# BEFORE THE ODISHA ELECTRICITY REGULATORY COMMISSION, **BIDYUT NIYAMAK BHAWAN.**

PLOT No-4, CHUNOKOLI, SHAILASHREE VIHAR, BHUBANESWAR-751021

Case No: 98 /2022

IN THE MATTER OF:

Application for approval of Capital Investment Plan for the FY 2023-24 in the Licensed Area of TP Central Odisha Distribution Ltd:-Supplementary

Submission

And

IN THE MATTER OF:

TP Central Odisha Distribution Ltd. (Formerly CESU), 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

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

> Jam 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: 04.05.2023

Chief-Regulatory & Government Affairs



File No TPCODL/Regulatory /2023/ 100 4<sup>th</sup> May, 2023

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

**Subject: Case 98 /2022 :-** Supplementary Submission for Approval of the Capital Investment Plan for FY 2023-24

Dear Sir,

TPCODL has submitted its Capital Investment Plan of Rs. 512.37 Cr (excluding capitalization of Interest, Employee Cost and GRIDCO's contribution in kind) for FY 2023-24 vide its filing dated 22<sup>nd</sup> Dec 2022.

Pursuant to our Board approval of Capital Investment of Rs. 300 Cr (excluding capitalization of Interest, Employee Cost and GRIDCO's contribution in kind) for FY 2023-24 ,TPCODL made additional submission for approval of Capital Investment Plan of the Board approved amount i.e. Rs. 300 Cr. (excluding capitalization of Interest, Employee Cost and GRIDCO's contribution in kind) for FY 2023-24 vide filing dated 29<sup>th</sup> April 2023.

In our above filing dated 29<sup>th</sup> April 2023, we have prayed before the Hon'ble Commission to consider our original petition dated 22<sup>nd</sup> Dec 2022 for activities where there is no change in scope and amount.

For the sake of convenience and ease of reference, we have compiled relevant aspects of both submissions for the Board Approved amount of Rs. 300 Cr. into a single document, which we are submitting through this filing.

We trust our submission is in order.

Yours faithfully

For TP Central Odisha Distribution Limited

(Puneet Munjal)

Chief (Regulatory & Government Affairs)



Cc:

- 1. The Managing Director, GRIDCO, Janpath, Bhubaneswar-751022.
- 2. The Managing Director, OPTCL, Janpath, Bhubaneswar-751022.
- The Principal Secretary to Government Department of Energy,
   Government of Odisha, 2<sup>nd</sup> Floor, Kharavel Bhawan,
   Gopabandhu Marg, Kesharinagar, Bhubaneswar-751001.
- 4. The Chief Load Despatcher, SLDC, SLDC Building, Mancheswar, Bhubaneswar-751077.

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

Case No:98 /2022

IN THE MATTER OF: Application for approval of Capital Investment Plan for the FY 2023-

24 in the Licensed Area of TP Central Odisha Distribution Ltd. -

Supplementary Submission

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 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 has submitted its Capital Investment Plan of Rs. 512.37 Cr. for FY 2023-24 vide its submission TPCODL/Regulatory/2022/204/9260 dated 22nd December 2022.

The Board of Directors in the meeting of 17<sup>th</sup> January 2023 have however approved Capital expenditure of Rs. 300 Cr (excluding IDC, Employee cost and GRIDCO's Contribution in kind) for FY 2023-24.

In view of the above, TPCODL made a further submission vide filing dated 29<sup>th</sup> April 2023 for approval of capital investment plan of the Board approved amount i.e. Rs. 300 Cr against the earlier submitted capex plan of Rs. 512.37 Cr for FY 2023-24 . The Table below depicts the revised capex being sought against the earlier submission dated 22.12.2022.

In our above filing dated 29th April 2023, we have prayed before the Hon'ble Commission to consider our original petition dated 22nd Dec 2022 for activities where there is no change in scope and amount.

For the sake of convenience and ease of reference, we have compiled relevant aspects of both submissions for the Board Approved amount of Rs. 300 Cr. into a single document, which is provided in the **Appendix**.

Table: Revised Capital Investment Plan for FY 2023-24

Main Budget head	Activity planned		Revised capex as per Board approval
	Safety & Security arrangement at Critical locations	₹ 0.25	0.25
	Testing Equipment for STS	₹ 5.00	3
Safety &	Interposing Pole	₹ 4.00	3.25
Statutory	Fencing / Boundary Wall / DT plinth	₹ 8.00	5
	Unsafe to Safe	₹ 5.00	4.5
	Safety & Statutory	22.25	16
	Defective Cable Replacement	₹ 9.46	5
Loss reduction	33KV & 11kv Feeder Metering for Energy Accounting	₹ 13.44	10
Loss reduction	Conversion of LT Bare to LT AB Cable	₹ 40.00	20
	Loss reduction	62.90	35
	SCADA Enablement of 60 Nos. of 33/11 kV Primary Substations	₹ 8.95	8
	FRTUs and Communication for RMU	₹ 1.62	1
	GSAS Implementation	₹ 25.00	13.75
	Weather stations installation and central integration with data accumulation and analytics	₹ 0.25	0.25
	Replacement of Sick Equipment	₹ 10.00	5
	Installation of Micro Grid (5 Nos)	₹ 5.00	3
Reliability	LVRT (10 Nos)	₹ 3.50	4
	Capacitor Bank Installation for Reactive Power compensation	₹ 1.00	1
	33KV Network Infrastructure	₹ 113.51	45
	11KV Network Infrastructure	₹ 50.00	22
	AR/FPI/MCCB/RMU	₹ 23.00	13
	33KV Feeder Refurbishment	₹ 24.00	7
	Earthling	₹ 1.00	1
	Reliability	266.83	124
	New Connection Release	₹ 20.00	10
Load Growth	Power Transformer Augmentation	₹ 35.48	30
	DT Augmentation	₹ 20.00	10
	Load Growth	75.48	50.00

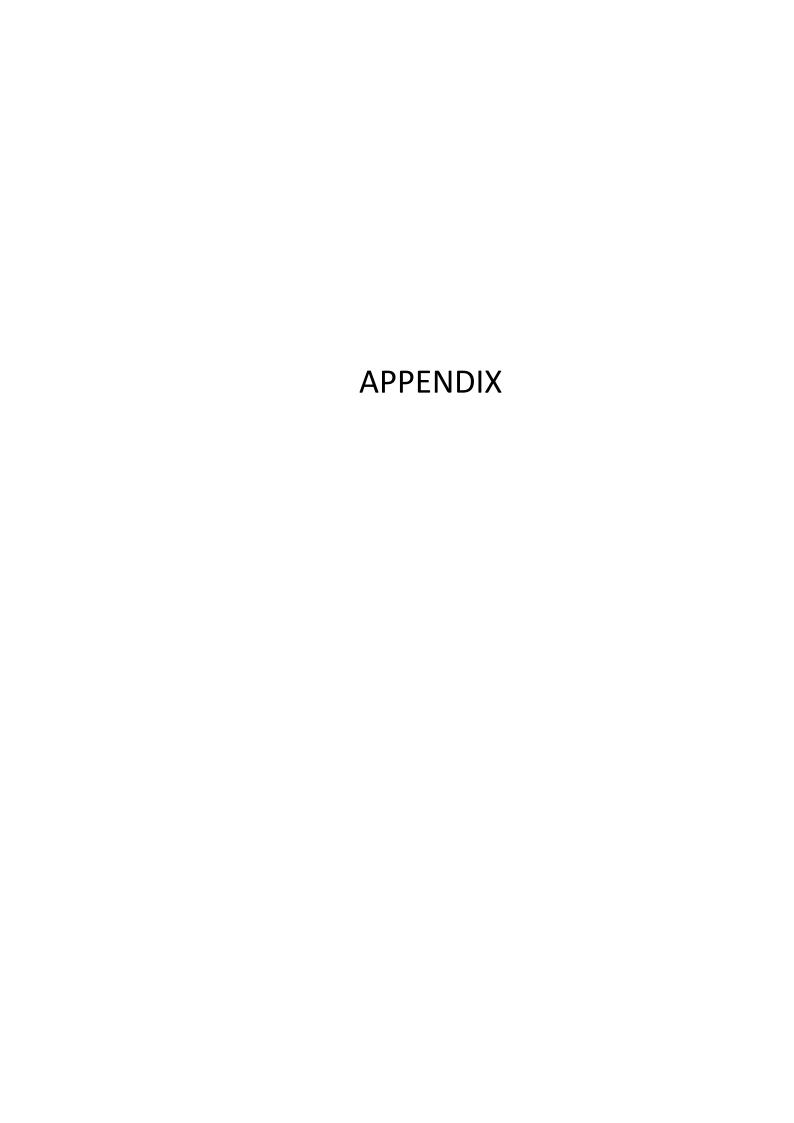
Main Budget head	Activity planned		Revised capex as per Board approval
	Call Management System for PSCC	₹ 1.00	1
	:- APSCC Modernization work for 23 APSCC at all Divisions	₹ 1.50	1
	IT - Software, User & Storage Devices, Back up system, Applications	₹ 12.11	11
	Server Room PAC & BMS	₹ 29.84	25
Infrastructure	Civil Works at various stores	₹ 23.99	21
	RMU / DT Workshop	₹ 1.63	1.2
	GIS Implementation	₹ 13.00	13
	Ready to Use Admin Asset	₹ 1.84	1.84
	Infrastructure	84.91	75.04
	Grand Total	512.37	300.04

The above capex is hard cost only i.e. excluding Interest During Constriction (IDC), Capitalization of Employee Cost and GRIDCO's contribution in kind which is in addition to the above.

#### <u>Prayers</u>

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

- 1. For the sake of convenience and ease of reference, the single document (prepared by compiling relevant aspects of both our earlier submission dated 22.12.2022 and 29.04.2023 ) submitted in this filing may kindly be referred to for approval of Capital Investment Plan of Rs. 300 Cr (Hard Cost Only) for FY 2023-24.
- 2. Allow Employee Cost and Interest during Construction based on actuals to be capitalised over and above the Capex (Hard Cost) for FY 2023-24.
- 3. Permit Carrying forward of the unspent Capital Expenditure approved for the previous years.
- 4. Permit making additional submission required in this matter.
- 5. Grant any other relief as deemed fit and proper in the facts and circumstances of the case.
- 6. Any other direction as the Hon'ble Commission may think appropriate.
- 7. Condone any delay in submission.





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# 1 Capital Investment Proposal for FY 2023-24

#### 1.1. Need for Capital Expenditure

TPCODL receives electrical power at 33KV level from 58 numbers of 220/33KV and 132/33KV transmission substations located within and in the vicinity of TPCODL operational area. TPCODL distributes the power at 33KV / 11KV / 440V / 230V depending on the demand of the consumers.

Capital investment is required to improve Power supply reliability, reduce the AT&C losses, ensure the safety and security of network, make the network adequate enough to cater the load growth and implementation of the technology to bring process efficiency in the operations. Further, other infrastructure inherited by the Company viz. Office, Stores, Customer Care/Service Centres etc. require significant refurbishment.

In view of achieving the above objectives, the TPCODL has been framing its Capex Investment plan, which is based upon the following need/requirements:

- Statutory & Safety Investment required for addressing unsafe conditions and making the network statutory compliant. This covers Refurbishment jobs, set up of safety culture through PPEs and testing equipment.
- Loss Reduction Investment required for taking initiatives to improve Billing or collection
  efficiency or reducing the technical Losses in the network. This includes Energy auditing,
  LT Bare to AB Cable and Defective cable replacement.
- Reliability Investment required to improve the Reliability and Quality of Power Supply by taking various initiatives like Feeder addition / augmentation, Transformer addition / augmentation and N-1 redundancy etc.
- Load Growth Investment is required to meet the Load Growth in the network and making the network future ready. This includes Augmentation / Addition of Feeder, Transformers etc.
- 5. **Technology and Infrastructure** Investment related to technology adoption and strengthening of various infrastructure to improve internal as well as external customer satisfaction. This includes IT infrastructure, GIS implementation, Civil infrastructure, Transformer Workshop and Admin assets.

As explained in our earlier petitions, TPCODL has identified a number of other challenges related to Metering infrastructure, Customer Services, and Technology usage. These challenges are planned to be addressed through a systematic investment plan prepared by TPCODL, a part of which was proposed by TPCODL for FY 2020-21 in the petition filed in Case



No 32 of 2020, Case 05 of 2021 for FY 2021-22 and also in the petition filed in Case 14 of 2022 and Case 51 of 2022 for FY 2022-23.

Tata Power has been an early implementer of latest technology in India and has perhaps most number of standalone and integrated technology platforms in use. These technologies have been instrumental in improving the overall performance of the company and been able to deliver benefit in terms of lowering losses and improving reliability and better management of business and consumers.

TPCODL considers customers as its most important stakeholders. Hence, it has prepared its strategy to create value for the customers by improving the reliability of supply for better customer experience. So, Capex intervention is required to reinforce the network to enhance the useful life of assets and bring in new technology.

The proposed Capex plan represents a justified and efficient level of total capital investment estimated by TPCODL to meet its service obligation ensuring safe and reliable network, maintaining high level of service standards and to provide customer services at benchmark level through process improvement, capacity building and technology adoption.



# 1.2. Status of Capex and Capitalization against Capex approved by the Hon'ble Commission for FY 2020-21, FY 2021-22 and FY 2022-23

The Hon'ble Commission has approved Capex of Rs.280.63 Cr for FY 2020-21 in its order dated 08.09.2020. For FY 2021-22, the Hon'ble Commission has approved a Capex of Rs.298.73 Cr in its order dated 18.09.2021. For FY 2022-23, the Hon'ble Commission has approved a Capex of Rs. 243.31 Cr vide order dated 19.07.2022. Further a supplementary capex of Rs. 137.25 Cr was approved vide order dated 16.12.2022 . The status of project progress against the Capex approved for FY 2020-21 , FY 2021-22 and FY 2022-23 as on 30.09.2022 and total estimated till 31.03.2023 is as provided in table below.

Table: Actual Status as on 30.09.2022 against Capex approved for FY -21, FY-22 & FY-23 (Rs Cr)

Sr No	Major Category	Capex approved for FY 2020-21	Capex approved for FY 2021-22	Capex approved for FY 2022-23	Total Cumulative Approved till FY-2022-23	Total Actual Capex till H-1 FY-23	Estimated Capex in H-2 FY-23	Total estimated Capex till 31.03.2023
1	Statutory and Safety	68.17	17.59	17.66	103.42	82.77	20.91	103.69
2	Loss Reduction	39.63	67.36	52.85	159.84	46.93	102.56	149.49
3	Reliability	72.48	114.42	131.63	318.53	161.78	95.69	257.47
4	Load Growth	9.00	30.52	118.26	157.78	29.52	30.00	59.52
5	Technology & Infrastructure	91.35	68.84	60.16	220.35	111.36	93.48	204.84
	Total	280.63	298.73	380.56	959.92	432.36	342.64	775.00

As mentioned above, TPCODL estimates cumulative Capital Expenditure of Rs. 775 Cr. by end of FY 23 against the Capex approval of Rs.959.92 Cr. in various Capex Approval Orders upto FY 23, leaving a gap of Rs. 185 Cr. However, it is worthwhile to point out that TPCODL has also incurred substantial capex under various Government Schemes Fani, Elephant corridor etc.

It is submitted that TPCODL is working towards bridging this gap of Rs. 185 Cr. (Rs. 960 Cr. (Approved) – Rs. 775 Cr. (Estimated) We wish to bring to the notice of the Hon'ble Commission that part of the lag is due to the prevalence of COVID in the initial year together with approval for Capex being received towards the latter part of the year, together with spill- over of Projects to subsequent year.



