Battery Charger & Battery Charger to DCDB	Km	0.30	10,000.00	3,000.00
26	<b>Laying of 1.1 kV XLPE Power Cables</b>				
26.1	3 1/2 Core x 120 mm <sup>2</sup> (for Station Transformer output )	Km	0.15	67,500.00	10,125.00
26.2	3 1/2 Core x 95 mm <sup>2</sup> (for Oil Filtration Machine Connection )	Km	0.10	67,500.00	6,750.00
26.3	3 1/2 Core x 25 mm <sup>2</sup> ( for Switchyard Lighting )	Km	0.30	33,750.00	10,125.00
26.4	4 Core 16 mm <sup>2</sup> (for Switchyard Lighting )	Km	0.30	33,750.00	10,125.00
26.5	2 Core 16 mm <sup>2</sup> (for Switchyard Lighting )	Km	0.30	20,250.00	6,075.00
<b>Erection, Commissioning , Wiring &amp; Testing of Battery &amp; Battery Charger</b>					
27	48 V, 100 AH, maintenance free VRLA Battery (Set. 4 Nos of 12V Battery with 150AH)	Set	1.00	3,375.00	3,375.00
28	48V, Float cum Boost Battery Charger (15 A float charging, 25 A boost charging)	No	1.00	4,050.00	4,050.00
<b>Erection, Commissioning , Wiring &amp; Testing of Sub-station Lighting And Fire Fighting System</b>					
29	Sub-Station Switchyard Lighting , Control Room Lighting (it includes supply of fixtures & Lamps (LED) with switch gear, GI Conduit etc.(120Wx4 sets and 100Wx6 sets out side the control room, 20 Watt CFL tube-10 sets inside control room .Control Room wiring to be done with Copper wires as per the requirement (Lighting fixtures are to be fixed rigidly on the Column at a suitable height with GI tubular pole so that the required lux as per the technical specification is maintained).	Lot	1.00	1,01,250.00	1,01,250.00
30	1.5 Ton capacity Split Air Conditioning units with Remote control facility: Including supply of split Air conditioner 5 Star rated, voltage stabiliser, control boxes etc. for completing the A.C scheme. (As per specification) for control room.	No	4.00	3,645.00	14,580.00
31	1400 mm sweep 250Volt A/C Ceiling Fan	No	5.00	675.00	3,375.00
32	300 mm sweep 70W A/C Exhaust Fan ( for Battery room and Toilet )	No	4.00	675.00	2,700.00
<b>Erection, Testing &amp; Commissioning of Fire Detection Alarm System, as per technical specification and scope of work.</b>					
32.1	Main Fire ALARM Control Panel (UI /FM /ULc/Vds Approved), Intelligent Addressable Modular Fire Alarm Control Panel based on 32 bit microprocessors including the following as per specification, A. Battery charger, B. SMF Batteries for 72 Hrs. back-up, C. Enclosure, D. min.240 character LCD display, (Other specification as mentioned), E. The panel should be modular, decentralized, with CPU /master control unit, loop cards, relay and interface card by means of duplicated electronics means hardware redundancy with full functionality, F. The panel must provide MODBUS/ RS485 port for integration with SCADA, G. The loop should be capable to have at least 50 elements / devices., as per technical specification and scope of work.	No's.	1.00	22,646.87	22,646.87
32.2	Intelligent Addressable multi sensor Detector- (Smoke + Fixed Tempt. + Rate of rise tempt.) For ceiling (UL /FM /ULC/Vds Approved) inclusive base and other installation accessories. (must have inbuilt short circuit isolator), as per technical specification and scope of work.	No's.	6.00	377.45	2,264.69
32.3	Intelligent Addressable multi sensor Detector- (Smoke + Fixed Tempt. + Rate of rise tempt.) For trench (UL /FM /ULC/Vds Approved) inclusive base and other installation accessories. (must have inbuilt short circuit isolator), as per technical specification and scope of work.	No's.	2.00	377.45	754.90
32.4	Response Indicator (Twin LED transparent type), as per technical specification and scope of work.	No's.	2.00	377.45	754.90
32.5	Addressable manual Call Point (must have inbuilt short circuit isolator,) (UL /FM /ULC/Vds Approved), as per technical specification and scope of work.	No's.	1.00	377.45	377.45
32.6	Electronic Hooter/Multi tone sounder (must have inbuilt short circuit isolator,)( UL /FM /ULC/Vds Approved) Indoor type, as per technical specification and scope of work.	No's.	1.00	377.45	377.45
32.7	2 Core X 1.5 sq.mm copper conductor, armored, RED colour FRLS PVC sheathed signal Cable, as per technical specification and scope of work.	Mtr.	150.00	58.07	8,710.34
32.8	4C X 2.5sqmm copper armoured FRLS cable with accessories (Gland, lug, saddle, etc.), as per technical specification and scope of work.	Mtr.	15.00	81.30	1,219.45
32.9	Steel wire reinforced flexible conduct pipe (16MM) with all accessories, as per technical specification and scope of work.	Mtr.	15.00	40.65	609.72
32.1	Surge Arrester for fire Alarm system, as per technical specification and scope of work.	No's.	1.00	2,555.03	2,555.03
32.1	Lightning Rod in Top of PSS Building, as per technical specification and scope of work.	No's.	1.00	2,206.62	2,206.62
33	<b>Erection, Commissioning of Fire Fighting System (portable and wheel mounted sets for control room)</b>				
33.1	Foam type- 9 Ltrs	No	2.00	174.21	348.41
33.2	CO <sub>2</sub> - 4.5 Kgs	No	2.00	174.21	348.41
33.3	Dry powder 4.5 Kg	No	2.00	174.21	348.41
33.4	Fire Bucket with Stand (4nos. in each Stand)	Set	1.00	348.41	348.41
<b>Erection, Commissioning , Wiring &amp; Testing of AC &amp; DC System</b>					
34	<b>AC System</b>				
34.1	ACDB (as per specification)	Lot	1.00	2,700.00	2,700.00
34.2	Main Lighting Distribution Board (as per specification)	Lot	1.00	2,700.00	2,700.00

Annexure-2					
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
34.3	Indoor Lighting Distribution Board as per specification	Lot	1.00	2,700.00	2,700.00
34.4	Receptable Panel near Power Transformer	No	1.00	2,700.00	2,700.00
35	DC System				
35.1	48 V DC Distribution Board as per specification .	No	2.00	2,700.00	5,400.00
36	Erection, Commissioning of Water Cooler with water Purifier System	No	1.00	2,700.00	2,700.00
36.1	Water Cooler with stainless steel stand	No	1.00	2,025.00	2,025.00
37	Commissioning & Testing of Maintenance Testing Equipment	Lot	1.00	1,35,000.00	1,35,000.00
38	Commissioning Tools and Plants (T&P's) Requirement	Lot	1.00	6,750.00	6,750.00
39	Commissioning Office Furniture	Lot	1.00	13,500.00	13,500.00
-	Laying of Materials for Installation of Power Transformer on Plinth ( as per Drawing )				
40	90 lb Rail 5.4 mts ( 2.7x2) 44.62 kg per mtr / Transformer each (Unit Wt=0.240 MT)	Nos	2.00	3,484.13	6,968.27
41	(500x500x10) mm GI plate 6 nos / Transformer each (Unit Wt=0.013 MT)	Nos	6.00	2,903.45	17,420.67
42	(65x65x5) mm GI angle of 5.4 mts length.4.9 kg/mtr. / Transformer each (Unit Wt=0.026 MT)	Nos	2.00	1,742.07	3,484.13
43	Construction of Cable Trench : 2 tier 2 rows U-Type RCC Cable trench with M-20 Grade concrete: The internal width 2000 mm, depth 1005 mm, with 75x75x6 mm support angles fixed RCC wall of 175 X 175 mm, Raft of 175mm & with ladder type cable tray (45x45x5)mm two angles at both side having welded flats of 25x5 mm at a gap of 150mm) for Power & control Cable with RCC Trench Cover Slab as per technical Specification, approved drawing and Direction of Engineer Incharge. Complete work including earth work in excavation in all kind of soil & rock and refilling the cavity by selective soil, leveling the surface around the pit with disposal of surplus earth.	Mtr	71.85	16,989.77	12,20,714.95
44	Chequered plate 1000X300X5.6mm thick for Cable Trench in side Control Room 12 Mtr	KG	638.00	11.61	7,409.59
45	33KV Line DP-2No's Installation				
45.1	Installation/Erection of 13 Mtr long, RS JOIST/WPB Pole including loading and unloading, transportation from site/tent upto 10 Km., excavation, refilling, flooding with water, ramming/compacting of foundation as per TP Central Orissa Distribution Co. Ltd. specifications and drawing including removal & disposal of extra malba as per instruction of EIC. The scope of work include providing & laying of 1:1.5:3 , M20, concrete of size - 500(B)x500(W)x2200(H) , and cooping of 500(B)x500(W				

Annexure-2					
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
46.10	Installation of Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	2.41	27.00	64.99
46.1	Fixing of complete 11KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts BA will do the excavation including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size ( 500mmx500mmx800mm) using 20mm BHG metal with all labour and material as per TPCODL Drawing & Standard	EA	8	2,250.00	18,000.00
46.2	Supply & Installation of Earthing pipe with 40mm dia 3 Mtr long Class-B GI Pipe(Jindal/Tata/Sail/Rinl) with earth chamber as per TP Central Orissa Distribution Co. Ltd. specification and drawing (Each pit resistance will be measured and recorded and shall be as per IS). Scope include supply of all required material like Earth Electrode, Salt, Charcoal, Nuts-Bolt ,40mm dia 3 Mtr GI pipe & PVC Pipe PCC ,and brick work for earthing chamber (Size: 2'x2') and RCC or other suitable slab cover(earth resistance measurement and with in limit to be achieved by BA).Scope of work also includes leveling & ramming of earth and removal of extra malba.	No.	8	4,500.00	36,000.00
46.2	Installation of 50x6mm GI Flat for earthing, 2.36kg/mtr., (12.5 Mtr. For L.A, 3 Mtr for AB Switch Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 20.5x2.36	KM	0.00	49,434.00	164.78
46.2	Installation of GI barbed wire anticlimbing device 3 Kg. Per support, 2 no's qty. required =(2x3kg)	SET	8	94.00	752.00
46.2	INST OF Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	9.63	27.00	259.98
46.2	Installation,Testing & comissioning of Lightning Arrester(11KV,10KA) (Station Class,class-2)	EA	12.00	1,386.00	16,632.00
46.20	Installation of 11KV 400 AMP isolator without earth switch with PI(polymer)	Set	4	9,634.00	38,536.00
46.2	Installation of 11 KV pin insulator polymer	No.	12	18.00	216.00
46.2	Installation of 11KV Polymer Disc Insulator (45KN- 90KN) along with Hardware fitting for 11KV line.Nutbolts will be paid separately	No.	24	45.00	1,080.00
46.2	Installation of All type of Connector PG Clamp	NO.	24	31.00	744.00
46.3	Installation of GI Nut , Bolt & Washer of different sizes	K.g.	54.87	26.40	1,448.62
46.3	Painting of Pole in Black & Yellow strip	Ltr	8	277.00	2,216.00
-	<b>Sub-Total for ERECTION,TESTING &amp; COMMISSIONING WORKS (In Rs.)</b>				<b>54,73,884.91</b>
-	<b>Total Cost in Cr.</b>				<b>0.55</b>
-	<b>Civil Works with supply of all materials like Cement, MS tor rod, Brick, Coarse &amp; Fine Agregrates &amp; Labour,T&amp;P etc.</b>				
1	Contour survey , plotting the contour on graph sheet and marking the finished ground level	Sqr Mtr	2,000.00	81.00	1,62,000.00
2	Cutting for Levelling and disposal of excess earth either in low laying area in sub-station or outside.	Cum	143.00	202.50	28,957.50
3	Filling of S/S area with borrowed earth (rolling & compacting of filled up soil before taking measurement).	Cum	2,320.00	348.41	8,08,319.09
4	<b>OUT DOOR DRAIN to DISCHARGE SWITCHYARD/ WATER FROM WASH BASIN AND CONTROL ROOM ROOF (10 mts</b>				
4.1	Excavation in all type soil (1.35x10x0.7)	Cum	9.45	174.21	1,646.25
4.2	PCC (1:3:6 ) (1.35x10x0.1)	Cum	1.35	5,226.20	7,055.37
4.3	PCC ( 1:2:4 ) (0.3x10x0.05)	Cum	0.15	6,039.17	905.87
4.4	Brick Masonary with cement mortar ( 1:5 ) (0.25x10x0.925+1/2x0.15x0.93x10)+(0.25x10x0.925)	Cum	5.32	6,387.58	33,979.26
4.4	Plastering with Cement mortar(1:6) ( 2x0.25x10+2x0.925x10+1x0.925x10+1x1.0x10 )	Sq-mtr	42.75	325.19	13,901.69
5	<b>Switch Yard and COMPOUND WALL For PILE Foundation for SBC Upto 10, for Open Cast for SBC more than 10 ( FOR 50x40 MTR AREA), as per technical specification and scope of work.</b>				
5.1	Construction of 2.5Mtr height (Above NGL) Compound-wall ( with RCC column & beam with M-20 Grade concrete ) along the property line of the sub-station as per technical specification and instruction of the Engineer in Charge.(the size of the bricks shall be 250mm having 1st class Fly-ash brick having compressive strength with 75kg/cm2). This also includes excavation in all types of soil or rocks, backfilling ,and disposal of excess earth . (Brick works rested on RCC Beam and RCC Column & footings , including Cement Plastering, Cement wash, Wall Painting two coats with weather coat.  Provision of the boundary wall Fencing with GI Grill of 700 mm height (20Kg / Mtr) fixing at the top of the wall. It includes supply of all the materials of the fencing .	Run. Mtr.	180.00	13,704.26	24,66,766.87
5.2	Boring and casting 300 mm dia single under reamed pile of 3.00 m. long with R.C.C. M-20 using 20 mm down graded chips with cost of all materials, Steel Rods, labours, T&P etc. & all other machinaries required for Compound Wall work etc.complete in all respect as per latest specification & direction of the Engineer in charge at a spacing of 3.3m c/c	Run. Mtr.	61.00	4,000.00	2,44,000.00
5.3	Power Transformer with Switch Yard GI Chain Linking Fencing with 2 Mtr Height.	Run. Mtr.	60.00	4,050.00	2,43,000.00
6	<b>Power Transformer Foundation / One (5 MVA)</b>				
6.1	Excavation in all type soil per Tfr.(3X3X1.1 mtr)	Cum	19.80	174.21	3,449.29
6.2	PCC (1:3:6 ) per Tfr.(3X3X0.075 mtr)	Cum	1.35	5,226.20	7,055.37
6.3	RCC ( 1:1.5:3 ) per Tfr. As per drawing	Cum	10.52	11,846.06	1,24,620.50
6.4	RRHG stone grouting with sand per Tfr.	Cum	9.00	2,903.45	26,131.01
6.5	Prefabricated RCC foundation of 33kV RMU	Nos.	1	23,145.30	23,145.30
7	<b>Construction of 100kVA 33/0.4 kV station Trf. Plinth</b>				
7.1	Excavation in all type soil (2.5X2.5X0.750 mtr)	Cum	4.69	174.21	816.59
7.2	PCC (1:3:6 ) (2.5X2.5X0.075 mtr)	Cum	0.47	5,226.20	2,449.78
7.3	RCC ( 1:1.5:3 ) (1.5X1.5X0.1 mtr)	Cum	0.23	11,846.06	2,665.36
7.4	Brick Masonary work (2.5x2.5x.925+2x(.5 x1.5x2.25) (1:5)	Cum	61.19	6,387.58	3,90,839.99
7.5	Cement Plastering (1:6) (1.5x2.25x4)+(1.5x1.5) 20mm thick	Sq Mtr	15.75	325.19	5,121.68
8	<b>Construction of oil sump pit for Transformer (1.6 X 1.6 X 2.3 )</b>				
8.1	Excavation of Earth(2.0x2.0x2.1)	Cum	8.40	174.21	1,463.34
8.2	PCC (1:3:6) 2X2X0.1	Cum	0.40	5,226.20	2,090.48
8.3	RCC(1:1.5:3) 1.6X1.6X0.1 for Top Slab	Cum	0.26	11,846.06	3,032.59
8.4	Brick Masonary work(2x2.1+2x1.6)x0.25x2.3 (1:5)	Cum	4.26	6,387.58	27,179.15
8.5	Cement Plastering (1:6) 2.3 ( 4x2.1+ 4x1.6 )+ 1.6x1.6	Sq.mtr	36.60	325.19	11,901.80
8.6	Drainage for Oil sump pit with 250 dia hume pipe	Mtr	24.00	4,645.51	1,11,492.29
9	<b>ROAD (6 Mtrs wide) Length of the road 20 mtrs</b>				
9.1	Excavation in all type soil 0.5mx1mx5m	Cum	60.00	174.21	10,452.40
9.2	Boulder Packing 0.5mx1mx5m	Cum	60.00	1,742.07	1,04,524.02
9.3	Water base course -I 0.075mx1mx5m	Cum	9.00	2,903.45	26,131.01
9.4	Water base course -II 0.075mx1mx5m	Cum	9.00	2,903.45	26,131.01
9.5	PCC ( 1:2:4 ) 0.1mx1mx5m	Cum	12.00	6,039.17	72,469.99
9.6	Fly ash Brick masonary in cement mortar (1:6) using the bricks of size 10" x 5" x 3" of crushing strength not less than 75 kg / centimetre square with dimensional tolerance 3% after immersing the bricks for 6 hours in water before use including hoisting to required height placing in position scaffolding, splays cutting, circular moulding, corbelling, chamfering and similar such type of work watering and curing etc. including cost, conveyance, royalty, cess, and taxes of all other materials machinaries scaffolding all labour T&P articles required for the work etc. complete in all respect as per the latest specification confirming to relevant IS Specification and direction of the Engineer-in-charge.	Cum	7.20	6,387.58	45,990.57
10	<b>(125x70x5) mm RS GI joist 5Mtr (STATION)</b>				
10.1	Excavation with back filling L 1m x W 1 x D 2	Cum	8.00	174.21	1,393.65
10.2	PCC (1:3:6)	Cum	0.40	5,226.20	2,090.48
10.3	RCC (1:1.5:3)	Cum	12.00	11,846.06	1,42,152.67

Annexure-2				
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work				
11	<b>Baffle Wall</b>			
11.1	Excavation with back filling 4.2mx0.75mx0.5m	Cum	1.58	174.21
11.2	PCC 1:3:6 4.2mx0.75mx0.1m	Cum	0.32	5,226.20
11.3	RCC 1:1.5:3 0.75x3.8x0.2+0.5x3.4x0.2+2.5x3x0.15	Cum	5.80	11,846.06
12	PCC (1:4:8) With cement For S/S area(75 mm) per Sq. mts.( (8x16x0.075)	Cum	9.60	5,226.20
13	Metal Spreading 100 mm. per Sq. mts. Area of spreading.	Cum	12.80	3,368.00
	<b>Switchgear Cum Control Room (22x10Mts) (column &amp; beam based) (as per specification &amp; inclusive of doors, windows, collapsible gate, PHD fittings, electrification, inner cable trench, Two nos main doors with concrete pillars, beams) etc. as per Technical specification in Civil section. Layout Drawing</b>			
14	<b>Switchgear Cum Control Room For Pile foundation in FLOOD AREA (with SBC upto 10)</b>			
14.1	Boring and casting 300 mm dia single under reamed pile of 5.00 m. long with R.C.C. M-20 using 20 mm down graded chips with cost of all materials, labours, T&P etc. & all other machinaries required for the work etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Nos	65.00	4,000.00
14.2	<b>Earth work in excavation of foundation trenches in all kinds of soil</b> including moorum, stony earth and earth mixed with boulders except sheet rock and boulders requiring blasting including dressing of sides and leveling the bed up to the required depth and depositing the excavated materials away from the work site within initial leads and lifts, including shoring, shuttering & dewatering (if required) with cost of labour, cess, hire & running charges of water pumps sundries, T & P & all other machinaries required for the work etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	150.00	174.21
14.3	<b>Supplying and filling in foundation and plinth with good river sand</b> well watered and rammed in layers not exceeding 23 cm in each layer including all leads and lifts, cost of all materials, labour, cess, sundries, T&P required for the work etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	189.00	929.10
14.4	Providing and lying plain <b>cement concrete of proportion (1:3:6)</b> in foundation and plinths using approved quality cement, 40 mm. size black hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	35.52	5,226.20
14.5	<b>K.B. Brick</b> masonry in cement mortar (1:6) using the bricks of size 10" x 5" x 3" of crushing strength not less than 100 kg / centimeter square with dimensional tolerance 3% after immersing the bricks for 6 hours in water before use including hoisting to required height placing in position scaffolding, splay cutting, circular moulding, corbelling, chamfering and similar such type of work watering and curing etc. including cost, conveyance, royalty, cess, and taxes of all other materials machinaries scaffolding all labour T&P articles required for the work etc. complete in all respect as per the latest specification confirming to relevant IS Specification and direction of the Engineer-in-charge.			-
14.5.1	<b>In Foundation and Plinth</b>	Cum	33.36	6,387.58
14.5.2	<b>Ground Floor</b>	Cum	100.44	6,387.58
14.6	<b>RCC work M-20</b> grade as per approved designs and drawings having a minimum compressive strength (in work test) 200 Kg./ Sqcm.in 15 cm. cubes at 28 days after mixing and test conducted in accordance with I.S.456 and I.S 516 using 12 mm. to 20 mm. size black hard crusher broken granite stone chips, screened and washed sharp sand for mortar of approved quality from approved quarry, to be mixed in concrete mixture with approved quality cement including hoisting, lowering, laying and compacting concrete by using vibrators, watering and curing for 28 days, centering and shuttering and finishing the exposed surface smooth providing grooves or beads wherever necessary including cost, conveyance, loading, unloading, royalties and taxes and cess of all materials, cost of all labours, sundries, T&P & all other machinaries required for the work but excluding cost and conveyance of M.S. or Tor steel and binding wires etc. Complete in all respect as per latest specification & direction of the Engineer in charge.		-	-
14.6.1	Pile cap & Grade beam	Cum	32.76	10,452.40
14.6.2	R.C.C. wall	Cum	3.36	10,452.40
14.6.3	Plinth Beam	Cum	9.72	10,452.40
14.6.4	Column & Beam- Ground Floor	Cum	33.60	10,452.40
14.6.5	Lintel-Ground Floor	Cum	3.96	10,452.40
14.6.6	65mm thick R.C.C.Chajja- Ground Floor	Sqm	23.28	987.17
14.6.7	Roof slab - Ground Floor	Cum	29.16	13,936.54
14.6.8	Staircase- Ground Floor	Cum	3.48	13,936.54
14.7	Cutting, Straightening coiled or bent up M.S. rods or Tor steel welding or jointing if necessary, bending, binding, tying the grills as required for R.C.C. works, providing fan hooks where necessary and hoisting, lowering and placing in proper position according to approved designs and drawings including cost, conveyance, loading, unloading, taxes of M.S. rods or Tor steel and binding wires of 18 to 20 gauge required for the work and cost of all labour, sundries, T&P and scaffolding complete in all respect as directed by the Engineer in charge (payment will be made according to the actual weight of M.S. rod / Tor steel consumed in the work and no separate payment will be made towards weight of binding wires which is to be borne by the contractor at his own cost etc. complete in all respect as per direction of the Engineer-in-charge.		-	-
14.7.1	Ground Floor	MT	16.90	95,233.00
14.8	Supplying, fitting and fixing <b>vitrified tile 60x60cm plain Ivory 8 to 10 mm thick</b> in floors of approved make with application of polymer modified cement based water resistant adhesive bed of required thickness of 10mm and filling joints with epoxy grout of approved quality including cost of all materials, takes labour T&P etc. required for the work etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	142.80	801.35
14.9	Supplying, fitting and fixing <b>vitrified tile 60x60cm plain Ivory 8 to 10 mm thick</b> in dado of approved make with application of polymer modified cement based water resistant adhesive bed of required thickness of 10mm and filling joints with epoxy grout of approved quality including cost of all materials, takes labour T&P etc. required for the work etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	15.20	801.35
14.10	Supplying, fitting and fixing <b>Floor tile of size 40cmx40 cm / 30cmx30cm in floors</b> on 25mm thick bed of cement mortar 1:1 (1cement : 1sand) jointed with neat cement slurry mixed with pigment to match the shades of the tiles of required thickness of approved quality including cost of all materials, takes labour T&P etc. required for the work.etc complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	19.50	847.81
14.11	Providing fitting fixing <b>Glazed /Ceramic tiles of size 20cmX30cm &amp; 6.5 to 6.7mm thick of size up to 0.10sqm in wall dados skirting and</b> on 12mm thick cement plaster (1:3) jointed with neat cement slurry mixed with pigments to match the shade of the tiles including rubbing and polishing complete including cost of precast tiles etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	24.20	696.83
14.1	Supplying, fitting and fixing 5"x2½" size Dressed seasoned Sal wood chaukaths including cost, conveyance royalty taxes of all materials. labour, all other machinaries, T & P articles required for the work complete in all respect as per the direction of the Engineer-in-Charge.	Cum	0.25	92,910.24
14.13	Supplying, fitting and fixing 30mm/32mm flush door shutter (Non-Sal hard wood frame fixed with 4mm BWR ply on both sides of frame including cost conveyance royalty taxes of all materials. labour, all other machinaries, T & P articles required for the work complete in all respect as per the direction of the Engineer-in-Charge.	Sqm	10.70	2,903.45
14.1	Providing and fixing of sliding windows of approved make to be fabricated from roll formed sections made of pre-painted steel (base steel as per IS-513 of 0.6 mm thick "D" quality, galvanized as per IS-277 with zinc of 120 Gm/ Sqm.) including cost conveyance royalty taxes of all materials. labour, all other machinaries, T & P articles required for the work complete in all respect as per the direction of the Engineer-in-Charge. <b>DOUBLE SHUTTER SLIDING WINDOW</b>	Sqm	20.80	5,806.89

Annexure-2					
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
14.15	Providing and fixing of FRP door frame including cost conveyance royalty taxes of all materials, labour, all other machinaries, T & P articles required for the work complete in all respect as per the latest specification and direction of the Engineer-in-Charge.	Mtr	10.20	812.96	8,292.24
14.2	Providing and fixing of FRP door shutter including cost conveyance royalty taxes of all materials, labour, all other machinaries, T & P articles required for the work complete in all respect as per the latest specification and direction of the Engineer-in-Charge.	Sqm	3.80	2,903.45	11,033.09
14.17	Providing <b>16mm. thick cement plaster</b> with cement mortar of mix (1:6) with approved quality cement with screened and washed sharp sand for mortar and finished smooth to the surface <b>over brick work</b> after racking out the joints including watering and curing, rounding of corners etc. complete with cost, conveyance, loading, unloading, royalties, cess, and taxes of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charge		-	-	-
14.17.1	<b>Ground Floor</b>	Sqm	685.05	325.19	2,22,768.56
14.18	Providing <b>12mm. thick cement plaster</b> with cement mortar of mix (1:6) with approved quality cement and screened and washed sharp sand for mortar and finished smooth to the surface <b>over brick work</b> after racking out the joints including watering and curing, rounding of corners etc. complete with cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charger in charge				-
14.18.1	<b>Ground Floor</b>	Sqm	541.19	325.19	1,75,987.32
14.19	Providing <b>12mm. thick cement plaster</b> with cement mortar of mix (1:3) with approved quality cement with screened and washed sharp sand for mortar and finished smooth to the surface <b>in ceiling and R.C.C. surface after chipping the surface in all floors</b> including watering and curing, rounding of corners etc. complete with cost, conveyance, loading, unloading, royalties, cess, and taxes of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charge.				-
14.19.1	<b>Ground Floor</b>	Sqm	484.90	325.19	1,57,682.61
14.20	Providing and finishing the wall surface with two coat of <b>cement wash</b> including scaffolding, all labour, cost, conveyance, cess, taxes of all materials, T&P articles, brushes all other machineries required for the work complete in all respect confirming to relevant I.S. Specification and direction of the Engineer-in-Charge			-	-
14.20.1	<b>Ground Floor</b>	Sqm	1,522.68	104.52	1,59,156.63
14.21	Supplying fitting and fixing of M.S shutter made out of M.S Angle 40mmx40mmx6mm, M.S.Flat 19 mm x 5 mm size, M.S. guide, top hood cover etc. as per design provided including cost, conveyance, royalties of all materials, cost of all labour, T&P articles required for the work etc. complete in all respect confirming to relevant I.S specification and direction of the Engineer-in Charge.	Kg	664.70	127.75	84,916.48
14.22	Supplying fitting and fixing of M.S grill made out of M.S M.S.Flat 19 mm x 5 mm size, as per design provided including cost, conveyance, royalties of all materials, cost of all labour, T&P articles required for the work etc. complete in all respect confirming to relevant I.S specification and direction of the Engineer-in Charge.	Kg	1,134.43	127.75	1,44,925.22
14.23	<b>Wall painting 2 coats with acrylic distemper</b> over one coat of wall primer of approved shade on new work to give an even shade in all floors at all height including scaffolding cost of brushes including cost of paint cost conveyance royalty of all materials labour,T&P articles required for the work etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.				-
14.23.1	<b>Ground Floor</b>	Sqm	876.36	133.56	1,17,045.30
14.24	<b>Painting two coats with weather coat</b> on exterior walls surface of approved quality and approved shade over a coat of primer in all floors at all height of approved quality and shade including cleaning and sand papering the surface and making the surface smooth with cost, conveyance, loading, unloading, and taxes of all materials, cost of all labour, sundries, T&P, scaffolding etc. required for the work complete in all respect as directed by Engineer-in-charge				-
14.24.1	<b>Ground Floor</b>	Sqm	646.44	191.63	1,23,875.60
14.25	<b>Painting two Coats with approved colour synthetic enamel paint</b> on wood / iron work in all floors at all height including scaffolding cost conveyance royalty of all materials labour,T&P articles required for the work etc. complete in all respect as per the latest specification and direction of the Engineer-in-charge.	Sqm	105.90	209.05	22,138.19
14.26	Providing <b>cement concrete (1:1.5:3)</b> using 12mm size black hard crusher broken granite stone chips, screened & washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc. Complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	25.32	5,226.20	1,32,327.41
14.27	Supplying, fitting and fixing of stainless steel of 304 grade in hand railing using 50mm dia of 2mm thick circular pipe with Balustrade of size 32mm x 32mm x 2mm @ 0.90mtr. C/C and stainless square pipe bracing of size 32mm x 32mm x 2mm in 3 rows in stair case as per approved design and specification, buffing, polishing etc. with cost, conveyance, taxes of all materials, labour, T&P etc. required for the complete in all respect.	Mtr	7.50	4,064.82	30,486.17
14.28	Providing and fixing M.S. fan clamp type-I of 16mm dia M.S. bar bent to shape with hooked ends in R.C.C. slab during laying including painting the exposed portion of loop as per standard design complete as directed by the Engineer-in-charge.	Nos	30.00	174.21	5,226.20
14.29	Providing <b>12mm. thick cement plaster</b> in cement mortar of mix (1:4) with neat cement punning with approved quality cement with screened and washed sharp sand for mortar and finished smooth to the surface in ceiling and R.C.C. surface after chipping the surface in septic tank including watering and curing, rounding of corners etc. complete with cost, conveyance, loading, unloading, royalties, cess, and taxes of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charge.	Sqm	9.75	325.19	3,170.56
14.30	Providing neat cement punning with approved quality cement finished smooth to the surface etc. complete with cost, conveyance, loading, unloading, royalties, cess, and taxes of all materials and cost of all labours, sundries, T&P and scaffolding required for the work etc. complete in all respect as desired by the Engineer in charge.	Sqm	162.76	278.73	45,366.21
14.31	40 mm thick grading concrete with cement concrete (1:2:4) using 12mm and down graded b.h.g. chips to the roof surface <b>with</b> water proofing cement compound finished smooth over RCC slab including hoisting and laying in position watering and curing for required number of days finished to smooth surface and desired slope including cost conveyance, royalty and taxes of all materials, labour T&P articles required for the work etc. complete in all respect confirming to relevant I.S specification and direction of the Engineer-in-Charge.	Sqm	267.54	243.89	65,250.16
14.32	Providing Fitting, fixing of Aluminium Door with OEL or equivalent anodized AL. door section as vertical member, as top, as bottom and middle member and 8mm plain glass fixed to door to be completed including all cost of labour T&P hire charges of drilling machine , labour charges etc.complete.	Sq. mtr.	14.20	5,806.89	82,457.84
14.33	Supply & Fixing of aluminium Ventilator with 8 mm thick glass as per approved drawing	Sq. mtr.	0.92	5,806.89	5,342.34
14.34	Finishing surface of wall with Acrylic wall Putty(water Based) of approved make and finished smooth and even surface to receive painting including cost of scaffolding staging charges with cost of all materials, taxes, labour, T&P etc. complete.	Sq. mtr.	742.00	127.75	94,791.67
14.35	<b>Septic Tank</b>				-
14.35.1	Earth work in excavation of foundation trenches in all kinds of soil including moorum, stony earth and earth mixed with boulders except sheet rock and boulders requiring blasting including dressing of sides and leveling the bed up to the required depth and depositing the excavated materials away from the work site within initial leads and lifts, including shoring, shuttering & dewatering (if required) with cost of labour,cess, hire & running charges of water pumps sundries , T & P & all other machinaries required for the work etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	10.60	348.41	3,693.18