# 1.3. Summary of the Capital Expenditure for FY 2023-24

TPCODL in line with the philosophy adopted for FY 2020-21, FY 2021-22 and FY 2022-23 has considered Capital Expenditure under five different heads:

- a) Statutory and Safety
- b) Loss Reduction
- c) Reliability
- d) Load Growth and
- e) Development of Infrastructure.

The summary of the Capex planned for FY 2023-24 (only Hard Cost i.e. without considering Employee Costs capitalized , Interest during Construction and GRIDCO's Contribution in kind ) is as summarized below

Table 1-1: Summary of Capex plan for FY 2023-24 (only Hard Cost i.e. without considering Employee Cost, IDC capitalization & GRIDCO's Contribution in kind)



Main Budget head	Activity planned	Capex Plan as per Board approved amount
	Safety & Security arrangement at critical locations	0.25
	Testing Equipment for STS	3
Safety &	Interposing Pole	3.25
Statutory	Fencing / Boundary Wall / DT plinth	5
	Unsafe to Safe	4.5
	Safety & Statutory	16
	Defective Cable Replacement	5
Loss reduction	33KV & 11kv Feeder Metering for Energy Accounting	10
2000 1 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Conversion of LT Bare to LT AB Cable	20
	Loss reduction	35
	SCADA Enablement of 50 Nos. of 33/11 kV Primary Substations	8
	FRTUs and Communication for RMU	1
	GSAS Implementation	13.75
	Weather stations installation and central integration with data accumulation	0.25
	and analytics	0.25
	Replacement of Sick Equipment	5
	Installation of Micro Grid (5 Nos)	3
Reliability	LVRT (10 Nos)	4
	Capacitor Bank Installation for Reactive Power compensation	1
	33KV Network Infrastructure	45
	11KV Network Infrastructure	22
	AR/FPI/MCCB/RMU	13
	33KV Feeder Refurbishment	7
	Earthing	1
	Reliability	124
	New Connection Release	10
Load Growth	Power Transformer Augmentation	30
Load Glowth	DT Augmentation	10
	Load Growth	50.00
	Call Management System for PSCC	1
	:- APSCC Modernization work for 15 APSCC at all Divisions	1
	IT - Software, User & Storage Devices, Back up system, Applications	11
	Server Room PAC & BMS	25
Infrastructure	Civil Works at various stores	21
	RMU / DT Workshop	1.2
	GIS Implementation	13
	Ready to Use Admin Asset	1.84
	Infrastructure	75.04
	Grand Total	300.04



## 1.4. Employee Costs and Interest During Construction to be capitalised

It is submitted that Employee Cost associated with the projects or capex schemes would also form a part of the Capex and would be eventually capitalized with the capital expenditure scheme. We wish to submit that the cost towards Employees working on such projects would be separate i.e in addition to the amount that is approved by the Hon'ble Commission under this petition.

Similarly, the Interest During Construction (IDC) is required to be worked out on the Debt Component (70%) of the Capex. The same would depend on the quantum of the capital expenditure spread during the year and hence the estimation has not been made at present in this petition. However we wish to submit that Interest During Construction amount would need to be added in addition to Hard Cost and Employee Cost to be capitalised.



# 2 Annual Capex Plan

# 2.1 Safety and Statutory

The proposed budget for Safety & Statutory under CAPEX FY 23-24 is Rs 16 Cr. The details of the same are as given in the table below:

**Table 2-1: Capital Expenditure Safety and Security** 

Main Budget head	Activity planned	FY 23-24 (Rs. Cr)
	Safety & Security arrangement at critical locations	0.25
	Testing Equipment for STS	3.00
Safety & Statutory	Interposing Pole	3.25
	Fencing / Boundary Wall / DT plinth	5.00
	Unsafe to Safe	4.50
Safety & Statutory	16.00	

The description of the various schemes are as under

# 2.1.1 Safety & Security Arrangement at various locations

Scheme Proposed	A. CCTV Installation, Racking system Installation B. Access control system for PSCC
Capex Amount	₹ 0.25 Cr
Benefit to customer	Safety & security of materials at stores

# A. CCTV Installation, Racking System Installation

Sl. no.	Activity Points	Justification
1.	Installation of CCTV at all stores.	For proper watch and ward, safety, security and monitoring of all high value items, also to avoid the risk of theft/burglary CCTV installation is necessary at all stores.



2.	Racking	Due to space constraint we are not able to keep meters &
	system at	meters box, jointing kit etc. within available space inside the
	Choudwar &	store. As these items cannot be kept in open space.
	Bhubaneswar	Racking system is required for proper storage of these indoor
	Store.	items.
	Cost Estimate	Rs. 0.1 Cr

#### **B.** Access control system for PSCC

Scheme Proposed	Implementation of access control system for PSCC for controlling unauthorized access		
Capex Amount	₹ 0.15 Cr		
Benefit to customer	Critical power supply arrangements would be controlled by group of pre-approved individuals		
	<ul> <li>Employee safety during public unrest, mob, etc.</li> </ul>		
	Record of entry and exit of all personnel in PSCC		

#### **Existing System**

TPCODL has 374 nos. of 33/11 kV Primary substations (PSS) out of which 105 nos. are controlled remotely via SCADA from Power System Control Centre (PSCC). Also, another 100 nos. of PSS are planned to operate from PSCC SCADA system. This makes PSCC a vital installation of TPCODL License area from where entire power system is managed. Currently, there is no mechanism to restrict unauthorized access to PSCC.

#### **Need of the Project**

As PSCC acts as a nerve centre of TPCODL, it is imperative that such vital installation be accessible to only group of approved individuals in order to avoid any unfavourable circumstance or any unnecessary disruption.

# **Proposed Scheme**

Since there is no mechanism to check unauthorized access to PSCC currently, it is proposed to develop an access control system specifically for PSCC to avoid unauthorized entry.

#### **Scope of Proposal**

The scope of this proposal includes implementation of access control system for PSCC for



controlling unauthorized access and to protect PSCC desk engineers during unfavourable scenarios like public unrest, mob, etc.

#### **Cost Estimate with Execution Timelines**

Cost estimate: Rs. 0.15 Cr.

#### **Proposed System after Implementation**

With implementation of access control, PSCC will have entry to only preapproved employeesand limit the access to external public.

#### 2.1.2 Testing Equipment for STS

Scheme Proposed	Procurement of standardized testing kits/equipment, calibration of the kits, distribution of the kits to each EMR office and providing training wherever required.
Capex Amount	₹ 3.00 Cr
Benefit to Consumer	<ul><li>Reliable and Quality power supply to the consumers</li><li>Reduction of frequent tripping</li></ul>
	<ul> <li>Downtime will reduce due to fast response in diagnosis of problem and reduced downtime</li> </ul>

#### Background

TPCODL has been agile in the adoption of latest technology in the power utility sector. Together with its culture of Consumer Service Excellence, Continuous Learning, Performance Orientation, Innovation and Empowerment; we are eager to set benchmarks in accelerated reduction of AT&C losses, improve power reliability, enhance consumer satisfaction and improve employee productivity.

Testing of electrical equipment is one of the major job of a power distribution utility. Testing decides healthiness of equipment with the passage of time.

# Business Objective

After taking over the electricity distribution business from erstwhile CESU, one of the major operational challenge in front of TPCODL was to provide uninterrupted power supply. The expectation of consumers' kept on rising continuously with the improvement in power reliability over period of time. Meeting the regulatory targets of improving AT&C loss along



with reliability and safety improvement is also one of the foremost requirement of TPCODL.

#### Justification

TPCODL has a wide operational area of 30,000 Sq. Km, consisting of 5 Electrical circles & 20 Divisions. We have nearly 400 nos. of 33/11kV substations with nearly 1200 nos. of PTRs along with 4200+ protective relays. Our jurisdiction has traditional as well as modern substation. The oldest substations are as old as 50years that has either electromagnetic or static type of relay.

The broader periphery requires large number of testing kits for smooth operation of the utility. However, we have only two locations for the storage of equipment testing kit in Bhubaneshwar & Cuttack. We have very few numbers of working testing kits (54 nos. of defective testing equipment). Lesser number of testing equipment hasimpacted our swift responses in breakdown cases and thus resulted in consumer dissatisfaction along with unreliability and poor quality of power. Few of those kits are old, traditional and heavier in the range of 10-15 kg. Transportation of the heavy kits is one of themajor concerns during the exigency breakdown condition. Due to presence of mechanical and electrical parts, there are few instances when long transportation has caused problems in the circuit because of damping and vibration.

Additionally, persisting fault in a network may cause failure of equipment and it is a major safety concern for lives. In the past, we were forced to charge the equipment in a hurry due to public agitation in the odd hours, which is also one of the major safety concern.

#### Proposed Solution

Advanced testing kits will be provided at decentralized locations for better and quick response in the case of exigency. Enough amount of testing equipment will help us to monitor the healthiness of power equipment throughout the year. It will also help to take proactive initiatives in case of abnormalities in the trend of healthiness.

#### Scope of the Proposal

Under the scope of proposal we plan to purchase standardize testing kits/equipment, calibration of the kits, distribution of the kits to each EMR office and provide trainingwherever required. We had estimated that for smooth functioning of TPCODL network in an ideal situation, we need testing equipment of 20.13 crore. But at the same time with maturity of the



system as well as manpower skill enhancement we need high end testing kits. TPCODLin an endeavour to implement new technologies in testing field as well, has decided so breakthis budget in several years so as to phase this expenditure. In FY 20-21 we got a budget of 4.71 crore, in FY 21-22 we got no budget for testing equipment. In FY 22-23 we got a budget of 2.51 crore for testing equipment. So in FY 23-24 we appeal for a budget of 3 crore.

• Cost Estimate and Execution Timelines

Table 2-2: Testing kit to be purchased in FY 2023-24



Testing equipment	Unit price	Qty	Total Rs
Tan delta Testing kit	2650000	1	2650000
CRM kit	144491	2	288982
Timer kit	93364	2	186728
IR testing kit	81674	50	4083700
industrial grade laptops	200000	2	400000
WRM	292373	4	1169492
TTR	222881	3	668643
Leakage current meter (DC)	15000	10	150000
AC clamp on meter	12000	75	900000
Tool kit	14500	20	290000
Multi meter	11900	25	297500
Low end thermovision camera	68000	10	680000
Oil PPM Test Kit	51920	1	51920
Galvonometer	1000	2	2000
Disolve Gas Analyzer Test Kit	5000000	1	5000000
Earth Resistance Tester	8968	50	448400
Man lifter	4350000	2	8700000
Drone	2000000	2	4000000
			29967365

#### Proposed System after Implementation

There are few benefits from this scheme:

- 1. Downtime will reduce due to fast response in diagnosis of problem
- 2. Reduction in ENS due to reduction in downtime.
- 3. Reliability improvement of the network.
- 4. Enhanced consumer delight due to improved reliability.
- 5. Reduction in overall equipment failure.
- 6. Employee satisfaction due to reduction in repeated calls.
- 7. Ease of monitoring of power equipment healthiness.
- 8. Continuous monitoring of equipment will lead to enhanced lifecycle of equipment.

Additionally, it is proposed to bring the technological interventions in the area of safety to reduce the risk of fall from height while carrying out the work on the poles for trimming of the trees. It is proposed to procure 2 numbers of man lifters to carry out the height work. The man lifter will be provided to the circles of TPCODL in phase manner.

TPCODL has always been the at the forefront to adopt new technologies for Improvement of existing conditions, in line to the same, it is proposed to Procure Drone Technology, as a pilot project for various operational applications.



#### 2.1.3 Interposing Poles

Scheme Proposed	It is proposed to erect intermediate poles to ensure safety and reliable power supply to end consumers.			
Capex Amount	₹ 3.25 Cr			
Benefit to customer	To ensure safety and reliable power supply to end consumers			

#### **Existing System**

TPCODL spanning over a geographical area of 29,354 sq.km has a vast network having 33kV network of 3717 Ckm, 11kV network of 35719 Ckm & LT network of 53914 Ckm. 8m, 9m & 11m PSC poles as well as WPB poles are used majorly in the existing network. There have been several irregularities in the span length of these networks where the span length ranges from 70mtr to more than 100mtr at some places. These large span lengths have resulted in:

- 1) Sagging of conductors,
- 2) Low ground clearances vertical clearance of conductor from ground is lower than the permissible limits of 5.5 m (for LT Lines) and 5.8 m (for HT Lines) and
- 3) Accidents due to sagging & low ground clearances.

#### **Need of Project**

To overcome such scenarios, where the span length is on the higher side and violates the safety and statutory guidelines, it is of utmost importance to provide intermediate poles in between the spans. Addition of intermediate poles will address the issue of sagging, low ground clearances & accidents caused due to this. Proper upkeep of the feeders is important for ensuring safety and reliability of power supply. During site visits, it was observed that most of the 33kV / 11kV / LT feeders are in deteriorated condition and pose safety threat to the human beings and animals. Most of the feeders have binding wire / multiple joints. As a result, there are chances of snapping of conductors and subsequent electrocution of human beings / animals since cradle guards are not provided.

Tree branches / creepers are exposed to live conductors at many locations. Huge number of tripping have been reported on 33kV and 11kV feeders in the previous years. With poor condition of network and absence of maintenance activities, it is difficult for utility to ensure reliable and quality power supply to the end users. During site visits, it has been observed that conductor of different sizes are being used in different phases which limits the circuit capacity. Moreover, over sagged wires in 33kV or 11kV feeders are posing major threat to thelives of human beings and animals. At some places, due to re-construction / widening of roads, vertical/horizontal clearances of the feeders have been reduced. This is not only causing violation of statutory guidelines but also increasing the chances of accidents.



#### **Proposal for CAPEX Investment**

To ensure safety and cater reliable power supply to end consumers TPCODL proposes refurbishment of 33kV, 11kV and LV lines, i.e., installation of interposing poles in a phased manner emphasizing critical areas such as schools, hospitals, markets and other key installations of frequent human mobility. This is an ongoing activity for which capex is being sought in a phased manner.

Table 2-3: Cost Estimate for Interposing Poles

SI. No.	Description	Quantity	
	Description	(in nos.)	(in Rs. cr.)
1	13mtr WPB Poles	130	0.81
2	11mtr WPB Poles	320	1.63
3	3 9mtr PSC Poles 525		0.81
	Total		3.25

Costing details are available in **Annexure – 1**.

#### **Benefit**

In many locations of transmission and distribution network of TPCODL, the span length is much more than standard limits as mentioned above. This leads to statutory violations of vertical clearances, as per guidelines.

With use of interposing poles at low clearance locations, statutory compliances will be met and hence safety of employee, public and animals will be enhanced, reducing the chances of electrocution.

#### 2.1.4 Installation / Construction of DT Plinth, Boundary Wall and Fencing of DSS

Scheme Proposed	Installation of Boundary Wall Fencing, DT Plinth.
Capex Amount	₹ 5.00 Cr
Benefit to	Improving the safety of people & stray animals.
customer	improving the safety of people & stray animals.

#### **Existing System**

Distribution Substations are located at various locations catering the power supply requirement to consumers. These are installed at various scattered locations along the road, public places, near the commercial areas etc. At many places, it was found that the condition of the Boundary wall of DSS are in a very poor and unsafe condition and DT plinth are in



deteriorated condition. This allows public and animals to have unattended access to the charged electrical equipment.

#### **Need of Project**

During the survey, it is observed that boundary walls or fencing and also transformer plinth is either damaged or not exists thus posing safety threat to stray animal and public at large. Ensuring safety of people & equipment is very important and hence is required to be attended on priority.

#### **Proposal for CAPEX Investment**

To ensure safety to end consumers TPCODL proposes construction of boundary wall/fencing and plinth for the DSS wherever required in a phased manner.

Quantity Amount SI. No. Description (in Nos.) (in Rs. cr.) DT Plinth (250kVA) 190 0.57 2 DT Plinth (500kVA) 160 0.64 3 **Boundary Wall** 1.856 160 4 Fencing 210 1.92 Total 5.0

Table 2-4: Cost Estimate for DT plinth and fencing

Costing details are available in **Annexure – 2**.

#### **Benefit**

In many locations the boundary wall fencing and DT plinths throughout the network of TPCODL are in deteriorated condition. This leads to safety protocol violations and pose threat to public and animals which can have unattended access to charged electrical equipment resulting in accidents. With use of interposing poles at low clearance locations, statutory compliances can be met and hence safety of employee, public and animals will be enhanced, reducing the chances of electrocution.

#### 2.1.5 Unsafe to Safe Location

Scheme Proposed	It is proposed for replacement of defective LT AB cable/ LT Bare conductor to new LT AB cable, replacement of HT conductors to ensure safety of humans and animals along with ensuring reliability of power supply to the end consumer.
Capex Amount	₹ 4.50 Cr
Benefit to customer	To ensure safety of humans and animals along with ensuring reliability of power supply to the end consumer



#### **Existing System**

TPCODL has a vast LT network of 53914 Ckm. This comprises of LT OH bare conductors, UG cables and LT AB cables. LT network plays important role of the power supply distribution system and spread across TPCODL licensed area for power distribution. There have been many LT Bare conductors and defective LT AB cables in the network, which result in accidents of common commuters in the area and animals. Insulation of LT AB cable degrades due to sun exposure.

The LT bare overhead lines and defective LT AB cables used are more prone to transient fault due to tree branch touching or any foreign particle falls on the line. Due to this, consumer experiences frequent faults.

#### **Need of Project**

To overcome such scenarios, where there are LT Bare overhead conductors and defective LT AB cables, it is of utmost importance to replace the same with new LT AB cables. Replacement with new overhead LT AB cable will address the issue of accidents caused due to this along with mitigation of overloading issues. Proper upkeep of the feeders is important for ensuring safety and reliability of power supply. During site visits, it was observed that there and many LT Bare overhead conductors and LT AB cables that are in defective condition, which pose safety threat to the human beings and animals. As a result, there are chances of less vertical clearances of conductors w.r.t ground and subsequent electrocution of human beings / animals.

It has been observed that LT Bare conductors and LT AB cables of different sizes are being used. This is not only causing violation of statutory guidelines but also increasing the chances of accidents.



#### **Proposal for CAPEX Investment**

To ensure safety and cater reliable power supply to end consumers TPCODL proposes replacement of LT Bare overhead conductors and defective LT AB cable with new LT AB cable in phased manner emphasizing critical areas such as schools, hospitals, markets and other key installations.

Table 2-5: Cost Estimate for Unsafe to Safe Locations

CL N.	DESCRIPTION OF WORK	11	Quantity	Amount
Sl. No.	DESCRIPTION OF WORK	Unit	(in km)	(in Rs. cr.)
1	Conversion of LT Bare/ deteriorated LT AB Cable to LT AB Cable (4X95 sq.mm)	Km	9	0.81
2	Conversion of LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX70 sq.mm)	Km	14	1.12
3	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX50 sq.mm)	Km	18	1.26
4	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX35 sq.mm)	Km	14	0.8
5	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (2CX35 sq.mm+1CX35 sq.mm)	Km	11	0.46
	Total		66	4.5

Costing details are available in **Annexure – 3**.

#### Benefit

By executing the proposals as made in this head, 415V network can be strengthened and we would be able to serve our consumers in much better way. Following benefits are envisaged from this investment:

- 1. Reliable Power supply to the consumers.
- 2. To avoid contact of LT Bare overhead conductors and defective LT AB cable due to degraded insulation with public and animals and avoid electrocution.

To improve the safety factor, minimize the accident risk, reduce the chances of fault & strengthen existing 415V network, it is suggested for replacement of LT Bare overhead conductors and defective LT AB cables with new LT AB cables. This in turn will help in providing reliable power supply for all consumers & stakeholders.



#### 2.2 Loss Reduction

The Various schemes for loss reduction envisaged for FY 2023-24 is as follows:

Table 2-6: Break up of Capital Expenditure under Loss Reduction

Main Budget head	Activity planned	FY 23-24 (Rs. Cr)
	Damaged Service line replacement	₹ 5.00
Loss	33KV & 11kv Feeder Metering for Energy Accounting	₹ 10.00
Reduction	Conversion of LT Bare to LT AB Cable	₹ 20.00
Total		35.00

# 2.2.1 Damaged Service Line Replacement

Scheme Proposed	Replacement of defective service cable			
Capex Amount	₹ 5.00 Cr			
Benefit to customer	Reliable power supply			
Dement to customer	Safety of person			

#### **Existing system-**

During various site visit and review of data base it has been seen that about 2 Lac meters are still electromechanical meters. More over all these mechanical meters are more than 10 years old and have already completed their useful life. The above issues are resulting into reduction in billing efficiency, high AT&C losses and thus hampers the collection efficiency. Further, it is also observed that, every year 50,000 to 1 Lac defective meters are identified. These meters also have cables with joints and they can become cause of electrocution and electricity pilferage.

#### Statutory compliance-

As per CEA (Installation and Operations of Meters) regulations 2006, Clause 4(1) and Clause 4(2), there should be No Mechanical Meter in utilities. Abstract of clause 4 (1) and (2) of CEA (Installation and Operations of Meters) regulations 2006. Clause 4 (1): All interface meters, consumer meters and energy accounting and audit meters shall be of static type. Clause 4(2)



: The meters not complying with these regulations shall be replaced by the licensee on his own or on request of the consumer. The meters may also be replaced as per the regulations or directions of the Appropriate Commission or pursuant to the reforms programme of the Appropriate Government. Same is covered in OERC supply code 2019 clause no 97.

#### Proposal-

Based on the above condition, a budget of Rs.5.00 Cr has been requested for replacement of defective cables if a cable is identified as damaged or having joint on inspection by officers.

#### Cost estimate-

As per estimate Cost of Cables required or installation of meters. These cases are where the service line is already damaged or are having joints from where pilferage is possible.

Table 2-7: Cost of cables

#### Cost of cable

Cable Size (Core * Sq mm)	Cable length -KM	Cost per unit (Rs) without GST	Rate of Installation / Replacement (Rs) without GST	Cost per unit (Rs)	Rate of installation (Rs)	Cost of Mat (Cr)	Cost of Inst (Cr)	Total Cost (Rs CR)
2*4	401	55.17	890.96	65.10	891.0	2.61	1.18	3.79
2*6	56	61.87	890.96	73.01	891.0	0.41	0.29	0.70
4*10	4.025	100.33	1104.29	118.39	1104.3	0.05	0.02	0.07
4*25	2	159.61	1120.75	188.34	1120.7	0.03	0.01	0.04
4*50	0.8424	250.00	1571	479.60	1571.0	0.04	0.00	0.04
4*95	0.5616	470.56	2219.44	479.60	2219.4	0.03	0.00	0.03
4*150	0.54	824.01	2219.44	732.10	2219.4	0.04	0.01	0.05
4*300	0.36	1378.62	3000.00	732.10	3000.0	0.03	0.00	0.03
4*2.5	1	117.8	890.96	732.10	891.0	0.07	0.04	0.11
6*2.5	1	184.24	890.96	732.10	891.0	0.07	0.04	0.11
10*2.5	1.24	202.00	0.00	200.00	0.0	0.02	0.00	0.02
Grand Total	468					3.40	1.59	5.00

Total CAPEX under this Head: Rs.5.00 Cr.

**Table 2-8: Differential Cost of Service Line** 



Differenti	Differential cost of Service Line								
Cable Size	Cost per Meter with GST	Length	Total Cost	Cable installation cost per length	Total cost of cable installation	Cost recovered upfront	Different ial Cost	Count of Connections	CAPEX Required
	(A) Rs / M	(B) (M)	C=A*B (Rs)	(D) (Rs)	E=C+D (Rs)	(F) (Rs)	G=(E-F) (Rs)	(H) Count	(J) Rs in Cr
2C X 4 sq mm	65.1006	25	1627.515	653.76	2281.275	1500	781.275	80000	6.25
2C X 6 sq.mm	73.0066	25	1825.165	662.14	2487.305	2500	-12.695	20000	-0.03
Total									6.22

For Three Phase meters cost on actual will be considered.

# 2.2.2 Metering at Feeder level for Energy Accounting

Scheme Proposed	Procurement of Metering accessories, CT, PT, Breakers, Control cables etc
Capex Amount	₹ 10.00 Cr
Benefit to customer	Accurate Energy accounting & billing, customer satisfaction

Energy Accounting prescribes accounting of all energy inflows at various voltage levels in the distribution periphery of the network, including renewable energy generation and open access consumers, as well as energy consumption by the end consumers.

The Bureau of Energy Efficiency with the previous approval of Central Government, in The Gazette of India, has made the following regulations:

Bureau of Energy Efficiency (Manner and Intervals for conduct of Energy Audit in electricity distribution companies) Regulation 2021 on 06<sup>th</sup> Oct 2021.

As per the regulations, Distribution Companies shall:

- a. Ensure that all feeder wise, circle wise and division wise periodic energy accounting shall be conducted by the energy manager of the electricity distribution company for each quarter of the financial year;
- b. Submit the periodic accounting report to the Bureau and State Designated Agency and also made available on the website of the electricity distribution company within 45 days from the date of the periodic accounting; and



c. Conduct an annual energy audit for every financial year, submit the annual energy audit report to the Bureau and respective State Designated Agency and also made available on the website of the electricity distribution company within a period of four months from the expiry of the relevant financial year.

Prerequisite for annual energy audit and periodic energy accounting includes:

a. Installation of functional meters for all consumers, transformers and feeders Provided that the meter installation is done in a phased manner within a period of three financial years (i.e. by FY 25) from the date of commencement of these regulations.

Further, going forward, we will be requiring CAPEX for maintenance (rectification/replacement) of faulty feeder meters in subsequent years.

- (i) energy flow between transmission and 33kV/11kV incoming distribution feeders(33kV Feeder Loss);
- (ii) Energy flow between 11 kV O/G Feeders to consumers (11kV Loss).
- (iii) Energy flow between distribution transformer to consumers (DT Loss)

A budget of Rs.10.00 Cr has been requested for metering at 33 and 11kV feeders including replacement of defective CTs/PTs/breakers, control cables etc., if same are identified as defective or not present on site on inspection by officers. Further, going forward, CAPEX will be required for maintenance of Metering system at Feeders level.

Table 2-9: Cost Estimate -33 kv & 11 kV feeder metering for Energy Accounting

Items	Quantity	Cost per unit (INR)	Cost per unit (INR) including GST @18%	Total Material Cost (Cr.)	Per unit Installation cost (including transportation)	Total Installation Cost (Cr.)	Total Cost (Cr.)
1 Ph 11 KV I/D CT 400/1 A	4	30,000	35,400	0.014	7788	0.003	0.017
1 Ph 11 KV O/D CT 400/1 A	36	30,000	35,400	0.127	7788	0.028	0.155
1 Ph 33 KV I/D CT 200/1 A	32	30,000	35,400	0.113	7788	0.025	0.138
1 Ph 33 KV O/D CT	104	30,000	35,400	0.368	7788	0.081	0.449
10 core ,2.5 mmsq Control Cable (Mtrs.)	5594	240	283	0.158		0.000	0.158
11kV C/R Panel	20	3,00,000	3,54,000	0.708	77880	0.156	0.864
11KV DP structure	18	1,50,000	1,77,000	0.319	38940	0.070	0.389
11KV MU 100-50/5A	4	38,500	45,430	0.018	9994.6	0.004	0.022
11KV MU 200-100/5A	11	38,500	45,430	0.050	9994.6	0.011	0.061
11KV MU 400-200/5A	7	38,500	45,430	0.032	9994.6	0.007	0.039
19/25mmsq Cable gland	777	100	118	0.009		0.000	0.009
1Ph I/D 11KV PT	65	25,000	29,500	0.192	6490	0.042	0.234
1Ph O/D 11KV PT	160	35,000	41,300	0.661	9086	0.145	0.806
1Ph O/D 33KV PT	181	30,000	35,400	0.641	7788	0.141	0.782



Items		Cost per	Cost per unit (INR) including GST	Total Material	Per unit Installation cost (including	Total Installation	Total Cost
2.5.0.1011	Quantity	unit (INR)	@18%	Cost (Cr.)	transportation)	Cost (Cr.)	(Cr.)
2 core ,2.5 mmsq Control Cable (Mtrs.)	1088	150	177	0.019		0.000	0.019
33kV OUTDOOR VCB	26	3,00,000	3,54,000	0.920	77880	0.202	1.123
33kV C/R Panel	21	3,00,000	3,54,000	0.743	77880	0.164	0.907
33KV DP structure	21	2,00,000	2,36,000	0.496	51920	0.109	0.605
33KV MU 200-100/5A	6	67,797	80,000	0.048	17600.1	0.011	0.059
33KV MU 400-200/5A	6	67,797	80,000	0.048	17600.1	0.011	0.059
33KV MU of Capacity 100/5A	7	74,119	87,460	0.061	19241.29	0.013	0.075
33KV MU of Capacity 200/1A	7	69,117	81,558	0.057	17942.77	0.013	0.070
33KV MU of Capacity 200/5A	4	67,797	80,000	0.032	17600.1	0.007	0.039
33KV MU of Capacity 400/1A	5	69,117	81,558	0.041	17942.77	0.009	0.050
33KV MU of Capacity 400/5A	10	67,797	80,000	0.080	17600.1	0.018	0.098
11KV MU of Capacity 11KV/110V,100/1A	4	30,664	36,184	0.014	7960.374	0.003	0.018
11KV MU of Capacity 11KV/110V,100/5A	4	38,500	45,430	0.018	9994.6	0.004	0.022
11KV MU of Capacity 11KV/110V,200/1A	7	30,664	36,184	0.025	7960.374	0.006	0.031
11KV MU of Capacity 11KV/110V,200/5A	7	38,500	45,430	0.032	9994.6	0.007	0.039
11KV MU of Capacity 11KV/110V,400/1A	7	30,664	36,184	0.025	7960.374	0.006	0.031
11KV MU of Capacity 11KV/110V,400/5A	8	38,500	45,430	0.036	9994.6	0.008	0.044
3Ph I/D 11KV PT	7	25,000	29,500	0.021	6490	0.005	0.025
3Ph I/D 33KV PT	13	30,000	35,400	0.046	7788	0.010	0.056
4 core ,2.5 sqmm Control Cable (Mtrs.)	6660	135	159	0.106		0.000	0.106
7 core Control Cable (Mtr.)	740	200	236	0.017		0.000	0.017
CT Junction box	7	7,000	8,260	0.006	1817.2	0.001	0.007
LA, EARTHING	4	2,000	2,360	0.001	519.2	0.000	0.001
Mounting Structure for PT	4	50,000	59,000	0.024	12980	0.005	0.029
Panel (7'X2')	39	15,000	17,700	0.069	3894	0.015	0.084
PT console box	11	7,000	8,260	0.009	1817.2	0.002	0.011
Smart Meter with Box -100/5A DT Meters (63kVA)	270	16,385	19,334	0.522	4253.546	0.115	0.637
Smart Meters 11kv	1069	8,055	9,505	1.016	2091.078	0.224	1.240
Smart Meters 33kv	246	8,055	9,505	0.234	2091.078	0.051	0.285
TB Disconnected	3996	50	59	0.024		0.000	0.024
ТТВ	222	404	477	0.011		0.000	0.011
TOTAL CAPEX				8.21		1.73	9.94



#### 2.2.3 LT Bare to LT AB Cable Conversion

Scheme Proposed	It is proposed for replacement of LT bare conductor with LT AB Cable to ensure reduced direct 'hooking' done on bare LT conductor lines thereby reducing commercial losses drastically in theft prone areas.
Capex Amount	₹ 20 Cr
Benefit to Consumer	To ensure quality power supply to the consumers and reduction of frequent tripping and ensuring safety to public and animals.