Annexure-2					
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
14.35.2	Supplying and filling in foundation and plinth with good river sand well watered and rammed in layers not exceeding 23 cm in each layer including all leads and lifts, cost of all materials, labour, cess, sundries, T&P required for the work etc. complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	0.95	929.10	882.65
14.35.3	Providing and lying plain cement concrete of proportion (1:3:6) in foundation and plinths using approved quality cement, 40 mm. size black hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc. complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	0.78	5,226.20	4,076.44
14.35.4	RCC work M-20 grade as per approved designs and drawings having a minimum compressive strength (in work test) 200 Kg./Sqcm. in 15 cm. cubes at 28 days after mixing and test conducted in accordance with I.S.456 and I.S 516 using 12 mm. to 20 mm. size black hard crusher broken granite stone chips, screened and washed sharp sand for mortar of approved quality from approved quarry, to be mixed in concrete mixture with approved quality cement including hoisting, lowering, laying and compacting concrete by using vibrators, watering and curing for 28 days, centering and shuttering and finishing the exposed surface smooth providing grooves or beads wherever necessary including cost, conveyance, loading, unloading, royalties and taxes and cess of all materials, cost of all labours, sundries, T&P & all other machinaries required for the work but excluding cost and conveyance of M.S. or Tor steel and binding wires etc. complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	4.56	11,846.06	54,018.01
15	<b>P.H. Fitting (Internal &amp; External) to Switch-Gear -Cum -Control Room</b>		-	-	-
15.1	Supplying all materials, labours, taxes and tools and plants for fitting and fixing of PVC pipes of following nominal bore conforming to ASTM-D-1785 (Schedule-80) including fittings and laying as per the site requirement etc., all complete including testing as per the direction and specification of Engineer-in-charge		-	-	-
15.1.1	15 mm dia	Mtr	15.00	139.37	2,090.48
15.1.2	20 mm dia	Mtr	20.00	174.21	3,484.13
15.1.3	25 mm dia	Mtr	15.00	197.43	2,961.51
15.1.4	40 mm dia	Mtr	20.00	232.28	4,645.51
15.1.5	50 mm dia	Mtr	20.00	301.96	6,039.17
15.2	Supplying all material, labour, T&P & fitting, fixing the following different water supply fittings of approved make with including supply of all necessary jointing materials etc. all complete as directed by the Engineer-in-charge.		-	-	-
15.2.1	25 mm dia Ball valve	Nos	2.00	290.34	580.69
15.2.2	50 mm dia Ball valve	Nos	2.00	476.16	952.33
15.2.3	25 mm dia F.W. valve	Nos	2.00	174.21	348.41
15.2.4	50 mm dia F.W. valve	Nos	2.00	348.41	696.83
15.3	Supplying all labour T&P and cutting holes in brick masonry wall for taking pipes through and mending good the damages with supply of all required materials etc. complete as per the direction of the Engineer-in-charge		-	-	-
15.3.1	For 15mm to 50mm CPVC pipe to pass in 125mm to 250mm thick wall	Nos	10.00	145.17	1,451.72
15.4	Supplying all labour T&P and materials and making grooves in brick walls vertically and horizontally to the required depth and width for fixing pipes & fittings of sizes 15mm dia to 25mm dia in the grooves, testing the pipe line against leakage, and filling the grooves with cement mortar(1:4) to bring the surface to original level including cost of mortars, curing and conveyance of materials etc. complete as per direction of the Engineer-in-charge.	Mtr	10.00	209.05	2,090.48
15.5	Supplying all materials, labour T&P and fittings of approved quality required for fixing of NP or CP Brass or GM fixtures of following sizes and specification with leak proof threaded joints tightened with spun yarn and white zinc or any tightened with spun yarn and white zinc or any including testing and rectification of detects, after testing complete as per direction of Engineer-in-charge.		-	-	-
15.5.1	Bibcock	Nos	5.00	464.55	2,322.76
15.5.2	Long Body Bibcock	Nos	2.00	493.59	987.17
15.5.3	Pillar cock	Nos	2.00	522.62	1,045.24
15.5.4	Angular stop cock	Nos	4.00	406.48	1,625.93
15.5.5	Soap Holder	Nos	2.00	81.30	162.59
15.5.6	Towel ring	Nos	2.00	139.37	278.73
15.5.7	Toilet paper holder	Nos	2.00	209.05	418.10
15.5.8	Glass self 22"	Nos	2.00	348.41	696.83
15.5.9	Towel rail 24"	Nos	2.00	261.31	522.62
15.5.10	Shower arm 190mm long light	Nos	2.00	185.82	371.64
15.5.11	CP Grating	Nos	2.00	52.26	104.52
15.5.12	Concealed stop cock	Nos	4.00	580.69	2,322.76
15.5.13	Connecting Pipe	Nos	2.00	69.68	139.37
15.5.14	Basin with pedestal	Nos	2.00	3,019.58	6,039.17
15.5.15	Providing and fixing vitreous China water closet (European with seat and lid), of Cerra Cascade "CASINO", CP brass buffers, 10 liter cascade dual flushing cistern hinges & rubber with fittings and brackets, 40 mm flush bend of CP brass, 20 mm overflow pipe with specials & mosquito proof coupling complete, painting on brackets and making good the walls and floors wherever required.	Nos	1.00	4,935.86	4,935.86
15.5.16	Providing and fixing vitreous China water closet Indian type of Orissa pattern size (580mmx440mm) of approved quality with PVC Slimline (Parryware make) 12.5 ltr capacity low level cistern with hinges & rubber with fittings and brackets, 40 mm flush bend of CP brass, 20 mm overflow pipe with specials & mosquito proof coupling complete, painting on brackets and making good the walls and floors wherever required.	Nos	1.00	4,180.96	4,180.96
15.5.17	Providing and fixing vitreous China water urinal of Cerra/Parry ware with fittings and brackets, flush bend of CP brass, and making good the walls and floors wherever required.	Nos	2.00	2,090.48	4,180.96
15.6	Supply of all materials, labour, T&P, fitting and fixing in all floors fixed type bevelled plate glass mirror of size 600mm x 450mm x 5.5mm thick best Indian make, supply of 13mm thick asbestos backing and CP Brass screw including cost conveyance, taxes of all materials complete as per specification and direction of Engineer-in-charge(Make-Modi Guard/Belgium)	Nos	2.00	1,509.79	3,019.58
15.7	Supply of all materials, joining materials, labour and T&P and laying UPVC SWR PIPES of Standard make with ISI Mark duly approved by the Engineer-in-charge including jointing, earthwork in excavation of trenches in all kind of soil to the required depth and refilling of pipe line trenches in 0.3048 mtrs layers with 300 mm deep sand around cushion duly watered and rammed or fixing to walls, floors with supply of necessary clamps, nails and cutting the pipe to length with wastage including supply of all Clamps, Clips, Endcaps & jointing materials etc., complete as per standard specification and direction of Engineer-in-charge.		-	-	-
15.7.1	100mm dia ( ISI Marked )	Mtr	10.00	313.57	3,135.72
15.7.2	150mm dia ( ISI Marked )	Mtr	25.00	441.32	11,033.09
15.8	Supplying all materials, labour T&P for jointing of the UPVC SWR SEWER pipe fittings of standard make duly approved by the Engineer-in-charge with joining material etc. suitably required for fixing on 100mm dia soil waste pipe complete with requisite testing as directed by Engineer-in-charge.		-	-	-
15.8.1	100mm dia "P" Trap	Nos	2.00	360.03	720.05
15.8.2	100mm dia Bend Plain	Nos	3.00	133.56	400.68
15.8.3	100mm Door Bend	Nos	3.00	174.21	522.62
15.8.4	100 mm dia Single Junction with Door	Nos	3.00	406.48	1,219.45
15.8.5	100 mm dia double Junction with Door	Nos	3.00	522.62	1,567.86
15.8.6	100mm dia Terminal Guard	Nos	2.00	290.34	580.69
15.8.7	100mm dia. Floor trap	Nos	3.00	232.28	696.83

Annexure-2				
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work				
15.9	Supplying all materials, labor T&P for jointing of the UPVC SWR SEWER pipes & fittings of standard make duly approved by the Engineer-in-charge suitably required for fixing on 100mm dia soil waste pipe complete with requisite testing as directed by Engineer-in-charge.		-	-
15.9.1	100mm Pipe	Nos	10.00	1,881.43
15.10	Fixing of UPVC vent pipes Including labour & T&P all complete as directed by the Engineer-in-charge.		-	-
15.10.1	100mm Pipe	Mtr	4.00	313.57
15.10.2	100mm Vent Cowl	No	2.00	406.48
15.11	Supplying all materials labour T&P and constructing inspection chamber C.C.(1:4:8) on bed with hard stone metal size 40mm and 250mm K.B.Bricks work having crushing strength 75 Kg to 99 Kg/cm <sup>2</sup> in cement mortar (1:4), R.C.C. roof slab with 500mm dia light pattern factory made SFRC M.H cover with frame, moulding and shaping the channel and benching with C.C. 1:2:4 with hard granite chips 12mm size, 12mm thick C.P 1:3 including cement punning inside, Cement plaster (1:3) outside the chamber, earth work in excavation in all kinds of soil and refilling the cavity around the chamber as per detail drawing & design and specification including cost, conveyance, taxes etc. all complete as directed by Engineer-in-charge.		-	-
15.11.1	750mmx 750mm x450mm	No	1.00	6,968.27
15.12	Providing and fixing 2000 litres capacity P.V.C Over head (Sintex make) tank with all piping and valve arrangement with all labour & materials ,including cost, T&P , scaffolding etc., complete as directed by the Engineer-in-charge.		-	-
15.12.1	2000 Ltr Capacity	No	1.00	20,904.80
15.13	Supplying all material, labour, T&P and constructing manhole chamber of size as mentioned below with 250mm nominal size K.B. Brick having crushing strength 75kg to 99kg /cm <sup>2</sup> in CM 1:4 over a bed of 150mm thick C.C(1:4:8) using 40mm size HG metal, plastering with 12mm thick cement mortar (1:3) on internal and external surface, inside finish with neat cement punning, providing & fixing step iron of appropriate quality & size with 3 coats anticorrosive paint, RCC (1:1.5:3) cover slab using 20m & down size graded HG chips along with factory made reinforced concrete cover with frame including breaking of pipe line where ever necessary and earth work in excavation in all kind of soil & rock and refilling the cavity by selective soil, leveling the surface around the chamber with disposal of surplus earth if any to a distance of 50mt as per specification, design & drawing including cost of curing and all taxes , royalty , cost , conveyance etc. all complete as directed by the Engineer-in-charge.	No	1.00	46,455.12
15.14	Supplying all material, labour, T&P and constructing 1.80m dia x 2.60m deep soak way pit with dry brick walling upto 2.00m height and 1st class K.B. Brickwork in cement mortar (1:6) for the remaining 06.60m height at top, 12mm thick cement plaster (1:4) inside and outside , 100mm thick gravel backing in the rear of well staining, 125mm thick RCC cover slab fitted with with iron lifting handles including earth work in excavation in all kind of soil & rock and refilling the cavity by selective soil, leveling the surface around the pit with disposal of surplus earth if any to a distance of 50mt including cost of curing and all taxes , royalty , cost , conveyance etc. all complete as directed by the Engineer-in-charge.	No	1.00	47,616.50
16	Watering system like 150 mm dia, 100 Mtr deep bore well (PVC pipe to be used) 1 HP submersive pump, switch yard water hydrant system for pouring water into the earth pits, tap for garden, including PVC pipes & other accessories required etc.	LS	1.00	2,12,996.73
18	RRHG retaining wall with 1:5 cement mortar Considering 0.6 mt height of retaining wall above the existing ground level per Meter as per Drawing TOTAL 74 Mtrs		-	-
18.1	Excavation in all type of soil( 0.8 Cum / Mtr)	Cum	105.60	174.21
18.2	PCC (1:4:8) 200 mm thick. With cement ( 0.2 Cum / Mtr)	Cum	26.40	5,226.20
18.3	PCC (1:2:4) 50 mm thick With cement ( 0.02 Cum / Mtr)	Cum	1.58	6,039.17
18.4	RRHG Cement Masonary (1:5) With cement ( 0.86 Cum / Mtr)	Cum	63.64	2,903.45
18	Laying of cable trench with supply of GI Cable Trench material & all Civil works			
18.1	Laying of 2 tier 2 rows cable trench (internal width 1500 mm,depth 680 mm, with 75X75X6 mm support angles fixed RCC column of 250 X 250 mm & with ladder type cable tray (45X45X5mm two angles at both side having welded flats of 25X5 mm at a gap of 150mm) for Power & control Cable. It includes supply of GI Cable Trench materials, supply of all civil items as per site requirement and as per detail drawing & design and specification including cost, conveyance, taxes etc. all complete as directed by Engineer-in-charge.	Mtr.	40.00	16,989.77
18.2	Laying of 2 tier 1 rows cable trench (internal width 750 mm,depth 680 mm, with 65X65X6 mm support angles fixed RCC column of 250 X 250 mm & with ladder type cable tray (45X45X5mm two angles at both side having welded flats of 25X5 mm at a gap of 150mm) for Power & control Cable. It includes supply of GI Cable Trench materials, supply of all civil items as per site requirement and as per detail drawing & design and specification including cost, conveyance, taxes etc. all complete as directed by Engineer-in-charge.	Mtr.	35.00	9,345.81
18.3	Laying of 2 tier 1 rows cable trench (internal width 500 mm,depth 580 mm, with 50X50X6 mm support angles fixed RCC column of 250 X 250 mm & with ladder type cable tray (45X45X5mm two angles at both side having welded flats of 25X5 mm at a gap of 150mm) for Power & control Cable. It includes supply of GI Cable Trench materials, supply of all civil items as per site requirement and as per detail drawing & design and specification including cost, conveyance, taxes etc. all complete as directed by Engineer-in-charge.	Mtr.	25.00	8,099.80
19	Excavation of Earth for 13 Mtr. long poles pit. (1000mm X 500mm X 2275mm) = 1.14 Cu.mtr., as per technical specification and scope of work.	Cum	4.56	174.21
20	Concreting of poles in ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55 Cu.mtr, as per technical specification and scope of work.	Cum	2.20	5,226.20
21	Couping of poles in ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr, as per technical specification and scope of work.	Cum	0.45	5,226.20
22	Excavation of Earth for 11 Mtr. long poles pit. (1000mm X 500mm X 1875mm) = 0.94 Cu.mtr., as per technical specification and scope of work.	Cum	7.52	174.21
23	Concreting of poles in ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45 Cu.mtr, as per technical specification and scope of work.	Cum	3.60	5,226.20
24	Couping of poles in ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr, as per technical specification and scope of work.	Cum	0.90	5,226.20
25	Fixing of stay set with 0.5Cum cement concrete foundation PCC 1:3:6 size ( 900mmx600mmx900mm) using 40mm BHG metal with all labor and material, including excavation and required backfilling, as per technical specification and scope of work.	No's.	12.00	2,438.89
26	Making of earth chamber with 50mm thick RCC Slab (with 8mm rod) cover for earth pit of size 450mmX450mm X600 mm depth as per direction of Engg in Charge.	No's.	52.00	1,742.07
27	Construction of 600mm dia Hume Pipe Single row culvert and approach road for Control room-cum- Switch gear room			-
27.1	Earth work in excavation of foundation trenches in all kinds of soil including moorum, stony earth and earth mixed with boulders except sheet rock and boulders requiring blasting including dressing of sides and leveling the bed up to the required depth and depositing the excavated materials away from the work site within initial leads and lifts, including shoring, shuttering & dewatering (if required) with cost of labour,cess, hire & running charges of water pumps sundries , T & P & all other machinaries required for the work etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	14.90	174.21
27.2	Supplying and filling in foundation and plinth with good river sand well watered and rammed in layers not exceeding 23 cm in each layer including all leads and lifts, cost of all materials, labour,cess, sundries, T&P required for the work etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	1.80	929.10

Annexure-2					
Construction of 33/11 KV Primary Substation with 2X5 MVA Trf., including complete Control Room Building and All Equipment Supply, Erection, Commissioning, Testing, Civil Works with supply of all materials, Labour, T&P etc. As per technical specification and scope of work					
27.3	Providing and lying plain cement concrete of proportion (1:3:6) in foundation and plinths using approved quality cement , 40 mm. size black hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	1.80	5,226.20	9,407.16
27.4	Providing cement concrete of M-15 grade using 20mm down graded black hard crusher broken granite stone chips, screened & washed sharp sand of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels laid in layers not exceeding 15 cm. thick in each layer including cost, conveyance, loading, unloading, royalties and taxes of all materials and cost of all labours, cess, sundries, T&P & all other machinaries required for the work including shoring, shuttering and dewatering if required including hire & running charges of water pump etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	8.30	12,775.16	1,06,033.81
27.5	Providing,laying and fixing in position R.C.C.hume pipes with collars jointed with cement mortar 1:3 complete with cost of all materials, and cost of all labours, cess, sundries, T&P & all other machinaries required for the work etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Mtr	7.50	4,645.51	34,841.34
27.6	Providing rough stone dry packing for guard walls & retaining walls including cost conveyance of all materials and cost of all labours, cess, sundries, T&P etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	5.30	2,903.45	15,388.26
27.7	Rolling and compacting to sub grade or formation loosening by cutting ordinary earth for 0.15 Mtr. depth including watering and rolling by PRR as per specification and direction of Engineer-in-Charge. (Data for 100sqm x 0.15m= 15 Cum).	Cum	97.50	754.90	73,602.33
27.8	Conveying from the stacks supplying, spreading morrum & sand mixture to proper camber and consolidation with H.R.R.including watering as per specification and direction of Engineer-in-Charge.	Cum	230.00	290.34	66,779.24
27.9	Soling the road surface with soling stones including filling the interstices with moorum and rolling with PRR including cost conveyance of all materials and cost of all labours, cess, sundries, T&P etc.complete in all respect as per latest specification & direction of the Engineer in charge.	Cum	75.00	1,858.20	1,39,365.36
27.1	Supplying and filling in sub base of road with borrowed earth including rolling & compacting all works complete as per specification and instruction of engineer. Payment shall be made for the compacted volume only as per spot levels taken at 2 intervals before start of work and after completion of the filling works.	Cum	780.00	348.41	2,71,762.45
.	Sub-Total for CIVIL WORKS with supply of all materials like Cement, MS tor rod, Brick, Coarse & Fine Agregrates & Labour,T&P etc. (In Rs.)				1,47,75,299.63
-	Total Cost in Cr.				1.48
			All Prices in Cr.		
A1	Total Cost for SUPPLY OF EQUIPMENT & MATERIALS (In Cr.)				5.22
B	Stock , Storage & Insurance @ 3 % of A				0.16
C	Sub - Total ( A+B )				5.37
D	Contingency @ 3 % of C				0.16
E	Tools &Plants Charges @ 2% of C (NOT CONSIDERED, As Separate Erection considered for All Supply Material )				-
F	Transportation @ 7.5% of C				0.40
G	Sub - Total ( C+D+E+F )				5.94
H1	Total Cost for ERECTION,TESTING & COMMISSIONING WORKS (In Cr.)				0.55
H2	Total Cost for CIVIL WORKS with supply of all materials like Cement, MS tor rod, Brick, Coarse & Fine Agregrates & Labour,T&P etc. (In Cr.)				1.48
H3	Total Cost for Erection & Civil works (H1+H2)				2.02
J	Total Cost (G+H)				7.96
L	Total Estimated Capital Cost i.e. J+K				7.96
M	GST @ 18% of L				1.43
N	CESS @ 1% of L				0.08
O1	Inspection Charges (As per Gov. Notification)				0.009
O2	GST On Inspection Fees (18% of O1)				0.002
O	Total Inspection fees (O1+O2)				0.010
P	Total Estimate to be deposit in Cr @ L+M+N+O (In Cr.)				9.50

Annexure-2					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (aloing with 1core spare cable) with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	5000		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.	1000		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	18000	1,495.47	2,69,18,460.00
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	54	11,900.00	6,42,600.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	6	6,350.00	38,100.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	9	6,100.00	54,900.00
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	14952.00	357.60	53,46,835.20
2	Supply of 33kV RMU				
a	No. of 33kV 3Way RMU (LLV+M)	nos.			
b	No. of 33kV 4Way RMU (LLVV+M)	nos.			
c	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.	1		
e	No. of 33kV 3Way RMU (LLL)	nos.			
f	No. of 33kV 4Way RMU (LLLL)	nos.			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	13.20	97.50	1,287.00
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,365.00	2,730.00
4	FRTU for RMU SCADA Automation				
a	No. of FRTU	nos.	1		
4.1	Pre-Wired FRTU Panel with FRTU	No.	1	1,21,744.00	1,21,744.00
4.2	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	1	1,00,000.00	1,00,000.00
4.3	Networking Accessories	No.	1	72.00	72.00

Annexure-2					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
4.4	CMR with Mounting Base for Digital Inputs	Nos.	32	650.00	20,800.00
4.5	Interposing Relay for Digital Output	Nos.	16	467.94	7,487.04
4.6	Battery Charger	Nos.	1	15,385.00	15,385.00
4.7	Battery	Nos.	1	8,333.00	8,333.00
4.8	4G Modem cum Router	Nos.	1	18,500.00	18,500.00
4.9	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	40	204.87	8,194.80
4.10	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	40	305.58	12,223.20
4.11	Twisted Pair Shielded & Over all shielded Instrumentation Cable	Mtr.	40	275.23	11,009.20
4.12	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	20	165.25	3,305.00
4.13	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	10	150.00	1,500.00
4.14	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	20.0	148.43	2,968.60
4.15	Armored CAT6 SFTP Cable	Mtr.	20	45.87	917.40
4.16	Un-Armored CAT6 SFTP Cable	Mtr.	20	89.45	1,789.00
4.17	Multi Function Meter	Nos.	2	18,651.00	37,302.00
Sub Total (Supply Portion) (in Rs.)					3,57,11,706.44
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	15000	94.50	14,17,500.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	54	2,400.00	1,29,600.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with HDPE pipe</b> (110mm dia, PN8 PE80) including suply of HDPE Pipe.	Mtr.	3000	2,300.00	69,00,000.00
1.6	Laying of <b>110mm dia PE 80-PN8, HDPE pipe</b> inside open trench.	Mtr.	14952.00	300.00	44,85,600.00
2	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-

Annexure-2					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	1.0	16,000.00	16,000.00
	Sub Total (Erection Portion) (in Rs.)				1,29,87,925.50
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)- Route Length	Mtr	4984		
1.1.a	Earth work excavation of soil	Cum	4186.56	700.00	29,30,592.00
1.1.b	Earth work excavation of hard rock	Cum	1794.24	1,720.00	30,86,092.80
1.2	Back filling with excavated soil outside and above the trench	Cum	5980.8	202.00	12,08,121.60
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	2492	2,643.67	65,88,027.21
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	1	23,145.30	23,145.30
3	Supply of GI Fencing with Gate around each RMU	sqmtr	20	3,600.00	72,000.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	2	3,700.00	7,400.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	200	1,012.00	2,02,400.00
	Sub Total (Civil Portion) (in Rs.)				1,41,88,022.11
A	Sub Total (Supply Portion)				3,57,11,706.44
B	Stock, Storage & Insurance @ 3 % of A				10,71,351.19
C	Sub Total (A+B)				3,67,83,057.63
D	Contingency @ 3 % of C				11,03,491.73
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				26.51
F	Transportation @ 7.5% of C				27,58,729.32
G	Erection Charges @ 10% of earthing items				132.56

Annexure-2		
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU		
H	Total (C+D+E+F+G)	4,06,45,437.76
I	Sub Total (Erection Portion + Civil Portion)	2,71,75,947.61
J	Total Cost (H+I)	6,78,21,385.37
L	Total Estimated Capital Cost i.e. (J+K)	6,78,21,385.37
M	GST @ 18% of L	1,22,07,849.37
M1	CESS @ 1% of L	67,82,138.54
N	Grand Total (L+M)	8,68,11,373.27
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.	3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km	7,500.00
Q	Inspection Fee of RMU - Rs. 1500/ RMU	1,500.00
R	Inspection Fee of Drawing Checking and Approval	750.00
S	Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)	8,68,24,123.27

Annexure-2					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			18		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	36	12,35,592.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	1118.52	85,007.52
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	71.3664	6,958.22
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96)	KG	76.00	1259.496	95,721.70
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	1111.968	84,509.57
6	Danger Plate, 2 no's.	No.	104.00	36	3,744.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	10.8324	1,056.16
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	36	5,850.00
9	H.T. Stay set (Complete )	Set	1,365.00	36	49,140.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	72	4,680.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	540	52,650.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	18	24,570.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	212.4	20,709.00
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	108	11,232.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	43.3296	4,224.64
16	33KV pin insulator polymer	No.	624.00	54	33,696.00
17	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	108	70,200.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	108	1,61,460.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	108	1,61,460.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	101.40	220.698	22,378.78
21	Black Paint	Ltr	286.00	18	5,148.00
22	Yellow Colour Paint for Background	Ltr	216.00	36	7,776.00
A	Total Cost of materials				21,47,763.58
B	Stock, Storage & Insurance i.e 3% of A				64,432.91
C	Sub Total (A+B)				22,12,196.49
D	Contingency @ 3% of C				66,365.89
E	Tools & Plants @ 2% of C				41,424.00
F	Transportation @ 7.5% of C				1,65,914.74
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				63,632.99
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				79,854.00
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				26,29,388.11
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	36	81,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr			

Annexure-2					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	76.00	164.432	12,496.83
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	7.9296	773.14
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	76.00	61.404	4,666.70
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	76.00	122.808	9,333.41
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	76.00	245.616	18,666.82
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	177.372	13,480.27
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	76.00	11.424	868.22
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	3.492	265.39
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	3.06	232.56
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	76.00	19.12	1,453.12
12	Danger Plate, 2 no's.	No.	104.00	4	416.00
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	1.2036	117.35
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	4	650.00
15	H.T. Stay set (Complete )	Set	1,365.00	4	5,460.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	8	520.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	60	5,850.00
18	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	4	5,460.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	97.50	113.28	11,044.80
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	12	1,248.00
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	4.8144	469.40
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	6	80,730.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	2	1,32,000.00
24	33KV pin insulator polymer	No.	624.00	6	3,744.00
25	H W fitting(B&S) 90KN.4 Bolt	No.	650.00	12	7,800.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	12	17,940.00
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	12	17,940.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	101.40	44.3	4,492.02
29	Black Paint	Ltr	286.00	2	

Annexure-2					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- )			12		
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	12	6,80,828.57
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	390.048	29,643.65
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	63.4368	6,185.09
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	70.20864	5,335.86
5	Danger Plate, 1 no's.	No.	104.00	12	1,248.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	3.6108	352.05
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	36	3,744.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	14.4432	1,408.21
9	33KV pin insulator polymer	No.	624.00	36	22,464.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	72	46,800.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	72	1,07,640.00
12	Earthing of Support ( Coil Type )	EA	215.80	12	2,589.60
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	3.144	306.54
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	72	1,07,640.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	58.548	5,936.77
16	Black Paint	Ltr	286.00	12	3,432.00
17	Yellow Colour Paint for Background	Ltr	216.00	24	5,184.00
A	Total Cost of materials				10,30,738.34
B	Stock, Storage & Insurance i.e 3% of A				30,922.15
C	Sub Total (A+B)				10,61,660.49
D	Contingency @ 3% of C				31,849.81
E	Tools & Plants @ 2% of C				21,233.21
F	Transportation @ 7.5% of C				79,624.54
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				35,062.67
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				36,040.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				12,65,471.42
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	6.6	42,900.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.35	8,775.00
K	Total Civil & Services				51,675.00
L	Total (J+K)				13,17,146.42
N	Sub Total (L+M)				13,17,146.42
O	Total GST @ 18% of (N)				2,37,086.36
O1	Total CESS @ 1% of (N)				13,171.46
P	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				15,67,404.24
No. of 3					

Annexure-2					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	8	1,300.00
16	H.T. Stay set (Complete )	Set	1,365.00	8	10,920.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	8	520.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	120	11,700.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	90.48	9,174.67
20	Black Paint	Ltr	286.00	8	2,288.00
21	Yellow Colour Paint for Background	Ltr	216.00	16	3,456.00
A	Total Cost of materials				7,49,250.78
B	Stock, Storage & Insurance i.e 3% of A				22,477.52
C	Sub Total (A+B)				7,71,728.30
D	Contingency @ 3% of C				23,151.85
E	Tools & Plants @ 2% of C				14,931.10
F	Transportation @ 7.5% of C				57,879.62
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				23,375.11
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				27,905.28
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				9,18,971.27
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.40	28,600.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.90	5,850.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	8	18,000.00
K	Total Civil & Services				52,450.00
L	Total (J+K)				9,71,421.27
N	Sub Total (L+M)				9,71,421.27
O	Total GST @ 18% of (N)				1,74,855.83
O1	Total CESS @ 1% of (N)				9,714.21
P	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				11,55,991.32
33 Kv Line Length In KM with 40 Mtr. Span (Ref. Drawing No.- )		10			
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	210	1,19,14,500.00
2	33 KV V cross Arm (GI) 22Kg each	No.	2,340.00	210	4,91,400.00
3	Top bracket 100x50x6mm GI channel ( 300mm each)	No.	195.00	210	40,950.00
4	Danger Plate, 1 no's.	No.	104.00	210	21,840.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG			

Annexure-2					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	23.63	1,53,562.50
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>9,04,312.50</b>
<b>L</b>	<b>Total (J+K)</b>				<b>2,48,97,827.02</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>2,48,97,827.02</b>
<b>O</b>	Total GST @ 18% of (N)				44,81,608.86
<b>O1</b>	Total CESS @ 1% of (N)				2,48,978.27
<b>P</b>	<b>Gross Total Material +Services (N+O+O1) for 33 KV Pin Points</b>				<b>2,96,28,414.15</b>
<b>Gross Total Summary</b>					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				34,89,095.60
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				7,83,766.99
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				15,67,404.24
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				11,55,991.32
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				2,96,28,414.15
<b>Q</b>	<b>Gross Total Material +Services</b>				<b>3,66,24,672.30</b>
<b>R</b>	Inspection Fee of Over Head Line (HT) - Rs.1500 up to 1 km.				1,500.00
<b>S</b>	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				<b>4,500.00</b>
<b>T</b>	Inspection Fee of Drawing Checking and Approval				750.00
<b>U</b>	<b>Gross Total Material, Services and Inspection Fees (Q+R+S+T)</b>				<b>3,66,31,422.30</b>

Annexure-2					
Standard BoQ and Estimate for 11kV 3C, 400sqmm UG Cable along with 11kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 11kV, 3Core, 400sqmm, XLPE insulation armoured UG cable with accessories</b>				
<b>a</b>	<b>Length of 11kV 3C, 400sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>2500</b>		
<b>b</b>	<b>Length of 11kV 3C, 400sqmm cable (HDD)</b>	<b>Mtr.</b>	<b>500</b>		
1.1	Supply of 11kV, 3Core, 400sqmm, XLPE insulation armoured UG cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA- 15kA)	Mtr.	3000.00	1,950.00	58,50,000.00
1.2	Supply of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400 sqmm, Aluminium UG cable for 3Core (Set)	Set	9	32,912.10	2,96,208.90
1.3	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400 sqmm, HT UG cable for 3Core (Set)	Set	9	12,456.60	1,12,109.40
1.4	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400 sqmm, HT UG cable for 3Core (Set)	Set	6	18,075.20	1,08,451.20
1.5	Supply of <b>HDPE</b> PE 80-PN8 pipe of <b>160mm</b> diameter (for 400sqmm HT cable laying)	Mtr.	2452.00	775.40	19,01,280.80
<b>2</b>	<b>Supply of 11kV RMU</b>				
<b>a</b>	<b>No. of 11kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 11kV 4Way RMU (LLVV)</b>	<b>nos.</b>	<b>3</b>		
<b>c</b>	<b>No. of 11kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 11kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
2.1	Supply of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	0	4,99,340.00	-
2.2	Supply of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	3	6,97,696.00	20,93,088.00
2.3	Supply of RMU 3W 11kV 630A with metering unit (LLV+M)( <b>CT Ratio to be mentioned</b> )	Nos.	0	5,99,901.00	-
2.4	Supply of RMU 4W 11kV 630A with metering unit (LLVV+M)( <b>CT Ratio to be mentioned</b> )	Nos.	0	8,25,045.00	-
<b>3</b>	<b>Earthing</b>				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	39.60	97.50	3,861.00
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	6	1,365.00	8,190.00
<b>4</b>	<b>FRTU for RMU SCADA Automation</b>				
<b>a</b>	<b>No. of FRTU</b>	<b>nos.</b>	<b>3</b>		
<b>4.1</b>	Pre-Wired FRTU Panel with FRTU	No.	3	1,21,744.00	3,65,232.00
<b>4.2</b>	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	3	1,00,000.00	3,00,000.00
<b>4.3</b>	Networking Accessories	No.	3	72.00	216.00
<b>4.4</b>	CMR with Mounting Base for Digital Inputs	Nos.	96	650.00	62,400.00
<b>4.5</b>	Interposing Relay for Digital Output	Nos.	48	467.94	22,461.12
<b>4.6</b>	Battery Charger	Nos.	3	15,385.00	46,155.00
<b>4.7</b>	Battery	Nos.	3	8,333.00	24,999.00
<b>4.8</b>	4G Modem cum Router	Nos.	3	18,500.00	55,500.00
<b>4.9</b>	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	120	204.87	24,584.40
<b>4.10</b>	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	120	305.58	36,669.60

Annexure-2					
Standard BoQ and Estimate for 11kV 3C, 400sqmm UG Cable along with 11kV RMU					
4.11	Twisted Pair Shielded & Over all shielded Instrumentation Cable 5 P X 1.0 mm2, Armored for Analog Input	Mtr.	120	275.23	33,027.60
4.12	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	60	165.25	9,915.00
4.13	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	30	150.00	4,500.00
4.14	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	60.0	148.43	8,905.80
4.15	Armored CAT6 SFTP Cable	Mtr.	60	45.87	2,752.20
4.16	Un-Armored CAT6 SFTP Cable	Mtr.	60	89.45	5,367.00
4.17	Multi Function Meter	Nos.	6	18,651.00	1,11,906.00
	Sub Total (Supply Portion) (in Rs.)				1,14,87,780.02
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method and HDD method				
1.1	Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method.	Mtr.	2500.00	94.50	2,36,250.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	9	2,400.00	21,600.00
1.3	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	9	1,900.80	17,107.20
1.4	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	6	1,900.80	11,404.80
1.5	Installation, Laying, Commissioning & Testing of 11kV, 3Core, 2Runs, 400sqmm, XLPE U/G cable by <b>HDD method with</b> HDPE pipe (160mm dia, PN8 PE80) including suply of HDPE Pipe.	Mtr.	500	2,800.00	14,00,000.00
1.6	Laying of <b>160mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	2452.00	300.00	7,35,600.00
2	Erection, Commissioning, Wiring and Testing of 11kV RMU				
2.1	Erection of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	0	9,639.00	-
2.2	Erection of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	3	9,639.00	28,917.00
2.3	Erection of RMU 3W 11kV 630A with metering unit (LLV+M)	Nos.	0	15,000.00	-
2.4	Erection of RMU 4W 11kV 630A with metering unit (LLVV+M)	Nos.	0	15,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	3.0	16,000.00	48,000.00
	Sub Total (Erection Portion) (in Rs.)				24,98,879.00
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				

Annexure-2					
Standard BoQ and Estimate for 11kV 3C, 400sqmm UG Cable along with 11kV RMU					
1.1	Earth work excavation of soil (1mtr. width X 1mtr. depth) Route Length	Mtr	1226		
1.1.a	Earth work excavation of <b>soil</b>	Cum	858.2	700.00	6,00,740.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	367.8	1,720.00	6,32,616.00
1.2	Back filling with excavated soil outside and above the trench	Cum	1226	202.00	2,47,652.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	613	2,643.67	16,20,570.10
<b>2</b>	<b>Civil works for Prefabricated RCC foundation with supply of all materials</b>				
2.1	Prefabricated RCC foundation of 11kV RMU	Nos.	3	23,145.30	69,435.90
3	Supply of GI Fencing with Gate around each <b>RMU</b>	sqmtr	60	3,600.00	2,16,000.00
4	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	6	3,700.00	22,200.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	100	1,012.00	1,01,200.00
	<b>Sub Total (Civil Portion) (in Rs.)</b>				<b>35,80,657.20</b>
<b>A</b>	<b>Sub Total (Supply Portion)</b>				<b>1,14,87,780.02</b>
B	Stock, Storage & Insurance @ 3 % of A				3,44,633.40
<b>C</b>	<b>Sub Total (A+B)</b>				<b>1,18,32,413.42</b>
D	Contingency @ 3 % of C				3,54,972.40
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				79.54
F	Transportation @ 7.5% of C				8,87,431.01
G	Erection Charges @ 10% of earthing items				397.68
<b>H</b>	<b>Total (C+D+E+F+G)</b>				<b>1,30,75,294.05</b>
I	Sub Total (Erection Portion + Civil Portion)				60,79,536.20
<b>J</b>	<b>Total Cost (H+I)</b>				<b>1,91,54,830.25</b>
<b>L</b>	<b>Total Estimated Capital Cost i.e. (J+K)</b>				1,91,54,830.25
M	GST @ 18% of L				34,47,869.44
<b>N</b>	<b>Grand Total (L+M)</b>				<b>2,26,02,699.69</b>
O	Inspection Fee of UG Line (HT) - Rs. 375 upto 1 KM.				375.00
P	Inspection Fee of UG Line (HT) - Rs. 225/ Additional Km				112.50
Q	Inspection Fee of RMU - Rs. 1500/ RMU				4,500.00
R	Inspection Fee of Drawing Checking and Approval				750.00
<b>S</b>	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>				<b>2,26,08,437.19</b>

Annexure-2					
11kV Line Length with 40 Mtr. Span using 100 SQ.MM. -AAA Conductor					
No. of DP required Without AB switch (Ref. Drawing No.- TPCODL-MVD-0012)			4		
MATERIALS OF DP Without AB Switch					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No	29,661.00	8	2,37,288.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 2.3 mtr., 2 no's channel required =( 2x9.56x2.3)	KG	76.00	175.904	13,368.70
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	15.8592	1,546.27
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.66 Mtr., 4 no's channel required =( 7.14x1.66x4)	KG	76.00	189.6384	14,412.52
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 2.671 mtr., 4 nos angle required = (4.5x2.671x4)	KG	76.00	192.312	14,615.7
6	Danger Plate, 2 no's.	No.	104.00	8	832.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	2.4072	234.70
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.551 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	8	1,300.00
9	H.T. Stay set (Complete )	Set	1,365.00	8	10,920.00
10	H.T. Stay Insulator Type-C	No.	65.00	8	520.00
11	7/10 SWG Stay Wire 15kg /stay	K.g.	97.50	120	11,700.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	4	5,460.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	47.2	4,602.00
14	GI barbed wire anticlimbing device 3 Kg. Per support, 2 no's qty. required =(2x3kg)	Kg	104.00	24	2,496.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	9.6288	938.81
16	11 KV pin insulator polymer	No.	260.00	12	3,120.00
17	H W fitting(B&S) 70KN, 3Bolt	No.	455.00	24	10,920.00
18	Disc insulator (B&S) 70 KN polymer	No.	1,495.00	24	35,880.00
19	PG Clamp for 100 sq.mm AAA conductor	NO.	754.00	24	18,096.00
20	GI Nut, Bolt & Washer of different sizes (12.261 Kg each DP without AB Switch)	K.g.	101.40	49.044	4,973.06
21	Black Paint	Ltr	286.00	4	1,144.00
22	Yellow Colour Paint for Background	Ltr	216.00	8	1,728.00
A	Total Cost of materials				3,96,095.78
B	Stock, Storage & Insurance i.e 3% of A				11,882.87
C	Sub Total (A+B)				4,07,978.65

Annexure-2					
11kV Line Length with 40 Mtr. Span using 100 SQ.MM. -AAA Conductor					
9	Danger Plate, 2 no's.	No.	104.00	12	1,248.00
10	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	3.6108	352.05
11	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.551 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	12	1,950.00
12	H.T. Stay set (Complete )	Set	1,365.00	12	16,380.00
13	H.T. Stay Insulator Type-C	No.	65.00	12	780.00
14	7/10 SWG Stay Wire 15kg /stay	K.g.	97.50	180	17,550.00
15	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	12	16,380.00
16	50x6mm GI Flat for earthing, 2.36kg/mtr., (12.5 Mtr. For L.A, 3 Mtr for AB Switch Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 20.5x2.36	KG	97.50	290.28	28,302.30
17	GI barbed wire anticlimbing device 3 Kg. Per support, 2 no's qty. required =(2x3kg)	Kg	104.00	36	3,744.00
18	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	14.4432	1,408.21
19	Lightning Arrester(12KV,10KA) (Station Class,class-2)	EA	4,615.00	18	83,070.00
20	AB Switch (11KV,400A,3pole,50Hz)	Set	15,405.00	6	92,430.00
21	11 KV pin insulator polymer	No.	260.00	18	4,680.00
22	H W fitting(B&S) 70KN, 3Bolt	No.	455.00	36	16,380.00
23	Disc insulator (B&S) 70 KN polymer	No.	1,495.00	36	53,820.00
24	PG Clamp for 100 sq.mm AAA conductor	NO.	754.00	36	27,144.00
25	GI Nut , Bolt & Washer of different sizes (13.718 Kg each DP with AB Switch)	K.g.	101.40	82.308	8,346.03
26	Black Paint	Ltr	286.00	6	1,716.00
27	Yellow Colour Paint for Background	Ltr	216.00	12	2,592.00
A	Total Cost of materials				8,55,768.00
B	Stock, Storage & Insurance i.e 3% of A				25,673.04
C	Sub Total (A+B)				8,81,441.04
D	Contingency @ 3% of C				26,443.23
E	Tools & Plants @ 2% of C				16,536.20</

Annexure-2					
11kV Line Length with 40 Mtr. Span using 100 SQ.MM. -AAA Conductor					
F	Transportation @ 7.5% of C				15,792.32
G	Erection Charges @ 5% on Trf/Breaker/Joist				6,110.17
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				8,836.09
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,51,831.03
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	1.80	11,700.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
K	Total Civil & Services				14,625.00
L	Total (J+K)				2,66,456.03
N	Sub Total (L+M)				2,66,456.03
O	Total GST @ 18% of (N)				47,962.09
O1	Total CESS @ 1% of (N)				2,664.56
P	Gross Total Material +Services (N+O+O1) for 11 KV Cut Point with 180 Degree Angle				3,17,082.68
No. of Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-MVD-0005)		6			
MATERIALS FOR 11 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No	29,661.00	6	1,77,966.00
2	Straight Cross Arm 100X50X6mm, 9.56 KG/Mtr., each channel length 1.2 mtr., 4 no's channel required =( 4x9.56x1.2)	KG	76.00	275.328	20,924.93
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	97.50	63.4368	6,185.09
4	Straight Cross Arm 100X50X6mm, 9.56 KG/Mtr., each channel length 0.306 mtr., 4 no's channel required =( 4x9.56x0.306)	KG	76.00	70.20864	5,335.86
5	Danger Plate, 1 no's.	No.	104.00	6	624.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	1.8054	176.03
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	18	1,872.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	7.2216	704.11
9	11 KV pin insulator polymer	No.	260.00	24	6,240.00
10	H W fitting(B&S) 70KN, 3Bolt	No.	455.00	36	16,380.00
11	Disc insulator (B&S) 70 KN polymer	No.			

Annexure-2					
11kV Line Length with 40 Mtr. Span using 100 SQ.MM. -AAA Conductor					
2	11 KV V cross Arm (10.2 Kg. each )	No.	1,053.00	100	1,05,300.00
3	Top bracket 100x50X6 mm GI channel (2kg each)	No.	195.00	100	19,500.00
4	Danger Plate, 1 no's. for each pole	No.	104.00	100	10,400.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	30.09	2,933.78
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	300.00	31,200.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	120.36	11,735.10
8	11 KV pin insulator polymer, 3 Nos. required for each support	No.	260.00	300	78,000.00
9	Earthing of Support ( Coil Type )	No.	215.80	100	21,580.00
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	26.20	2,554.50
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	101.40	145.00	14,703.00
12	100 mm2 AAAC	Mtr.	71.50	30900.00	22,09,350.00
13	Crimping type Midspan Compression Joint for 100 sq.mm AAA conductor	EA	175.25	30	5,257.50
14	Black Paint	Ltr	286.00	100.0	28,600.00
15	Yellow Colour Paint for Background	Ltr	216.00	200.0	43,200.00
A	Total Cost of materials				55,50,413.88
B	Stock, Storage & Insurance i.e 3% of A				1,66,512.42
C	Sub Total (A+B)				57,16,926.29
D	Contingency @ 3% of C				1,71,507.79
E	Tools & Plants @ 2% of C				1,14,338.53
F	Transportation @ 7.5% of C				4,28,769.47
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,52,754.15
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				2,66,184.33
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				68,50,480.56
Civil & Services					
1	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	45.00	2,92,500.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	11.25	73,125.00
3	Dismantling of 09/11 Mtr. Joist/WPB Pole- 116X100mm (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within 10km /site store and refilling the pit with loose earth and ramming including removal and disposal of malba at proper location as per instruction of EIC.	EA	1,350.00	50.00	67,500.00
4	Dismantling of ACSR/AAAC 34/ 55/80 mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	Mtr.	6.30	30900.00	1,94,670.00
5	Dismantling of 11kV Pin and Disc Insulator including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	150.00	1,215.00
K	Total Civil & Services				6,29,010.00
L	Total Material+Services (I+K)				74,79,490.56
N	Sub Total (L+M)				74,79,490.56
O	Total GST @ 18% of (N)				13,46,308.30
O1	Total CESS @ 1% of (N)				74,794.91
P	Gross Total Material +Services (N+O+O1) for 11 KV Pin Points With WPB				89,00,593.76
Gross Total Summary					
1	Gross Total Material +Services (N+O+O1) for DP Without AB Switch				6,49,630.37
2	Gross Total Material +Services (N+O+O1) for DP With AB Switch				13,92,483.30
3	Gross Total Material +Services (N+O+O1) for 11 KV Cut Point with 180 Degree Angle				3,17,082.68
4	Gross Total Material +Services (N+O+O1) for 11 KV Cut Point with 90 Degree Angle				5,87,654.17
5	Gross Total Material +Services (N+O+O1) for 11 KV Pin Points With WPB				89,00,593.76
Q	Gross Total Material +Services				1,18,47,444.29
R	Inspection Fee of Over Head Line (HT) - Rs. 375 up to 1 km.				
S	Inspection Fee of Over Head Line (HT) - Rs. 225/ Additional Km				
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				1,18,48,194.29

Annexure-3			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		PURI ELECTRICAL DIVISION, PURI	
Name of the Sub-Division : -		Sakhigopal	
Name of the Section : -		Satasankha, Puri	
Name of the Work :-		33kV New Line from Satasankha Grid (33kV Proposed Mangalpur Feeder)	
Scope of work:-		Laying of 33kV underground cable with 3R, 1CX630sqmm Cable- 3.5Ckm. Construction of 33kV 4 Pole with Isolator- 1 No.	
Names of Schemes: -		TPCODL CAPEX	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Laying of 33kV underground cable with 3R, 1CX630sqmm Cable- 3.5Ckm.	₹ 4,80,61,167.38
2	B	Construction of 33kV 4 Pole with Isolator- 1 No.	₹ 9,78,548.67
		Total Amount	₹ 4,90,39,716.04
		Total Amount (In Cr)	₹ 4.90
Total estimated cost is Rs.4.9 Crore.			

Annexure-3					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (along with 1core spare cable) with accessories</b>				
<b>a</b>	<b>Length of 33kV 1C, 630sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>3000</b>		
<b>b</b>	<b>Length of 33kV 1C, 630sqmm cable (HDD)</b>	<b>Mtr.</b>	<b>500</b>		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	10500	1,495.47	1,57,02,435.00
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	33	11,900.00	3,92,700.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	6	6,350.00	38,100.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set		6,100.00	-
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	8952.00	357.60	32,01,235.20
<b>2</b>	<b>Supply of 33kV RMU</b>				
<b>a</b>	<b>No. of 33kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 33kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
<b>c</b>	<b>No. of 33kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 33kV 4Way RMU (LLVV)</b>	<b>nos.</b>			
<b>e</b>	<b>No. of 33kV 3Way RMU (LLL)</b>	<b>nos.</b>			
<b>f</b>	<b>No. of 33kV 4Way RMU (LLLL)</b>	<b>nos.</b>			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	23,35,264.00	-
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
<b>3</b>	<b>Earthing</b>				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	0.00	97.50	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,365.00	-
<b>4</b>	<b>FRTU for RMU SCADA Automation</b>				
<b>a</b>	<b>No. of FRTU</b>	<b>nos.</b>	<b>0</b>		
<b>4.1</b>	Pre-Wired FRTU Panel with FRTU	No.	0	1,21,744.00	-
<b>4.2</b>	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	0	1,00,000.00	-

Annexure-3					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
4.3	Networking Accessories	No.	0	72.00	-
4.4	CMR with Mounting Base for Digital Inputs	Nos.	0	650.00	-
4.5	Interposing Relay for Digital Output	Nos.	0	467.94	-
4.6	Battery Charger	Nos.	0	15,385.00	-
4.7	Battery	Nos.	0	8,333.00	-
4.8	4G Modem cum Router	Nos.	0	18,500.00	-
4.9	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	0	204.87	-
4.10	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	0	305.58	-
4.11	Twisted Pair Shielded & Over all shielded Instrumentation Cable	Mtr.	0	275.23	-
4.12	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	0	165.25	-
4.13	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	0	150.00	-
4.14	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	0.0	148.43	-
4.15	Armored CAT6 SFTP Cable	Mtr.	0	45.87	-
4.16	Un-Armored CAT6 SFTP Cable	Mtr.	0	89.45	-
4.17	Multi Function Meter	Nos.	0	18,651.00	-
Sub Total (Supply Portion) (in Rs.)					1,93,34,470.20
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	9000	94.50	8,50,500.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	33	2,400.00	79,200.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	0	2,081.70	-
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with HDPE pipe</b> (110mm dia, PN8 PE80) including suply of HDPE Pipe.	Mtr.	1500	2,300.00	34,50,000.00
1.6	Laying of <b>110mm dia PE 80-PN8, HDPE pipe</b> inside open trench.	Mtr.	8952.00	300.00	26,85,600.00
2	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-

Annexure-3					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	-
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
<b>3</b>	<b>FRTU and OFC for RMU SCADA Automation</b>				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	0.0	16,000.00	-
	<b>Sub Total (Erection Portion) (in Rs.)</b>				<b>70,77,790.20</b>
<b>Civil Portion</b>					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Civil works with supply of all materials like cement, MS tor rod, brick, coarse &amp; fine aggregates and labour, T&amp;P, etc for UG Cable Trench</b>				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)- Route Length	Mtr	2984		
1.1.a	Earth work excavation of <b>soil</b>	Cum	2506.56	700.00	17,54,592.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	1074.24	1,720.00	18,47,692.80
1.2	Back filling with excavated soil outside and above the trench	Cum	3580.8	202.00	7,23,321.60
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	1492	2,643.67	39,44,356.58
<b>2</b>	<b>Civil works for Prefabricated RCC foundation with supply of all materials</b>				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	0	23,145.30	-
<b>3</b>	<b>Supply of GI Fencing with Gate around each RMU</b>	sqmtr	0	3,600.00	-
<b>4</b>	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	0	3,700.00	-
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	117	1,012.00	1,18,404.00
	<b>Sub Total (Civil Portion) (in Rs.)</b>				<b>84,58,610.18</b>
<b>A</b>	<b>Sub Total (Supply Portion)</b>				<b>1,93,34,470.20</b>
B	Stock, Storage & Insurance @ 3 % of A				5,80,034.11
<b>C</b>	<b>Sub Total (A+B)</b>				<b>1,99,14,504.31</b>
D	Contingency @ 3 % of C				5,97,435.13
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				14,93,587.82

Annexure-3		
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU		
G	Erection Charges @ 10% of earthing items	-
H	<b>Total (C+D+E+F+G)</b>	<b>2,20,05,527.26</b>
I	Sub Total (Erection Portion + Civil Portion)	1,55,36,400.38
J	<b>Total Cost (H+I)</b>	<b>3,75,41,927.64</b>
L	<b>Total Estimated Capital Cost i.e. (J+K)</b>	<b>3,75,41,927.64</b>
M	GST @ 18% of L	67,57,546.97
M1	CESS @ 1% of L	37,54,192.76
N	<b>Grand Total (L+M)</b>	<b>4,80,53,667.38</b>
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.	3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km	3,750.00
Q	Inspection Fee of RMU - Rs. 1500/ RMU	-
R	Inspection Fee of Drawing Checking and Approval	750.00
S	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>	<b>4,80,61,167.38</b>

Annexure-3					
BoQ and Estimate for 33 KV 4 Pole using WPB GI Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.) with Isolator and LA					
No. of 33 KV 4-Pole with Isolator			1		
MATERIALS FOR 33 KV 4-P With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB(GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	4	1,37,288.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel required =( 8x9.56x4.3)	KG	76.00	328.864	24,993.66
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required = (24x2.36x0.280)	KG	97.50	15.8592	1,546.27
4	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)/ Isolator	KG	76.00	184.212	14,000.11
5	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 8 no's channel required =( 8x7.14x4.3)	KG	76.00	245.616	18,666.82
6	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 8 nos angle required = (8*4.5*4.927)	KG	76.00	177.372	13,480.27
7	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no channel required =( 1x7.14x0.8)/ Isolator	KG	76.00	17.136	1,302.34
8	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 no angle required = (1*4.5*0.388)/ Isolator	KG	76.00	5.238	398.09
9	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 no angle required = (1*4.5*0.340)/ Isolator	KG	76.00	4.59	348.84
10	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)/ Isolator	KG	76.00	28.68	2,179.68
11	Danger Plate, 2 no's.	No.	104.00	2	208.00
12	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	0.6018	58.68
13	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	3	4,095.00
14	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 5 mtr. For raising)	KG	97.50	62.54	6,097.65
15	GI barbed wire anticlimbing device 3 Kg. Per support, 4 no's qty. required =(4x3kg)	Kg	104.00	12	1,248.00
16	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 16 no's = (16x0.59x0.510)	KG	97.50	4.8144	469.40
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	9	1,21,095.00
18	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	3	1,98,000.00
19	33KV pin insulator polymer	No.	624.00	6	3,744.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	18	11,700.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	18	26,910.00
22	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	24	35,880.00
23	232 sq.mm AAA conductor	Mtr.	203.45	30.9	6,286.61
24	GI Nut , Bolt & Washer of different sizes	K.g.	101.40	45	4,563.00
25	Black Paint	Ltr	286.00	1	286.00
26	Yellow Colour Paint for Background	Ltr	216.00	2	432.00
A	Total Cost of materials			6,35,277.41	
B	Stock, Storage & Insurance i.e 3% of A			19,058.32	
C	Sub Total (A+B)			6,54,335.74	
D	Contingency @ 3% of C			19,630.07	
E	Tools & Plants @ 2% of C			13,002.36	
F	Transportation @ 7.5% of C			49,075.18	
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			7,070.33	

Annexure-3					
BoQ and Estimate for 33 KV 4 Pole using WPB GI Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.) with Isolator and LA					
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				50,871.12
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				7,93,984.80
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
3	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	3	11,100.00
K	Total Civil & Services				28,325.00
L	Total (J+K)				8,22,309.80
N	Sub Total (L+M)				8,22,309.80
O	Total GST @ 18% of (N)				1,48,015.76
O1	Total CESS @ 1% of (O1)				8,223.10
P	Gross Total Material +Services (N+O+O1) for 33 KV 4-P With Isolator				9,78,548.67

Annexure-4			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		NED, Nimapada	
Name of the Sub-Division : -		Pipili	
Name of the Section : -		Pipili No.-1	
Name of the Work :-		33kV New Line from Pratapsasan Grid (33kV Proposed Trahiachyutanagar Feeder)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 7Ckm.Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable-1Ckm. Construction for 1 no. of 33kV Outdoor Bay at Trahiachyuta Nagar PSS.	
Names of Schemes: -		TPCODL CAPEX	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 7Ckm.	₹ 2,61,36,726.20
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable-1Ckm.	₹ 1,40,53,343.76
3	C	Construction for 1 no. of 33kV Outdoor Bay at Trahiachyuta Nagar PSS.	₹ 36,39,033.16
		Total Amount	₹ 4,38,29,103.13
		Total Amount (In Cr)	₹ 4.38
Total estimated cost is Rs.4.38 Crore.			