#### **Existing System**

In power distribution, LT network plays an important role for power supply distribution system and it is spread across TPCODL licensed area for power distribution. The bare overhead used is more prone to transient fault due to tree branch touching or when any foreign objects fall on the line. Due to this, consumer experiences frequent fault and LT technical losses also increases. These bare conductor lines are subject to electricity theft through direct hooking and thus causing revenue leakage in the system. Through conversion of LT bare conductor to LT ABC, safety will be ensured and it will help TPCODL in maintaining the adequate clearance from consumer's premises.

# **Need of the Project**

This is an ongoing project. Frequent tripping can be avoided by use of aerial bunched insulated cables instead of bare conductors. Theft of electricity through hooking will be reduced leading to lower AT&C losses. To avoid direct hooking, it is proposed to convert LT OH bare conductor into LT AB cable. This will help in eliminating the direct theft and thus protecting the revenue leakage.

Through the execution of this scheme, we are envisaging 8 MU reduction through theft of electricity in a year. By execution of this scheme, approximately 13200 span of LT bare conductor to be changed. If we take 5 hooking per span we will be able to remove and regularize approximately 0.6 Lakh hooking.

#### Statutory Compliance requirement

Hon'ble OERC had given target of AT&C loss reduction for TPCODL and the same has been mandated in vesting order. By implementation of aerial bunched insulated cables instead of bare conductors pilferage of electricity can be curtailed which subsequently helps in reduction of AT&C losses.

#### **Cost Estimate**



Table 2-10: Cost Estimate for Conversion for :LT bare to LT AB cable

	DESCRIPTION OF WORK	Unit	Quantity	Amount
Sl. No.	DESCRIPTION OF WORK		(in km)	(in Rs.Cr.)
1	Conversion of LT Bare to LT AB Cable (4X95 sq.mm)	Km	24	2.2
2	Conversion of LT Bare to LT AB Cable (4CX70 sq.mm)	Km	60	4.9
3	Conversion LT Bare to LT AB Cable (4CX50 sq.mm)	Km	104	7.2
4	Conversion LT Bare to LT AB Cable (4CX35 sq.mm)	Km	60	3.6
5 Conversion LT Bare to LT AB Cable (2CX35 sq.mm+1CX35 sq.mm)		Km	48	2.1
Total			296	20

Costing details are available in **Annexure – 4**.

#### **Benefits**

By executing the proposals as made in this head, 415V network can be strengthened and we would be able to serve our consumers in much better way. Following benefits are envisaged from this investment:

- 1. Reliable Power supply to the Consumers since bare conductor will be replaced into insulated cable.
- 2. Comparatively safer than the LT Bare conductor and eliminate the element of risk if comes in close proximity.
- 3. Simpler installation, as crossbars and insulators are not required.
- 4. Suitable for congested lanes as well.
- 5. Electricity theft becomes difficult as hooking would not be possible.
- 6. Maintenance required is less and necessary inspection of lines.

To improve the safety factor, minimize the safety accident risk, reduce the chances of fault and strengthen existing 415V network, it is suggested for replacement of overhead bare conductors with new aerial bundled cables. This in turn will help in providing reliable power supply for all consumers & stakeholders.



# 2.3 Reliability

The Various schemes under the head of Reliability envisaged for FY 2023-24 is as follows:

Table 2-11: Break up of Capital Expenditure under Reliability

Main Budget Head	Activity planned	FY 23 - 24	
Main Budget Head	Activity planned	(Rs. In Crs)	
	50 Nos. 33/11 kV PSS in FY23-24		
	Balance 70 Nos. 33/11 kV PSS in FY24-25	₹ 8.00	
	RTU, DC System, Real-time Visual Monitoring		
	FRTU and RMU communication - 30 Nos RMU per year	₹ 1.00	
	GSAS for 55 Nos PSS.	₹ 13.75	
	Weather stations installation and central integration	₹ 0.25	
	with data accumulation and analytics		
	Sick Equipment includes defective VCBs, RMUs,	₹ 5.00	
Reliability	Micro Grid for 2 Locations to improve the Reliability and	₹ 3.00	
	address Low voltage issues		
	Line Voltage Regulators for 10 Nos 11KV Feeders	₹ 4.00	
	Capacitor Banks installation for 10 Locations	₹ 1.00	
	33KV Network Infrastructure	₹ 45.00	
	11KV Network Infrastructure	₹ 22.00	
	AR/FPI/MCCB/RMU	₹ 13.00	
	Refurbishment of 33KV feeders	₹ 7.00	
	1000 Nos earthing	₹ 1.00	
		124	

# 2.3.1 SCADA enablement of conventional substation

Scheme Proposed	SCADA Enablement of Conventional Sub Stations
Capex	₹8.00 Cr
Amount	

Note: Detailed DPR for the same is annexed as Annexure-5



#### 2.3.2 FRTU and Communication for RMU

Scheme Proposed	FRTU & Communication for RMU
Capex Amount	₹ 1.00 Cr

Note: Detailed DPR for the same is annexed as Annexure-5.

## 2.3.3 GSAS Implementation

Scheme Proposed	GSAS Implementation
Capex	₹ 13.75 Cr
Amount	

#### **Background**

TPCODL has been in the forefront in the adoption of latest technology in the power utility sector pan Odisha. Together with its culture of Consumer Service Excellence, Continuous Learning, Performance Orientation, Innovation and Empowerment, it has been able to set benchmarks in accelerated reduction of tripping, equipment failure, enhance consumer satisfaction and improve employee productivity.

One of the significant challenges that the utilities face is restricting the fault at minimum possible section of the electrical network and clearing the fault in minimum possible time. To achieve this feat and utility works round the clock to minimize equipment failure, equipment down time and faster restoration thus ensuring reliability and enhanced MTTR. All the utility across the globe moving towards deployment of smart grid in order to ensure above mentioned goals. Going towards that direction TPCODL deploys GSAS (Grid station automation system) in its working region — the very first step towards the direction of the integrated smart grid. TPCODL already deployed GSAS in FY 20-21 and till now integrated 52 RAPDRP stations and 100 ODSSP stations from a centralized location in Bhubaneshwar and unmanned 35 stations overall and determined to unman another 65 stations by the end of FY 21-22. GSAS being a budget influenced project for any utility it is being divided into phases over the several financial years, as follows

- I. Phase 1: FY 20-21: Integration of 52 RAPDRP stations, 4 PNP stations and 54 ODSSP stations
- II. Phase 2: FY 21-22: Integration of 80 ODSSP stations and 22 conventional old stations in urban areas



- III. Phase 3: FY 22-23: Integration of 67 conventional old stations spread across TPCODL area covering BBSR1, BBSR2 and Cuttack
- IV. Phase 4: FY 23-24: Integration of rest of the stations spread across TPCODL area including rural stations of Dhenkanal and Paradeep.
- V. Phase 5: FY 24-25: Left over stations of rural areas, if any.

#### **Need of the Project**

After taking over the electricity distribution business from erstwhile CESU, one of the major operational challenges in front of TPCODL was to improve the reliability of power supply. Implementation of GSAS comes in an integrated package of involvement of less manpower, smart utilization of asset, quick decision making, automated remote monitoring and control along with state of the art asset management. Till H-1 FY-23 74 stations have been unmanned and estimate by end of FY-24 is 100.

- 1. Quick decision making for restoration of faults
- 2. Fact based energization/ restoration
- 3. Centralized PSCC taking all the decisions for charging/restoration
- 4. Human intervention free system at sub-station level
- 5. The unmanning substation provided required manpower for manning other stations as per statutory requirement
- 6. Safety for operators/ public who were visiting sub-stations for complaint/ operation/ commercial purposes.

#### **Proposed Solution**

There are large number of sub-stations where considerable MUs are being lost with significant number of tripping and with informal trial closing. Keeping in view of remarkable improvement in terms of reliability and MTTR under 1st phase of unmanning of 56 stations till now, we would like to request the Hon'ble Commission to kindly consider for GSAS for 60 stations of Industrial, Urban and Semi urban areas phase-3. This would lead to further improvement of reliability and MTTR with strategic trial closing guidance leading to less equipment failure and adherence to the PA timeline. Along with this there will be huge saving in account of unmanning of the stations by allowing relocation of the available manpower to some other jobs.

#### Scope of the proposal

Primarily, 67 stations of Urban, Industrial and Semi urban categories are selected across TPCODL area for GSAS in FY 22-23 which will accelerate the future reliability indices of the system along with the unmanning of the stations in TPCODL area. Since due to restricted



budget of only 16 crore in FY 22-23 we could implement GSAS in 27 stations with improvised solutions. So in this period there are left over 67-27 = 40 stations which will be covered in FY 23-24 and to make total 60 stations we will take another 20 stations from phase 3 as mentioned above.

#### Cost

In FY 22-23 the budget of the 27 conventional sub-stations, tentative cost is INR. Rs.16 Cr.

So, based on that basis in FY 23-24 the budget of the 30 conventional stations, tentative cost is **Rs.13.75 Cr.** 

# **Cost Benefit Analysis**

## TANGIBLE BENEFIT

- 1) Improvement in power reliability and MTTR.
- 2) Reduction in MU loss due to unwanted tripping's.
- 3) Major difference will be APSCC supervised charging, thus
- 4) Significant reduction in equipment failure due to repetitive charging
- 5) Unmanning of the stations in future course.

# **INTANGIBLE BENEFIT:**

Installation of LDRs would definitely lead to increase the reliability of the power system network, which would help to increase customer delight and thus loyalty.



# 2.3.4 Weather Stations Installations and Central Integration with Data Accumulation and Analytics

Weather data is the basic requirement for enablement of accurate load forecasting. Procuring this data from available external services is unreliable and expensive. Hence, internally weather stations are proposed to be put strategically across TPCODL.

# **Existing System in Place**

Presently day ahead load forecasting done using an Excel based approach with some historical data. This is submitted on the earlier day to SLDC for incorporation as the discoms day ahead schedule. The historical data used comprises of two main components viz. load trends yesterday, yester month and yesteryear along with climatic condition variation. Currently, this climatic data is taken from third parties which are expensive and unreliable.

# **Need of the Project**

DISCOM demand varies significantly with change in weather. In order to study Discom's demand variation with respect to change in weather, historical weather database is required. This is currently procured from third parties and is often very subjective, superficial, expensive and unreliable. Hence, it is required to deploy our own weather stations to gather all essential weather parameters reliably at one place.

# **Proposal for Capex Investment**

Since there is no mechanism to record historical weather format in-house currently, it is proposed to develop a weather monitoring network specifically for TPCODL to be able to have a bird eye view of current weather condition of all major locations across our license area.

## **Scope of Proposal**

The scope of this proposal includes installation of weather stations at 20 strategic locations at PTCODL and establishing connectivity of all field devices to a central server where all the weather data can be stored.

#### Cost Estimate with Execution timelines

Cost estimate for FY24: Rs.0.25 Cr. Execution Timeline: Phase wise over the course of 3 financial years.



# Proposed system after implementation

With implementation of weather monitoring system, PSCC will have a live picture of current weather condition of major locations of TPCODL as well as availability of a weather data repository for usage in trend mapping and load forecasting.

## Cost benefit analysis

After implementation of the above stated infrastructure, following tangible and intangible benefits will be there:

- Weather of critical locations of TPCODL can be centrally monitored
- Central database for historical weather information across license area
- Accurate and reliable data for load forecasting and trend monitoring

# 2.3.5 Replacement of Sick Equipment

Brief description	The Power distribution network & its equipment health is a critic factor for ensuring reliable & quality power supply to the exconsumers.	
Capex Amount	₹ 5.00 Cr.	
Benefit to Consumer	To ensure reliable and quality power supply to the consumers.	

# **Existing System**

For any distribution company, apart from a strong 33kV & 11kV network, healthy & trouble free network equipment or asset base is a must. It forms the base for reliable power supply to the consumer.

In TPCODL, based on the detailed survey reports, it was found that at some places intervention at Equipment level is required to make the network strong & trouble free, so as to ensure reliable power distribution till customer point.

## **Need of the Project**

To strengthen the existing network, it is suggested to replace the sick equipment in the existing network.

Further, this replacement will help in utilization of the resource to the optimum level, managing the load in case of any exigency and mitigate the issue of overloading etc.



# **Proposal for Capex investment**

Although TPCODL field teams are committed to upkeep the equipment by doing preventive maintenance, but still some of the equipment gets faulty and may result to pre-mature failure due to frequent tripping.

Pre-mature failure of the equipment results into long duration outage as it becomes difficult to restore the power supply if it happens during odd hours or if spare equipment is not available in the inventory.

Hence, to ensure highest reliability and achieve utmost efficiency, all equipment needs to operate properly at all the times. In last year of operations, TPCODL has done the survey to identify the sick equipment that exists in the system, which may fail, or lying faulty and proposed for their replacement so that reliability to the end consumers can be ensured.

In this scheme, we have proposed replacement of faulty network equipment in phased manner at priority locations.

#### **Cost Estimate**

Detailed annexure is available for reference in Annexure 6

#### Benefit

TPCODL intends to implement the following actions to improve the reliability of power supply. Identification and replacement of faulty / sick equipment causing frequent tripping's.

Introduction of new technology to ensure faster restoration of supply in case of any tripping.

### 2.3.6 Installation of Micro Grids

Brief description	In order to ensure reliable power supply to the consumers having loads in scattered locations and sparsely populated, huge investments like construction of substations, network connectivity lines, etc. are not justifiable. Thus in order to mitigate the issue and provide reliable and quality power supply to the consumers, micro grids are proposed.
Capex Amount	₹ 3.00 Cr.
Benefit to Consumer	To facilitate reliable, resilient and quality power supply to the distant consumers.

TPCODL license area is spread over a geography of 29354 Sq. km and serve the registered consumer base of 2.6 million. The complete geography comprises of many different types of



terrains, dense forest areas, rural areas with sparse population, etc. which restricts the utility to serve reliable power supply to the areas. Mainly the areas of Nayagarh, Dhenkanal circle having hilly terrain, huge river crossings and dense forest cover causing challenges to TPCODL to provide reliable and quality Power Supply IN these area. In order to ensure reliable power supply to the consumer huge investments like construction of substations, network connectivity lines, etc. are not appropriate as long term load demand in such area is also not promising. Thus in order to mitigate the issue and provide reliable and quality power supply to the consumers, micro grids are proposed.

A micro grid is a local electrical grid with defined electrical boundaries, acting as a single and controllable entity. It is a group of interconnected loads and distributed energy resources that acts as a single controllable entity with respect to the grid. It can connect and disconnect from the grid to operate in grid-connected or island mode. Micro grids can improve customer reliability and resilience to grid disturbances. Micro grids provide efficient, low-cost, clean energy, enhance local resiliency, and improve the operation and stability of the regional electric grid. A micro grid is a self-sufficient energy system that serves a discrete geographic footprint, such as inaccessible places, difficult terrains, etc.

A micro grid typically uses one or more distributed energy sources (solar panels, battery storage etc.) to produce its power. In addition, many newer micro grids contain energy storage, typically from batteries. Some also include electric vehicle charging stations.

## Quicker Adoption of Clean Energy

On the principle that big projects take longer than to develop than smaller ones, micro grids can accelerate the transition to clean energy. With smaller footprints and reduced environmental impacts, micro grids are subject to fewer regulations and to less community opposition, expediting development.

Benefits of Micro grids to the environment, to utility operators and to customers

- Micro grids offer the opportunity to deploy more zero-emission electricity sources, thereby reducing greenhouse gas emissions.
- Micro grids can make use of on-site energy that would otherwise be lost through transmission lines and heat that would otherwise be lost up the smokestack.
- Micro grids can improve local management of power supply and demand, which can help defer costly investments by utilities in new power generation.
- Provide efficient, low-cost, clean energy.
- Critical infrastructure that increases reliability and resilience.