Annexure-4					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			10		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	20	6,86,440.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =( 2x9.56x3.25)	KG	76.00	621.4	47,226.40
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	39.648	3,865.68
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96)	KG	76.00	699.72	53,178.72
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	617.76	46,949.76
6	Danger Plate, 2 no's.	No.	104.00	20	2,080.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	6.018	586.76
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	20	3,250.00
9	H.T. Stay set (Complete )	Set	1,365.00	20	27,300.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	40	2,600.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	300	29,250.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	10	13,650.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	118	11,505.00
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	60	6,240.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	24.072	2,347.02
16	33KV pin insulator polymer	No.	624.00	30	18,720.00
17	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	60	39,000.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	60	89,700.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	60	89,700.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	101.40	122.61	12,432.65
21	Black Paint	Ltr	286.00	10	2,860.00
22	Yellow Colour Paint for Background	Ltr	216.00	20	4,320.00
A	Total Cost of materials				11,93,201.99
B	Stock, Storage & Insurance i.e 3% of A				35,796.06
C	Sub Total (A+B)				12,28,998.05
D	Contingency @ 3% of C				36,869.94
E	Tools & Plants @ 2% of C				23,013.33
F	Transportation @ 7.5% of C				92,174.85
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				35,351.66
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				44,363.33
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				14,60,771.17
Civil & Services					
Sl. No.</					

Annexure-4					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	8	2,74,576.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	76.00	328.864	24,993.66
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	15.8592	1,546.27
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	76.00	122.808	9,333.41
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	76.00	245.616	18,666.82
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	76.00	491.232	37,333.63
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	354.744	26,960.54
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	76.00	22.848	1,736.45
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	6.984	530.78
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	6.12	465.12
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	76.00	38.24	2,906.24
12	Danger Plate, 2 no's.	No.	104.00	8	832.00
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	2.4072	234.70
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	8	1,300.00
15	H.T. Stay set (Complete )	Set	1,365.00	8	10,920.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	16	1,040.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	120	11,700.00
18	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	8	10,920.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	97.50	226.56	22,089.60
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	24	2,496.00
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	9.6288	938.81
22	Lightning Arrester(30KV,10KA) (Station Class,class				

Annexure-4					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
O	Total GST @ 18% of (N)				2,37,105.98
O1	Total CESS @ 1% of (N)				13,172.55
P	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				15,67,533.99
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- )				10	
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	10	5,67,357.14
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	325.04	24,703.04
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	52.864	5,154.24
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	58.5072	4,446.55
5	Danger Plate, 1 no's.	No.	104.00	10	1,040.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	3.009	293.38
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	30	3,120.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	12.036	1,173.51
9	33KV pin insulator polymer	No.	624.00	30	18,720.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	60	39,000.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	60	89,700.00
12	Earthing of Support ( Coil Type )	EA	215.80	10	2,158.00
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	2.62	255.45
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	60	89,700.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	48.79	4,947.31
16	Black Paint	Ltr	286.00	10	2,860.00
17	Yellow Colour Paint for Background	Ltr	216.00	20	4,320.00
A	Total Cost of materials				8,58,948.61
B	Stock, Storage & Insurance i.e 3% of A				25,768.46
C	Sub Total (A+B)				8,84,717.07
D	Contingency @ 3% of C				26,541.51
E	Tools & Plants @ 2% of C				17,694.34
F	Transportation @ 7.5% of C				66,353.78
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				29,218.89
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				30,033.92
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				10,54,559.52
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	5.5	35,750.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125				

Annexure-4					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	4.8144	469.40
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	624.00	16	9,984.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	24	15,600.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	24	35,880.00
12	Earthing of Support ( Coil Type )	No.	215.80	4	863.20
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	1.048	102.18
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	24	35,880.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	4	650.00
16	H.T. Stay set (Complete )	Set	1,365.00	4	5,460.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	4	260.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	60	5,850.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	45.24	4,587.34
20	Black Paint	Ltr	286.00	4	1,144.00
21	Yellow Colour Paint for Background	Ltr	216.00	8	1,728.00
A	Total Cost of materials				3,74,625.39
B	Stock, Storage & Insurance i.e 3% of A				11,238.76
C	Sub Total (A+B)				3,85,864.15
D	Contingency @ 3% of C				11,575.92
E	Tools & Plants @ 2% of C				7,465.55
F	Transportation @ 7.5% of C				28,939.81
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				11,687.56
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				13,952.64
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				4,59,485.64
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.20	14,300.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation				

Annexure-4					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				5,47,085.19
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,67,95,460.16
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	80.85	5,25,525.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	16.54	1,07,493.75
K	Total Civil & Services				6,33,018.75
L	Total (J+K)				1,74,28,478.91
N	Sub Total (L+M)				1,74,28,478.91
O	Total GST @ 18% of (N)				31,37,126.20
O1	Total CESS @ 1% of (N)				1,74,284.79
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				2,07,39,889.91
Gross Total Summary					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				19,38,386.44
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				15,67,533.99
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				13,06,170.20
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				5,77,995.66
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				2,07,39,889.91
Q	Gross Total Material +Services				2,61,29,976.20
R	Inspection Fee of Over Head Line (HT) - Rs.1500 up to 1 km.				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				4,500.00
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				2,61,36,726.20

Annexure-4					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (along with 1core spare cable) with accessories</b>				
<b>a</b>	<b>Length of 33kV 1C, 630sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>700</b>		
<b>b</b>	<b>Length of 33kV 1C, 630sqmm cable (HDD)</b>	<b>Mtr.</b>	<b>300</b>		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	3000	1,495.47	44,86,410.00
1.2	Supply of Straight throU/Gh jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	6	11,900.00	71,400.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	6	6,350.00	38,100.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set		6,100.00	-
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	2052.00	357.60	7,33,795.20
<b>2</b>	<b>Supply of 33kV RMU</b>				
<b>a</b>	<b>No. of 33kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 33kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
<b>c</b>	<b>No. of 33kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 33kV 4Way RMU (LLVV)</b>	<b>nos.</b>			
<b>e</b>	<b>No. of 33kV 3Way RMU (LLL)</b>	<b>nos.</b>			
<b>f</b>	<b>No. of 33kV 4Way RMU (LLLL)</b>	<b>nos.</b>			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	23,35,264.00	-
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
<b>3</b>	<b>Earthing</b>				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	0.00	97.50	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,365.00	-
<b>4</b>	<b>FRTU for RMU SCADA Automation</b>				
<b>a</b>	<b>No. of FRTU</b>	<b>nos.</b>	<b>0</b>		
4.1	Pre-Wired FRTU Panel with FRTU	No.	0	1,21,744.00	-
4.2	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	0	1,00,000.00	-

Annexure-4					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
4.3	Networking Accessories	No.	0	72.00	-
4.4	CMR with Mounting Base for Digital Inputs	Nos.	0	650.00	-
4.5	Interposing Relay for Digital Output	Nos.	0	467.94	-
4.6	Battery Charger	Nos.	0	15,385.00	-
4.7	Battery	Nos.	0	8,333.00	-
4.8	4G Modem cum Router	Nos.	0	18,500.00	-
4.9	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	0	204.87	-
4.10	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	0	305.58	-
4.11	Twisted Pair Shielded & Over all shielded Instrumentation Cable	Mtr.	0	275.23	-
4.12	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	0	165.25	-
4.13	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	0	150.00	-
4.14	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	0.0	148.43	-
4.15	Armored CAT6 SFTP Cable	Mtr.	0	45.87	-
4.16	Un-Armored CAT6 SFTP Cable	Mtr.	0	89.45	-
4.17	Multi Function Meter	Nos.	0	18,651.00	-
Sub Total (Supply Portion) (in Rs.)					53,29,705.20
Erection Portion					
Sl. No.	Description of Items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	2100	94.50	1,98,450.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	6	2,400.00	14,400.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	0	2,081.70	-
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with HDPE pipe</b> (110mm dia, PN8 PE80) including suply of HDPE Pipe.	Mtr.	900	2,300.00	20,70,000.00
1.6	Laying of <b>110mm dia PE 80-PN8, HDPE pipe</b> inside open trench.	Mtr.	2052.00	300.00	6,15,600.00
2	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-

Annexure-4					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	-
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	0.0	16,000.00	-
	Sub Total (Erection Portion) (in Rs.)				29,10,940.20
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)- Route Length	Mtr	684		
1.1.a	Earth work excavation of soil	Cum	574.56	700.00	4,02,192.00
1.1.b	Earth work excavation of hard rock	Cum	246.24	1,720.00	4,23,532.80
1.2	Back filling with excavated soil outside and above the trench	Cum	820.8	202.00	1,65,801.60
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	342	2,643.67	9,04,135.36
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	0	23,145.30	-
3	Supply of GI Fencing with Gate around each RMU	sqmtr	0	3,600.00	-
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	0	3,700.00	-
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	33	1,012.00	33,396.00
	Sub Total (Civil Portion) (in Rs.)				19,99,300.96
A	Sub Total (Supply Portion)				53,29,705.20
B	Stock, Storage & Insurance @ 3 % of A				1,59,891.16
C	Sub Total (A+B)				54,89,596.36
D	Contingency @ 3 % of C				1,64,687.89
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				4,11,719.73

Annexure-4		
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU		
G	Erection Charges @ 10% of earthing items	-
H	<b>Total (C+D+E+F+G)</b>	<b>60,66,003.97</b>
I	Sub Total (Erection Portion + Civil Portion)	49,10,241.16
J	<b>Total Cost (H+I)</b>	<b>1,09,76,245.13</b>
K	Other Overhead /(including Supervision Charges) @ 6 % of J	
L	<b>Total Estimated Capital Cost i.e. (J+K)</b>	<b>1,09,76,245.13</b>
M	GST @ 18% of L	19,75,724.12
M1	CESS @ 1% of L	10,97,624.51
N	<b>Grand Total (L+M)</b>	<b>1,40,49,593.76</b>
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.	3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km	
Q	Inspection Fee of RMU - Rs. 1500/ RMU	-
R	Inspection Fee of Drawing Checking and Approval	750.00
S	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>	<b>1,40,53,343.76</b>

**Annexure-4**

<b>Construction of 33kV Outdoor Bay arrangement.</b>					
<b>No. of Bus isolator requirement</b>			3		
<b>No. of VCB Requirement</b>			1		
<b>Sl. No.</b>	<b>Description of Materials</b>	<b>Unit</b>	<b>Unit Rate</b>	<b>Total Quantity</b>	<b>Total Amount</b>
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	1	26,600.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	1	31,920.00
3	T-1A GI Column ( for 33 kv Bus) ( 6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	2	47,120.00
4	T-2A GI Column ( for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	2	56,240.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	1	15,200.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	4	53,200.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	990	75,240.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	200	15,200.00
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	285	21,660.00
10	GI Spikes with cone and GI ( 2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	4	14,567.67
11	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	8	10,920.00
12	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation )= 20x2.36	KG	97.50	188.8	18,408.00
13	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,74,300.00	0.1	27,430.00
14	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,31,157.00	3	3,93,471.00
15	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR- 600-300-150/1-1A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for feeder protection	EA	7,02,000.00	1	7,02,000.00
16	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	33,046.00	3	99,138.00
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	12	1,61,460.00
18	Control Cable 10Core x 2.5 mm <sup>2</sup>	Mtr	429.00	150	64,350.00
19	Control Cable 16Core x 2.5 mm <sup>2</sup>	Mtr	523.90	150	78,585.00
20	Control Cable 4Core x 2.5 mm <sup>2</sup>	Mtr	145.60	50	7,280.00
21	Control Cable 7Core x 2.5 mm <sup>2</sup>	Mtr	236.60	50	11,830.00
22	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	18	26,910.00
23	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	18	11,700.00
24	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop	No.	1,404.00	18	25,272.00
25	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	48	71,760.00
26	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	101.40	54.872	5,564.02
27	Black Paint	Ltr	286.00	4	1,144.00
28	Yellow Colour Paint for Background	Ltr	286.00	8	2,288.00
<b>A</b>	<b>Total Cost of materials</b>				<b>20,76,457.69</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				62,293.73
<b>C</b>	<b>Sub Total (A+B)</b>				<b>21,38,751.42</b>
<b>D</b>	Contingency @ 3% of C				64,162.54

**Annexure-4**

**Construction of 33kV Outdoor Bay arrangement.**

E	Tools & Plants @ 2% of C	42,775.03
F	Transportation @ 7.5% of C	1,60,406.36
G	Erection Charges @ 5% on Trf/Breaker/Joist	36,153.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Earthing)	1,40,444.38
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv	-
J	<b>Sum of (C to I)</b>	<b>25,82,692.74</b>

**Civil & Services**

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
A	<b>VCB Foundation</b>				
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	7.28	3,508.96
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	4.00	800.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	1020.00	0.34	348.08
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.46	2,334.15
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	2.83	18,362.50
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	13.25	3,988.25
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	140.00	15,260.00
B	<b>CT &amp; PT Foundation</b>			0.00	-
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	7.97	3,840.94
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	4.50	900.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	900.00	0.36	326.70
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.36	1,862.19
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	2.36	15,356.25
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	14.94	4,496.94
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	122.43	13,344.87
C	<b>Column as per Drawing Schedule-</b>			0.00	-
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	51.31	24,731.30
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	24.00	4,800.00

**Annexure-4**

<b>Construction of 33kV Outdoor Bay arrangement.</b>					
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	2.10	10,773.00
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	14.18	92,137.50
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	89.64	26,981.64
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	734.58	80,069.22
D	<b>Isolator</b>				
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	14.18	6,832.35
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	6.00	1,200.00
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.85	4,363.07
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	8.55	55,575.00
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	44.82	13,490.82
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	367.29	40,034.61
7	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3700.00	8	29,600.00
K	<b>Total Civil &amp; Services</b>				<b>4,75,318.33</b>
L	<b>Total (J+K)</b>				<b>30,58,011.06</b>
N	<b>Sub Total (L+M)</b>				<b>30,58,011.06</b>
O	Total GST @ 18% of (N)				5,50,441.99
P	Total Cess @ 1% of (N)				30,580.11
Q	<b>Gross Total Material +Services (N+O+P)</b>				<b>36,39,033.16</b>

Annexure-5			
TP CENTRAL ODISHA DISTRIBUTION LTD.			
Name of the Division :-		NAYAGARH ELECTRICAL DIVISION, NAYAGARH	
Name of the Sub-Division : -		Daspalla	
Name of the Section : -		Daspalla, Nayagarh	
Name of the Work :-		33kV New Lines from Daspalla Grid (33kV Proposed Daspalla, Banigochha & Gania Feeders)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 0.35Ckm. Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 0.37Ckm. Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 32Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm. Construction of 33kV 4 Pole structure with Isolator- 2nos.	
Names of Schemes: -		TPCODL CAPEX	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Gross Total
1	A	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 0.35Ckm.	₹ 12,97,797.24
2	B	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 0.37Ckm.	₹ 13,33,614.81
3	C	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 32Ckm.	₹ 12,23,63,262.25
4	D	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm.	₹ 1,44,82,689.32
5	E	Construction of 33kV 4 Pole structure with Isolator- 2nos.	₹ 20,90,891.18
		Total Estimated Cost	₹ 14,15,68,254.81
		Total Estimated Cost (in Cr)	₹ 14.16
Total estimated cost is Rs.14.16 Crore.			

Annexure-5					
33kV Line Length using 241 SQ.MM. -AAA Conductor (0.35Ckm)					
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)			1		
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	1	34,322.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	32.504	2,470.30
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	5.2864	515.42
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	5.85072	444.65
5	Danger Plate, 1 no's.	No.	104.00	1	104.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	0.3009	29.34
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	3	312.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	1.2036	117.35
9	33KV pin insulator polymer	No.	624.00	3	1,872.00
10	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	3	993.00
11	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	6	5,490.00
12	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar ) ( 2 Nos of spike per Set in each Pole )	Set	332.00	2	664.00
13	H W fitting(B&S)90KN,4 Bolt	No.	650.00	6	3,900.00
14	Disc insulator (B&S)90 KN polymer	No.	1,495.00	6	8,970.00
15	Earthing of Support ( Coil Type )	EA	215.80	1	215.80
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	0.262	25.55
17	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	4.879	494.73
18	Black Paint	Ltr	286.00	1	286.00
19	Yellow Colour Paint for Background	Ltr	216.00	2	43

Annexure-5					
33kV Line Length using 241 SQ.MM. -AAA Conductor (0.35Ckm)					
12	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	4	1,324.00
13	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	6	5,490.00
14	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	2	664.00
15	Earthing of Support ( Coil Type )	No.	215.80	1	215.80
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	0.262	25.55
17	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	1	162.50
18	H.T. Stay set (Complete )	Set	1,365.00	1	1,365.00
19	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	1	65.00
20	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	15	1,462.50
21	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	11.31	1,146.83
22	Black Paint	Ltr	286.00	1	286.00
23	Yellow Colour Paint for Background	Ltr	216.00	2	432.00
A	Total Cost of materials				69,750.63
B	Stock, Storage & Insurance i.e 3% of A				2,092.52
C	Sub Total (A+B)				71,843.15
D	Contingency @ 3% of C				2,155.29
E	Tools & Plants @ 2% of C				1,373.93
F	Transportation @ 7.5% of C				5,388.24
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,767.58
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				3,334.48
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				85,862.68
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	0.55	3,575.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.11	731.25
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay				

Annexure-5					
33kV Line Length using 241 SQ.MM. -AAA Conductor (0.35Ckm)					
E	Tools & Plants @ 2% of C			14,664.00	
F	Transportation @ 7.5% of C			54,989.98	
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			12,373.08	
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)			48,573.82	
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-	
J	Sum of (C to I)			8,85,796.65	
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	3.85	25,025.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.79	5,118.75
K	Total Civil & Services				30,143.75
L	Total (J+K)				9,15,940.40
N	Sub Total (L+M)				9,15,940.40
O	Total GST @ 18% of (N)				1,64,869.27
O1	Total GST @ 1% of (N)				9,159.40
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				10,89,969.07
Gross Total Summary					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				-
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				-
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				95,599.64
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				1,09,978.53
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				10,89,969.07
Q	Gross Total Material +Services				12,95,547.24
R	Inspection Fee of Over Head Line (HT) - Rs. 1500 upto 1 KM				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				12,97,797.24

Annexure-5					
33kV Line Length using 241 SQ.MM. -AAA Conductor (0.37Ckm)					
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)			1		
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	1	34,322.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	32.504	2,470.30
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	5.2864	515.42
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	5.85072	444.65
5	Danger Plate, 1 no's.	No.	104.00	1	104.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	0.3009	29.34
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	3	312.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	1.2036	117.35
9	33KV pin insulator polymer	No.	624.00	3	1,872.00
10	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	3	993.00
11	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	6	5,490.00
12	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar ) ( 2 Nos of spike per Set in each Pole )	Set	332.00	2	664.00
13	H W fitting(B&S)90KN,4 Bolt	No.	650.00	6	3,900.00
14	Disc insulator (B&S)90 KN polymer	No.	1,495.00	6	8,970.00
15	Earthing of Support ( Coil Type )	EA	215.80	1	215.80
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with				

Annexure-5					
33kV Line Length using 241 SQ.MM. -AAA Conductor (0.37Ckm)					
12	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	4	1,324.00
13	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	6	5,490.00
14	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	2	664.00
15	Earthing of Support ( Coil Type )	No.	215.80	1	215.80
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	0.262	25.55
17	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	1	162.50
18	H.T. Stay set (Complete )	Set	1,365.00	1	1,365.00
19	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	1	65.00
20	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	15	1,462.50
21	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	11.31	1,146.83
22	Black Paint	Ltr	286.00	1	286.00
23	Yellow Colour Paint for Background	Ltr	216.00	2	432.00
A	Total Cost of materials				69,750.63
B	Stock, Storage & Insurance i.e 3% of A				2,092.52
C	Sub Total (A+B)				71,843.15
D	Contingency @ 3% of C				2,155.29
E	Tools & Plants @ 2% of C				1,373.93
F	Transportation @ 7.5% of C				5,388.24
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,767.58
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				3,334.48
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				85,862.68
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	0.55	3,575.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.11	731.25
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	1	2,250.00
K	Total Civil & Services				6,556.25
L	Total (J+K)				92,418.93
N	Sub Total (L+M)				92,418.93
O	Total GST @ 18% of (N)				16,635.41
O1	Total GST @ 1% of (N)				924.19
P	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				1,09,978.53
33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)			0.37		
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	7	2,40,254.00
2	33 KV V cross Arm (GI) 22Kg each	No.	2,340.00	7	16,380.00
3	Top bracket 100x50x6mm GI channel ( 2kg each)	No.	195.00	7	1,365.00
4	Danger Plate, 1 no's.	No.	104.00	7	728.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	2.11	205.36
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	21.00	2,184.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	8.43	821.46
8	33KV pin insulator polymer	No.	624.00	21	13,104.00
9	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	21	6,951.00
10	Earthing of Support ( Coil Type )	No.	215.80	7	1,510.60
11	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	1.83	178.82
12	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	101.40	10.15	1,029.21
13	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	14	4,648.00
14	241 sq.mm AAA conductor	Mtr.	386.00	1143.30	4,41,313.80
15	Crimping type Midspan Compression Joint for 241 sq.mm AAA conductor	EA	4,701.00	0	-
16	Black Paint	Ltr	286.00	7.0	2,002.00
17	Yellow Colour Paint for Background	Ltr	216.00	14.0	3,024.00
A	Total Cost of materials				7,35,699.25
B	Stock, Storage & Insurance i.e 3% of A				22,070.98
C	Sub Total (A+B)				7,57,770.22
D	Contingency @ 3% of C				22,733.11

Annexure-5					
33kV Line Length using 241 SQ.MM. -AAA Conductor (0.37Ckm)					
E	Tools & Plants @ 2% of C				15,155.40
F	Transportation @ 7.5% of C				56,832.77
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				12,373.08
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				51,030.86
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				9,15,895.44
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	3.85	25,025.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.79	5,118.75
K	Total Civil & Services				30,143.75
L	Total (J+K)				9,46,039.19
N	Sub Total (L+M)				9,46,039.19
O	Total GST @ 18% of (N)				1,70,287.05
O1	Total GST @ 1% of (N)				9,460.39
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				11,25,786.64
Gross Total Summary					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				-
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				-
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				95,599.64
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				1,09,978.53
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				11,25,786.64
Q	Gross Total Material +Services				13,31,364.81
R	Inspection Fee of Over Head Line (HT) - Rs. 1500 upto 1 KM				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				13,33,614.81

Annexure-5					
33kV Line Length using 241 SQ.MM. -AAA Conductor (32Ckm)					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			58		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	116	39,81,352.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =( 2x9.56x3.25)	KG	76.00	3604.12	2,73,913.12
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	229.9584	22,420.94
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96)	KG	76.00	4058.376	3,08,436.58
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	3583.008	2,72,308.61
6	Danger Plate, 2 no's.	No.	104.00	116	12,064.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	34.9044	3,403.18
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	116	18,850.00
9	H.T. Stay set (Complete )	Set	1,365.00	116	1,58,340.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	232	15,080.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	1740	1,69,650.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	58	79,170.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	684.4	66,729.00
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	348	36,192.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	139.6176	13,612.72
16	33KV pin insulator polymer	No.	624.00	174	1,08,576.00
17	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	174	57,594.00
18	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	348	3,18,420.00
19	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar ) ( 2 Nos of spike per Set in each Pole )	Set	332.00	232	77,024.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	348	2,26,200.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	348	5,20,260.00
22	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	101.40	711.138	72,109.39
23	Black Paint	Ltr	286.00	58	16,588.00
24	Yellow Colour Paint for Background	Ltr	216.00	116	25,056.00
A	Total Cost of materials				68,53,349.54
B	Stock, Storage & Insurance i.e 3% of A				2,05,600.49
C	Sub Total (A+B)				70,58,950.02
D	Contingency @ 3% of C				2,11,768.50
E	Tools & Plants @ 2% of C				1,32,092.55
F	Transportation @ 7.5% of C				5,29,421.25
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				2,05,039.63
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				2,50,383.48
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				83,87,655.43
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	116	2,61,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	63.8	4,14,700.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	13.05	84,825.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	58	2,14,600.00
K	Total Civil & Services				9,75,125.00
L	Total (J+K)				93,62,780.43
N	Sub Total (L+M)				93,62,780.43
O	Total GST @ 18% of (N)				16,85,300.48
O1	Total GST @ 1% of (N)				93,627.80
P	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				1,11,41,708.71
No. of 33 KV DP required With Isolator (Ref. Drawing No.- TPCODL-TCE-0001)		6			
MATERIALS FOR 33 KV DP With Isolator					

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	12	4,11,864.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	76.00	493.296	37,490.50
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	23.7888	2,319.41
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	76.00	184.212	14,000.11
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	76.00	368.424	28,000.22
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	76.00	736.848	56,000.45
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	532.116	40,440.82
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	76.00	34.272	2,604.67
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	10.476	796.18
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	9.18	697.68
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	76.00	57.36	4,359.36
12	Danger Plate, 2 no's.	No.	104.00	12	1,248.00
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	3.6108	352.05
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	12	1,950.00
15	H.T. Stay set (Complete )	Set	1,365.00	12	16,380.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	24	1,560.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	180	17,550.00
18	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	12	16,380.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	97.50	339.84	33,134.40
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	36	3,744.00
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	14.4432	1,408.21
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	18	2,42,190.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	6	3,96,000.00
24	33KV pin insulator polymer	No.	624.00	18	11,232.00
25	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	18	5,958.00
26	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	36	32,940.00
27	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	24	7,968.00
28	H W fitting(B&S)90KN,4 Bolt	No.	650.00	36	23,400.00
29	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	36	53,820.00
30	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	101.40	132.9	13,476.06
31	Black Paint	Ltr	286.00	6	1,716.00
32	Yellow Colour Paint for Background	Ltr	216.00	12	2,592.00
A	<b>Total Cost of materials</b>				<b>14,83,572.12</b>
B	Stock, Storage & Insurance i.e 3% of A				44,507.16
C	<b>Sub Total (A+B)</b>				<b>15,28,079.28</b>
D	Contingency @ 3% of C				45,842.38
E	Tools & Plants @ 2% of C				29,452.89
F	Transportation @ 7.5% of C				1,14,605.95
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				21,211.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				1,04,842.48
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	<b>Sum of (C to I)</b>				<b>18,44,033.97</b>
<b>Civil &amp; Services</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	12	27,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	6.6	42,900.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.35	8,775.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	12	44,400.00
K	<b>Total Civil &amp; Services</b>				<b>1,23,075.00</b>
L	<b>Total (J+K)</b>				<b>19,67,108.97</b>
N	<b>Sub Total (L+M)</b>				<b>19,67,108.97</b>
O	Total GST @ 18% of (N)				3,54,079.61

O1	Total GST @ 1% of (N)				19,671.09
P	Gross Total Material +Services (N+O+01) for 33 KV DP With Isolator				23,40,859.68
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)				44	
<b>MATERIALS FOR 33 KV Cut Point with 180 Degree Angle</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	44	15,10,168.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	1430.176	1,08,693.38
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	232.6016	22,678.66
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	257.43168	19,564.81
5	Danger Plate, 1 no's.	No.	104.00	44	4,576.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	13.2396	1,290.86
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	132	13,728.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	52.9584	5,163.44
9	33KV pin insulator polymer	No.	624.00	132	82,368.00
10	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	132	43,692.00
11	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	264	2,41,560.00
12	Spike (GI) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	88	29,216.00
13	H W fitting(B&S)90KN,4 Bolt	No.	650.00	264	1,71,600.00
14	Disc insulator (B&S)90 KN polymer	No.	1,495.00	264	3,94,680.00
15	Earthing of Support ( Coil Type )	EA	215.80	44	9,495.20
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	11.528	1,123.98
17	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	214.676	21,768.15
18	Black Paint	Ltr	286.00	44	12,584.00
19	Yellow Colour Paint for Background	Ltr	216.00	88	19,008.00
A	Total Cost of materials				27,12,958.47
B	Stock, Storage & Insurance i.e 3% of A				81,388.75
C	Sub Total (A+B)				27,94,347.23
D	Contingency @ 3% of C				83,830.42
E	Tools & Plants @ 2% of C				55,886.94
F	Transportation @ 7.5% of C				2,09,576.04
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				77,773.65
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				1,23,887.42
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				33,45,301.70
<b>Civil &amp; Services</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	24.2	1,57,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	4.95	32,175.00
K	Total Civil & Services				1,89,475.00
L	Total (J+K)				35,34,776.70
N	Sub Total (L+M)				35,34,776.70
O	Total GST @ 18% of (N)				6,36,259.81
O1	Total GST @ 1% of (N)				35,347.77
P	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				42,06,384.27
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)				20	
<b>MATERIALS FOR 33 KV Cut Point with 90 Degree Angle</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	20	6,86,440.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	1300.16	98,812.16
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	97.50	211.456	20,616.96
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	234.0288	17,786.19
5	Danger Plate, 1 no's.	No.	104.00	20	2,080.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	6.018	586.76
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	60	6,240.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	24.072	2,347.02
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	624.00	80	49,920.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	120	78,000.00

11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	120	1,79,400.00
12	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	80	26,480.00
13	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	120	1,09,800.00
14	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	40	13,280.00
15	Earthing of Support ( Coil Type )	No.	215.80	20	4,316.00
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	5.24	510.90
17	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	20	3,250.00
18	H.T. Stay set (Complete )	Set	1,365.00	20	27,300.00
19	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	20	1,300.00
20	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	300	29,250.00
21	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	226.2	22,936.68
22	Black Paint	Ltr	286.00	20	5,720.00
23	Yellow Colour Paint for Background	Ltr	216.00	40	8,640.00
<b>A</b>	<b>Total Cost of materials</b>				<b>13,95,012.66</b>
<b>B</b>	<b>Stock, Storage &amp; Insurance i.e 3% of A</b>				<b>41,850.38</b>
<b>C</b>	<b>Sub Total (A+B)</b>				<b>14,36,863.04</b>
<b>D</b>	<b>Contingency @ 3% of C</b>				<b>43,105.89</b>
<b>E</b>	<b>Tools &amp; Plants @ 2% of C</b>				<b>27,478.60</b>
<b>F</b>	<b>Transportation @ 7.5% of C</b>				<b>1,07,764.73</b>
<b>G</b>	<b>Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole</b>				<b>35,351.66</b>
<b>H</b>	<b>Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)</b>				<b>66,689.68</b>
<b>I</b>	<b>Erection Charges @ 20% of PSC pole- Not to be used for 33kv</b>				<b>-</b>
<b>J</b>	<b>Sum of (C to I)</b>				<b>17,17,253.61</b>
<b>Civil &amp; Services</b>					
<b>Sl. No.</b>	<b>Description of Materials</b>	<b>Unit</b>	<b>Unit Rate</b>	<b>Total Quantity</b>	<b>Total Amount</b>
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	11.00	71,500.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	2.25	14,625.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	20	45,000.00
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>1,31,125.00</b>
<b>L</b>	<b>Total (J+K)</b>				<b>18,48,378.61</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>18,48,378.61</b>
<b>O</b>	<b>Total GST @ 18% of (N)</b>				<b>3,32,708.15</b>
<b>O1</b>	<b>Total GST @ 1% of (N)</b>				<b>18,483.79</b>
<b>P</b>	<b>Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle</b>				<b>21,99,570.54</b>
<b>33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)</b>			<b>32</b>		
<b>MATERIALS FOR 33 KV Pin Points</b>					
<b>Sl. No.</b>	<b>Description of Materials</b>	<b>Unit</b>	<b>Unit Rate</b>	<b>Total Quantity</b>	<b>Total Amount</b>
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	672	2,30,64,384.00
2	33 KV V cross Arm (GI) 22Kg each	No.	2,340.00	672	15,72,480.00
3	Top bracket 100x50x6mm GI channel ( 2kg each)	No.	195.00	672	1,31,040.00
4	Danger Plate, 1 no's.	No.	104.00	672	69,888.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	202.20	19,714.97
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	2016.00	2,09,664.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	808.82	78,859.87
8	33KV pin insulator polymer	No.	624.00	2016	12,57,984.00
9	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	2016	6,67,296.00
10	Earthing of Support ( Coil Type )	No.	215.80	672	1,45,017.60
11	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	176.06	17,166.24
12	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	101.40	974.40	98,804.16
13	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	1344	4,46,208.00
14	241 sq.mm AAA conductor	Mtr.	386.00	98880.00	3,81,67,680.00
15	Crimping type Midspan Compression Joint for 241 sq.mm AAA conductor	EA	4,701.00	96	4,51,296.00
16	Black Paint	Ltr	286.00	672.0	1,92,192.00
17	Yellow Colour Paint for Background	Ltr	216.00	1344.0	2,90,304.00
<b>A</b>	<b>Total Cost of materials</b>				<b>6,68,79,978.84</b>
<b>B</b>	<b>Stock, Storage &amp; Insurance i.e 3% of A</b>				<b>20,06,399.37</b>
<b>C</b>	<b>Sub Total (A+B)</b>				<b>6,88,86,378.21</b>
<b>D</b>	<b>Contingency @ 3% of C</b>				<b>20,66,591.35</b>
<b>E</b>	<b>Tools &amp; Plants @ 2% of C</b>				<b>13,77,727.56</b>
<b>F</b>	<b>Transportation @ 7.5% of C</b>				<b>51,66,478.37</b>

G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole	11,87,815.78
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)	45,13,006.27
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv	-
J	<b>Sum of (C to I)</b>	<b>8,31,97,997.53</b>
<b>Civil &amp; Services</b>		
<b>Sl. No.</b>	<b>Description of Materials</b>	<b>Unit      Unit Rate      Total Quantity      Total Amount</b>
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr      6,500.00      369.60      24,02,400.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr      6,500.00      75.60      4,91,400.00
K	<b>Total Civil &amp; Services</b>	<b>28,93,800.00</b>
L	<b>Total (J+K)</b>	<b>8,60,91,797.53</b>
N	<b>Sub Total (L+M)</b>	<b>8,60,91,797.53</b>
O	Total GST @ 18% of (N)	1,54,96,523.55
O1	Total GST @ 1% of (N)	8,60,917.98
P	<b>Gross Total Material +Services (N+O+O1) for 33 KV Pin Points</b>	<b>10,24,49,239.06</b>
<b>Gross Total Summary</b>		
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator	1,11,41,708.71
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator	23,40,859.68
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle	42,06,384.27
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle	21,99,570.54
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points	10,24,49,239.06
Q	<b>Gross Total Material +Services</b>	<b>12,23,37,762.25</b>
R	Inspection Fee of Over Head Line (HT) - Rs. 1500 upto 1 KM	1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km	<b>23,250.00</b>
T	Inspection Fee of Drawing Checking and Approval	750.00
U	<b>Gross Total Material, Services and Inspection Fees (Q+R+S+T)</b>	<b>12,23,63,262.25</b>

Annexure-5					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (along with 1core spare cable) with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	800		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.	200		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	3000	1,495.47	44,86,410.00
1.2	Supply of Straight throU/Gh jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	9	11,900.00	1,07,100.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	6	6,350.00	38,100.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set		6,100.00	-
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	2352.00	357.60	8,41,075.20
2	Supply of 33kV RMU				
a	No. of 33kV 3Way RMU (LLV+M)	nos.			
b	No. of 33kV 4Way RMU (LLVV+M)	nos.			
c	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.			
e	No. of 33kV 3Way RMU (LLL)	nos.			
f	No. of 33kV 4Way RMU (LLLL)	nos.			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	23,35,264.00	-
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	0.00	97.50	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,365.00	-
4	FRTU for RMU SCADA Automation				
a	No. of FRTU	nos.	0		
4.1	Pre-Wired FRTU Panel with FRTU	No.	0	1,21,744.00	-
4.2	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	0	1,00,000.00	-
4.3	Networking Accessories	No.	0	72.00	-
4.4	CMR with Mounting Base for Digital Inputs	Nos.	0	650.00	-
4.5	Interposing Relay for Digital Output	Nos.	0	467.94	-
4.6	Battery Charger	Nos.	0	15,385.00	-

Annexure-5					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
4.7	Battery	Nos.	0	8,333.00	-
4.8	4G Modem cum Router	Nos.	0	18,500.00	-
4.9	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	0	204.87	-
4.10	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	0	305.58	-
4.11	Twisted Pair Shielded & Over all shielded Instrumentation Cable	Mtr.	0	275.23	-
4.12	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	0	165.25	-
4.13	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	0	150.00	-
4.14	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	0.0	148.43	-
4.15	Armored CAT6 SFTP Cable	Mtr.	0	45.87	-
4.16	Un-Armored CAT6 SFTP Cable	Mtr.	0	89.45	-
4.17	Multi Function Meter	Nos.	0	18,651.00	-
Sub Total (Supply Portion) (in Rs.)					54,72,685.20
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	2400	94.50	2,26,800.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	9	2,400.00	21,600.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	0	2,081.70	-
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with HDPE pipe</b> (110mm dia, PN8 PE80) including supply of HDPE Pipe.	Mtr.	800	2,300.00	18,40,000.00
1.6	Laying of <b>110mm dia PE 80-PN8, HDPE pipe</b> inside open trench.	Mtr.	2352.00	300.00	7,05,600.00
2	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	-
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	<b>FRTU and OFC for RMU SCADA Automation</b>				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	0.0	16,000.00	-
Sub Total (Erection Portion) (in Rs.)					28,06,490.20

Annexure-5					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
<b>Civil Portion</b>					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Civil works with supply of all materials like cement, MS tor rod, brick, coarse &amp; fine aggregates and labour, T&amp;P, etc for UG Cable Trench</b>				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)-Route Length	Mtr	784		
1.1.a	Earth work excavation of <b>soil</b>	Cum	658.56	700.00	4,60,992.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	282.24	1,720.00	4,85,452.80
1.2	Back filling with excavated soil outside and above the trench	Cum	940.8	202.00	1,90,041.60
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	392	2,643.67	10,36,318.89
<b>2</b>	<b>Civil works for Prefabricated RCC foundation with supply of all materials</b>				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	0	23,145.30	-
3	Supply of GI Fencing with Gate around each <b>RMU</b>	sqmtr	0	3,600.00	-
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	0	3,700.00	-
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	33	1,012.00	33,396.00
	<b>Sub Total (Civil Portion) (in Rs.)</b>				<b>22,76,444.49</b>
<b>A</b>	<b>Sub Total (Supply Portion)</b>				<b>54,72,685.20</b>
B	Stock, Storage & Insurance @ 3 % of A				1,64,180.56
<b>C</b>	<b>Sub Total (A+B)</b>				<b>56,36,865.76</b>
D	Contingency @ 3 % of C				1,69,105.97
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				4,22,764.93
G	Erection Charges @ 10% of earthing items				-
<b>H</b>	<b>Total (C+D+E+F+G)</b>				<b>62,28,736.66</b>
I	Sub Total (Erection Portion + Civil Portion)				50,82,934.69
<b>J</b>	<b>Total Cost (H+I)</b>				<b>1,13,11,671.35</b>
<b>L</b>	<b>Total Estimated Capital Cost i.e. (J+K)</b>				<b>1,13,11,671.35</b>
M	GST @ 18% of L				20,36,100.84
M1	CESS @ 1% of L				11,31,167.13
<b>N</b>	<b>Grand Total (L+M)</b>				<b>1,44,78,939.32</b>
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.				3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km				
Q	Inspection Fee of RMU - Rs. 1500/ RMU				-
R	Inspection Fee of Drawing Checking and Approval				750.00
<b>S</b>	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>				<b>1,44,82,689.32</b>

Annexure-5					
BoQ and Estimate for 33 KV 4 Pole using WPB GI Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.) with Isolator and LA					
No. of 33 KV 4-Pole with Isolator			2		
MATERIALS FOR 33 KV 4-P With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB(GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	8	2,74,576.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel required =( 8x9.56x4.3)	KG	76.00	657.728	49,987.33
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required = (24x2.36x0.280)	KG	97.50	31.7184	3,092.54
4	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)/ Isolator	KG	76.00	122.808	9,333.41
5	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 8 no's channel required =( 8x7.14x4.3)	KG	76.00	491.232	37,333.63
6	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 8 nos angle required = (8*4.5*4.927)	KG	76.00	354.744	26,960.54
7	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no channel required =( 1x7.14x0.8)/ Isolator	KG	76.00	39.984	3,038.78
8	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 no angle required = (1*4.5*0.388)/ Isolator	KG	76.00	12.222	928.87
9	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 no angle required = (1*4.5*0.340)/ Isolator	KG	76.00	10.71	813.96
10	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)/ Isolator	KG	76.00	66.92	5,085.92
11	Danger Plate, 2 no's.	No.	104.00	4	416.00
12	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	1.2036	117.35
13	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	6	8,190.00
14	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 5 mtr. For raising)	KG	97.50	125.08	12,195.30
15	GI barbed wire anticlimbing device 3 Kg. Per support, 4 no's qty. required =(4x3kg)	Kg	104.00	24	2,496.00
16	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 16 no's = (16x0.59x0.510)	KG	97.50	9.6288	938.81
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	21	2,82,555.00
18	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	7	4,62,000.00
19	33KV pin insulator polymer	No.	624.00	12	7,488.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	36	23,400.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	36	53,820.00
22	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	48	71,760.00
23	232 sq.mm AAA conductor	Mtr.	203.45	61.8	12,573.21
24	GI Nut , Bolt & Washer of different sizes	K.g.	101.40	90	9,126.00
25	Black Paint	Ltr	286.00	2	572.00
26	Yellow Colour Paint for Background	Ltr	216.00	4	864.00
A	Total Cost of materials				13,59,662.66
B	Stock, Storage & Insurance i.e 3% of A				40,789.88
C	Sub Total (A+B)				14,00,452.54
D	Contingency @ 3% of C				42,013.58
E	Tools & Plants @ 2% of C				27,840.34
F	Transportation @ 7.5% of C				1,05,033.94
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				14,140.66
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				1,10,920.36
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				17,00,401.41
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
3	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	6	22,200.00
K	Total Civil & Services				56,650.00
L	Total (J+K)				17,57,051.41
N	Sub Total (L+M)				17,57,051.41
O	Total GST @ 18% of (N)				3,16,269.25
O1	Total CESS @ 1% of (O1)				17,570.51
P	Gross Total Material +Services (N+O+O1) for 33 KV 4-P With Isolator				20,90,891.18

Annexure-6			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		PURI ELECTRICAL DIVISION, PURI	
Name of the Sub-Division : -		Sakhigopal	
Name of the Section : -		Satasankha, Puri	
Name of the Work :-		33kV New Line from Satasankha Grid (33kV Proposed Satasankha-2 Feeder)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 8Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm cable- 1.5Ckm. Construction of 33kV 4 Pole structure with Isolator- 1 No.	
Names of Schemes: -		TPCODL CAPEX	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 8Ckm.	₹ 2,97,35,347.05
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm cable- 1.5Ckm.	₹ 2,12,80,956.31
3	C	Construction of 33kV 4 Pole structure with Isolator- 1 No.	₹ 9,78,548.67
		Total Amount	₹ 5,19,94,852.03
		Total Amount (In Cr)	₹ 5.20
Total estimated cost is Rs.5.20 Crore.			

Annexure-6					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			12		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	24	8,23,728.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	745.68	56,671.68
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	47.5776	4,638.82
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	839.664	63,814.46
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required =(4*4.5*3.432)	KG	76.00	741.312	56,339.71
6	Danger Plate, 2 no's.	No.	104.00	24	2,496.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's =(2x0.59x0.510)	KG	97.50	7.2216	704.11
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	162.50	24	3,900.00
9	H.T. Stay set (Complete)	Set	1,365.00	24	32,760.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	48	3,120.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	360	35,100.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	12	16,380.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)=5x2.36	KG	97.50	141.6	13,806.00
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	72	7,488.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's =(8x0.59x0.510)	KG	97.50	28.8864	2,816.42
16	33KV pin insulator polymer	No.	624.00	36	22,464.00
17	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	72	46,800.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	72	1,07,640.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	72	1,07,640.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	101.40	147.132	14,919.18
21	Black Paint	Ltr	286.00	12	3,432.00
22	Yellow Colour Paint for Background	Ltr	216.00	24	5,184.00
A	Total Cost of materials				14,31,842.39
B	Stock, Storage & Insurance i.e 3% of A				42,955.27
C	Sub Total (A+B)				14,74,797.66
D	Contingency @ 3% of C				44,243.93
E	Tools & Plants @ 2% of C				27,616.00
F	Transportation @ 7.5% of C				1,10,609.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				42,421.99
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				53,236.00
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				17,52,925.40
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	24	54,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	13.2	85,800.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	2.7	17,550.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	12	44,400.00
K	Total Civil & Services				2,01,750.00
L	Total (J+K)				19,54,675.40
N	Sub Total (L+M)				19,54,675.40
O	Total GST @ 18% of (N)				3,51,841.57
O1	Total CESS @ 1% of (N)				19,546.75
P	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				23,26,063.73
No. of 33 KV DP required With Isolator (Ref. Drawing No.- TPCODL-TCE-0001)		4			
MATERIALS FOR 33 KV DP With Isolator					

Annexure-6					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	8	2,74,576.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	76.00	328.864	24,993.66
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	15.8592	1,546.27
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	76.00	122.808	9,333.41
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	76.00	245.616	18,666.82
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	76.00	491.232	37,333.63
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	354.744	26,960.54
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	76.00	22.848	1,736.45
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	6.984	530.78
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	6.12	465.12
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	76.00	38.24	2,906.24
12	Danger Plate, 2 no's.	No.	104.00	8	832.00
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	2.4072	234.70
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	8	1,300.00
15	H.T. Stay set (Complete )	Set	1,365.00	8	10,920.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	16	1,040.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	120	11,700.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	8	10,920.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	97.50	226.56	22,089.60
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	24	2,496.00
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	9.6288	938.81
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	12	1,61,460.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	4	2,64,000.00
24	33KV pin insulator polymer	No.	624.00	12	7,488.00
25	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	24	15,600.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	24	35,880.00
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	24	35,880.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	101.40	88.6	8,984.04
29	Black Paint	Ltr	286.00	4	1,144.00
30	Yellow Colour Paint for Background	Ltr	216.00	8	1,728.00
A	Total Cost of materials				9,93,684.08
B	Stock, Storage & Insurance i.e 3% of A				29,810.52
C	Sub Total (A+B)				10,23,494.60
D	Contingency @ 3% of C				30,704.84
E	Tools & Plants @ 2% of C				19,730.76
F	Transportation @ 7.5% of C				76,762.10
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				14,140.66
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				70,372.49
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				12,35,205.45
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	8	18,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	8	29,600.00
K	Total Civil & Services				82,050.00
L	Total (J+K)				13,17,255.45
N	Sub Total (L+M)				13,17,255.45

Annexure-6					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
O	Total GST @ 18% of (N)				2,37,105.98
O1	Total CESS @ 1% of (N)				13,172.55
P	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				15,67,533.99
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- )				13	
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	13	7,37,564.29
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	422.552	32,113.95
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	68.7232	6,700.51
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	76.05936	5,780.51
5	Danger Plate, 1 no's.	No.	104.00	13	1,352.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	3.9117	381.39
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	39	4,056.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	15.6468	1,525.56
9	33KV pin insulator polymer	No.	624.00	39	24,336.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	78	50,700.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	78	1,16,610.00
12	Earthing of Support ( Coil Type )	EA	215.80	13	2,805.40
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	3.406	332.09
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	78	1,16,610.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	63.427	6,431.50
16	Black Paint	Ltr	286.00	13	3,718.00
17	Yellow Colour Paint for Background	Ltr	216.00	26	5,616.00
A	Total Cost of materials				11,16,633.20
B	Stock, Storage & Insurance i.e 3% of A				33,499.00
C	Sub Total (A+B)				11,50,132.19
D	Contingency @ 3% of C				34,503.97
E	Tools & Plants @ 2% of C				23,002.64
F	Transportation @ 7.5% of C				86,259.91
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				37,984.56
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				39,044.10
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				13,70,927.38
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	7.15	46,475.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.4625	9,506.25
K	Total Civil & Services				55,981.25
L	Total (J+K)				14,26,908.63
N	Sub Total (L+M)				14,26,908.63
O	Total GST @ 18% of (N)				2,56,843.55
O1	Total CESS @ 1% of (N)				14,269.09
P	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				16,98,021.27
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- )				3	
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	3	1,70,207.14
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	195.024	14,821.82
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	97.50	31.7184	3,092.54
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	35.10432	2,667.93
5	Danger Plate, 1 no's.	No.	104.00	3	312.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	0.9027	88.01
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	9	936.00

Annexure-6					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	3.6108	352.05
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	624.00	12	7,488.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	18	11,700.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	18	26,910.00
12	Earthing of Support ( Coil Type )	No.	215.80	3	647.40
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	0.786	76.64
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	18	26,910.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	3	487.50
16	H.T. Stay set (Complete )	Set	1,365.00	3	4,095.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	3	195.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	45	4,387.50
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	33.93	3,440.50
20	Black Paint	Ltr	286.00	3	858.00
21	Yellow Colour Paint for Background	Ltr	216.00	6	1,296.00
<b>A</b>	<b>Total Cost of materials</b>				<b>2,80,969.04</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				8,429.07
<b>C</b>	<b>Sub Total (A+B)</b>				<b>2,89,398.11</b>
<b>D</b>	Contingency @ 3% of C				8,681.94
<b>E</b>	Tools & Plants @ 2% of C				5,599.16
<b>F</b>	Transportation @ 7.5% of C				21,704.86
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,765.67
<b>H</b>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				10,464.48
<b>I</b>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>3,44,614.23</b>
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.65	10,725.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.34	2,193.75
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	3	6,750.00
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>19,668.75</b>
<b>L</b>	<b>Total (J+K)</b>				<b>3,64,282.98</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>3,64,282.98</b>
<b>O</b>	Total GST @ 18% of (N)				65,570.94
<b>O1</b>	Total CESS @ 1% of (N)				3,642.83
<b>P</b>	<b>Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle</b>				<b>4,33,496.74</b>
33 Kv Line Length In KM with 40 Mtr. Span (Ref. Drawing No.- )			8		
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	168	95,31,600.00
2	33 KV V cross Arm (GI) 22Kg each	No.	2,340.00	168	3,93,120.00
3	Top bracket 100x50x6mm GI channel ( 300mm each)	No.	195.00	168	32,760.00
4	Danger Plate, 1 no's.	No.	104.00	168	17,472.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	50.55	4,928.74
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	504.00	52,416.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	202.20	19,714.97
8	33KV pin insulator polymer	No.	624.00	504	3,14,496.00
9	Earthing of Support ( Coil Type )	No.	215.80	168	36,254.40
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	44.02	4,291.56
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	101.40	243.60	24,701.04
12	232 sq.mm AAA conductor	Mtr.	203.45	24720.00	50,29,284.00
13	Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor	EA	842.95	24	20,230.70
14	Black Paint	Ltr	286.00	168.0	48,048.00
15	Yellow Colour Paint for Background	Ltr	216.00	336.0	72,576.00
<b>A</b>	<b>Total Cost of materials</b>				<b>1,56,01,893.41</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				4,68,056.80
<b>C</b>	<b>Sub Total (A+B)</b>				<b>1,60,69,950.22</b>
<b>D</b>	Contingency @ 3% of C				4,82,098.51
<b>E</b>	Tools & Plants @ 2% of C				3,21,399.00
<b>F</b>	Transportation @ 7.5% of C				12,05,246.27
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				4,90,877.40

Annexure-6					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				6,25,240.22
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,91,94,811.62
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	92.40	6,00,600.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	18.90	1,22,850.00
K	Total Civil & Services				7,23,450.00
L	Total (J+K)				1,99,18,261.62
N	Sub Total (L+M)				1,99,18,261.62
O	Total GST @ 18% of (N)				35,85,287.09
O1	Total CESS @ 1% of (N)				1,99,182.62
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				2,37,02,731.32
Gross Total Summary					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				23,26,063.73
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				15,67,533.99
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				16,98,021.27
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				4,33,496.74
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				2,37,02,731.32
Q	Gross Total Material +Services				2,97,27,847.05
R	Inspection Fee of Over Head Line (HT) - Rs.1500 up to 1 km.				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				5,250.00
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				2,97,35,347.05

## Annexure-6

## BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU

## Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (aloing with 1core spare cable) with accessories</b>				
<b>a</b>	<b>Length of 33kV 1C, 630sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>1000</b>		
<b>b</b>	<b>Length of 33kV 1C, 630sqmm cable (HDD)</b>	<b>Mtr.</b>	<b>500</b>		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	4500	1,495.47	67,29,615.00
1.2	Supply of Straight throU/Gh jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	12	11,900.00	1,42,800.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	12	6,350.00	76,200.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set		6,100.00	-
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	2904.00	357.60	10,38,470.40
<b>2</b>	<b>Supply of 33kV RMU</b>				
<b>a</b>	<b>No. of 33kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 33kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
<b>c</b>	<b>No. of 33kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 33kV 4Way RMU (LLVV)</b>	<b>nos.</b>			
<b>e</b>	<b>No. of 33kV 3Way RMU (LLL)</b>	<b>nos.</b>			
<b>f</b>	<b>No. of 33kV 4Way RMU (LLLL)</b>	<b>nos.</b>			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	23,35,264.00	-
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
<b>3</b>	<b>Earthing</b>				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	0.00	97.50	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,365.00	-
<b>4</b>	<b>FRTU for RMU SCADA Automation</b>				
<b>a</b>	<b>No. of FRTU</b>	<b>nos.</b>	<b>0</b>		
4.1	Pre-Wired FRTU Panel with FRTU	No.	0	1,21,744.00	-
4.2	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	0	1,00,000.00	-
4.3	Networking Accessories	No.	0	72.00	-
4.4	CMR with Mounting Base for Digital Inputs	Nos.	0	650.00	-

**Annexure-6**

<b>BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU</b>					
<b>4.5</b>	Interposing Relay for Digital Output	Nos.	0	467.94	-
<b>4.6</b>	Battery Charger	Nos.	0	15,385.00	-
<b>4.7</b>	Battery	Nos.	0	8,333.00	-
<b>4.8</b>	4G Modem cum Router	Nos.	0	18,500.00	-
<b>4.9</b>	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	0	204.87	-
<b>4.10</b>	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	0	305.58	-
<b>4.11</b>	Twisted Pair Shielded & Over all shielded Instrumentation Cable	Mtr.	0	275.23	-
<b>4.12</b>	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	0	165.25	-
<b>4.13</b>	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	0	150.00	-
<b>4.14</b>	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	0.0	148.43	-
<b>4.15</b>	Armored CAT6 SFTP Cable	Mtr.	0	45.87	-
<b>4.16</b>	Un-Armored CAT6 SFTP Cable	Mtr.	0	89.45	-
<b>4.17</b>	Multi Function Meter	Nos.	0	18,651.00	-
<b>Sub Total (Supply Portion) (in Rs.)</b>					<b>79,87,085.40</b>
<b>Erection Portion</b>					
<b>Sl. No.</b>	<b>Description of items</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (in Rs.)</b>	<b>Amount (in Rs.)</b>
<b>1</b>	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	3000	94.50	2,83,500.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	12	2,400.00	28,800.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	0	2,081.70	-
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with</b> HDPE pipe (110mm dia, PN8 PE80) including supply of HDPE Pipe.	Mtr.	1500	2,300.00	34,50,000.00
1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	2904.00	300.00	8,71,200.00
<b>2</b>	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	-

**Annexure-6**

BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	0.0	16,000.00	-
	Sub Total (Erection Portion) (in Rs.)				46,58,480.40
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)-Route Length	Mtr	968		
1.1.a	Earth work excavation of soil	Cum	813.12	700.00	5,69,184.00
1.1.b	Earth work excavation of hard rock	Cum	348.48	1,720.00	5,99,385.60
1.2	Back filling with excavated soil outside and above the trench	Cum	1161.6	202.00	2,34,643.20
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	484	2,643.67	12,79,536.58
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	0	23,145.30	-
3	Supply of GI Fencing with Gate around each RMU	sqmtr	0	3,600.00	-
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	0	3,700.00	-
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	96	1,463.40	1,40,486.40
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	50	1,012.00	50,600.00
	Sub Total (Civil Portion) (in Rs.)				28,73,835.78
A	Sub Total (Supply Portion)				79,87,085.40
B	Stock, Storage & Insurance @ 3 % of A				2,39,612.56
C	Sub Total (A+B)				82,26,697.96
D	Contingency @ 3 % of C				2,46,800.94
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				6,17,002.35
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				90,90,501.25
I	Sub Total (Erection Portion + Civil Portion)				75,32,316.18
J	Total Cost (H+I)				1,66,22,817.43
L	Total Estimated Capital Cost i.e. (J+K)				1,66,22,817.43
M	GST @ 18% of L				29,92,107.14

**Annexure-6**

<b>BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU</b>		
M1	CESS @ 1% of L	16,62,281.74
<b>N</b>	<b>Grand Total (L+M)</b>	<b>2,12,77,206.31</b>
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.	3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km	
Q	Inspection Fee of RMU - Rs. 1500/ RMU	-
R	Inspection Fee of Drawing Checking and Approval	750.00
<b>S</b>	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>	<b>2,12,80,956.31</b>

## Annexure-6

BoQ and Estimate for 33 KV 4 Pole using WPB GI Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.) with Isolator and LA					
No. of 33 KV 4-Pole with Isolator			1		
<b>MATERIALS FOR 33 KV 4-P With Isolator</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB(GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	4	1,37,288.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel required =( 8x9.56x4.3)	KG	76.00	328.864	24,993.66
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required =(24x2.36x0.280)	KG	97.50	15.8592	1,546.27
4	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)/ Isolator	KG	76.00	184.212	14,000.11
5	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 8 no's channel required =( 8x7.14x4.3)	KG	76.00	245.616	18,666.82
6	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 8 nos angle required =( 8*4.5*4.927)	KG	76.00	177.372	13,480.27
7	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no channel required =( 1x7.14x0.8)/ Isolator	KG	76.00	17.136	1,302.34
8	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 no angle required =( 1*4.5*0.388)/ Isolator	KG	76.00	5.238	398.09
9	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 no angle required =( 1*4.5*0.340)/ Isolator	KG	76.00	4.59	348.84
10	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)/ Isolator	KG	76.00	28.68	2,179.68
11	Danger Plate, 2 no's.	No.	104.00	2	208.00
12	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's =( 2x0.59x0.510)	KG	97.50	0.6018	58.68
13	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	3	4,095.00
14	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 5 mtr. For raising)	KG	97.50	62.54	6,097.65
15	GI barbed wire anticlimbing device 3 Kg. Per support, 4 no's qty. required =(4x3kg)	Kg	104.00	12	1,248.00
16	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 16 no's =( 16x0.59x0.510)	KG	97.50	4.8144	469.40
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	9	1,21,095.00
18	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	3	1,98,000.00
19	33KV pin insulator polymer	No.	624.00	6	3,744.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	18	11,700.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	18	26,910.00
22	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	24	35,880.00
23	232 sq.mm AAA conductor	Mtr.	203.45	30.9	6,286.61
24	GI Nut , Bolt & Washer of different sizes	K.g.	101.40	45	4,563.00
25	Black Paint	Ltr	286.00	1	286.00
26	Yellow Colour Paint for Background	Ltr	216.00	2	432.00
<b>A</b>	<b>Total Cost of materials</b>				<b>6,35,277.41</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				19,058.32
<b>C</b>	<b>Sub Total (A+B)</b>				<b>6,54,335.74</b>
<b>D</b>	Contingency @ 3% of C				19,630.07
<b>E</b>	Tools & Plants @ 2% of C				13,002.36
<b>F</b>	Transportation @ 7.5% of C				49,075.18
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				7,070.33
<b>H</b>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				50,871.12
<b>I</b>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>7,93,984.80</b>
<b>Civil &amp; Services</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
3	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	3	11,100.00
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>28,325.00</b>
<b>L</b>	<b>Total (J+K)</b>				<b>8,22,309.80</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>8,22,309.80</b>
<b>O</b>	Total GST @ 18% of (N)				1,48,015.76
<b>O1</b>	Total CESS @ 1% of (O1)				8,223.10
<b>P</b>	<b>Gross Total Material +Services (N+O+O1) for 33 KV 4-P With Isolator</b>				<b>9,78,548.67</b>

Annexure-7			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		KHORDHA ELECTRICAL DIVISION, KHORDHA	
Name of the Sub-Division : -		KHORDHA ,KHD, Khordha	
Name of the Section : -		Khordha III, Khordha	
Name of the Work :-		33kV New Line from Argul Grid (33kV Proposed Delang New Feeder)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 6.5Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 3.5Ckm. Construction of 33kV 4 Pole structure with Isolator- 1 No.	
Names of Schemes: -		TPCODL CAPEX	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 6.5Ckm.	₹ 2,43,62,298.52
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 3.5Ckm.	₹ 4,81,18,624.20
3	C	Construction of 33kV 4 Pole structure with Isolator- 1 No.	₹ 9,78,548.67
		Total Amount	₹ 7,34,59,471.39
		Total Amount (In Cr)	₹ 7.35
Total estimated cost is Rs.7.35 Crore.			

Annexure-7					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			9		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	18	6,17,796.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =( 2x9.56x3.25)	KG	76.00	559.26	42,503.76
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	35.6832	3,479.11
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96)	KG	76.00	629.748	47,860.85
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	555.984	42,254.78
6	Danger Plate, 2 no's.	No.	104.00	18	1,872.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	5.4162	528.08
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	18	2,925.00
9	H.T. Stay set (Complete )	Set	1,365.00	18	24,570.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	36	2,340.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	270	26,325.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	9	12,285.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	106.2	10,354.50
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	54	5,616.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	21.6648	2,112.32
16	33KV pin insulator polymer	No.	624.00	27	16,848.00
17	H W fitting(B&S) 90KN.4 Bolt	No.	650.00	54	35,100.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	54	80,730.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	54	80,730.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	101.40	110.349	11,189.39
21	Black Paint	Ltr	286.00	9	2,574.00
22	Yellow Colour Paint for Background	Ltr	216.00	18	3,888.00
A	Total Cost of materials				10,73,881.79
B	Stock, Storage & Insurance i.e 3% of A				32,216.45
C	Sub Total (A+B)				11,06,098.24
D	Contingency @ 3% of C				33,182.95
E	Tools & Plants @ 2% of C				20,712.00
F	Transportation @ 7.5% of C				82,957.37
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				31,816.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				39,927.00
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				13,14,694.05
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	18	40,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	9.9	64,350.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	2.025	13,162.50
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	9	33,300.00
K	Total Civil & Services				1,51,312.50
L	Total (J+K)				14,66,006.55
N	Sub Total (L+M)				14,66,006.55
O	Total GST @ 18% of (N)				2,63,881.18
O1	Total CESS @ 1% of (N)				14,660.07
P	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				17,44,547.80
No. of 33 KV DP required With Isolator (Ref. Drawing No.- TPCODL-TCE-0001)		4			
MATERIALS FOR 33 KV DP With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount

Annexure-7					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	8	2,74,576.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	76.00	328.864	24,993.66
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	15.8592	1,546.27
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	76.00	122.808	9,333.41
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	76.00	245.616	18,666.82
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	76.00	491.232	37,333.63
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	354.744	26,960.54
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	76.00	22.848	1,736.45
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	6.984	530.78
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	6.12	465.12
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	76.00	38.24	2,906.24
12	Danger Plate, 2 no's.	No.	104.00	8	832.00
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	2.4072	234.70
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	8	1,300.00
15	H.T. Stay set (Complete )	Set	1,365.00	8	10,920.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	16	1,040.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	120	11,700.00
18	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	8	10,920.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	97.50	226.56	22,089.60
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	24	2,496.00
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	9.6288	938.81
22	Lightning Arrester(30KV, 10KA) (Station Class, class-2)	EA	13,455.00	12	1,61,460.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	4	2,64,000.00
24	33KV pin insulator polymer	No.	624.00	12	7,488.00
25	H W fitting(B&S) 90KN, 4 Bolt	No.	650.00	24	15,600.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	24	35,880.00
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	24	35,880.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	101.40	88.6	8,984.04
29	Black Paint	Ltr	286.00	4	1,144.00
30	Yellow Colour Paint for Background	Ltr	216.00	8	1,728.00
<b>A</b>	<b>Total Cost of materials</b>				<b>9,93,684.08</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				29,810.52
<b>C</b>	<b>Sub Total (A+B)</b>				<b>10,23,494.60</b>
<b>D</b>	Contingency @ 3% of C				30,704.84
<b>E</b>	Tools & Plants @ 2% of C				19,730.76
<b>F</b>	Transportation @ 7.5% of C				76,762.10
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				14,140.66
<b>H</b>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				70,372.49
<b>I</b>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>12,35,205.45</b>
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	8	18,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	8	29,600.00
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>82,050.00</b>
<b>L</b>	<b>Total (J+K)</b>				<b>13,17,255.45</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>13,17,255.45</b>
<b>O</b>	Total GST @ 18% of (N)				2,37,105.98
<b>O1</b>	Total CESS @ 1% of (N)				13,172.55

Annexure-7					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
P	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				15,67,533.99
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- )				10	
<b>MATERIALS FOR 33 KV Cut Point with 180 Degree Angle</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	10	5,67,357.14
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	325.04	24,703.04
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	52.864	5,154.24
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	58.5072	4,446.55
5	Danger Plate, 1 no's.	No.	104.00	10	1,040.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	3.009	293.38
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	30	3,120.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	12.036	1,173.51
9	33KV pin insulator polymer	No.	624.00	30	18,720.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	60	39,000.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	60	89,700.00
12	Earthing of Support ( Coil Type )	EA	215.80	10	2,158.00
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	2.62	255.45
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	60	89,700.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	48.79	4,947.31
16	Black Paint	Ltr	286.00	10	2,860.00
17	Yellow Colour Paint for Background	Ltr	216.00	20	4,320.00
A	Total Cost of materials				8,58,948.61
B	Stock, Storage & Insurance i.e 3% of A				25,768.46
C	Sub Total (A+B)				8,84,717.07
D	Contingency @ 3% of C				26,541.51
E	Tools & Plants @ 2% of C				17,694.34
F	Transportation @ 7.5% of C				66,353.78
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				29,218.89
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				30,033.92
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				10,54,559.52
<b>Civil &amp; Services</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	5.5	35,750.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.125	7,312.50
K	Total Civil & Services				43,062.50
L	Total (J+K)				10,97,622.02
N	Sub Total (L+M)				10,97,622.02
O	Total GST @ 18% of (N)				1,97,571.96
O1	Total CESS @ 1% of (N)				10,976.22
P	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				13,06,170.20
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- )				3	
<b>MATERIALS FOR 33 KV Cut Point with 90 Degree Angle</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	3	1,70,207.14
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	195.024	14,821.82
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	97.50	31.7184	3,092.54
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	35.10432	2,667.93
5	Danger Plate, 1 no's.	No.	104.00	3	312.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	0.9027	88.01
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	9	936.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	3.6108	352.05
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	624.00	12	7,488.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	18	11,700.00