- · Reduce grid congestion and peak loads.
- Providing power supply to inaccessible places and difficult terrains.
- Use local energy resources and jobs.

# 2.3.7 Installation of LVRT (Low Voltage Regulator Transformer ) at Low Voltage Areas

Brief description	In order to mitigate low voltage issues in the 11kV network and reduc huge investments LVRT are proposed in the existing network.	
Capex Amount	₹ 4.0 Cr.	
Benefit to Consumer	To ensure quality power supply to the consumers.	

Low voltage causes serious problems for motors and reduces the efficiency of all types of electrical appliances including LED lamp heater, AC, refrigerator etc. Many 11kV lines in TPCODL service area are extended over long distances (up to 100km) to feed loads scattered over large rural areas. Poor Voltage regulation / Low voltages has been a common problem for years. Consumers those are connected at remote locations are continuously facing low voltage problems. Actually measured customer's voltage is found in the range of 60 to 70% of standard supply voltage in many remote areas. The major causes of low voltages experienced is due to lengthy and radial feeders. Low voltage at 11kV level is experienced in many areas of TPCODL network namely Dudurukote, Town-1, Siminai areas of DED division, Satyabhamapur, Dasbatia, Mangalpur, Pipili Bazar areas of NED division, Shyamsundarpur, Kuanria, Daspalla, Poibadi, Golapokhari areas of NYED division and many more.

Most of the remote areas are smaller load pockets with scattered loads, generally 200kVA, 500kVA or 1000kVA at the most.

Table 2-12: Cost estimate for installation of LVRT

SI. No.	DESCRIPTION OF WORK	Quantity	Amount
31. INO.		(in nos.)	(in Rs. cr.)
1	7/11kV 1000 kVA Line	8	4.0
	Voltage Regulator DTR		
Total			4.0

Detailed annexure is available for reference in Annexure 7



#### **Benefits**

Constructing a new 33kV substation is very expensive & therefore cannot be justified for the area where total load is very small i.e. < 1000kVA. Installation of Line Voltage Regulator Transformer at mid line location which will boost the voltages up to 35% on downstream network. LVRT is a specially designed Autotransformer with inbuilt on load Tap Changer & a voltage control relay. LVRT is the most economical solution & it is an "alternative to costly grid expansion".

# 2.3.8 Capacitor Bank Installation for Reactive Power Compensation

Brief description	In order to mitigate low voltage issues in the downstream network, i.e. LT network, improvement of voltage at LT side of the DT is proposed to mitigate low voltage issues and avoid huge investments.
Capex Amount	₹1 Cr.
Benefit to Consumer	To ensure quality power supply to consumers.

TPCODL caters to a vast area of consumers for which an elaborate distribution network is in place to cater the power supply to the licensed area. This network comprises of many radial and lengthy feeders which results in low voltage pockets due to poor power factor in certain pockets. In order to mitigate the low voltage issues in the downstream network, i.e. DT LT side, huge investments are required in the form of construction of new feeders/ new substation/ feeder bifurcation, etc. with numerous RoW issues during execution of the works along with an extended timeline for work completion. Further, to compensate the reactive power, it is always advisable to install the Capacitor Banks closer to the load end to improve the voltage profile.

# **Benefits**

Improvement Technical loss reduction, power factor correction and improvement of the system voltage profiles are among the capacitor allocation benefits.



# 2.3.9 33kV Network Infrastructure

Scheme Proposed	Proposal for construction of new 33kV lines, conductor augmentation, 33kV bus splitting and proposal for HT AVR at PSS in order to optimize the feeder loadings, mitigate feeder overloading, mitigate low voltage issues, power evacuation from Grids and achieving N-1 redundancy.
Capex Amount	₹ 45.00 Cr
Benefit to customer	By executing the proposals as made in this head, 33kV network can be strengthened and consumers can avail reliable and quality power supply.

In TPCODL, 33kV network is the backbone of power supply system and spread across TPCODL licensed area and connected with various 33/11kV structures from where the power is transformed at 11kV for further distribution. 33kV network is lengthy and radial in nature at most of the places.

To summarize, following areas where interventions can be made to strengthen the existing network are identified:

- Lengthy and radial connectivity of the network.
- Overloading of the 33kV feeders.
- 33kV feeders facing low voltage issues.
- Power evacuation from recently charged/ proposed GSS.
- Absence of N-1 redundancy at least to critical installations.
- Circuit capacity restricted to lower size of conductor in existing line.

In order to mitigate overloading and low voltage issues in the 33kV network, various proposals are put forward vis-à-vis, conductor augmentation, construction of new feeders, bus splitting to bifurcate loading of the overloaded or low voltage experiencing feeders, installation of HT AVR in substations to improve the voltage at the downstream network. In addition, new feeders have been proposed to evacuate power from the existing lightly loaded or recently commissioned OPTCL grid substations. To strengthen existing 33kV network, it is suggested to construct interlinking lines in the existing network to make the system in ring and mitigate the issue of single connectivity. Further, this interconnection would help in managing the load in case of any exigency and mitigate the issue of overloading.

**HT AVR:** The automatic voltage regulator is used to regulate the voltage. It steps up the fluctuating voltage into a constant 33KV voltage. The fluctuation in the voltage mainly occurs due to the variation in load on the supply system. The variation in voltage damages the



equipment of the power system. The variation in the voltage can be controlled by installing the voltage control equipment at several places likes near the transformers, feeders, etc. The voltage regulator is provided in more than one point in the power system for controlling the voltage variations. In TPCODL 33KV network, low voltages issues are being experienced and in order to mitigate the same various mitigation proposals are proposed in the network. Many of these proposals require huge capex investments and longer timelines. In order to optimize the investment requirement and also timely addressing these issues, this approach of installing 33KV Automatic Voltage Regulators are being proposed.

In order to provide the reliable and quality power supply to the consumers in TPCODL's licensed area, we have conducted the survey of all 33kV feeders to identify the weaker sections that require immediate attention. Based on the survey reports, it is observed that in some of the feeders, conductor sizes are different resulting into compromising the circuit capacity, which is limited to the lowest size of the conductor available in the circuit. However, looking at the existing load demand after Covid and factoring the projected load growth as per the trend, it is required to be rectified so as to avoid overloading and low voltage issues of the network. This will help in optimizing the feeder loading and will support in shifting the load to another structure or OPTCL grid in case of any source failure.

Moreover, in various forums, OPTCL has raised the issue of recently commissioned or to be commissioned 220/33kV or 132/33kV which are either lightly loaded or even have no loading. OPTCL has asked TPCODL to evacuate power from these Grid substations and ease out the loading on other OPTCL Grids that are currently catering the loads. Therefore, TPCODL is also proposing evacuation of power from these OPTCL Grid substations by constructing new 33kV feeders or interconnectors to transfer the loads.

This overall expenditure will help in strengthening the 33kV network to some extent since the requirement is huge but considering the resource availability, it will be done in a phased manner.

To strengthen existing 33kV network, it is suggested to lay some interconnectors in the existing network to convert the system in ring and mitigate the issue of single connectivity. Further, this interconnection would help in managing the load in case of any exigency and mitigate the issue of overloading. Apart from the interconnectors, we have also proposed conductor augmentation, 33kV new lines, 33kV bus splitting and installation of HT AVR in substations to address the overloading and low voltage issues.

Detailed annexure is available for reference in **Annexure 8** 



# 2.3.10 11kV Network Infrastructure

Scheme Proposed	Proposal for conductor augmentation, new 11kV line to optimize the feeder loadings, achieving N-1 contingency condition, avoiding feeder overloading and low voltages.	
Capex Amount	₹ 22 Cr	
Benefit to customer	<ul> <li>Reliable power supply to consumers</li> <li>Improvement in reliability Indices like SAIDI &amp; SAIFI.</li> </ul>	

## **Existing System**

11kV feeders are the main power link between Primary substations (PSS) with the distribution substation (DSS) and give power supply to 11kV HT consumers. Below are the major observations in the existing 11kV network:

- Many 11kV feeders have conductor of different sizes used in different phases, which restricts the circuit capacity limiting to the lowest size of the conductor used in the circuit. This lead to overloading of the feeder, low voltage issue and Higher Technical losses.
- Most of the places, the protection devices (Lighting arrester, LT Distribution Board (LTDB) and Air Break (AB) Switch) are either not available or in bypassed condition.
- Interconnection between feeders mostly are done through jumpering and some places through off-load AB switches, for normal load transferring from one feeder to another feeder it requires shutdown of both feeder.
- Most of the feeders are passing through dense vegetation area and this leads frequent tripping of feeder on Transient fault.
- The feeders are lengthy with multiple T-off branches without isolating device. Any fault in any of the branches leads to shutdown of entire feeder and it takes longer time for restoration since disconnection of the faulty branches requires physical disconnection.
- Many 11kV feeder are overloaded.
- Many of the feeders are having binding wire / multiple joints in a single span. As a result, there are chances of snapping of conductors and subsequent electrocution of human beings / animals since cradle guards are not provided.
- Houses / Structures are found constructed directly below 11kV feeders / close to 11kV feeders at many locations both in urban and rural areas.
- It is also observed that no intermediate are used in 11kV feeders for mechanical strength and for conductor jointing. These double poles are essential to avoid cascading effect of failure of poles uprooting during any disaster.



 Large number of interruptions were reported on 11kV feeders prior to TPCODL commencing operation on 1st June 2020 (>250 per feeder per annum).

## **Need of Proposal**

In TPCODL, most of the 11kV feeders are long and radial in nature. During contingency, it is not possible for the field teams to transfer the load to the healthy section and thus all consumers connected to the affected feeders remain out of service until the field team locates and repairs the fault.

This scheme is proposed to ensure flexibility to the field teams in 11kV feeder operation. In this head, all such issues can be mitigated by:

- i. Laying of new 11kV feeders.
- ii. Augmenting the existing 11kV feeders to address overloading issues of the feeders. This will help in strengthening the existing 11kV network.

#### **Cost Estimate**

Detailed annexure is available for reference in Annexure-9.

#### **Benefit**

These proposals will help in converting the radial network into ring and mitigate the issue of single connectivity. Further, this interconnection would help in managing the load in case of any exigency and mitigate the issue of overloading. Thus, will lead to lower interruption and ensure quality power supply hence leading to satisfaction of our consumers.

# 2.3.11 33 kV and 11kV Auto Recloser /MCCB/ RMU

Scheme Proposed	To strengthen & make existing 33kV and 11kV network more reliable, it suggested to install Auto Recloser, RMU and MCCBs.	
Capex Amount	₹ 13 Cr	
Benefit to customer	<ul> <li>Ease of operation to the field teams</li> <li>Improving the safety in terms of Equipment operation</li> </ul>	

# **Existing System**

During contingency or in case of any fault in the network, it is not possible for the field teams to transfer the load to the healthy section/ isolate the faulty section from the healthy section



and thus all consumers connected to the affected feeders remain out of service until the field team locates and repairs the fault.

## **Provision of Auto Recloser**

Auto Reclosers are used in overhead lines, distribution systems so that they can prevent or interrupt faults. The auto recloser is a protective device that would automatically trip and reclose for a preset number of times. The auto recloser is composed of a relay that would automatically close the recloser after clearing the fault. An auto recloser is a circuit breaker equipped with a mechanism that can automatically close the breaker after it has been opened due to a fault. These are used on overhead distribution systems to interrupt temporary faults. It has been found that majority of the faults are transient faults which exist in a system for a short time. This means these types of faults clear themselves and line can be charged. In this case the auto recloser restores the supply automatically by being closed and improves service reliability.

Protective devices are installed in the network to protect the network from damages which may take place in abnormal cases, short circuits etc. Major problem exists in dealing with transient faults. For e.g. a tree branch that is blown off a tree during windstorm and lands on the line may cause a short circuit that could cause damage. However, the fault will quickly clear itself as the branch falls to the ground. If the only protection system were the breakers at the substations/distribution centres, large areas of the substation would be blacked out while the operating personnel reset the breakers.

Reclosers address this problem by further dividing up the network into smaller sections. This means reclosers may be installed at each branch. As the reclosers are installed at smaller sections, they handle much less power than the breakers at feeder stations and therefore can be set to trip at much lower power levels. This means that a single event of fault will cut off only the section handled by the single recloser, long before the feeder station would notice a problem.

# **Provision of Ring Main Unit**

Ring Main Unit is a compact Gas Insulated Switchgear cubicle equipped with SF6 Switch disconnector and SF6 circuit breakers. Ring Main Units are the major part of Ring Main Network. The power is distributed through these RMUs for the end consumers.

The main aim of this ring main network is to provide consumers uninterrupted supply. This is possible by feeding consumers with another healthy feeder in case of loss of supply due to working feeder. If a fault occurs in any branch of sub transmission circuit, that branch is



removed from service and power continues from the remaining loop without discontinuity in the supply. Every consumer has redundant supply in Ring main distribution system.

# Advantages of Ring Main Units:

- The major advantage of Ring Main Units is the safety they provide to the operators. Like the operation of switching devices with interlocking system requires less knowledge and effort.
- Working with IEDs allows remote operation. SCADA implementation is easy with smart Ring main units.
- The space occupied by RMUs is less as they are Gas Insulated Switchgear.
- The time taken for installation and commissioning of RMUs is very less. RMUs require less maintenance.

## **Provision of LTDB at DSS**

Distribution Substation (DSS) comprises of various equipment, which perform specific task to ensure delivering the power supply at appropriate voltage to the end consumers. Main components are 11kV AB Switch, 11kV HG Fuse, Transformer, LV Protection, Earthing, Fencing and LT Distribution Box.

The most expensive equipment in the DSS is Transformer and its life depends upon healthy condition of all other components be it LV Protection, HV Protection, Earthing or fencing. It is observed at many location the LT side & HT Side protection is bypassed through GI Wires. Due to this bypassed scenario, for any maintenance or corrective work at LT level, due to non-availability of switching equipment, outage / Hand trip is taken from the 33/11kV PSS resulting into interruption to all the consumers connected on that 11KV feeder even though for a short duration. Similarly, for any fault on LV Side lead to tripping of 11KV Feeder breaker at DSS.

However, this can be addressed by installing a LTDB after Distribution transformer so that only that LT feeder needs to be taken into outage where the work is supposed to be carried out. The main function of LTDB is to individually control the LT feeders thus helping in attending the complaint of any feeder without disturbing the power supply to other LT feeders from same Distribution transformer. This will help in reducing the affected consumer count and thus improving the reliability indices.

It is therefore recommended to carry out the refurbishment of the Distribution substation so that majority of the consumers are benefitted.

# **Need of Project**

This scheme is proposed to ensure flexibility to the field teams in 11kV feeder operation. At some locations there is no LT protection at Distribution Transformers and therefore to



attend/work at LT feeder, outage to be taken from 33/11kV structure which results into interruption to all consumers connected to particular 11kV feeder.

Moreover, in city area, interconnectors & load break switch is required to address the issue of overloading, load shifting during exigencies & improving reliability.

With installation of RMU, equipment safety will increase for field operation team, with less maintenance & beautification of the network. SCADA implementation will become easy with smart Ring Main Units.

## **Cost Estimate**

Table 2-13: Cost Estimate for 33 kV & 11 kV Auto Recloser/MCCB/RMU

CL No	Description.	Quantity	Amount
Sl. No.	Description	(in nos.)	(in Rs.Cr.)
1	11kV line DP with Auto Re-closure	21	2.58
2	LT Distribution Box with MCCB, for 100kVA transformer	80	0.90
3	LT Distribution Box with MCCB, for 250kVA transformer	54	1.70
4	LT Distribution Box with MCCB, for 500kVA transformer	40	1.69
5	3W 11kV RMU (LLV) along with 3C, 400sqmm UG Cable, jointing kits and LA.	10	1.53
6	4W 11kV RMU (LLVV) along with 3C, 400sqmm UG Cable, jointing kits and LA.	8	1.41
7	4W 33kV RMU (LLVV) along with 1C, 630sqmm UG Cable, jointing kits and LA.	7	3.19
	Total		

Detailed annexure are available for reference in Annexure 10

# **Benefit**

This will lead to:

- 1. Reliable power supply to consumers
- 2. Improvement in Reliability Indices like SAIDI & SAIFI.
- 3. Ease of operation to the field teams
- 4. Improving the safety in terms of Equipment operation



With auto-reclosers in 11KV feeders, field engineers would have flexibility to isolate the section locally instead of switching off entire feeder. In case of any tripping, maintenance engineer can isolate the faulty section and restore the supply of remaining consumers thereby improving the reliability. Consumer will experience less power cut and thus reduction in consumer complaint.

#### 2.3.12 33 kV Feeder Refurbishment

Scheme Proposed	33kV feeder refurbishment for reliable and quality power supply to consumers.	
Capex Amount	₹7 Cr	
Benefit to customer	<ul> <li>Reliable power supply to the consumers.</li> <li>Improving the circuit capacity by replacing the weaker section with appropriate sized conductor.</li> </ul>	

In order to provide the reliable and quality power supply to the consumers in TPCODL's licensed area, we have conducted the survey of all 33kV feeders to identify the weaker section, which require immediate attention. Based on the survey reports, it is observed that in some of the feeders, conductor sizes are different resulting into compromising the circuit capacity, which is limited to the lowest size of the conductor available in the circuit. Taking into consideration the existing load demand and factoring the projected load growth, it is required to be rectified so as to avoid overloading of the network.

#### **Cost Estimate**

This overall expenditure will help in strengthening the 33kV network to some extent since the requirement is huge but considering the resource availability, it will be done in a phased manner.

Detailed annexure is available for reference in **Annexure 11** 



# 2.3.13 Earthing

Scheme Proposed	Strengthening of the earthing system in power distribution system.
Capex Amount	₹1 Cr
Benefit to consumer	<ul> <li>Lesser chances of fault</li> <li>Reliable power supply</li> <li>Equipment Safety</li> </ul>

# **Existing System**

During the site visits, it is observed that at most of the places earthing is in either damaged condition or not available. This is because of the depletion of the earthing electrodes or connections and such situations may pose safety threat to the human beings or animals in the form of shocks. Therefore, as a corrective measure, earthing is required to be done to ensure safety of man and material.

# **Need of the Project/ Statutory Compliance**

The main objective of an earthing system is to provide an alternate path for the fault current to flow so that it will not endanger the user, maintain the voltage at any part of an electrical system at a known value and prevent excessive voltage on the equipment.

As per Central Electricity Authority Regulations (Measures relating to Safety and Electric Supply, 2010) rule 41, there is provision of earthing, neutral wire in a 3-phase, 4-wire system and the additional third wire in a 2-phase, 3-wire system.

**Earthing-** (1) All metal supports and all Reinforced and Pre-stressed Cement Concrete supports of overhead lines and metallic fittings attached thereto, shall be either permanently and efficiently earthed by providing a continuous earth wire and securely fastening to each pole and connecting with earth ordinarily at three points in every km with the spacing between the points being as neatly equidistant as possible or each support and the metallic fitting attached thereto shall be efficiently earthed.

- (2) Metallic bearer wire used for supporting insulated wire of overhead service lines of voltage not exceeding 650 V shall be efficiently earthed or insulated.
- (3) Each stay-wire shall be similarly earthed unless insulator has been placed in it at a height not less than 3.0 meters from the ground.



In an electrical installation, earthing system plays an important role for proper working of the power distribution system, and protection of human beings against electric shock.

In case the earthing of any power equipment or network becomes weak or defective due to corroded connections or damaged connection, clearance of fault may take more time and putting stress on the equipment connected in the network

## **Cost Estimate**

Table 2-14: Cost Estimate for Earthing

SI.	DESCRIPTION OF WORK	Quantity	Amount
No.		(in nos.)	(in Rs.Cr.)
1	Earthing	990	1.00

Detailed annexure is available for reference in **Annexure 12** 



# 2.4 Load Growth

The overall capital Expenditure under this head is a given in the table below:

Table 2-15: Estimated Capital Investment in Load Growth

Main Budget head	Activity planned	FY 23 - 24 (Rs. Cr)
	New Connection Release	₹ 10.00
Load Growth	Power Transformer Augmentation	₹ 30.00
	DT Augmentation	₹ 10.00
Total		50.00

# 2.4.1 New Connection Release

Scheme Proposed	In order to meet this growing load, network infrastructure needs to be strengthened, and new energy meters to be installed to release the new connection. Some of the connections can be released from the existing network and some may require augmentation/addition/extensionbefore release of new connection. For carrying out network extension/augmentation/addition, we propose expenditure to the tune of Rs 20 Crores under this head. To consider load growth, network extension / augmentation / addition is expected to be carried out to cater the new demand.
Capex Amount	₹ 10 Cr.
Benefit to customer	Better the availability of materials, faster will be process of providing new connection hence more will be the customer satisfaction



# 2.4.2 Power Transformer Augmentation

Scheme Proposed	To cater the increasing load demand, PTR augmentation is required to avoid any overloading conditions. In addition, to ensure reliable power supply to our consumers, PTRs has to be kept at optimum loading so as to avoid any mechanical stress on the transformers due to overloading.
Capex Amount	₹ 30.00 Cr.
Benefit to customer	To reduce over-burdening of existing PTRs thereby reducing load shedding and improving quality of power supply to the consumers.

To avoid any overloading issues especially in urban areas where the load growth is high, TPCODL has undertaken the assessment of the loading of the power transformers and found that to meet the estimated summer'23 load, it is required to augment some of the power transformers which may get overloaded considering the current peak and load growth for the next two years.

To carry out the detailed study of the PTR, inputs were collected from existing log sheet data and SCADA data from each 33/11 kV substations. Then we analysed the loading pattern & fixed the load growth for next 2 years.

While superimposing the future loading pattern on the existing network we found that some of the Power Transformers might be overloaded and the present capacity of transformers will not suffice the overloading criteria of >75% loading of PTR.

Hence based on the survey reports and discussion with the field teams, few proposals have been identified where we need to augment the Power transformers to have a trouble free summer.

To mitigate the same, various proposals are put forth for approval where we have considered:

- 1. Power Transformer augmentation
- 2. Power Transformer swapping
- 3. Load shifting from one transformer to other transformer within the substation

## **Cost Estimate**



**Table 2-16: Cost Estimate Power Transformer Augmentation** 

SI No.	Description	•	Amount in Crs
1	Augmentation of 7.5MVA and 8 MVA PTRs to 16MVA PTR	11	30.06
Total	Total Budget		₹ 30.06

Detailed annexure is available for reference in **Annexure13** 

These proposals will thereby reduce the overloading of PTRs and in turn improve the reliability and ensure quality power supply to the consumers.

# 2.4.3 DT Augmentation

Scheme Proposed	To cater the increasing load demand, especially with the introduction of schemes like 5T and others, DT augmentation is required to avoid overloading of transformer leading to transformer failure and power interruptions.
Capex Amount	₹ 10 Cr.
Benefit to customer	Reliable power supply by reducing chances of fault in network, thereby reducing power interruptions along with reduction of over-burdening of existing Distribution transformers thereby reducing power cuts.

**Existing System** - To cater the increasing load demand, especially with the introduction of schemes like 5T and others, DT augmentation is required to avoid overloading of transformer leading to transformer failure and power interruptions.

Also to ensure reliable power supply to our consumers, Distribution Transformers has to be kept at optimum loading so as to avoid any mechanical stress on the transformers due to overloading.

When a distribution transformer loading exceeds 100% of the rated capacity of the transformer, then it is considered to be "overloaded". After capturing the loading of the



Distribution Transformers, it has been observed that at several locations, especially in urban area, DTs are operating at overloaded condition.

To avoid these overloading issues especially in urban areas where the load growth is high, it is required to augment the capacity of the Distribution transformers so as to mitigate the overloading issue.

**Need of Project** - In case of overloading of the Distribution Transformer, it not only hampers the power supply to the consumers but also may cause pre-mature failure of DT occurs due to operating for long hours on overload condition. Thus to abide by the safe loading limits, augmentation of distribution transformers are proposed for locations, where loading is exceeding the maximum value.

When a distribution transformer loading exceeds 90% of the rated capacity of the transformer, then it is considered to be "overloaded".

After capturing the loading of the Distribution Transformers, it has been observed that at several locations, especially in urban area, DTs are operating at overloaded condition.

To avoid these overloading issues especially in urban areas where the load growth is high, it is required to augment the capacity of the Distribution transformers so as to mitigate the overloading issue.

**Proposal for Capex investment** - In this proposal, TPCODL intends to carry out Distribution Transformer's augmentation for those DTs, which are identified as overloaded based on the peak load served.

## **Cost Estimate**

Table 2-17 : Cost estimate – DT Augmentation

SI. No.	Description	Quantity (in nos.)	Amount (in Rs.Cr.)
1	100kVA to 250kVA	43	5.5
2	250kVA to 500kVA	20	4.49
	10.00		

Detailed annexure is available for reference in Annexure 14

**Benefits** - To cater the increasing load demand, especially with the introduction of schemes like 5T and others, DT augmentation is required to avoid overloading of transformer leading to transformer failure and power interruptions.



In addition, to ensure reliable power supply to our consumers, Distribution Transformers has to be kept at optimum loading to avoid any mechanical stress on the transformers due to overload.



# 2.5 Technology & Infrastructure

The Capital Expenditure for capital expenditure under this head is as follows:

Table 2-18: Capital Cost for Technology & Infrastructure Development

Main Budget head	Activity planned	FY 23 - 24 (Rs. Cr)
	Call management system for PSCC	₹ 1.00
	APSCC Modernization work for 15 APSCC at all divisions	₹ 1.00
Tachnology &	IT-Software , User Devices, Backup system, Storage devices and Applications	₹ 11.00
Technology & Infrastructure	Centralized Server Room at Technology Center, PAC & BMS	₹ 25.00
	Civil Upgradation	₹ 21.00
	RMU & DT Workshop	₹ 1.20
	GIS Implementation	₹ 13.00
	Ready to Use Office Assets	₹ 1.84
Total		₹ 75.04

# 2.5.1 Call Management System for PSCC

**Existing system in place** - Presently TPCODL has 374 nos. of 33/11 kV Primary substations (PSS) out of which 105 nos. controlled remotely via SCADA from Power System Control Centre (PSCC). Also, another 100 nos. of PSS are being planned to operate from PSCC SCADA system. This is managed remotely by regular communication between PSCC, field staff and operators. Currently, the entire operational communications are managed from standalone mobile phones. To cater to these vital areas and additionally to migrate to remote operationcoverage area from BBSR1 and Cuttack to other circles and CPSCC operation of other circle grids, PSCC employee strength has increased which has resulted in need of infrastructure development.

**Need of the project** - Due to the significant growth in number of PSS controlled centrally from PSCC, there is a huge call inrush during peak outage hours as well as in inclement weather conditions. Managing those calls from standalone mobile phones are difficult since there is no option of call forwarding, recording and logging of incoming/outgoing calls.



**Proposal for capex investment** - A central call management system is required in order to streamline and manage the operation desk effectively so that the outages can be managed in minimum possible time without any hassle to the on-desk engineer as well as the person who has requested for an outage over call.

**Scope of proposal** - The scope of this proposal includes implementation of a central call management system for PSCC. In order to increase the efficiency of calls being attended by on-desk engineer at PSCC, it is being proposed.

Cost estimate - Cost estimate: Rs.1 Cr.

Table 2-19: Cost Estimate for Call Management System for PSCC

Activities	Budget Req (Rs. Cr)
Call Management System for PSCC	0.25
Infra for PSCC: Desktops, Lan Printer, Scanner	0.15
Ergnomic Chairs for PSCC Operations Desk with high rest and lumbar support	0.13
Pantry Accessories for shift duty engineers: Fridge, Microwave, Coffee Vending Machine, etc	0.03
Noise Dampening for reduction of ambient noise between operation desks in PSCC	0.05
Development of AR/VR integrated PSCC tour guide	0.25
Body and mind Fitness enhancing equipment for PSCC desk engineer	0.15
Total	1.01

# 2.5.2 APSCC Modernization Work for 15 Nos of APSCC at all Divisions

**Existing system in place** - Presently TPCODL has 374 no. of 33/11 kV Primary substations (PSS) out of which 105 numbers controlled remotely via SCADA from Power System Control Centre (PSCC) and balance 269 no. of PSS monitored and managed by APSCC (Area Power System Control Centre). These APSCC are placed strategically across the license area in order to be able to control a dedicated area under it purview.

**Need of the project** - These APSCC centres are very crucial from system operation and statistics gathering point of view. It is with the help of these APSCC centres that operations of



entire TPCODL have been streamline, standardized and monitored centrally. These APSCC centres are currently devoid of a proper control room setup. Due to this basic infra such as an enclosed neat area, desktop table, desktops with stable internet connection, drinking water and toilet facilities are not properly available at all places. This might serve as a hindrance for smooth and effective operations management.

**Proposal for capex investment** - It is proposed to modernize these APSCC centres and equip them with better facilities. This would not only stabilize the operation mechanism but also help to have a better control.

**Scope of proposal** - The scope of this proposal includes installation of two no. of workstations at each APSCC along with necessary infra for control room such as tables, chairs, toilets, drinking water facility, etc. in order to establish the same with typical control room standards.

Cost estimate - Cost estimate for FY24: Rs.1.00 Cr.

**Proposed system after implementation** - With implementation of APSCC modernization work, the APSCCs will be better equipped and more stabilized to manage the control area more effectively.

**Benefit** - After implementation of the above stated infrastructure, following tangible and intangible benefits will be there:

- Better equipment with APSCC control rooms
- Desktops with better internet connectivity would ensure seamless operation

# 2.5.3 IT-Software ,User Devices, Backup System ,Storage Devices and Application

Activity planned	FY 23 – 24 (Rs. Cr)
IT - Software, User Devices, Backup system, Storage devices	11.00
and Applications	

<u>Information Technology Schemes-</u> Capex Proposals for FY 2023-24 to FY 2027-28, List of IT Capex Schemes



# Table 2-20: List of IT capex schemes

		Expenditure Planned					
S No	Scheme Description	FY 23 - 24 (Cr.)	FY 24 - 25 (Cr.)	FY 25 - 26 (Cr.)	_	FY 27 - 28 (Cr.)	Total Budget Require ment (Cr.)
1	Desktops and Laptops	1.18	3.00	7.00	7.00	1.00	19.18
2	Printers and Scanners		2.12			1.06	3.18
3	Enterprise Grade Next GEN Firewall	2.30					2.30
4	Enterprise aggregation Router	0.21					0.21
5	Storage capacity Increase		0.95			3.10	4.05
6	Backup Software	0.27					0.27
7	Upgrade Existing Tape library	1.20					1.20
8	Document Digitization	6.00					6.00
9	Server with OS at DR and DC		9.00 (DR)			9.00 (DC)	18.00
	Total	11	15.07	7.00	7.00	14.16	54.39

#### **Scheme Wise Detailed Justification**

# 1. Laptops / Desktops

**Background** - All locations offices of Central Odisha are needed to be enabled with IT system to provide reliable and quality power and best in class services to consumers. To enable employees to work on automated systems, and for providing various services to the Consumers, Laptops and Desktops are being required. Total 1932 Nos of front-end computing devices (1557 Nos of Laptop and 375 Nos of Desktop) have been procured since June 2020 and provided to the employees for this purpose. Also with increase in consumer base and adoption/implementation of new technologies, an additional requirement of front-end devices arises.