Annexure-7					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	18	26,910.00
12	Earthing of Support ( Coil Type )	No.	215.80	3	647.40
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	0.786	76.64
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	18	26,910.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	3	487.50
16	H.T. Stay set (Complete )	Set	1,365.00	3	4,095.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	3	195.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	45	4,387.50
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	33.93	3,440.50
20	Black Paint	Ltr	286.00	3	858.00
21	Yellow Colour Paint for Background	Ltr	216.00	6	1,296.00
<b>A</b>	<b>Total Cost of materials</b>				<b>2,80,969.04</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				8,429.07
<b>C</b>	<b>Sub Total (A+B)</b>				<b>2,89,398.11</b>
<b>D</b>	Contingency @ 3% of C				8,681.94
<b>E</b>	Tools & Plants @ 2% of C				5,599.16
<b>F</b>	Transportation @ 7.5% of C				21,704.86
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,765.67
<b>H</b>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				10,464.48
<b>I</b>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>3,44,614.23</b>
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.65	10,725.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.34	2,193.75
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	3	6,750.00
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>19,668.75</b>
<b>L</b>	<b>Total (J+K)</b>				<b>3,64,282.98</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>3,64,282.98</b>
<b>O</b>	Total GST @ 18% of (N)				65,570.94
<b>O1</b>	Total CESS @ 1% of (N)				3,642.83
<b>P</b>	<b>Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle</b>				<b>4,33,496.74</b>
<b>33 Kv Line Length In KM with 40 Mtr. Span</b>		<b>6.5</b>			
<b>(Ref. Drawing No.- )</b>					
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	137	77,72,792.86
2	33 KV V cross Arm (GI) 22Kg each	No.	2,340.00	137	3,20,580.00
3	Top bracket 100x50x6mm GI channel ( 300mm each)	No.	195.00	137	26,715.00
4	Danger Plate, 1 no's.	No.	104.00	137	14,248.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	41.22	4,019.27
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	411.00	42,744.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	164.89	16,077.09
8	33KV pin insulator polymer	No.	624.00	411	2,56,464.00
9	Earthing of Support ( Coil Type )	No.	215.80	137	29,564.60
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	35.89	3,499.67
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	101.40	198.65	20,143.11
12	232 sq.mm AAA conductor	Mtr.	203.45	20085.00	40,86,293.25
13	Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor	EA	842.95	18	15,173.03
14	Black Paint	Ltr	286.00	137.0	39,182.00
15	Yellow Colour Paint for Background	Ltr	216.00	274.0	59,184.00
<b>A</b>	<b>Total Cost of materials</b>				<b>1,27,06,679.87</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				3,81,200.40
<b>C</b>	<b>Sub Total (A+B)</b>				<b>1,30,87,880.26</b>
<b>D</b>	Contingency @ 3% of C				3,92,636.41
<b>E</b>	Tools & Plants @ 2% of C				2,61,757.61
<b>F</b>	Transportation @ 7.5% of C				9,81,591.02
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				4,00,298.83
<b>H</b>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				5,08,190.36
<b>I</b>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>1,56,32,354.49</b>

Annexure-7					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	75.35	4,89,775.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	15.41	1,00,181.25
K	Total Civil & Services				5,89,956.25
L	Total (J+K)				1,62,22,310.74
N	Sub Total (L+M)				1,62,22,310.74
O	Total GST @ 18% of (N)				29,20,015.93
O1	Total CESS @ 1% of (N)				1,62,223.11
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				1,93,04,549.78
Gross Total Summary					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				17,44,547.80
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				15,67,533.99
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				13,06,170.20
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				4,33,496.74
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				1,93,04,549.78
Q	Gross Total Material +Services				2,43,56,298.52
R	Inspection Fee of Over Head Line (HT) - Rs.1500 up to 1 km.				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				3,750.00
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				2,43,62,298.52

Annexure-7					
Standard BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (along with 1core spare cable) with accessories</b>				
<b>a</b>	<b>Length of 33kV 1C, 630sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>3000</b>		
<b>b</b>	<b>Length of 33kV 1C, 630sqmm cable (HDD)</b>	<b>Mtr.</b>	<b>500</b>		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	10500	1,495.47	1,57,02,435.00
1.2	Supply of Straight throU/Gh jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	33	11,900.00	3,92,700.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	12	6,350.00	76,200.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set		6,100.00	-
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	8904.00	357.60	31,84,070.40
<b>2</b>	<b>Supply of 33kV RMU</b>				
<b>a</b>	<b>No. of 33kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 33kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
<b>c</b>	<b>No. of 33kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 33kV 4Way RMU (LLVV)</b>	<b>nos.</b>			
<b>e</b>	<b>No. of 33kV 3Way RMU (LLL)</b>	<b>nos.</b>			
<b>f</b>	<b>No. of 33kV 4Way RMU (LLLL)</b>	<b>nos.</b>			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	23,35,264.00	-
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
<b>3</b>	<b>Earthing</b>				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	0.00	97.50	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,365.00	-
<b>4</b>	<b>FRTU for RMU SCADA Automation</b>				
<b>a</b>	<b>No. of FRTU</b>	<b>nos.</b>	<b>0</b>		
<b>4.1</b>	Pre-Wired FRTU Panel with FRTU	No.	0	1,21,744.00	-
<b>4.2</b>	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	0	1,00,000.00	-

Annexure-7					
Standard BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
4.3	Networking Accessories	No.	0	72.00	-
4.4	CMR with Mounting Base for Digital Inputs	Nos.	0	650.00	-
4.5	Interposing Relay for Digital Output	Nos.	0	467.94	-
4.6	Battery Charger	Nos.	0	15,385.00	-
4.7	Battery	Nos.	0	8,333.00	-
4.8	4G Modem cum Router	Nos.	0	18,500.00	-
4.9	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	0	204.87	-
4.10	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	0	305.58	-
4.11	Twisted Pair Shielded & Over all shielded Instrumentation Cable	Mtr.	0	275.23	-
4.12	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	0	165.25	-
4.13	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	0	150.00	-
4.14	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	0.0	148.43	-
4.15	Armored CAT6 SFTP Cable	Mtr.	0	45.87	-
4.16	Un-Armored CAT6 SFTP Cable	Mtr.	0	89.45	-
4.17	Multi Function Meter	Nos.	0	18,651.00	-
Sub Total (Supply Portion) (in Rs.)					1,93,55,405.40
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	9000	94.50	8,50,500.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	33	2,400.00	79,200.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	0	2,081.70	-
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with HDPE pipe</b> (110mm dia, PN8 PE80) including suply of HDPE Pipe.	Mtr.	1500	2,300.00	34,50,000.00
1.6	Laying of <b>110mm dia PE 80-PN8, HDPE pipe</b> inside open trench.	Mtr.	8904.00	300.00	26,71,200.00
2	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-

Annexure-7					
Standard BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	-
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	0.0	16,000.00	-
	Sub Total (Erection Portion) (in Rs.)				70,75,880.40
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)- Route Length	Mtr	2968		
1.1.a	Earth work excavation of soil	Cum	2493.12	700.00	17,45,184.00
1.1.b	Earth work excavation of hard rock	Cum	1068.48	1,720.00	18,37,785.60
1.2	Back filling with excavated soil outside and above the trench	Cum	3561.6	202.00	7,19,443.20
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	1484	2,643.67	39,23,207.21
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	0	23,145.30	-
3	Supply of GI Fencing with Gate around each RMU	sqmtr	0	3,600.00	-
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	0	3,700.00	-
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	96	1,463.40	1,40,486.40
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	117	1,012.00	1,18,404.00
	Sub Total (Civil Portion) (in Rs.)				84,84,510.41
A	Sub Total (Supply Portion)				1,93,55,405.40
B	Stock, Storage & Insurance @ 3 % of A				5,80,662.16
C	Sub Total (A+B)				1,99,36,067.56
D	Contingency @ 3 % of C				5,98,082.03
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				14,95,205.07

Annexure-7		
Standard BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU		
G	Erection Charges @ 10% of earthing items	-
H	<b>Total (C+D+E+F+G)</b>	<b>2,20,29,354.66</b>
I	Sub Total (Erection Portion + Civil Portion)	1,55,60,390.81
J	<b>Total Cost (H+I)</b>	<b>3,75,89,745.47</b>
L	<b>Total Estimated Capital Cost i.e. (J+K)</b>	<b>3,75,89,745.47</b>
M	GST @ 18% of L	67,66,154.18
M1	CESS @ 1% of L	37,58,974.55
N	<b>Grand Total (L+M)</b>	<b>4,81,14,874.20</b>
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.	3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km	
Q	Inspection Fee of RMU - Rs. 1500/ RMU	-
R	Inspection Fee of Drawing Checking and Approval	750.00
S	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>	<b>4,81,18,624.20</b>

Annexure-7					
BoQ and Estimate for 33 KV 4 Pole using WPB GI Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.) with Isolator and LA					
No. of 33 KV 4-Pole with Isolator			1		
MATERIALS FOR 33 KV 4-P With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB(GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	4	1,37,288.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel required =( 8x9.56x4.3)	KG	76.00	328.864	24,993.66
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required = (24x2.36x0.280)	KG	97.50	15.8592	1,546.27
4	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)/ Isolator	KG	76.00	184.212	14,000.11
5	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 8 no's channel required =( 8x7.14x4.3)	KG	76.00	245.616	18,666.82
6	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 8 nos angle required = (8*4.5*4.927)	KG	76.00	177.372	13,480.27
7	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no channel required =( 1x7.14x0.8)/ Isolator	KG	76.00	17.136	1,302.34
8	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 no angle required = (1*4.5*0.388)/ Isolator	KG	76.00	5.238	398.09
9	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 no angle required = (1*4.5*0.340)/ Isolator	KG	76.00	4.59	348.84
10	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)/ Isolator	KG	76.00	28.68	2,179.68
11	Danger Plate, 2 no's.	No.	104.00	2	208.00
12	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	0.6018	58.68
13	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	3	4,095.00
14	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 5 mtr. For raising)	KG	97.50	62.54	6,097.65
15	GI barbed wire anticlimbing device 3 Kg. Per support, 4 no's qty. required =(4x3kg)	Kg	104.00	12	1,248.00
16	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 16 no's = (16x0.59x0.510)	KG	97.50	4.8144	469.40
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	9	1,21,095.00
18	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	3	1,98,000.00
19	33KV pin insulator polymer	No.	624.00	6	3,744.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	18	11,700.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	18	26,910.00
22	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	24	35,880.00
23	232 sq.mm AAA conductor	Mtr.	203.45	30.9	6,286.61
24	GI Nut , Bolt & Washer of different sizes	K.g.	101.40	45	4,563.00
25	Black Paint	Ltr	286.00	1	286.00
26	Yellow Colour Paint for Background	Ltr	216.00	2	432.00
A	Total Cost of materials				6,35,277.41
B	Stock, Storage & Insurance i.e 3% of A				19,058.32
C	Sub Total (A+B)				6,54,335.74
D	Contingency @ 3% of C				19,630.07
E	Tools & Plants @ 2% of C				13,002.36
F	Transportation @ 7.5% of C				49,075.18
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				7,070.33
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				50,871.12
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				7,93,984.80
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
3	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	3	11,100.00
K	Total Civil & Services				28,325.00
L	Total (J+K)				8,22,309.80
N	Sub Total (L+M)				8,22,309.80
O	Total GST @ 18% of (N)				1,48,015.76
O1	Total CESS @ 1% of (O1)				8,223.10
P	Gross Total Material +Services (N+O+O1) for 33 KV 4-P With Isolator				9,78,548.67

Annexure-8			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		PURI ELECTRICAL DIVISION, PURI	
Name of the Sub-Division : -		Sakhigopal, Puri	
Name of the Section : -		Satasankha, Puri	
Name of the Work :-		33kV New Line from Satasankha Grid (33kV Proposed Satasankha-1 Feeder)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 6Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 3.5Ckm.Construction of 33kV 4 Pole structure with Isolator- 2 Nos.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 6Ckm.	₹ 2,19,30,088.90
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 3.5Ckm.	₹ 4,80,60,417.38
3	C	Construction of 33kV 4 Pole structure with Isolator- 2 Nos.	₹ 17,88,268.61
		<b>Total Amount</b>	<b>₹ 7,17,78,774.88</b>
		<b>Total Amount (In Cr)</b>	<b>₹ 7.18</b>
Total estimated cost is Rs.7.18 Crore.			

Annexure-8					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			11		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	22	7,55,084.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =( 2x9.56x3.25)	KG	76.00	683.54	51,949.04
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	43.6128	4,252.25
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96)	KG	76.00	769.692	58,496.59
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	679.536	51,644.74
6	Danger Plate, 2 no's.	No.	104.00	22	2,288.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	6.6198	645.43
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	22	3,575.00
9	H.T. Stay set (Complete )	Set	1,365.00	22	30,030.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	44	2,860.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	330	32,175.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	11	15,015.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	129.8	12,655.50
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	66	6,864.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	26.4792	2,581.72
16	33KV pin insulator polymer	No.	624.00	33	20,592.00
17	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	66	42,900.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	66	98,670.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	66	98,670.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	101.40	134.871	13,675.92
21	Black Paint	Ltr	286.00	11	3,146.00
22	Yellow Colour Paint for Background	Ltr	216.00	22	4,752.00
A	Total Cost of materials				13,12,522.19
B	Stock, Storage & Insurance i.e 3% of A				39,375.67
C	Sub Total (A+B)				13,51,897.85
D	Contingency @ 3% of C				40,556.94
E	Tools & Plants @ 2% of C				25,314.66
F	Transportation @ 7.5% of C				1,01,392.34
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				38,886.83
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				48,799.67
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				16,06,848.29
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	22	49,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	12.1	78,650.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	2.475	16,087.50
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	11	40,700.00
K	Total Civil & Services				1,84,937.50
L	Total (J+K)				17,91,785.79
N	Sub Total (L+M)				17,91,785.79
O	Total GST @ 18% of (N)				3,22,521.44
O1	Total CESS @ 1% of (N)				17,917.86
P	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				21,32,225.09
No. of 33 KV DP required With Isolator (Ref. Drawing No.- TPCODL-TCE-0001)			1		
MATERIALS FOR 33 KV DP With Isolator					

Annexure-8					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	2	68,644.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	76.00	82.216	6,248.42
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	3.9648	386.57
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	76.00	30.702	2,333.35
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	76.00	61.404	4,666.70
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	76.00	122.808	9,333.41
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	88.686	6,740.14
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	76.00	5.712	434.11
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	1.746	132.70
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	1.53	116.28
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	76.00	9.56	726.56
12	Danger Plate, 2 no's.	No.	104.00	2	208.00
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	0.6018	58.68
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	2	325.00
15	H.T. Stay set (Complete )	Set	1,365.00	2	2,730.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	4	260.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	30	2,925.00
18	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	2	2,730.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	97.50	56.64	5,522.40
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	6	624.00
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	2.4072	234.70
22	Lightning Arrester(30KV, 10KA) (Station Class, class-2)	EA	13,455.00	3	40,365.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	1	66,000.00
24	33KV pin insulator polymer	No.	624.00	3	1,872.00
25	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	6	3,900.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	6	8,970.00
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	6	8,970.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	101.40	22.15	2,246.01
29	Black Paint	Ltr	286.00	1	286.00
30	Yellow Colour Paint for Background	Ltr	216.00	2	432.00
A	Total Cost of materials				2,48,421.02
B	Stock, Storage & Insurance i.e 3% of A				7,452.63
C	Sub Total (A+B)				2,55,873.65
D	Contingency @ 3% of C				7,676.21
E	Tools & Plants @ 2% of C				4,932.69
F	Transportation @ 7.5% of C				19,190.52
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,535.17
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				17,593.12
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				3,08,801.36
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	2	4,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.1	7,150.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.225	1,462.50
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	2	7,400.00
K	Total Civil & Services				20,512.50
L	Total (J+K)				3,29,313.86
N	Sub Total (L+M)				3,29,313.86

Annexure-8					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
O	Total GST @ 18% of (N)				59,276.50
O1	Total CESS @ 1% of (N)				3,293.14
P	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				3,91,883.50
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- )				8	
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	8	4,53,885.71
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	260.032	19,762.43
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	42.2912	4,123.39
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	46.80576	3,557.24
5	Danger Plate, 1 no's.	No.	104.00	8	832.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	2.4072	234.70
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	24	2,496.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	9.6288	938.81
9	33KV pin insulator polymer	No.	624.00	24	14,976.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	48	31,200.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	48	71,760.00
12	Earthing of Support ( Coil Type )	EA	215.80	8	1,726.40
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	2.096	204.36
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	48	71,760.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	39.032	3,957.84
16	Black Paint	Ltr	286.00	8	2,288.00
17	Yellow Colour Paint for Background	Ltr	216.00	16	3,456.00
A	Total Cost of materials				6,87,158.89
B	Stock, Storage & Insurance i.e 3% of A				20,614.77
C	Sub Total (A+B)				7,07,773.66
D	Contingency @ 3% of C				21,233.21
E	Tools & Plants @ 2% of C				14,155.47
F	Transportation @ 7.5% of C				53,083.02
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				23,375.11
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				24,027.14
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				8,43,647.62
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
K	Total Civil & Services				34,450.00
L	Total (J+K)				8,78,097.62
N	Sub Total (L+M)				8,78,097.62
O	Total GST @ 18% of (N)				1,58,057.57
O1	Total CESS @ 1% of (N)				8,780.98
P	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				10,44,936.16
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- )				4	
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	4	2,26,942.86
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	260.032	19,762.43
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	97.50	42.2912	4,123.39
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	46.80576	3,557.24
5	Danger Plate, 1 no's.	No.	104.00	4	416.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	1.2036	117.35
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	12	1,248.00

Annexure-8					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	4.8144	469.40
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	624.00	16	9,984.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	24	15,600.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	24	35,880.00
12	Earthing of Support ( Coil Type )	No.	215.80	4	863.20
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	1.048	102.18
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	24	35,880.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	4	650.00
16	H.T. Stay set (Complete )	Set	1,365.00	4	5,460.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	4	260.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	60	5,850.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	45.24	4,587.34
20	Black Paint	Ltr	286.00	4	1,144.00
21	Yellow Colour Paint for Background	Ltr	216.00	8	1,728.00
<b>A</b>	<b>Total Cost of materials</b>				<b>3,74,625.39</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				11,238.76
<b>C</b>	<b>Sub Total (A+B)</b>				<b>3,85,864.15</b>
<b>D</b>	Contingency @ 3% of C				11,575.92
<b>E</b>	Tools & Plants @ 2% of C				7,465.55
<b>F</b>	Transportation @ 7.5% of C				28,939.81
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				11,687.56
<b>H</b>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				13,952.64
<b>I</b>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>4,59,485.64</b>
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.20	14,300.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	4	9,000.00
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>26,225.00</b>
<b>L</b>	<b>Total (J+K)</b>				<b>4,85,710.64</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>4,85,710.64</b>
<b>O</b>	Total GST @ 18% of (N)				87,427.91
<b>O1</b>	Total CESS @ 1% of (N)				4,857.11
<b>P</b>	<b>Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle</b>				<b>5,77,995.66</b>
<b>33 Kv Line Length In KM with 40 Mtr. Span</b>					
(Ref. Drawing No.- )			6		
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	126	71,48,700.00
2	33 KV V cross Arm (GI) 22Kg each	No.	2,340.00	126	2,94,840.00
3	Top bracket 100x50x6mm GI channel ( 300mm each)	No.	195.00	126	24,570.00
4	Danger Plate, 1 no's.	No.	104.00	126	13,104.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	37.91	3,696.56
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	378.00	39,312.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	151.65	14,786.23
8	33KV pin insulator polymer	No.	624.00	378	2,35,872.00
9	Earthing of Support ( Coil Type )	No.	215.80	126	27,190.80
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	33.01	3,218.67
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	101.40	182.70	18,525.78
12	232 sq.mm AAA conductor	Mtr.	203.45	18540.00	37,71,963.00
13	Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor	EA	842.95	18	15,173.03
14	Black Paint	Ltr	286.00	126.0	36,036.00
15	Yellow Colour Paint for Background	Ltr	216.00	252.0	54,432.00
<b>A</b>	<b>Total Cost of materials</b>				<b>1,17,01,420.06</b>
<b>B</b>					

Annexure-8					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,68,158.05
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				4,68,930.17
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,43,96,108.71
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	69.30	4,50,450.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	14.18	92,137.50
K	Total Civil & Services				5,42,587.50
L	Total (J+K)				1,49,38,696.21
N	Sub Total (L+M)				1,49,38,696.21
O	Total GST @ 18% of (N)				26,88,965.32
O1	Total CESS @ 1% of (N)				1,49,386.96
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				1,77,77,048.49
Gross Total Summary					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				21,32,225.09
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				3,91,883.50
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				10,44,936.16
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				5,77,995.66
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				1,77,77,048.49
Q	Gross Total Material +Services				2,19,24,088.90
R	Inspection Fee of Over Head Line (HT) - Rs.1500 up to 1 km.				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				3,750.00
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				2,19,30,088.90

## Annexure-8

## BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU

## Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (along with 1core spare cable) with accessories</b>				
<b>a</b>	<b>Length of 33kV 1C, 630sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>3000</b>		
<b>b</b>	<b>Length of 33kV 1C, 630sqmm cable (HDD)</b>	<b>Mtr.</b>	<b>500</b>		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	10500	1,495.47	1,57,02,435.00
1.2	Supply of Straight throU/Gh jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	33	11,900.00	3,92,700.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	6	6,350.00	38,100.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set		6,100.00	-
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	8952.00	357.60	32,01,235.20
<b>2</b>	<b>Supply of 33kV RMU</b>				
<b>a</b>	<b>No. of 33kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 33kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
<b>c</b>	<b>No. of 33kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 33kV 4Way RMU (LLVV)</b>	<b>nos.</b>			
<b>e</b>	<b>No. of 33kV 3Way RMU (LLL)</b>	<b>nos.</b>			
<b>f</b>	<b>No. of 33kV 4Way RMU (LLLL)</b>	<b>nos.</b>			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	23,35,264.00	-
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
<b>3</b>	<b>Earthing</b>				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	0.00	97.50	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,365.00	-
<b>4</b>	<b>FRTU for RMU SCADA Automation</b>				
<b>a</b>	<b>No. of FRTU</b>	<b>nos.</b>	<b>0</b>		
<b>4.1</b>	Pre-Wired FRTU Panel with FRTU	No.	0	1,21,744.00	-
<b>4.2</b>	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	0	1,00,000.00	-
<b>4.3</b>	Networking Accessories	No.	0	72.00	-
<b>4.4</b>	CMR with Mounting Base for Digital Inputs	Nos.	0	650.00	-

**Annexure-8**

<b>BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU</b>					
<b>4.5</b>	Interposing Relay for Digital Output	Nos.	0	467.94	-
<b>4.6</b>	Battery Charger	Nos.	0	15,385.00	-
<b>4.7</b>	Battery	Nos.	0	8,333.00	-
<b>4.8</b>	4G Modem cum Router	Nos.	0	18,500.00	-
<b>4.9</b>	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	0	204.87	-
<b>4.10</b>	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	0	305.58	-
<b>4.11</b>	Twisted Pair Shielded & Over all shielded Instrumentation Cable	Mtr.	0	275.23	-
<b>4.12</b>	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	0	165.25	-
<b>4.13</b>	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	0	150.00	-
<b>4.14</b>	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	0.0	148.43	-
<b>4.15</b>	Armored CAT6 SFTP Cable	Mtr.	0	45.87	-
<b>4.16</b>	Un-Armored CAT6 SFTP Cable	Mtr.	0	89.45	-
<b>4.17</b>	Multi Function Meter	Nos.	0	18,651.00	-
<b>Sub Total (Supply Portion) (in Rs.)</b>					<b>1,93,34,470.20</b>
<b>Erection Portion</b>					
<b>Sl. No.</b>	<b>Description of items</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (in Rs.)</b>	<b>Amount (in Rs.)</b>
<b>1</b>	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	9000	94.50	8,50,500.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	33	2,400.00	79,200.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	0	2,081.70	-
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with HDPE pipe</b> (110mm dia, PN8 PE80) including supply of HDPE Pipe.	Mtr.	1500	2,300.00	34,50,000.00
1.6	Laying of <b>110mm dia PE 80-PN8, HDPE pipe</b> inside open trench.	Mtr.	8952.00	300.00	26,85,600.00
<b>2</b>	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	-

**Annexure-8**

BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	0.0	16,000.00	-
	Sub Total (Erection Portion) (in Rs.)				70,77,790.20
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)- Route Length	Mtr	2984		
1.1.a	Earth work excavation of soil	Cum	2506.56	700.00	17,54,592.00
1.1.b	Earth work excavation of hard rock	Cum	1074.24	1,720.00	18,47,692.80
1.2	Back filling with excavated soil outside and above the trench	Cum	3580.8	202.00	7,23,321.60
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	1492	2,643.67	39,44,356.58
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kv RMU	Nos.	0	23,145.30	-
3	Supply of GI Fencing with Gate around each RMU	sqmtr	0	3,600.00	-
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	0	3,700.00	-
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	117	1,012.00	1,18,404.00
	Sub Total (Civil Portion) (in Rs.)				84,58,610.18
A	Sub Total (Supply Portion)				1,93,34,470.20
B	Stock, Storage & Insurance @ 3 % of A				5,80,034.11
C	Sub Total (A+B)				1,99,14,504.31
D	Contingency @ 3 % of C				5,97,435.13
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				14,93,587.82
G	Erection Charges @ 10% of earthing items				-

**Annexure-8**

<b>BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU</b>		
M1	CESS @ 1% of L	37,54,192.76
<b>N</b>	<b>Grand Total (L+M)</b>	<b>4,80,53,667.38</b>
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.	3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km	3,000.00
Q	Inspection Fee of RMU - Rs. 1500/ RMU	-
R	Inspection Fee of Drawing Checking and Approval	750.00
<b>S</b>	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>	<b>4,80,60,417.38</b>

Annexure-8					
BoQ and Estimate for 33 KV 4 Pole using WPB GI Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.) with Isolator and LA					
No. of 33 KV 4-Pole with Isolator			2		
MATERIALS FOR 33 KV 4-P With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB(GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	8	2,74,576.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel required =( 8x9.56x4.3)	KG	76.00	657.728	49,987.33
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required = (24x2.36x0.280)	KG	97.50	31.7184	3,092.54
4	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)/ Isolator	KG	76.00	307.02	23,333.52
5	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 8 no's channel required =( 8x7.14x4.3)	KG	76.00	491.232	37,333.63
6	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 8 nos angle required = (8*4.5*4.927)	KG	76.00	354.744	26,960.54
7	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no channel required =( 1x7.14x0.8)/ Isolator	KG	76.00	28.56	2,170.56
8	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 no angle required = (1*4.5*0.388)/ Isolator	KG	76.00	8.73	663.48
9	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 no angle required = (1*4.5*0.340)/ Isolator	KG	76.00	7.65	581.40
10	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)/ Isolator	KG	76.00	47.8	3,632.80
11	Danger Plate, 2 no's.	No.	104.00	4	416.00
12	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	1.2036	117.35
13	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	6	8,190.00
14	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 5 mtr. For raising)	KG	97.50	125.08	12,195.30
15	GI barbed wire anticlimbing device 3 Kg. Per support, 4 no's qty. required =(4x3kg)	Kg	104.00	24	2,496.00
16	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 16 no's = (16x0.59x0.510)	KG	97.50	9.6288	938.81
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	15	2,01,825.00
18	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	5	3,30,000.00
19	33KV pin insulator polymer	No.	624.00	12	7,488.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	36	23,400.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	36	53,820.00
22	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	48	71,760.00
23	232 sq.mm AAA conductor	Mtr.	203.45	61.8	12,573.21
24	GI Nut , Bolt & Washer of different sizes	K.g.	101.40	90	9,126.00
25	Black Paint	Ltr	286.00	2	572.00
26	Yellow Colour Paint for Background	Ltr	216.00	4	864.00
A	Total Cost of materials				11,58,113.48
B	Stock, Storage & Insurance i.e 3% of A				34,743.40
C	Sub Total (A+B)				11,92,856.88
D	Contingency @ 3% of C				35,785.71
E	Tools & Plants @ 2% of C				23,688.42
F	Transportation @ 7.5% of C				89,464.27
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				14,140.66
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				90,160.79
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				14,46,096.73
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
3	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	6	22,200.00
K	Total Civil & Services				56,650.00
L	Total (J+K)				15,02,746.73
N	Sub Total (L+M)				15,02,746.73
O	Total GST @ 18% of (N)				2,70,494.41
O1	Total CESS @ 1% of (O1)				15,027.47
P	Gross Total Material +Services (N+O+O1) for 33 KV 4-P With Isolator				

Annexure-9			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		SED	
Name of the Sub-Division : -		Salepur	
Name of the Section : -		Bahugram	
Name of the Work :-		33kV New Lines from Bahugram Grid (33kV Proposed Bahugram-1 and Bahugram-2 Feeders)	
Scope of work:-		Construction of 33kV Double Ckt. O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 7Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 0.5Ckm along wit 1no. 33kV 4W RMU. Construction of 33kV 4 Pole structure with Isolator- 9nos. Construction for 2 nos. of 33kV Outdoor Bay at Bahugram-2 PSS.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV Double Ckt. O/H Line using 13mtr H-Pole & 232sqmm AAAC Conductor- 7Ckm.	₹ 3,35,63,373.53
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 0.5Ckm along wit 1no. 33kV 4W RMU.	₹ 1,09,14,996.89
3	C	Construction of 33kV 4 Pole structure with Isolator- 9nos.	₹ 45,86,219.94
4	D	Construction for 2 nos. of 33kV Outdoor Bay at Bahugram-2 PSS.	₹ 69,51,884.40
5		<b>Total Amount</b>	<b>₹ 5,60,16,474.76</b>
		<b>Total Amount (In Cr)</b>	<b>₹ 5.60</b>
<b>Total estimated cost is Rs.5.60 Crore.</b>			

Annexure-9					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- )			14		
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	14	7,94,300.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (3x2x 9.56x1.7)	K.g.	76.00	1365.168	1,03,752.77
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (24x2.36x0.280)	K.g.	97.50	222.0288	21,647.81
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	0	-
5	Danger Plate, 1 no's.	No.	104.00	14	1,456.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	4.2126	410.73
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	42	4,368.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	16.8504	1,642.91
9	33KV pin insulator polymer	No.	624.00	84	52,416.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	168	1,09,200.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	168	2,51,160.00
12	Earthing of Support ( Coil Type )	EA	215.80	14	3,021.20
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	3.668	357.63
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	168	2,51,160.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	68.306	6,926.23
16	Black Paint	Ltr	286.00	14	4,004.00
17	Yellow Colour Paint for Background	Ltr	216.00	28	6,048.00
A	Total Cost of materials				16,11,871.28
B	Stock, Storage & Insurance i.e 3% of A				48,356.14
C	Sub Total (A+B)				16,60,227.42
D	Contingency @ 3% of C				49,806.82
E	Tools & Plants @ 2% of C				33,204.55
F	Transportation @ 7.5% of C				1,24,517.06
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				40,906.45
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				84,209.84
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				19,92,872.13
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	7.7	50,050.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.575	10,237.50
K	Total Civil & Services				60,287.50
L	Total (J+K)				20,53,159.63
N	Sub Total (L+M)				20,53,159.63
O	Total GST @ 18% of (N)				3,69,568.73
O1	Total CESS @ 1% of (N)				20,531.60
P	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				24,43,259.96
33 Kv Line Length In KM with 40 Mtr. Span (Ref. Drawing No.- )					
				7	
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	161	91,34,450.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	97.50	15699	15,30,694.62
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 12 no's required = (12x2.36x0.280)	K.g.	97.50	1277	1,24,474.90
4	Danger Plate, 1 no's.	No.	104.00	161	16,744.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	48.44	4,723.38
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	483.00	50,232.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	193.78	18