**Requirement** - In order to achieve best in class services for consumers (increasing at around 6% per annum), it is proposed to procure Laptops and Desktops with 5 years' warranty till FY: 2024-25 and to replace out of Warranty Devices during FY25-26 - FY27-28.

**Proposal** - It is proposed to procure/ replace total 1950 Nos of Laptops and Desktops during FY23-24 to FY27-28.

# **Scope of Proposal**

Table 2-21: Scope of Proposals for Laptops and Desktops



User Devic	User Devices						
FY	Item	Estimated	Unit Cost including GST (in	Amount (in			
	Description	Nos.	Rupees)	Rs.Cr.)			
FY 23 - 24	Laptops	60	100000	0.60			
	Desktops	80	73000	0.58			
FY 24 - 25	Laptops	270	100000	2.70			
	Desktops	40	73000	0.29			
FY 25 - 26	Laptops	700	100000	7.00			
FY 26 - 27	Laptops	700	100000	7.00			
FY 27 - 28	Laptops	100	100000	1.00			
Total Budg	Total Budget Requirement for 5 Years (Cr.) 19.18						

#### **Benefits**

- Performing automated business processes 3
- Office automation
- Improved employee productivity
- Enhanced Consumer Satisfaction
- Faster communication

# **Scheme Completion Time**

Five years from date of CAPEX approval by OERC.

#### 2. Printers & Scanners

**Background** - All offices of Central Odisha need to be enabled with IT system, Printing and Scanning facility to provide best in class services to consumers. Total 385 Nos of Printers and 365 Nos of Scanners have been procured since June 2020 for different offices. Also with increase in consumer base and adoption/implementation of new technologies, an additional requirement of printers and scanners arises.

**Requirement** - For functioning of important business processes and meeting the PA timelines, TPCODL is required to procure approx. 600 numbers of printers and 600 numbers of scanners for the office locations. Out of which 400 numbers of printers and 400 numbers of scanners is being procured during FY: 2024-25 and 200 numbers of printers and 200 numbers of scanners is being procured during FY: 2027-28.



**Requirement** - TPCODL is required to procure approx. 600 numbers of printers and 600 numbers of scanners during FY: 2024-25 to FY: 2027-28 to cater to the new requirements

# **Scope of Proposal**

Table 2-22: Scope of Proposals for Printers and Scanners

Printers and Scanners						
FY	Item	Estimated	Unit Cost including GST	Amount (in F		
	Description	Nos.	(in Rupees)	Crores.)		
FY 24 - 25	Printer	400	18000	0.72		
	Scanner	400	35000	1.40		
FY 27 - 28	Printer	200	18000	0.36		
	Scanner	200	35000	0.70		
Total Budg	Total Budget Requirement for 5 Years (Cr.) 3.18					

#### **Benefits**

- Duplicate Bill and other important document print at Customer Care.
- Official document print.
- Record keeping.
- Door step Bill print and delivery.
- Scanning of official document.
- Copy of official/important documents.
- Payment receipt printing.
- Cheque printing for Business Associates.
- Printing of various reports for Regulator and other stake holders
- Scanning of documents related to PA timelines for sending to Regulator.
- Printing of Finance data.
- Other official work.

**Scheme Completion Time** - Five years from date of CAPEX approval by OERC.

# 3. Enterprise Grade Next GEN Firewall



**Background** - TPCODL leverages Information Technology to conduct its business critical operations such as metering, billing, collection, recording consumer & employee information, monitoring & management of electrical network assets etc. To conduct these functions, software applications such as SAP ERP, SAP ISU, AMR, AMI, ADMS, GIS, Mobile Apps and other Applications have been deployed. Business critical data is being collected, processed, stored and made available to users through these applications. TPCODL also provides Web/Mobile Applications to its customers and employees on Internet and sends information through emails, SMS alerts etc. to consumers & employees.

More and more IT applications and services are being exposed to internet in order to make employees, consumers, vendors and other stakeholders to work from remote / home and ensure the continuity of business in unforeseen situations. Accessing and using IT applications and services through internet poses the risk of Cyber-attacks. This increases the probability of penetration into our network with cyber-attacks by unauthorized users / hackers may result in disruption of critical business processes. Hence, it is important to protect our network, digital infrastructure, software applications and other services from malicious attacks and cybercrimes for business continuity and protection of customers and other stakeholders' confidential data.

**Requirement** - Next-generation firewalls (NGFWs) are a core cybersecurity product, up there with <u>endpoint protection</u> as a foundational security tool that our organization needs. As defending data and applications become more complicated, the security products built to withstand evolving threats also grow more powerful. The vast expansion of <u>IoT</u> devices, remote work, and advanced threats like <u>ransomware</u> has made protecting the perimeter both harder and more critical than ever, thus making firewall evaluation more complicated. So, additional security measure should be adopted to ensure data protection, traffic filtration, and vulnerability assessment of deployed additional IT applications in the data center and disaster recovery center.

**Proposal** - It is proposed for Procurement of Enterprise Grade Next GEN Firewall as IT security equipment.

#### **Benefits**

- Protect networks and data from unauthorized access.
- Better management of security.
- Improved information security and business continuity management.



- Improved stakeholder confidence in your information security arrangements.
- Improved company credentials with the correct security controls in place.

Scheme Completion Time - One year from date of CAPEX approval by Hon'ble OERC.

# 4. Enterprise aggregation router

**Background** - To support business growth, multiple offices have been opened up at various locations of TPCODL. Users are also expected to increase at existing locations due to automation of business processes. Network connectivity at these locations is required to enable employees to perform business critical processes like metering, billing, collection, power outage management and meeting performance assurance timelines. Unavailability of network will increase the restoration time of power outage and delay in providing other critical services to consumers thereby affecting the consumer satisfaction. Hence, network connectivity at these locations are required to be enabled through network equipment like enterprise aggregation Routers. These devices combine traffic links at greater speeds to support the growing need for remote access to internal networks and external networks like the internet and cloud.

**Requirement** - Link Aggregation increases bandwidth and throughput by aggregating multiple network interfaces and provides traffic failover to maintain the network connection in case the connection is down.

**Proposal** - It is required to procure enterprise aggregation Routers to provide robust and secure network connectivity at office locations.

### Benefits

- Robust and secure IT network connectivity at various locations
- Meeting PA timelines leading to consumer satisfaction
- Efficiency in performing critical business processes
- Aggregation services in routers and edge platforms help enable network edge routing.

**Scheme Completion Time** - One year from date of CAPEX approval by OERC.

## 5. Storage upgrade

**Background** - TPCODL has leveraged the power of Information Technology to provide best in class services to consumers, earn consumer delight, and improve satisfaction among other stakeholders. Hence, a proper facility of storing and keeping important business data is



needed for smooth function and to cater the customer needs. For this, SAN Storage with capacity of 250 TB effective has already been in use. A SAN (storage area network) is a network of storage devices that can be accessed by multiple servers or computers, providing a shared pool of storage space. Each computer on the network can access storage on the SAN as though they were local disks connected directly to the computer.

**Requirement** - IT systems have been implemented to provide end-to-end solutions for important business functions viz. Commercial, Operations, Finance, HR and Administration etc. SAP ERP is the backbone for various enterprise functions. SAP ISU has been implemented for Customer Relationship Management, Billing and other commercial processes. Hence, a proper facility of storing and keeping important/ voluminous data, documents and files is needed for smooth function and to cater the customer needs. Storage systems are helpful in keeping all these data, documents and files in a neat and systematic manner. Also for business continuity purpose, Disaster recovery center (DR site to recover and restore its data, technology infrastructure and operations when its primary data center is unavailable) is being set up to quickly recover data from disasters such as hardware failure, ransomware attack, human error, accidental/malicious deletion, any unforeseen situations etc.

For DC-DR Replication and Storage allocation to DR servers and to accommodate more upcoming applications, Storage upgrade is proposed.

**Proposal** - It is proposed to upgrade storage for business continuity purpose when its primary data center is unavailable.

# **Benefits**

- Stringent data integrity to avoid any revenue leakage
- Optimum Data management.
- Improved System Performance
- The Power to Handle Bigger Data.
- Streamline system administration
- Data Security & Safety

## 6. Backup Software



**Background** - A proper facility of Backup and restore of important business-critical data is needed for smooth function of the IT system and to cater the customer needs in efficient manner. The biggest benefit of regular remote data backup is its Higher Reliability. Remote backup can be automated and updated on a daily basis or at a set time interval based on importance and requirement. Since backup is done via the internet, quick recovery of any files/ data is possible.

**Requirement** - Back up software create copies of business data & keep them secure and restore backup data onto devices if and when necessary. It offers protection for business data by copying data from servers, databases, desktops, laptops and other devices in case user error, corrupt files or physical disaster. In the event of data loss, data is restored to its previous state from a backup.

**Proposal** - It is proposed to procure 70 instances back up software with 7 Years Warranty to cater the new backup requirement.

## **Benefits**

- Restore business critical data
- Disaster Recovery
- Remote Backup
- On-Demand Restoration
- Security and Compliance
- Greater Reliability

**Scheme Completion Time** - One years from date of CAPEX approval by OERC.

# 7. Upgrade Existing Tape library

**Background** - Tape backup is the practice of periodically copying data from a primary storage device to a tape cartridge so the data can be recovered if there is a hard disk crash or failure. Tape backups can be done manually or be programmed to happen automatically with appropriate software. A proper facility of Backup and restore of important business-critical data is needed for smooth function of the IT system.

**Requirement** - All offices of TP Central Odisha need to be enabled with IT system to provide best in class services to consumers. For functioning of important business processes, backup and archiving of massive amount of business data and meeting the PA timelines, TPCODL is



required to upgrade existing Tape Library.

**Proposal** - TPCODL is required to upgrade existing Tape Library during FY: 2023-24 to cater to increasing amount of business data.

#### **Benefits**

- Durability.
- Record keeping.
- Backup and archiving
- Reduction in storage cost
- Less prone to Cyber-attacks.

**Scheme Completion Time** - One years from date of CAPEX approval by OERC.

## 8. Digitization of Documents

**Background** - TP Odisha DISCOMs has envisaged the requirement for Implementation of Centralized Digital Workplace Suite (namely, TP DWS) for its distribution companies within Odisha namely, TPSODL, TPWODL, TPNODL and TPCODL as a centralized web-based application which can be accessed by its employees of various divisions/ sub-divisions/ circle offices/ other offices of the state over Omni Channels such as Laptops, Mobile application, desktop, Chatbot etc. This application will help TP Odisha DISCOMs to effectively automate their Inward and Outward processes/documents/workflows etc. It is submitted that TPCODL will incur expenditure of the portion it is going to use.

**Requirement** - Implementation of Centralized Digital Workplace Suite (namely, TP DWS) will bring transparency & accountability in the system and provide additional tool for TP Odisha DISCOMs Officials to effectively track the Inwards and Outwards communications across the organization over One Integrated platform.

The proposed system is expected to be a proven framework, which can be leveraged for other business process automation in future as per future business needs. Therefore, the proposed solution is expected to be flexible, scalable and modular framework with provision for future service configuration and customization.

**Proposal** -It is proposed for implementation of Centralized Digital Workplace Suite (namely, TP DWS) for its distribution companies within Odisha.

# Benefits -

- a) One Integrated System driven by a proven framework-based solution
- b) Multi-Tenant platform enabling all DISCOMs over an integrated centralized platform
- c) Improve Automation / Digitization Quotient
- d) Integrated Dashboard & Real Time Legacy
- e) Omni Channel access



- f) Digitization of Legacy
- g) A scalable and flexible futuristic framework-based platform based on open source and open standards for enabling business services incrementally in future

### 9. Server with OS at DR and DC

**Background** - TPCODL has leveraged the power of Information Technology to provide best in class services to consumers, earn consumer delight, and improve satisfaction among other stakeholders. Hence, a proper IT Infrastructure is needed for smooth function of IT system and to cater the customer needs.

**Requirement** - IT systems have been implemented to provide end-to-end solutions for important business functions viz. Commercial, Operations, Finance, HR and Administration etc. Also for business continuity purpose, Disaster recovery center (DR site to recover and restore its data, technology infrastructure and operations when its primary data center is unavailable) is being set up to quickly recover data from disasters. For business continuity purpose, 30 numbers of Servers with operating system is being proposed to procure and install at DR Center during FY: 2024-25. In addition, as the warranty of the existing Servers at Data Center shall expire after 5 years from date of installation, it is proposed to procure and install 30 numbers of Servers with operating system at Data Center during FY: 2027-28.

**Proposal** -It is proposed to procure and install 30numbers of Servers with OS at DR for business continuity purpose and to procure and install 30numbers of Servers with OS at DC to replace the out of warranty Servers.

#### Benefits -

- Optimum Data management.
- Improved System Performance
- Streamline system administration
- Efficiency in performing critical business processes

**Scheme Completion Time** -Five years from date of CAPEX approval by OERC.

**Conclusion** - Strengthening of IT infrastructures shall result in

- 1 Ease of operational activities and communication
- Better customer handling and service
- Enhanced customer satisfaction



# 2.5.4 Centralized Server Room at Technology Center, PAC, & BMS –IT Scheme

Activity planned	FY 23 - 24
Set up of Centralized Server Room at Technology Center, PAC	₹ 25.00 Cr
& BMS	

**Background** - A robust, reliable, resilient, scalable and secure IT and OT system is vital for providing reliable power and services to consumers. To ensure the running of critical IT & OT applications, set up of Server Room is required for housing of hardware, server, rack and network communication equipment.

Requirement - Technology Centre which is being established at Power House Area to host all the IT and OT systems pertaining to Metering, Billing, collection and SCADA for all 4 utilities – TPCODL, TPWODL, TPNODL and TPSODL. These systems being used for delivering distribution services to all the consumers of Odisha – approx. 1 Cr. Electricity distribution comes under the critical infrastructure for the nation and continuous, reliable along with stable power distribution services is vital. Continuous operations of technology components are mandatory to ensure stable supply in the distribution services. In order to keep all the technology components functioning, reliable power supply from multiple power sources are mandatory. Design of technology centre as per best practices are being built by providing power through Online UPS and DG Set, online redundant UPS will ensure clean power to the Servers whereas DG Set provide power services in case of electricity outages due to simultaneous maintenance or failure at Grid level, UPS level, Batteries level.

Many critical services like AMR, GIS, CRM, SAP ERP, SAP-ISU etc. are being implemented and run on 24x7 basis for providing reliable power supply to consumers and ensuring best in class customer services. It is proposed to set up of Server Room at Technology centre, which will enable operational excellence, value added customer services, optimized distribution system asset performance, energy efficiency and conservations, and environmental sustainability.

Following aspects have been taken into consideration for the Centralised Data Center.

- 1. New Technology Centre at Bhubaneswar will house the Data Center facility for TPCODL along with other three (03) Discoms (TPNODL, TPSODL, and TPWODL) of Odisha.
- 2. Data Center shall hold Production, Development and Testing / Staging Server environments for both IT and OT applications like SAP-ISU, SAP-ERP, SAP BW HANA, GIS, Smart Metering (Head End System & Meter Data Management System), Call Center



System, Mobile and Web applications like Spot Billing, Spot Collection, Counter Collection, Payment Gateway Integration, Mera MMG, Suraksha Kavach, Samadhan, Vishleshan, Heatmap, BIRD, CSAT, iCAMS, Permit to Leave, Biometric System, Integration Server, NMS & EMS Solution SCADA & DMS etc.