Annexure-9					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
15	Yellow Colour Paint for Background	Ltr	216.00	322.0	69,552.00
<b>A</b>	<b>Total Cost of materials</b>				<b>2,05,45,117.17</b>
B	Stock, Storage & Insurance i.e 3% of A				6,16,353.52
<b>C</b>	<b>Sub Total (A+B)</b>				<b>2,11,61,470.69</b>
D	Contingency @ 3% of C				6,34,844.12
E	Tools & Plants @ 2% of C				4,23,229.41
F	Transportation @ 7.5% of C				15,87,110.30
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				4,70,424.18
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				11,75,298.72
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>2,54,52,377.42</b>
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	88.55	5,75,575.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	18.11	1,17,731.25
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>6,93,306.25</b>
<b>L</b>	<b>Total (J+K)</b>				<b>2,61,45,683.67</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>2,61,45,683.67</b>
O	Total GST @ 18% of (N)				47,06,223.06
O1	Total CESS @ 1% of (N)				2,61,456.84
<b>P</b>	<b>Gross Total Material +Services (N+O+O1) for 33 KV Pin Points</b>				<b>3,11,13,363.56</b>
Gross Total Summary					
1	Gross Total Material +Services (N+O) for 33 KV DP Without Isolator				-
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator				-
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				24,43,259.96
4	Gross Total Material +Services (N+O) for 33 KV Cut Point with 90 Degree Angle				-
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				3,11,13,363.56
<b>Q</b>	<b>Gross Total Material +Services</b>				<b>3,35,56,623.53</b>
R	Inspection Fee of Over Head Line (HT) - Rs.1500 up to 1 km.				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				4,500.00
T	Inspection Fee of Drawing Checking and Approval				750.00
<b>U</b>	<b>Gross Total Material, Services and Inspection Fees (Q+R+S+T)</b>				<b>3,35,63,373.53</b>

Annexure-9					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (aloing with 1core spare cable) with accessories</b>				
<b>a</b>	<b>Length of 33kV 1C, 630sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>500</b>		
<b>b</b>	<b>Length of 33kV 1C, 630sqmm cable (HDD)</b>	<b>Mtr.</b>			
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	1500	1,495.47	22,43,205.00
1.2	Supply of Straight throU/Gh jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set		11,900.00	-
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	9	6,350.00	57,150.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	9	6,100.00	54,900.00
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	1428.00	357.60	5,10,652.80
<b>2</b>	<b>Supply of 33kV RMU</b>				
<b>a</b>	<b>No. of 33kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 33kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
<b>c</b>	<b>No. of 33kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 33kV 4Way RMU (LLVV)</b>	<b>nos.</b>	<b>1</b>		
<b>e</b>	<b>No. of 33kV 3Way RMU (LLL)</b>	<b>nos.</b>			
<b>f</b>	<b>No. of 33kV 4Way RMU (LLLL)</b>	<b>nos.</b>			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
<b>3</b>	<b>Earthing</b>				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	13.20	97.50	1,287.00
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,365.00	2,730.00
<b>4</b>	<b>FRTU for RMU SCADA Automation</b>				
<b>a</b>	<b>No. of FRTU</b>	<b>nos.</b>	<b>1</b>		
4.1	Pre-Wired FRTU Panel with FRTU	No.	1	1,21,744.00	1,21,744.00
4.2	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	1	1,00,000.00	1,00,000.00
4.3	Networking Accessories	No.	1	72.00	72.00
4.4	CMR with Mounting Base for Digital Inputs	Nos.	32	650.00	20,800.00

Annexure-9					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
4.5	Interposing Relay for Digital Output	Nos.	16	467.94	7,487.04
4.6	Battery Charger	Nos.	1	15,385.00	15,385.00
4.7	Battery	Nos.	1	8,333.00	8,333.00
4.8	4G Modem cum Router	Nos.	1	18,500.00	18,500.00
4.9	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	40	204.87	8,194.80
4.10	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	40	305.58	12,223.20
4.11	Twisted Pair Shielded & Over all shielded Instrumentation Cable	Mtr.	40	275.23	11,009.20
4.12	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	20	165.25	3,305.00
4.13	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	10	150.00	1,500.00
4.14	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	20.0	148.43	2,968.60
4.15	Armored CAT6 SFTP Cable	Mtr.	20	45.87	917.40
4.16	Un-Armored CAT6 SFTP Cable	Mtr.	20	89.45	1,789.00
4.17	Multi Function Meter	Nos.	2	18,651.00	37,302.00
Sub Total (Supply Portion) (in Rs.)					55,76,719.04
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	1500	94.50	1,41,750.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	0	2,400.00	-
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with</b> HDPE pipe (110mm dia, PN8 PE80) including suply of HDPE Pipe.	Mtr.	0	2,300.00	-
1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	1428.00	300.00	4,28,400.00
2	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-

Annexure-9					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
<b>3</b>	<b>FRTU and OFC for RMU SCADA Automation</b>				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	1.0	16,000.00	16,000.00
	<b>Sub Total (Erection Portion) (in Rs.)</b>				<b>6,31,620.60</b>
<b>Civil Portion</b>					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Civil works with supply of all materials like cement, MS tor rod, brick, coarse &amp; fine aggregates and labour, T&amp;P, etc for UG Cable Trench</b>				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)- Route Length	Mtr	476		
1.1.a	Earth work excavation of <b>soil</b>	Cum	399.84	700.00	2,79,888.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	171.36	1,720.00	2,94,739.20
1.2	Back filling with excavated soil outside and above the trench	Cum	571.2	202.00	1,15,382.40
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	238	2,643.67	6,29,193.61
<b>2</b>	<b>Civil works for Prefabricated RCC foundation with supply of all materials</b>				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	1	23,145.30	23,145.30
3	Supply of GI Fencing with Gate around each <b>RMU</b>	sqmtr	20	3,600.00	72,000.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	2	3,700.00	7,400.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	72	1,463.40	1,05,364.80
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	17	1,012.00	17,204.00
	<b>Sub Total (Civil Portion) (in Rs.)</b>				<b>15,44,317.31</b>
<b>A</b>	<b>Sub Total (Supply Portion)</b>				<b>55,76,719.04</b>
B	Stock, Storage & Insurance @ 3 % of A				1,67,301.57
<b>C</b>	<b>Sub Total (A+B)</b>				<b>57,44,020.61</b>
D	Contingency @ 3 % of C				1,72,320.62
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				26.51
F	Transportation @ 7.5% of C				4,30,801.55
G	Erection Charges @ 10% of earthing items				132.56
<b>H</b>	<b>Total (C+D+E+F+G)</b>				<b>63,47,301.85</b>
I	Sub Total (Erection Portion + Civil Portion)				21,75,937.91
<b>J</b>	<b>Total Cost (H+I)</b>				<b>85,23,239.76</b>
<b>L</b>	<b>Total Estimated Capital Cost i.e. (J+K)</b>				<b>85,23,239.76</b>
M	GST @ 18% of L				15,34,183.16
M1	CESS @ 1% of L				8,52,323.98
<b>N</b>	<b>Grand Total (L+M)</b>				<b>1,09,09,746.89</b>

Annexure-9		
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU		
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.	3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km	
Q	Inspection Fee of RMU - Rs. 1500/ RMU	1,500.00
R	Inspection Fee of Drawing Checking and Approval	750.00
S	<b>Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)</b>	<b>1,09,14,996.89</b>

## Annexure-9

**BoQ and Estimate for 33 KV 4 Pole using WPB GI Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.) with Isolator and LA**

No. of 33 KV 4-Pole with Isolator		9			
<b>MATERIALS FOR 33 KV 4-P With Isolator</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB(GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	36	12,35,592.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel required =( 8x9.56x4.3)	KG	76.00	2959.776	2,24,942.98
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required = (24x2.36x0.280)	KG	97.50	142.7328	13,916.45
4	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)/ Isolator	KG	76.00	122.808	9,333.41
5	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 8 no's channel required =( 8x7.14x4.3)	KG	76.00	2210.544	1,68,001.34
6	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 8 nos angle required = (8*4.5*4.927)	KG	76.00	1596.348	1,21,322.45
7	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no channel required =( 1x7.14x0.8)/ Isolator	KG	76.00	11.424	868.22
8	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 no angle required = (1*4.5*0.388)/ Isolator	KG	76.00	3.492	265.39
9	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 no angle required = (1*4.5*0.340)/ Isolator	KG	76.00	3.06	232.56
10	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)/ Isolator	KG	76.00	19.12	1,453.12
11	Danger Plate, 2 no's.	No.	104.00	18	1,872.00
12	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	5.4162	528.08
13	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	27	36,855.00
14	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 5 mtr. For raising)	KG	97.50	562.86	54,878.85
15	GI barbed wire anticlimbing device 3 Kg. Per support, 4 no's qty. required =(4x3kg)	Kg	104.00	108	11,232.00
16	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 16 no's = (16x0.59x0.510)	KG	97.50	43.3296	4,224.64
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	6	80,730.00
18	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	2	1,32,000.00
19	33KV pin insulator polymer	No.	624.00	54	33,696.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	162	1,05,300.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	162	2,42,190.00
22	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	216	3,22,920.00
23	232 sq.mm AAA conductor	Mtr.	203.45	278.1	56,579.45
24	GI Nut , Bolt & Washer of different sizes	K.g.	101.40	405	41,067.00
25	Black Paint	Ltr	286.00	9	2,574.00
26	Yellow Colour Paint for Background	Ltr	216.00	18	3,888.00
A	<b>Total Cost of materials</b>				<b>29,06,462.93</b>
B	Stock, Storage & Insurance i.e 3% of A				87,193.89
C	<b>Sub Total (A+B)</b>				<b>29,93,656.82</b>
D	Contingency @ 3% of C				89,809.70
E	Tools & Plants @ 2% of C				59,113.92
F	Transportation @ 7.5% of C				2,24,524.26
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				63,632.99
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				

Annexure-9					
Construction for 1 no. of 33kV Outdoor Bay arrangement consisting of 1 VCB and 2 isolator).					
No. of Bus isolator requirement			6		
No. of VCB Requirement			2		
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	2	53,200.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	2	63,840.00
3	T-1A GI Column ( for 33 kv Bus) ( 6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	4	94,240.00
4	T-2A GI Column ( for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	4	1,12,480.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	2	30,400.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	8	1,06,400.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	1980	1,50,480.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	400	30,400.00
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	570	43,320.00
10	GI Spikes with cone and GI ( 2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	8	29,135.35
11	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	16	21,840.00
12	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation )= 20x2.36	KG	97.50	377.6	36,816.00
13	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,74,300.00	0.1	27,430.00
14	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,31,157.00	6	7,86,942.00
15	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR- 600-300-150/1-1A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for feeder protection	EA	7,02,000.00	2	14,04,000.00
16	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	33,046.00	6	1,98,276.00
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	24	3,22,920.00
18	Control Cable 10Core x 2.5 mm <sup>2</sup>	Mtr	429.00	300	1,28,700.00
19	Control Cable 16Core x 2.5 mm <sup>2</sup>	Mtr	523.90	300	1,57,170.00
20	Control Cable 4Core x 2.5 mm <sup>2</sup>	Mtr	145.60	100	14,560.00
21	Control Cable 7Core x 2.5 mm <sup>2</sup>	Mtr	236.60	100	23,660.00
22	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	36	53,820.00
23	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	36	23,400.00
24	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm <sup>2</sup> drop	No.	1,404.00	36	50,544.00
25	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	96	1,43,520.00
26	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	101.40	109.744	11,128.04
27	Black Paint	Ltr	286.00	8	2,288.00
28	Yellow Colour Paint for Background	Ltr	286.00	16	4,576.00
A	Total Cost of materials				41,25,485.39
B	Stock, Storage & Insurance i.e 3% of A				1,23,764.56
C	Sub Total (A+B)				42,49,249.95
D	Contingency @ 3% of C				1,27,477.5

Annexure-9					
Construction for 1 no. of 33kV Outdoor Bay arrangement consisting of 1 VCB and 2 isolator).					
E	Tools & Plants @ 2% of C			84,985.00	
F	Transportation @ 7.5% of C			3,18,693.75	
G	Erection Charges @ 5% on Trf/Breaker/Joist			72,306.00	
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Earthing)			2,78,063.47	
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-	
J	Sum of (C to I)			51,30,775.67	
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
A	<b>VCB Foundation</b>				
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	14.56	7,017.92
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	8.00	1,600.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	1020.00	0.68	696.15
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.91	4,668.30
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	5.65	36,725.00
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	26.50	7,976.50
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	280.00	30,520.00
B	<b>CT &amp; PT Foundation</b>			0.00	-
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	15.94	7,681.88
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	9.00	1,800.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	900.00	0.73	653.40
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.73	3,724.38
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	4.73	30,712.50
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	29.88	8,993.88
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	244.86	26,689.74
C	<b>Column as per Drawing Schedule-</b>			0.00	-
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	51.31	24,731.30
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	24.00	4,800.00

Annexure-9					
Construction for 1 no. of 33kV Outdoor Bay arrangement consisting of 1 VCB and 2 isolator).					
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	2.10	10,773.00
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	14.18	92,137.50
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	89.64	26,981.64
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	734.58	80,069.22
D	<b>Isolator</b>				
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	28.35	13,664.70
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	12.00	2,400.00
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	1.70	8,726.13
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	17.10	1,11,150.00
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	89.64	26,981.64
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	734.58	80,069.22
7	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3700.00	16	59,200.00
K	<b>Total Civil &amp; Services</b>				<b>7,11,143.99</b>
L	<b>Total (J+K)</b>				<b>58,41,919.66</b>
N	<b>Sub Total (L+M)</b>				<b>58,41,919.66</b>
O	Total GST @ 18% of (N)				10,51,545.54
P	Total Cess @ 1% of (N)				58,419.20
Q	<b>Gross Total Material +Services (N+O+P)</b>				<b>69,51,884.40</b>

Annexure-10			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CED	
Name of the Sub-Division : -		Badachana	
Name of the Section : -		Balichandrapur	
Name of the Work :-		33kV New Line from Balichandrapur Grid (33kV Proposed Balchandrapur-1 and Balichandrapur-2 Feeders)	
Scope of work:-		Construction of 33kV Double Ckt. O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 2 Ckm. Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 10 Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1 Ckm along with 2nos. 33kV 4W RMU. Construction for 2nos. of 33kV Outdoor Bay at Balichandrapur PSS.	
Names of Schemes: -		TPCODL CAPEX	
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV Double Ckt. O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 2 Ckm.	₹ 95,90,606.72
2	B	Construction of 33kV O/H Line using 13mtr H-Pole & 232sqmm AAAC conductor- 10 Ckm.	₹ 3,71,86,161.18
3	C	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1 Ckm along with 2nos. 33kV 4W RMU.	₹ 2,27,35,918.32
4	D	Construction for 2nos. of 33kV Outdoor Bay at Balichandrapur PSS.	₹ 69,51,884.40
		Total Amount	₹ 7,64,64,570.62
		Total Amount (In Cr)	₹ 7.65
Total estimated cost is Rs.7.65 Crore.			

## Annexure-10

33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points &amp; 13 Mtr WPB Pole for DP

No. of 33 KV Cut Point with 180 Degree Angle  
(Ref. Drawing No.- )

4

**MATERIALS FOR 33 KV Cut Point with 180 Degree Angle**

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	4	2,26,942.86
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (3x2x 9.56x1.7)	K.g.	76.00	390.048	29,643.65
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (24x2.36x0.280)	K.g.	97.50	63.4368	6,185.09
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	0	-
5	Danger Plate, 1 no's.	No.	104.00	4	416.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	1.2036	117.35
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	12	1,248.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	4.8144	469.40
9	33KV pin insulator polymer	No.	624.00	24	14,976.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	48	31,200.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	48	71,760.00
12	Earthing of Support ( Coil Type )	EA	215.80	4	863.20
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	1.048	102.18
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	48	71,760.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	19.516	1,978.92
16	Black Paint	Ltr	286.00	4	1,144.00
17	Yellow Colour Paint for Background	Ltr	216.00	8	1,728.00
<b>A</b>	<b>Total Cost of materials</b>				<b>4,60,534.65</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				13,816.04
<b>C</b>	<b>Sub Total (A+B)</b>				<b>4,74,350.69</b>
<b>D</b>	Contingency @ 3% of C				14,230.52
<b>E</b>	Tools & Plants @ 2% of C				9,487.01
<b>F</b>	Transportation @ 7.5% of C				35,576.30
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				11,687.56
<b>H</b>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				24,059.95
<b>I</b>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>5,69,392.04</b>
<b>Civil &amp; Services</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>17,225.00</b>
<b>L</b>	<b>Total (J+K)</b>				<b>5,86,617.04</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>5,86,617.04</b>
<b>O</b>	Total GST @ 18% of (N)				1,05,591.07
<b>O1</b>	Total CESS @ 1% of (N)				5,866.1

## Annexure-10

33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
15	Yellow Colour Paint for Background	Ltr	216.00	92.0	19,872.00
A	Total Cost of materials				58,70,033.48
B	Stock, Storage & Insurance i.e 3% of A				1,76,101.00
C	Sub Total (A+B)				60,46,134.48
D	Contingency @ 3% of C				1,81,384.03
E	Tools & Plants @ 2% of C				1,20,922.69
F	Transportation @ 7.5% of C				4,53,460.09
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,34,406.91
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				3,35,799.63
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				72,72,107.83
<b>Civil &amp; Services</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	25.30	1,64,450.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	5.18	33,637.50
K	Total Civil & Services				1,98,087.50
L	Total (J+K)				74,70,195.33
N	Sub Total (L+M)				74,70,195.33
O	Total GST @ 18% of (N)				13,44,635.16
O1	Total CESS @ 1% of (N)				74,701.95
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				88,89,532.45
<b>Gross Total Summary</b>					
1	Gross Total Material +Services (N+O) for 33 KV DP Without Isolator				-
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator				-
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				6,98,074.28
4	Gross Total Material +Services (N+O) for 33 KV Cut Point with 90 Degree Angle				-
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				88,89,532.45
Q	Gross Total Material +Services				95,87,606.72
R	Inspection Fee of Over Head Line (HT) - Rs.1500 up to 1 km.				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				750.00
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				95,90,606.72

## Annexure-10

33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			15		
<u>MATERIALS FOR 33 KV DP Without Isolator</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	30	10,29,660.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =( 2x9.56x3.25)	KG	76.00	932.1	70,839.60
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	59.472	5,798.52
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96)	KG	76.00	1049.58	79,768.08
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	926.64	70,424.64
6	Danger Plate, 2 no's.	No.	104.00	30	3,120.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	9.027	880.13
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	30	4,875.00
9	H.T. Stay set (Complete )	Set	1,365.00	30	40,950.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	60	3,900.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	450	43,875.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	15	20,475.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	177	17,257.50
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	90	9,360.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	36.108	3,520.53
16	33KV pin insulator polymer	No.	624.00	45	28,080.00
17	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	90	58,500.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	90	1,34,550.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	90	1,34,550.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	101.40	183.915	18,648.98
21	Black Paint	Ltr	286.00	15	4,290.00
22	Yellow Colour Paint for Background	Ltr	216.00	30	6,480.00
A	Total Cost of materials				17,89,802.98
B	Stock, Storage & Insurance i.e 3% of A				53,694.09
C	Sub Total (A+B)				18,43,497.07
D	Contingency @ 3% of C				55,304.91
E	Tools & Plants @ 2% of C				34,520.00
F	Transportation @ 7.5% of C				1,38,262.28
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				53,027.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				66,545.00
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				21,91,156.75
<u>Civil &amp; Services</u>					
Sl. No.	Description of Materials	Unit			

## Annexure-10

**33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP**

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	10	3,43,220.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	76.00	411.08	31,242.08
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	19.824	1,932.84
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	76.00	153.51	11,666.76
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	76.00	307.02	23,333.52
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	76.00	614.04	46,667.04
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	443.43	33,700.68
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	76.00	28.56	2,170.56
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	8.73	663.48
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	7.65	581.40
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	76.00	47.8	3,632.80
12	Danger Plate, 2 no's.	No.	104.00	10	1,040.00
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	3.009	293.38
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	10	1,625.00
15	H.T. Stay set (Complete )	Set	1,365.00	10	13,650.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	20	1,300.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	150	14,625.00
18	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	10	13,650.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	97.50	283.2	27,612.00
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	30	3,120.00
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	12.036	1,173.51
22	Lightning Arrester(30KV, 10KA) (Station Class, class-2)	EA	13,455.00	15	2,01,825.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00	5	3,30,000.00
24	33KV pin insulator polymer	No.	624.00	15	9,360.00
25	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	30	19,500.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	30	44,850.00
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	30	44,850.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	101.40	110.75	11,230.05
29	Black Paint	Ltr	286.00	5	1,430.00
30	Yellow Colour Paint for Background	Ltr	216.00	10	2,160.00
<b>A</b>	<b>Total Cost of materials</b>				<b>12,42,105.10</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				37,263.15
<b>C</b>					

## Annexure-10

33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP					
O	Total GST @ 18% of (N)				2,96,382.48
O1	Total CESS @ 1% of (N)				16,465.69
P	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				19,59,417.49
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- )				15	
<b>MATERIALS FOR 33 KV Cut Point with 180 Degree Angle</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole(GI)	No	56,735.71	15	8,51,035.71
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	487.56	37,054.56
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	79.296	7,731.36
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	87.7608	6,669.82
5	Danger Plate, 1 no's.	No.	104.00	15	1,560.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	4.5135	440.07
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	45	4,680.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	18.054	1,760.27
9	33KV pin insulator polymer	No.	624.00	45	28,080.00
10	H W fitting(B&S)90KN, 4 Bolt	No.	650.00	90	58,500.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	90	1,34,550.00
12	Earthing of Support ( Coil Type )	EA	215.80	15	3,237.00
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	3.93	383.18
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	90	1,34,550.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	73.185	7,420.96
16	Black Paint	Ltr	286.00	15	4,290.00
17	Yellow Colour Paint for Background	Ltr	216.00	30	6,480.00
A	Total Cost of materials				12,88,422.92
B	Stock, Storage & Insurance i.e 3% of A				38,652.69
C	Sub Total (A+B)				13,27,075.61
D	Contingency @ 3% of C				39,812.27
E	Tools & Plants @ 2% of C				26,541.51
F	Transportation @ 7.5% of C				99,530.67
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				43,828.34
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				45,050.88
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				15,81,839.28
<b>Civil &amp; Services</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	8.25	53,625.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr			



## Annexure-10

33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor 13 Mtr. H-Pole for Pin-Points and Cut-Points & 13 Mtr WPB Pole for DP				
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			6,13,596.75
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)			7,81,550.28
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-
J	Sum of (C to I)			2,39,93,514.52
Civil & Services				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	115.50
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	23.63
K	Total Civil & Services			9,04,312.50
L	Total (J+K)			2,48,97,827.02
N	Sub Total (L+M)			2,48,97,827.02
O	Total GST @ 18% of (N)			44,81,608.86
O1	Total CESS @ 1% of (N)			2,48,978.27
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points			2,96,28,414.15
Gross Total Summary				
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator			29,07,579.66
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator			19,59,417.49
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle			19,59,255.31
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle			7,22,494.57
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points			2,96,28,414.15
Q	Gross Total Material +Services			3,71,77,161.18
R	Inspection Fee of Over Head Line (HT) - Rs.1500 up to 1 km.			1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km			6,750.00
T	Inspection Fee of Drawing Checking and Approval			750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)			3,71,86,161.18

Annexure-10					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (aloing with 1core spare cable) with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	700		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.	300		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	3000	1,495.47	44,86,410.00
1.2	Supply of Straight throU/Gh jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	9	11,900.00	1,07,100.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	21	6,350.00	1,33,350.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	21	6,100.00	1,28,100.00
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	1932.00	357.60	6,90,883.20
2	Supply of 33kV RMU				
a	No. of 33kV 3Way RMU (LLV+M)	nos.			
b	No. of 33kV 4Way RMU (LLVV+M)	nos.			
c	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.	2		
e	No. of 33kV 3Way RMU (LLL)	nos.			
f	No. of 33kV 4Way RMU (LLLL)	nos.			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) (CT Ratio to be mentioned)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) (CT Ratio to be mentioned)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	2	23,35,264.00	46,70,528.00
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	26.40	97.50	2,574.00
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	4	1,365.00	5,460.00
4	FRTU for RMU SCADA Automation				
a	No. of FRTU	nos.	2		
4.1	Pre-Wired FRTU Panel with FRTU	No.	2	1,21,744.00	2,43,488.00
4.2	Managed Layer2 Ethernet Switch (FRTU Panel)	No.	2	1,00,000.00	2,00,000.00
4.3	Networking Accessories	No.	2	72.00	144.00
4.4	CMR with Mounting Base for Digital Inputs	Nos.	64	650.00	41,600.00
4.5	Interposing Relay for Digital Output	Nos.	32	467.94	14,974.08
4.6	Battery Charger	Nos.	2	15,385.00	30,770.00

Annexure-10					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
4.7	Battery	Nos.	2	8,333.00	16,666.00
4.8	4G Modem cum Router	Nos.	2	18,500.00	37,000.00
4.9	Instrumentation Cable 12 C X 0.5 mm2, Armored cable for Status and Indications	Mtr.	80	204.87	16,389.60
4.10	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Mtr.	80	305.58	24,446.40
4.11	Twisted Pair Shielded & Over all shielded Instrumentation Cable 5 P X 1.0 mm2, Armored for Analog Input	Mtr.	80	275.23	22,018.40
4.12	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Mtr.	40	165.25	6,610.00
4.13	2 C X 4 mm2 Cable for DC Power Supply	Mtr.	20	150.00	3,000.00
4.14	4P X 0.36 mm2, Armored Communication Cable for MFM	Mtr.	40.0	148.43	5,937.20
4.15	Armored CAT6 SFTP Cable	Mtr.	40	45.87	1,834.80
4.16	Un-Armored CAT6 SFTP Cable	Mtr.	40	89.45	3,578.00
4.17	Multi Function Meter	Nos.	4	18,651.00	74,604.00
Sub Total (Supply Portion) (in Rs.)					1,09,67,465.68
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	<b>Erection, Commissioning &amp; Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare</b>				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	2100	94.50	1,98,450.00
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	9	2,400.00	21,600.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	21	2,081.70	43,715.70
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	21	2,081.70	43,715.70
1.5	Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE U/G cable by <b>HDD method with HDPE pipe</b> (110mm dia, PN8 PE80) including suply of HDPE Pipe.	Mtr.	900	2,300.00	20,70,000.00
1.6	Laying of <b>110mm dia PE 80-PN8, HDPE pipe</b> inside open trench.	Mtr.	1932.00	300.00	5,79,600.00
2	<b>Erection, Commissioning, Wiring and Testing of 33kV RMU</b>				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	2	8,000.00	16,000.00
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	<b>FRTU and OFC for RMU SCADA Automation</b>				
3.1	Services of FRTU Panel, Communication and Other Supplied System	EA	2.0	16,000.00	32,000.00
Sub Total (Erection Portion) (in Rs.)					30,05,081.40
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)

Annexure-10					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)-Route Length	Mtr	644		
1.1.a	Earth work excavation of <b>soil</b>	Cum	540.96	700.00	3,78,672.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	231.84	1,720.00	3,98,764.80
1.2	Back filling with excavated soil outside and above the trench	Cum	772.8	202.00	1,56,105.60
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	322	2,643.67	8,51,261.94
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	2	23,145.30	46,290.60
3	Supply of GI Fencing with Gate around each RMU	sqmtr	40	3,600.00	1,44,000.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	4	3,700.00	14,800.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	168	1,463.40	2,45,851.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	33	1,012.00	33,396.00
	Sub Total (Civil Portion) (in Rs.)				22,69,142.14
A	Sub Total (Supply Portion)				1,09,67,465.68
B	Stock, Storage & Insurance @ 3 % of A				3,29,023.97
C	Sub Total (A+B)				1,12,96,489.65
D	Contingency @ 3 % of C				3,38,894.69
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				53.02
F	Transportation @ 7.5% of C				8,47,236.72
G	Erection Charges @ 10% of earthing items				265.12
H	Total (C+D+E+F+G)				1,24,82,939.21
I	Sub Total (Erection Portion + Civil Portion)				52,74,223.54
J	Total Cost (H+I)				1,77,57,162.75
L	Total Estimated Capital Cost i.e. (J+K)				1,77,57,162.75
M	GST @ 18% of L				31,96,289.30
M1	CESS @ 1% of L				17,75,716.28
N	Grand Total (L+M)				2,27,29,168.32
O	Inspection Fee of UG Line (HT) - Rs. 3000/ km.				3,000.00
P	Inspection Fee of UG Line (HT) - Rs. 1500/ Additional Km				
Q	Inspection Fee of RMU - Rs. 1500/ RMU				3,000.00
R	Inspection Fee of Drawing Checking and Approval				750.00
S	Gross Total Material, Services and Inspection Fees (N+O+P+Q+R)				2,27,35,918.32

Annexure-10					
Construction for 1 no. of 33kV Outdoor Bay arrangement consisting of 1 VCB and 2 isolator).					
No. of Bus isolator requirement			6		
No. of VCB Requirement			2		
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	2	53,200.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line - 1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	2	63,840.00
3	T-1A GI Column ( for 33 kv Bus) ( 6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	4	94,240.00
4	T-2A GI Column ( for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	4	1,12,480.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	2	30,400.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	8	1,06,400.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	1980	1,50,480.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	400	30,400.00
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	570	43,320.00
10	GI Spikes with cone and GI ( 2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	8	29,135.35
11	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	16	21,840.00
12	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation )= 20x2.36	KG	97.50	377.6	36,816.00
13	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,74,300.00	0.1	27,430.00
14	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,31,157.00	6	7,86,942.00
15	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR- 600-300-150/1-1A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for feeder protection	EA	7,02,000.00	2	14,04,000.00
16	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	33,046.00	6	1,98,276.00
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	24	3,22,920.00
18	Control Cable 10Core x 2.5 mm <sup>2</sup>	Mtr	429.00	300	1,28,700.00
19	Control Cable 16Core x 2.5 mm <sup>2</sup>	Mtr	523.90	300	1,57,170.00
20	Control Cable 4Core x 2.5 mm <sup>2</sup>	Mtr	145.60	100	14,560.00
21	Control Cable 7Core x 2.5 mm <sup>2</sup>	Mtr	236.60	100	23,660.00
22	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	36	53,820.00
23	H W fitting(B&S) 90KN,4 Bolt	No.	650.00	36	23,400.00
24	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm <sup>2</sup> drop	No.	1,404.00	36	50,544.00
25	PG Clamp for 232 sq.mm AAA conductor	NO.	1,495.00	96	1,43,520.00
26	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Structures)	K.g.	101.40	109.744	11,128.04
27	Black Paint	Ltr	286.00	8	

Annexure-10					
<b>Construction for 1 no. of 33kV Outdoor Bay arrangement consisting of 1 VCB and 2 isolator).</b>					
E	Tools & Plants @ 2% of C			84,985.00	
F	Transportation @ 7.5% of C			3,18,693.75	
G	Erection Charges @ 5% on Trf/Breaker/Joist			72,306.00	
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Earthing)			2,78,063.47	
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-	
J	<b>Sum of (C to I)</b>			<b>51,30,775.67</b>	
<b><u>Civil &amp; Services</u></b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
A	<b>VCB Foundation</b>				
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	14.56	7,017.92
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	8.00	1,600.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	1020.00	0.68	696.15
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.91	4,668.30
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	5.65	36,725.00
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	26.50	7,976.50
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	280.00	30,520.00
B	<b>CT &amp; PT Foundation</b>			0.00	-
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	15.94	7,681.88
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	9.00	1,800.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	900.00	0.73	653.40
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.73	3,724.38
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	4.73	30,712.50
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	29.88	8,993.88
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	244.86	26,689.74
C	<b>Column as per Drawing Schedule-</b>			0.00	-
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	51.31	24,731.30
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	24.00	4,800.00

Annexure-10					
Construction for 1 no. of 33kV Outdoor Bay arrangement consisting of 1 VCB and 2 isolator).					
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	2.10	10,773.00
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	14.18	92,137.50
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	89.64	26,981.64
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	734.58	80,069.22
D	<b>Isolator</b>				
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	28.35	13,664.70
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	12.00	2,400.00
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	1.70	8,726.13
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	17.10	1,11,150.00
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	89.64	26,981.64
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	734.58	80,069.22
7	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3700.00	16	59,200.00
K	<b>Total Civil &amp; Services</b>				<b>7,11,143.99</b>
L	<b>Total (J+K)</b>				<b>58,41,919.66</b>
N	<b>Sub Total (L+M)</b>				<b>58,41,919.66</b>
O	Total GST @ 18% of (N)				10,51,545.54
P	Total Cess @ 1% of (N)				58,419.20
Q	<b>Gross Total Material +Services (N+O+P)</b>				<b>69,51,884.40</b>

Annexure-11			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		DHENKANAL ELECTRIC DIVISION (DED)	
Name of the Sub-Division : -		Gondia	
Name of the Section : -		Gondia	
Name of the Work :-		33kV New Lines from Gondia Grid (33kV Proposed Joranda and College Feeder)	
Scope of work:-		Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 2.5Ckm. Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 4Ckm. Construction of 33kV 4 Pole structure with Isolator- 2nos.	
Names of Schemes: -		TPCODL CAPEX	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 2.5Ckm.	₹ 94,97,340.19
2	B	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 4Ckm.	₹ 1,48,49,691.06
4	C	Construction of 33kV 4 Pole structure with Isolator- 2nos.	₹ 21,25,926.06
		Total Amount	₹ 2,64,72,957.30
		Total Amount (In Cr)	₹ 2.65
Total estimated cost is Rs.2.65 Crore.			

## Annexure-11

## 33kV Line Length using 241 SQ.MM. -AAA Conductor

No. of 33 KV DP required Without Isolator  
(Ref. Drawing No.- TPCODL-HVD-0004)

5

**MATERIALS FOR 33 KV DP Without Isolator**

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	10	3,43,220.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required = (2x9.56x3.25)	KG	76.00	310.7	23,613.20
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	19.824	1,932.84
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required = (5x7.14x1.96)	KG	76.00	349.86	26,589.36
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	308.88	23,474.88
6	Danger Plate, 2 no's.	No.	104.00	10	1,040.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	3.009	293.38
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	10	1,625.00
9	H.T. Stay set (Complete )	Set	1,365.00	10	13,650.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	20	1,300.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	150	14,625.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	5	6,825.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	59	5,752.50
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	30	3,120.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	12.036	1,173.51
16	33KV pin insulator polymer	No.	624.00	15	9,360.00
17	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	15	4,965.00
18	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	30	27,450.00
19	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	20	6,640.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	30	19,500.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	30	44,850.00
22	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	101.40	61.305	6,216.33
23	Black Paint	Ltr	286.00	5	1,430.00
24	Yellow Colour Paint for Background	Ltr	216.00	10	2,160.00
A	<b>Total Cost of materials</b>				<b>5,90,805.99</b>
B	Stock, Storage & Insurance i.e 3% of A				17,724.18
C	<b>Sub Total (A+B)</b>				<b>6,08,530.17</b>
D	Contingency @ 3% of C				18,255.91
E	Tools & Plants @ 2% of C				11,387.29
F	Transportation @ 7.5% of C				

## Annexure-11

## 33kV Line Length using 241 SQ.MM. -AAA Conductor

No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)

3

## MATERIALS FOR 33 KV Cut Point with 180 Degree Angle

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	3	1,02,966.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	97.512	7,410.91
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	15.8592	1,546.27
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	17.55216	1,333.96
5	Danger Plate, 1 no's.	No.	104.00	3	312.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	0.9027	88.01
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	9	936.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	3.6108	352.05
9	33KV pin insulator polymer	No.	624.00	9	5,616.00
10	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	9	2,979.00
11	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	18	16,470.00
12	Spike (GI) (using 50x6mm Flat welded with 8 mm square bar) (2 Nos of spike per Set in each Pole)	Set	332.00	6	1,992.00
13	H W fitting(B&S)90KN,4 Bolt	No.	650.00	18	11,700.00
14	Disc insulator (B&S)90 KN polymer	No.	1,495.00	18	26,910.00
15	Earthing of Support (Coil Type)	EA	215.80	3	647.40
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	0.786	76.64
17	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	14.637	1,484.19
18	Black Paint	Ltr	286.00	3	858.00
19	Yellow Colour Paint for Background	Ltr	216.00	6	1,296.00
<b>A</b>	<b>Total Cost of materials</b>				<b>1,84,974.44</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				5,549.23
<b>C</b>	<b>Sub Total (A+B)</b>				<b>1,90,523.67</b>
<b>D</b>	Contingency @ 3% of C				5,715.71
<b>E</b>	Tools & Plants @ 2% of C				3,810.47
<b>F</b>	Transportation @ 7.5% of C				14,289.28
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				5,302.75
<b>H</b>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				8,446.87
<b>I</b>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>2,28,088.75</b>

## Civil &amp; Services

## Annexure-11

## 33kV Line Length using 241 SQ.MM. -AAA Conductor

7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	6	624.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	2.4072	234.70
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	624.00	8	4,992.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	12	7,800.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	12	17,940.00
12	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	8	2,648.00
13	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	12	10,980.00
14	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	4	1,328.00
15	Earthing of Support ( Coil Type )	No.	215.80	2	431.60
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	0.524	51.09
17	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	2	325.00
18	H.T. Stay set (Complete )	Set	1,365.00	2	2,730.00
19	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	2	130.00
20	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	30	2,925.00
21	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	22.62	2,293.67
22	Black Paint	Ltr	286.00	2	572.00
23	Yellow Colour Paint for Background	Ltr	216.00	4	864.00
<b>A</b>	<b>Total Cost of materials</b>				<b>1,39,501.27</b>
<b>B</b>	<b>Stock, Storage &amp; Insurance i.e 3% of A</b>				<b>4,185.04</b>
<b>C</b>	<b>Sub Total (A+B)</b>				<b>1,43,686.30</b>
<b>D</b>	<b>Contingency @ 3% of C</b>				<b>4,310.59</b>
<b>E</b>	<b>Tools &amp; Plants @ 2% of C</b>				<b>2,747.86</b>
<b>F</b>	<b>Transportation @ 7.5% of C</b>				<b>10,776.47</b>
<b>G</b>	<b>Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole</b>				<b>3,535.17</b>
<b>H</b>	<b>Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)</b>				<b>6,668.97</b>
<b>I</b>	<b>Erection Charges @ 20% of PSC pole- Not to be used for 33kv</b>				<b>-</b>
<b>J</b>	<b>Sum of (C to I)</b>				<b>1,71,725.36</b>

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.10	7,150.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.23	1,462.50
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm				

## Annexure-11

## 33kV Line Length using 241 SQ.MM. -AAA Conductor

13	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	106	35,192.00
14	241 sq.mm AAA conductor	Mtr.	386.00	7725.00	29,81,850.00
15	Crimping type Midspan Compression Joint for 241 sq.mm AAA conductor	EA	4,701.00	6	28,206.00
16	Black Paint	Ltr	286.00	53.0	15,158.00
17	Yellow Colour Paint for Background	Ltr	216.00	106.0	22,896.00
<b>A</b>	<b>Total Cost of materials</b>				<b>52,38,974.38</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				1,57,169.23
<b>C</b>	<b>Sub Total (A+B)</b>				<b>53,96,143.61</b>
<b>D</b>	Contingency @ 3% of C				1,61,884.31
<b>E</b>	Tools & Plants @ 2% of C				1,07,922.87
<b>F</b>	Transportation @ 7.5% of C				4,04,710.77
<b>G</b>	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				93,681.90
<b>H</b>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				3,52,250.56
<b>I</b>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
<b>J</b>	<b>Sum of (C to I)</b>				<b>65,16,594.02</b>
<b>Civil &amp; Services</b>					
<b>Sl. No.</b>	<b>Description of Materials</b>	<b>Unit</b>	<b>Unit Rate</b>	<b>Total Quantity</b>	<b>Total Amount</b>
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	29.15	1,89,475.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	5.96	38,756.25
<b>K</b>	<b>Total Civil &amp; Services</b>				<b>2,28,231.25</b>
<b>L</b>	<b>Total (J+K)</b>				<b>67,44,825.27</b>
<b>N</b>	<b>Sub Total (L+M)</b>				<b>67,44,825.27</b>
<b>O</b>	Total GST @ 18% of (N)				12,14,068.55
<b>O1</b>	Total GST @ 1% of (N)				67,448.25
<b>P</b>	<b>Gross Total Material +Services (N+O+O1) for 33 KV Pin Points</b>				<b>80,26,342.08</b>
<b>Gross Total Summary</b>					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				9,60,492.13
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				-
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				2,86,798.93
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				2,19,957.05
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				80,26,342.08
<b>Q</b>	<b>Gross Total Material +Services</b>				

Annexure-11					
33kV Line Length using 241 SQ.MM. -AAA Conductor					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			3		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	6	2,05,932.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	186.42	14,167.92
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	11.8944	1,159.70
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96)	KG	76.00	209.916	15,953.62
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	185.328	14,084.93
6	Danger Plate, 2 no's.	No.	104.00	6	624.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	1.8054	176.03
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	6	975.00
9	H.T. Stay set (Complete )	Set	1,365.00	6	8,190.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	12	780.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	90	8,775.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	3	4,095.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	35.4	3,451.50
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	18	1,872.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	7.2216	704.11
16	33KV pin insulator polymer	No.	624.00	9	5,616.00
17	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	9	2,979.00
18	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	18	16,470.00
19	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	12	3,984.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	18	11,700.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,495.00	18	26,910.00
22	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	101.40	36.783	3,729.80
23	Black Paint	Ltr	286.00	3	858.00
24	Yellow Colour Paint for Background	Ltr	216.00	6	1,296.00
A	Total Cost of materials				3,54,483.60
B	Stock, Storage & Insurance i.e 3% of A				10,634.51
C	Sub Total (A+B)				

Annexure-11					
33kV Line Length using 241 SQ.MM. -AAA Conductor					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	2	68,644.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	76.00	82.216	6,248.42
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	3.9648	386.57
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	76.00	30.702	2,333.35
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	76.00	61.404	4,666.70
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	76.00	122.808	9,333.41
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	88.686	6,740.14
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	76.00	5.712	434.11
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	1.746	132.70
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	1.53	116.28
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	76.00	9.56	726.56
12	Danger Plate, 2 no's.	No.	104.00	2	208.00
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	0.6018	58.68
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	2	325.00
15	H.T. Stay set (Complete )	Set	1,365.00	2	2,730.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	4	260.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	30	2,925.00
18	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	2	2,730.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	97.50	56.64	5,522.40
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	6	624.00
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	2.4072	234.70
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	3	40,365.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	66,000.00		

Annexure-11					
33kV Line Length using 241 SQ.MM. -AAA Conductor					
O	Total GST @ 18% of (N)				59,013.27
O1	Total GST @ 1% of (N)				3,278.51
P	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				3,90,143.28
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)				5	
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	5	1,71,610.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	162.52	12,351.52
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	26.432	2,577.12
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	29.2536	2,223.27
5	Danger Plate, 1 no's.	No.	104.00	5	520.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	1.5045	146.69
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	15	1,560.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	6.018	586.76
9	33KV pin insulator polymer	No.	624.00	15	9,360.00
10	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	15	4,965.00
11	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	30	27,450.00
12	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	10	3,320.00
13	H W fitting(B&S)90KN,4 Bolt	No.	650.00	30	19,500.00
14	Disc insulator (B&S)90 KN polymer	No.	1,495.00	30	44,850.00
15	Earthing of Support ( Coil Type )	EA	215.80	5	1,079.00
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	1.31	127.73
17	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	24.395	2,473.65
18	Black Paint	Ltr	286.00	5	1,430.00
19	Yellow Colour Paint for Background	Ltr	216.00	10	2,160.00
A	Total Cost of materials				3,08,290.74
B	Stock, Storage & Insurance i.e 3% of A				9,248.72
C					

Annexure-11					
33kV Line Length using 241 SQ.MM. -AAA Conductor					
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	624.00	12	7,488.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	18	11,700.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	18	26,910.00
12	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	12	3,972.00
13	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	18	16,470.00
14	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar ) ( 2 Nos of spike per Set in each Pole )	Set	332.00	6	1,992.00
15	Earthing of Support ( Coil Type )	No.	215.80	3	647.40
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	0.786	76.64
17	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	3	487.50
18	H.T. Stay set (Complete )	Set	1,365.00	3	4,095.00
19	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	3	195.00
20	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	45	4,387.50
21	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	33.93	3,440.50
22	Black Paint	Ltr	286.00	3	858.00
23	Yellow Colour Paint for Background	Ltr	216.00	6	1,296.00
A	Total Cost of materials				2,09,251.90
B	Stock, Storage & Insurance i.e 3% of A				6,277.56
C	Sub Total (A+B)				2,15,529.46
D	Contingency @ 3% of C				6,465.88
E	Tools & Plants @ 2% of C				4,121.79
F	Transportation @ 7.5% of C				16,164.71
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				5,302.75
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				10,003.45
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,57,588.04
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.65	10,725.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.34	2,193.75
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum				

Annexure-11					
33kV Line Length using 241 SQ.MM. -AAA Conductor					
D	Contingency @ 3% of C			2,63,521.92	
E	Tools & Plants @ 2% of C			1,75,681.28	
F	Transportation @ 7.5% of C			6,58,804.81	
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			1,55,547.30	
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)			5,67,311.81	
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-	
J	Sum of (C to I)			1,06,04,931.27	
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	48.40	3,14,600.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	9.90	64,350.00
K	Total Civil & Services				3,78,950.00
L	Total (J+K)				1,09,83,881.27
N	Sub Total (L+M)				1,09,83,881.27
O	Total GST @ 18% of (N)				19,77,098.63
O1	Total GST @ 1% of (N)				1,09,838.81
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				1,30,70,818.71
Gross Total Summary					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				5,76,295.28
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				3,90,143.28
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				4,77,998.21
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				3,29,935.58
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				1,30,70,818.71
Q	Gross Total Material +Services				1,48,45,191.06
R	Inspection Fee of Over Head Line (HT) - Rs. 1500 upto 1 KM				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				2,250.00
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				1,48,49,691.06

Annexure-11					
BoQ and Estimate for 33 KV 4 Pole using WPB GI Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.) with Isolator and LA					
No. of 33 KV 4-Pole with Isolator			2		
MATERIALS FOR 33 KV 4-P With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB(GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	8	2,74,576.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel required =( 8x9.56x4.3)	KG	76.00	657.728	49,987.33
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required = (24x2.36x0.280)	KG	97.50	31.7184	3,092.54
4	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)/ Isolator	KG	76.00	429.828	32,666.93
5	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 8 no's channel required =( 8x7.14x4.3)	KG	76.00	491.232	37,333.63
6	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 8 nos angle required = (8*4.5*4.927)	KG	76.00	354.744	26,960.54
7	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no channel required =( 1x7.14x0.8)/ Isolator	KG	76.00	39.984	3,038.78
8	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 no angle required = (1*4.5*0.388)/ Isolator	KG	76.00	12.222	928.87
9	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 no angle required = (1*4.5*0.340)/ Isolator	KG	76.00	10.71	813.96
10	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)/ Isolator	KG	76.00	66.92	5,085.92
11	Danger Plate, 2 no's.	No.	104.00	4	416.00
12	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	1.2036	117.35
13	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	6	8,190.00
14	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 5 mtr. For raising)	KG	97.50	125.08	12,195.30
15	GI barbed wire anticlimbing device 3 Kg. Per support, 4 no's qty. required =(4x3kg)	Kg	104.00	24	2,496.00
16	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 16 no's = (16x0.59x0.510)	KG	97.50	9.6288	938.81
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	21	2,82,555.00
18	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)				

Annexure-12			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-	DHENKANAL ELECTRIC DIVISION (DED)		
Name of the Sub-Division : -	KAMAKHAYANAGAR		
Name of the Section : -	Bhuban		
Name of the Work :-	33kV New Line from Goda Grid (33kV Proposed Bhuban Feeder)		
Scope of work:-	Construction of 33kV O/H line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 3.2Ckm. Construction of 33kV 4 Pole structure with Isolator- 1 No.		
Names of Schemes: -	TPCODL CAPEX		
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H line using 13mtr WPB Pole & 241sqmm AAAC covered conductor- 3.2Ckm.	₹ 1,20,52,317.77
2	B	Construction of 33kV 4 Pole structure with Isolator- 1 No.	₹ 14,50,611.17
		<b>Total Amount</b>	<b>₹ 1,35,02,928.94</b>
		<b>Total Amount (In Cr)</b>	<b>₹ 1.35</b>
Total estimated cost is Rs.1.35 Crore.			

## Annexure-12

## 33kV Line Length using 241 SQ.MM. -AAA Conductor

No. of 33 KV DP required Without Isolator  
(Ref. Drawing No.- TPCODL-HVD-0004)

6

**MATERIALS FOR 33 KV DP Without Isolator**

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	12	4,11,864.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	372.84	28,335.84
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	23.7888	2,319.41
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96)	KG	76.00	419.832	31,907.23
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	370.656	28,169.86
6	Danger Plate, 2 no's.	No.	104.00	12	1,248.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	3.6108	352.05
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	12	1,950.00
9	H.T. Stay set (Complete )	Set	1,365.00	12	16,380.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	24	1,560.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	180	17,550.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	6	8,190.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	70.8	6,903.00
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	36	3,744.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	14.4432	1,408.21
16	33KV pin insulator polymer	No.	624.00	18	11,232.00
17	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	18	5,958.00
18	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	36	32,940.00
19	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar ) ( 2 Nos of spike per Set in each Pole )	Set	332.00	24	7,968.00
20	H W fitting(B&S)90KN,4 Bolt	No.	650.00	36	23,400.00
21	Disc insulator (B&S) 90 KN polymer	No.</			

## Annexure-12

## 33kV Line Length using 241 SQ.MM. -AAA Conductor

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	4	1,37,288.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	130.016	9,881.22
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	21.1456	2,061.70
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	23.40288	1,778.62
5	Danger Plate, 1 no's.	No.	104.00	4	416.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	1.2036	117.35
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	12	1,248.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	4.8144	469.40
9	33KV pin insulator polymer	No.	624.00	12	7,488.00
10	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	12	3,972.00
11	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	24	21,960.00
12	Spike (GI) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	8	2,656.00
13	H W fitting(B&S)90KN,4 Bolt	No.	650.00	24	15,600.00
14	Disc insulator (B&S)90 KN polymer	No.	1,495.00	24	35,880.00
15	Earthing of Support ( Coil Type )	EA	215.80	4	863.20
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	1.048	102.18
17	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	101.40	19.516	1,978.92
18	Black Paint	Ltr	286.00	4	1,144.00
19	Yellow Colour Paint for Background	Ltr	216.00	8	1,728.00
<b>A</b>	<b>Total Cost of materials</b>				<b>2,46,632.59</b>
<b>B</b>	Stock, Storage & Insurance i.e 3% of A				7,398.98
<b>C</b>	<b>Sub Total (A+B)</b>				<b>2,54,031.57</b>
<b>D</b>	Contingency @ 3% of C				7,620.95
<b>E</b>	Tools & Plants @ 2% of C				5,080.63
<b>F</b>					

## Annexure-12

33kV Line Length using 241 SQ.MM. -AAA Conductor					
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	0.524	51.09
17	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	2	325.00
18	H.T. Stay set (Complete )	Set	1,365.00	2	2,730.00
19	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	2	130.00
20	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	30	2,925.00
21	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	22.62	2,293.67
22	Black Paint	Ltr	286.00	2	572.00
23	Yellow Colour Paint for Background	Ltr	216.00	4	864.00
A	Total Cost of materials				1,39,501.27
B	Stock, Storage & Insurance i.e 3% of A				4,185.04
C	Sub Total (A+B)				1,43,686.30
D	Contingency @ 3% of C				4,310.59
E	Tools & Plants @ 2% of C				2,747.86
F	Transportation @ 7.5% of C				10,776.47
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,535.17
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				6,668.97
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,71,725.36
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.10	7,150.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.23	1,462.50
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	2	4,500.00
K	Total Civil & Services				13,112.50
L	Total (J+K)				1,84,837.86

## Annexure-12

33kV Line Length using 241 SQ.MM. -AAA Conductor					
J	Sum of (C to I)				83,57,277.18
<b>Civil &amp; Services</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	37.40	2,43,100.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	7.65	49,725.00
K	Total Civil & Services				2,92,825.00
L	Total (J+K)				86,50,102.18
N	Sub Total (L+M)				86,50,102.18
O	Total GST @ 18% of (N)				15,57,018.39
O1	Total GST @ 1% of (N)				86,501.02
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				1,02,93,621.59
<b>Gross Total Summary</b>					
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator				11,52,590.56
2	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				-
3	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 180 Degree Angle				3,82,398.57
4	Gross Total Material +Services (N+O+O1) for 33 KV Cut Point with 90 Degree Angle				2,19,957.05
5	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points				1,02,93,621.59
Q	Gross Total Material +Services				1,20,48,567.77
R	Inspection Fee of Over Head Line (HT) - Rs. 1500 upto 1 KM				1,500.00
S	Inspection Fee of Over Head Line (HT) - Rs. 750/ Additional Km				1,500.00
T	Inspection Fee of Drawing Checking and Approval				750.00
U	Gross Total Material, Services and Inspection Fees (Q+R+S+T)				1,20,52,317.77

## Annexure-12

**BoQ and Estimate for 33 KV 4 Pole using WPB GI Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.) with Isolator and LA**

No. of 33 KV 4-Pole with Isolator			2		
<b>MATERIALS FOR 33 KV 4-P With Isolator</b>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB(GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	8	2,74,576.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel required =( 8x9.56x4.3)	KG	76.00	657.728	49,987.33
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required = (24x2.36x0.280)	KG	97.50	31.7184	3,092.54
4	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)/ Isolator	KG	76.00	184.212	14,000.11
5	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 8 no's channel required =( 8x7.14x4.3)	KG	76.00	491.232	37,333.63
6	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 8 nos angle required = (8*4.5*4.927)	KG	76.00	354.744	26,960.54
7	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no channel required =( 1x7.14x0.8)/ Isolator	KG	76.00	17.136	1,302.34
8	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 no angle required = (1*4.5*0.388)/ Isolator	KG	76.00	5.238	398.09
9	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 no angle required = (1*4.5*0.340)/ Isolator	KG	76.00	4.59	348.84
10	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)/ Isolator	KG	76.00	28.68	2,179.68
11	Danger Plate, 2 no's.	No.	104.00	4	416.00
12	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	1.2036	117.35
13	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	6	8,190.00
14	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 5 mtr. For raising)	KG	97.50	125.08	12,195.30
15	GI barbed wire anticlimbing device 3 Kg. Per support, 4 no's qty. required =(4x3kg)	Kg	104.00	24	2,496.00
16	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 16 no's = (16x0.59x0.510)	KG	97.50	9.6288	938.81
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	13,455.00	9	1,2

Annexure-13			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-	TALCHER ELECTRIC DIVISION (TED)		
Name of the Sub-Division : -	Parjang		
Name of the Section : -	Parjang-1		
Name of the Work :-	33kV New Line from Chainpal Grid (33kV Proposed Parjang Feeder)		
Scope of work:-	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC OH covered conductor- 21Ckm. Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm. Construction of 33kV 4 Pole structure with Isolator- 1no. Construction of 2 nos. 'PC+6' EHT Tower for river crossing (300mtr. span).Construction for 1 no. of 33kV Outdoor Bay at Parjang PSS.		
Names of Schemes: -	TPCODL CAPEX		
<b><u>ABSTRACT OF ESTIMATE</u></b>			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV O/H Line using 13mtr WPB Pole & 241sqmm AAAC OH covered conductor- 21Ckm.	₹ 8,10,89,787.45
2	B	Construction of 33kV U/G Line with 3R, 1CX630sqmm Cable- 1Ckm.	₹ 1,40,53,343.76
3	C	Construction of 33kV 4 Pole structure with Isolator- 1no.	₹ 9,78,548.67
4	C	Construction of 2 nos. 'PC+6' EHT Tower for river crossing (300mtr. span).	₹ 1,17,58,371.00
5	D	Construction for 1 no. of 33kV Outdoor Bay at Parjang PSS.	₹ 36,39,033.16
		<b>Total Amount</b>	<b>₹ 11,15,19,084.04</b>
		<b>Total Amount (In Cr)</b>	<b>₹ 11.15</b>
<b>Total estimated cost is Rs.11.15 Crore.</b>			

Annexure-13					
33kV Line Length using 241 SQ.MM. -AAA Conductor					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			34		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long. 30.44KG/Mtr.)	No	34,322.00	68	23,33,896.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	2112.76	1,60,569.76
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	134.8032	13,143.31
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96)	KG	76.00	2379.048	1,80,807.65
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	2100.384	1,59,629.18
6	Danger Plate, 2 no's.	No.	104.00	68	7,072.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	97.50	20.4612	1,994.97
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	68	11,050.00
9	H.T. Stay set (Complete )	Set	1,365.00	68	92,820.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	136	8,840.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	1020	99,450.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,365.00	34	46,410.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	97.50	401.2	39,117.00
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	204	21,216.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	97.50	81.8448	7,979.87
16	33KV pin insulator polymer	No.	624.00	102	63,648.00
17	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	102	33,7

Annexure-13					
33kV Line Length using 241 SQ.MM. -AAA Conductor					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	16	5,49,152.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =( 2x9.56x4.3)	KG	76.00	657.728	49,987.33
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	97.50	31.7184	3,092.54
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3)	KG	76.00	245.616	18,666.82
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =( 2x7.14x4.3)	KG	76.00	491.232	37,333.63
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3)	KG	76.00	982.464	74,667.26
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required =( 4*4.5*4.927)	KG	76.00	709.488	53,921.09
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8)	KG	76.00	45.696	3,472.90
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required =( 1*4.5*0.388)	KG	76.00	13.968	1,061.57
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required =( 1*4.5*0.340)	KG	76.00	12.24	930.24
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =( 2x9.56x0.5)	KG	76.00	76.48	5,812.48
12	Danger Plate, 2 no's.	No.	104.00	16	1,664.00
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's =( 2x0.59x0.510)	KG	97.50	4.8144	469.40
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	16	2,600.00
15	H.T. Stay set (Complete )	Set	1,365.00	16	21,840.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	6		

Annexure-13					
33kV Line Length using 241 SQ.MM. -AAA Conductor					
O	Total GST @ 18% of (N)				4,72,106.15
O1	Total GST @ 1% of (N)				26,228.12
P	Gross Total Material +Services (N+O+O1) for 33 KV DP With Isolator				31,21,146.23
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)				30	
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB (GI) Pole 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	34,322.00	30	10,29,660.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	975.12	74,109.12
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	97.50	158.592	15,462.72
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	175.5216	13,339.64
5	Danger Plate, 1 no's.	No.	104.00	30	3,120.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	97.50	9.027	880.13
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	104.00	90	9,360.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	97.50	36.108	3,520.53
9	33KV pin insulator polymer	No.	624.00	90	56,160.00
10	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	90	29,790.00
11	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	180	1,64,700.00
12	Spike (GI) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	60	19,920.00
13					

Annexure-13					
33kV Line Length using 241 SQ.MM. -AAA Conductor					
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	624.00	48	29,952.00
10	H W fitting(B&S)90KN,4 Bolt	No.	650.00	72	46,800.00
11	Disc insulator (B&S)90 KN polymer	No.	1,495.00	72	1,07,640.00
12	Non Metallic Ties 33KV (For covered conductor)	No.	331.00	48	15,888.00
13	IPC for 241 sq.mm AAA conductor (For covered conductor)	No.	915.00	72	65,880.00
14	Spike (GI ) (using 50x6mm Flat welded with 8 mm square bar) ( 2 Nos of spike per Set in each Pole )	Set	332.00	24	7,968.00
15	Earthing of Support ( Coil Type )	No.	215.80	12	2,589.60
16	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	97.50	3.144	306.54
17	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	162.50	12	1,950.00
18	H.T. Stay set (Complete )	Set	1,365.00	12	16,380.00
19	H.T. Stay Insulator Type-C (2 No's.)	No.	65.00	12	780.00
20	7/8 SWG Stay Wire 15kg /stay	K.g.	97.50	180	17,550.00
21	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	101.40	135.72	13,762.01
22	Black Paint	Ltr	286.00	12	3,432.00
23	Yellow Colour Paint for Background	Ltr	216.00	24	5,184.00
<b>A</b>	<b>Total Cost of materials</b>				<b>8,37,007.60</b>
<b>B</b>	<b>Stock, Storage &amp; Insurance i.e 3% of A</b>				<b>25,110.23</b>
<b>C</b>	<b>Sub Total (A+B)</b>				<b>8,62,117.83</b>
<b>D</b>	Contingency @ 3% of C				25,863.53
<b>E</b>	Tools & Plants @ 2% of C				1

Annexure-13				
33kV Line Length using 241 SQ.MM. -AAA Conductor				
D	Contingency @ 3% of C			13,56,200.57
E	Tools & Plants @ 2% of C			9,04,133.71
F	Transportation @ 7.5% of C			33,90,501.43
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			7,79,504.10
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)			29,61,660.36
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-
J	Sum of (C to I)			5,45,98,685.88
Civil & Services				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	242.55
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	49.61
K	Total Civil & Services			18,99,056.25
L	Total (J+K)			5,64,97,742.13
N	Sub Total (L+M)			5,64,97,742.13
O	Total GST @ 18% of (N)			1,01,69,593.58
O1	Total GST @ 1% of (N)			5,64,977.42
P	Gross Total Material +Services (N+O+O1) for 33 KV Pin Points			6,72,32,313.13
Gross Total Summary				
1	Gross Total Material +Services (N+O+O1) for 33 KV DP Without Isolator			

Annexure-13					
BoQ and Estimate for 33kV, 1C 630sqmm U/G Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
<b>1</b>	<b>Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (along with 1core spare cable) with accessories</b>				
<b>a</b>	<b>Length of 33kV 1C, 630sqmm cable (open trench)</b>	<b>Mtr.</b>	<b>700</b>		
<b>b</b>	<b>Length of 33kV 1C, 630sqmm cable (HDD)</b>	<b>Mtr.</b>	<b>300</b>		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation U/G Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	3000	1,495.47	44,86,410.00
1.2	Supply of Straight throU/Gh jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium U/G Cable kits for 1Core	Set	6	11,900.00	71,400.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set	6	6,350.00	38,100.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT U/G Cable kits for 1Core	Set		6,100.00	-
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV U/G cable	Mtr.	2052.00	357.60	7,33,795.20
<b>2</b>	<b>Supply of 33kV RMU</b>				
<b>a</b>	<b>No. of 33kV 3Way RMU (LLV+M)</b>	<b>nos.</b>			
<b>b</b>	<b>No. of 33kV 4Way RMU (LLVV+M)</b>	<b>nos.</b>			
<b>c</b>	<b>No. of 33kV 3Way RMU (LLV)</b>	<b>nos.</b>			
<b>d</b>	<b>No. of 33kV 4Way RMU (LLVV)</b>	<b>nos.</b>			
<b>e</b>	<b>No. of 33kV 3Way RMU (LLL)</b>	<b>nos.</b>			
<b>f</b>	<b>No. of 33kV 4Way RMU (LLLL</b>				







































































































































































