- 3. Apart from above to handle proper communication, networking and Cyber-Security, various network, Communication & Security appliances (e.g. Next-Gen Firewall, SIEM, SOAR, WAF, PAM, IPS / IDS, Centralised Console for End-Pont & Servers etc) shall also be placed to facilitate monitoring of smooth running of network via NOC, smooth running of DC via Security Operation Centre (SOC) endpoint Security.
- 4. Additionally, to support the huge data, Racks with Unified Storage, Tape Library, and Backup Infra are to be placed inside the Data Center for each Discom.
- 5. Even Racks should also be kept for the expansion towards delivery of future projects.
- 6. Like TPCODL, 25 Racks shall be utilized by each Discom to handle IT & OT applications totaling to 100 Rack provision.
- 7. Online UPS is to be provisioned to supply uninterrupted (0 ms), rectified and clean power to these sensitive equipment in the 100 Racks. Similarly, precision AC provisioning is also to be done for cooling of these servers along with controlledenvironment.
- 8. While housing the Server of other three Discoms, they shall enter into agreement with TPCODL for colocation Charges per Rack basis. This will lead to quick achievement of Rol.

**Proposal** -It is proposed for Set up of Server room with 100-rack space at Technology Center. **Scope of Proposal** –



Server Room PAC, BMS & UPS		FY 23-24			
			Unit Price	Total Price (Rs.	Price with
Sr. No	Item Description	Unit	(Rs.Cr)	Cr)	Cr)
PAC with 5	Years Warranty Support				
1	Supply of floor mounted bottom discharge 30TR Air cooled Precision Air Conditioner with scroll compressor & SNMP card	6	0.42	2.52	3.23
	Installation and commissioning of floor mounted				
2	bottom discharge 30TR Air cooled Precision Air Conditioner	6	0.06	0.36	0.42
PAC Sub To	tal				3.65
BMS with 3	Years Warranty Support				
1	Addressable Fire Alarm System	1	0.44	0.44	0.56
2	Server Room Gas based Suppression system	1	0.6	0.6	0.76
3	VESDA (Very Early Smoke Detection Apparatus)	1	0.08	0.08	0.1
4	WLD (Water Leakage Detection System)	1	0.05	0.05	0.06
5	Rodent Repellent	1	0.04	0.04	0.06
6	CCTV system	1	0.25	0.25	0.36
7	Access Doors	1	0.25	0.25	0.33
	DCIM (Data Centre Infrastructure Management	4	0.24	0.24	0.42
8	System)	1	0.34	0.34	0.43
BMS Sub To	rtal				2.66
UPS with 4	Years Warranty Support				
	Supply & installation of 600 KVA UPS System 3Ph/3Ph. With Battery circuit breaker, SNMP card and Paralleling kit to work in N+N				
1	configuration - Set	2	1.2	2.4	2.832
2	Supply & installation of LI-ION Battery with 1 hour back up on 600KVA load (Battery Bank) – Set	2	5.704	11.4	14.592
3	Power distribution unit with K13 rated Isolation Transformer in N+N configuration	2	0.4	0.8	0.944
4	60 KVA UPS for auxiliary load and emergency lighting (SCADA Display Panel, IT Display Panel, Camera, Access Control & Biometric) - Set	1	0.192	0.192	0.224
5	SMF Battery for 1 hour back up – Set	1	0.08	0.08	0.104
UPS Sub To	tal				18.696
	Total (PAC, BMS & UPS)				25.006

**Budgetary Requirement** - The approx. Capex budget requirement for set up of Server room with 100-rack space at Technology Centre is **Rs.25 Cr**. While this centralized server room is going to be built by TPCODL, it will be used by all four DISCOMs. Other three DISCOMs will enter into agreement for hosting their servers in this server room on chargeable basis.

#### Benefits -

- Infrastructure for business critical applications.
- Providing reliable power supply to consumers through availability of IT & OT services



- Ease in monitoring and control of IT & OT system.
- Meeting PA timelines leading to consumer satisfaction
- Efficiency in performing critical business processes
- Ease in inter office communication and ease of availability of legacy documents

**Scheme Completion Time** - One years from date of CAPEX approval by OERC.

### 2.5.5 Civil Upgradation

In the Infrastructure Head, many civil related activities are planned in the next 5 years. Details of the same along with Total Budget requirement are mentioned below:



A - 1 * *1	D. J. J.	Latter Control
Activity	Budget	Justification
Planned	req. (Rs.	
	Cr)	
Distribution	1.0	Currently many DT foundations are coming under submerged
Transformer		condition and most of the DT transformer need to be upgraded in
foundation -		coming years for load enhancement. New DT foundations will be
100		constructed to mitigate the DT foundation Requirement.
numbers/year		
PSS	2.0	At many locations, the existing compound wall is of only 1mtr to 1.4
Compound		metre height. Also at many locations there are no compound walls
Wall works -		available to protect form theft and encroachment. In view of above it
25 numbers /		is planned to take up upgradation of existing compound wall and also
year		to construct new compound wall to secure the area.
Chain-link	1.0	Bill collection centers and Section offices are housed inside our PSS
	1.0	
0		premises. Local public visit these locations for bill payment and bill
switch yard		resolution. Due to unavailability of barricading inside switchyard side,
		it has become and identified as high hazard area. Under this project it
		is planned to take up chain-link fencing in a phased manner of such
		locations to restrict unauthorized entry of local public.
Structural	2.5	We have already completed renovation of section offices about 150
strengthening		numbers out of 247 in previous year capex Budget as planned in
of Section		phased manner. Under this plan it is intended to take up renovation
Offices		of remaining section offices. Also around 40 section offices are under
		rented premises and are operating form nonuser friendly work
		environment. It is proposed to construct new section offices in nearby
New	2.5	PSS premises utilizing our land available, thereby creating a user
construction		friendly and hygienic workplace to employees and consumers.
for Rented to		
own locations		
Workshop at	0.4	It is proposed to utilize the existing discarded/retired equipment and
Infocity		do refurbishment of the equipment. Currently there are no
		sheds/workshop available for carrying out such activities. Hence it is
		proposed construct a workshop at Infocity PSS.
Furniture at	2.1	We have upcoming technology center of seating capacity 180
offices		numbers and an office building at Nayapalli by OPTCL of seating
		capacity 200 Nos and SCRIPS building 4 numbers of 30 seating
		capacity each. Budget proposed under this shall be used to cater to
		above said buildings and to newly renovated and constructed Section
		offices.
New Store	0.4	During Cyclones it is envisaged that material movement form Cuttack
Shed at KED-I		to Paradeep circle becomes difficult and are readily non-available due
Siled de RES 1		to lack of proper storage facility. It is proposed to construct a storage
		shed in KED -1 premises to store necessary materials and equipment
		at these stores.
Store-Security	2.5	During erstwhile CESU period, materials were stored haphazardly on
Store-Security	2.5	, , ,
enhancement		open ground and at present, they are beyond revival due to formation
and Concrete		of sludge. Under this Capex it is proposed to upgrade the flooring by
flooring		GSB and Concreting of store Area which will in turn help in proper and
		safe storage and revival of material.
		Also security arrangements such as security chowky, watch tower,
		Compound wall are proposed.



DT overhauling workshop division wise	1.0	Currently there are no workshops for transformer overhauling. Hence all the repairs are conducted in open, which in turn provides less output. Therefore is it proposed to construct a DT overhauling workshop in each circle which can cater to repair needs of transformer.
Civil Infrastructure for Technology centre	4.61	Escalated cost of HVAC and other materials to complete the construction of Technology Center
Total	21.0	



#### 2.5.6 RMU / DT Workshop

Scheme	RMU / DT workshop
Proposed	
Capex Amount	₹ 1.20 Cr
Benefit to customer	<ul> <li>Improving the safety of people &amp; stray animal Improving safety of the equipment.</li> </ul>
	<ul> <li>Improved working environment for comfort of customer and employees.</li> </ul>

**Existing system in Place** - TPCODL has a vast ring network comprising of 750 RMU, 238 CSS & 270 auto reclosers, which deliver reliable and quality power supply to its valuable customer base. Further, ACB is also being installed by project team on continuous basis. Various issues which generally arises during day to day operations are being attended by cable & switchgear team. A total of 93 numbers of complaints have been resolved as on Sep-22. However, there are several other issues which can't be repaired on site. Either the switchgear needs to be lifted by OEM for repairing at their manufacturing plant or it is scrapped along with installation of a new one.

Repairing at vendor premises is again a very costly affair as the transportation charges for "To & Fro" journey is too expensive in addition to repairing cost.

These type of issues are generally as follows -

- a) SF6 Leakage from Tank Surface or Bushings
- b) Damaged/Faulty Bushings of RMU
- c) Flashover
- d) Internal Contact Problem inside SF6 Tank
- e) Internal short circuit inside SF6 Tank etc.

**Proposed system-** In view of above, we propose to set up a switchgear workshop with basic in-house testing & repair facility. The various activities that can be carried out in the workshop are repairing SF6 gas tanks, fabrication of switchgear doors & covers, replacement of complete mechanisms, renovation of flash over RMU/CSS with painting, ACB pole replacement, CSS overhauling, auto recloser spare replacement with testing etc.

**Benefits-** We do hope that this activity would help to enhance the life of switchgear through in-house 'testing & repair' facility as well as reduce the operational expenditure (OPEX) as compared to repairing of this high value assets at vendor premises.



## 2.5.7 GIS Implementation

Scheme Proposed	GIS Implementation
Capex Amount	₹ 13.00 Cr
Benefit to customer	Improving the safety of people & stray animal Improving safety of the equipment
	improving safety of the equipment

**Existing system in place**-As per approved Road map of GIS, status of GIS implementation is as follows:



Activity	Up to FY 23	FY23	Expected by	Remarks
	Plan	Actuals till Oct'22	March'23	
33/11kV Network including GSS Boundary, All PSS and its Connected Network for entire TPCODL Area	All total 374 Nos PSS, 820 Nos Power Transformer 3,743.28 Km of Network Length captured	Completed and available in GIS System		Data and Application Rolled out
11 kV (line UG and OH) network for entire TPCODL	Approx. 35000 Linear Km of Network and its connected 79034 Nos of DT to be captured	22076 Km Linear Length and its connected poles captured 53282 Nos of DT Captured	Activity to be completed by Mid of March	Data and Application tobe Rolled out
LT Line (UG and OH) network to be captured for entire TPCODL	Approx. 58205 Linear Km of Network and its connected DT to be captured	20197 Km Linear Length and its connected poles captured	Another 25000 Km Linear Length to be captured	Data and Application tobe Rolled out
Consumer Indexing to be completed for entire TPCODL	Approx. 27 Lakhs consumer to be captured	12.8 Lakhs consumer captured	Another 10 lakhs consumer to be captured	Data and Application tobe Rolled out
Implementation of ESRI enterprise GIS Solution	Upgradation of Hardware, Software and Its installation, Configuration and Integration with other modules (SAP, NA, MDAS, SCADA and Energy Audit)	Database and Application Configured in DC environment Cut off data migrated and Production environment rolled out Staging Table for Integration is ready for data exchange	All integration to be activeand made synch able	Depending on readiness of other module the data will flow from and to other systems. DR to be established

**Need of the Project** – Due to climatic condition and local resistances, the consumer indexing activity got delayed and to be completed by FY 24. In the meantime, the changes happening at site is also being captured to make the GIS data updated till final roll out of the project.

**Proposal for the capex investment** – Due to delay and absence of funds **(As only 20 Cr approved against 33 Cr for FY 23)**, work order for Land base, Data Migration activity couldn't be processed. Implementation of upgraded GIS with DC and DR Configuration along with other modules (SCADA, Smart Meter/ MDAS) could also not be started.



### 2.5.8 Ready to Use Office Assets

In TPCODL, the office space is currently crowded and lacks proper seating plan. Some of offices are owned and others are on rented property. One of the challenges existing in TPCODL in using current buildings and infrastructure is to accommodate more employees in already existing property and providing a hygienic, well ventilated and spacious working environment to our colleagues.

In last 3 FY, we have renovated many parts of our existing offices, which included shifting of old files and shelves – thereby increasing the floor area and also using proper seating arrangement in a planned manner.

With the objective to provide best in class services to consumers, earn consumer delight, and improve satisfaction among other stakeholders and maintaining a clean & safe working environment, following infrastructures are required at work place:

- a) Most of the chairs currently existing in our office are wooden, which is not the best option to be considered from ergonomic point of view. That is why, ergonomic office chairs are designed for sitting long periods with ease. This naturally helps employees work more efficiently and productively. Another benefit is reduction in healthcare expenses related to poor posture from unsuitable office chairs. Already replacement have been made in few of our offices.
- b) Considering the fact that the state of Orissa is one of the most humid states of our country, Water cooler & R.O Water Purifiers are required for proper hydration employees and to ensure good health and improve overall efficiency.
- c) Office air conditioning systems are required to provide a comfortable working environment to bring and control Energy Efficiency, Humidity, Air Quality, and Reduction in Noise & Keeping Business Critical Equipment at the Right Temperature. In addition, stabilizers are advised along with A.Cs to avoid voltage fluctuations.



To facilitate smooth operation and support hygiene and conducive work environment, TPCODL proposes **Rs.1.84 Cr.** under Admin head to support various departments / locations.

Table 2-23 : Cost estimate Ready to use Office Assets

Sl.no.	Item	Value (in Rs. Cr)
1	Office Furniture	1.00
2	Water Cooler / Purifier	0.13
3	Air conditioner	0.55
4	Office Ready to use Asset	0.16
	TOTAL	1.84

	ANNEXURE-1 Interposing Poles						
SI. No.	SI. No. Description Quantity (in nos.)						
1	13mtr WPB Poles	130	0.8				
2	11mtr WPB Poles	320	1.6				
3	3 9mtr PSC Poles 525		0.8				
	Total						

	Standard BoQ for 13mtr WPB Pin point Pole						
	No. of 13mtr WPB Pin point poles			1			
	MATERIALS FOR 33 KV Pin Points						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	1	31,200.00		
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	1	1,959.20		
3	Top bracket 100x50x6mm GI channel ( 2kg each)	No.	186.00	1	186.00		
4	Danger Plate, 1 no's.	No.	99.20	1	99.20		
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.30	27.98		
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3.00	297.60		
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.20	111.93		
8	33KV pin insulator polymer	No.	595.20	3	1,785.60		
9	Earthing of Support ( Coil Type )	No.	205.84	1	205.84		
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.26	24.37		
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	1.45	140.24		
12	Black Paint	Ltr	272.80	1.0	272.80		
13	Yellow Colour Paint for Background	Ltr	272.80	2.0	545.60		
A				ost of materials	36,856.37		
В	<u> </u>	stock, Sto		ance i.e 3% of A  Sub Total (A+B)	1,105.69		
<b>C</b>				ency @ 3% of C	<b>37,962.06</b> 1,138.86		
E				lants @ 2% of C	759.24		
F				ion @ 7.5% of C	2,847.15		
G	Erection Charge	es @ 5%		er/WPB/ H-Pole	1,606.80		
Н	Erection Charges @ 10% of C (except Trf/Breake	r/WPB/	H-Pole/HT sta	y set/PSC pole)	582.61		
ı	Erection Charges @ 20%	of PSC	oole- Not to b	e used for 33kv	-		
J				Sum of (C to I)	44,896.72		
	<u>Civil &amp; Services</u>						
SI.	Description of Materials	Unit	Unit Rate	Total	Total		
No.		Ont	Offic Rule	Quantity	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		
К	K Total Civil & Services						
L	Total (J+K)						
М	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				2,952.18		
N	Sub Total (L+M) 5						
0	Total GST @ 18% of (N)				9,387.93 521.55		
P	Total CESS @1% of (N)						
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points 62,0						

	Standard BoQ for 11mtr WPB Pin point Pole						
	No. of 11mtr WPB Pin point poles 1						
	MATERIALS FOR 11 KV Pin Points With WPB						
SI.	Description of Materials	Unit	Unit   Unit Rate		Total		
No.	Description of Waterials	Oint.	- Ome nate	Quantity	Amount		
1	WPB 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No.	26,516.95	1	26,516.95		
2	11 KV V cross Arm (10.2 K.g. each)	No.	1,004.40	1	1,004.40		
3	Top bracket 100x50X6 mm GI channel (2kg each)	No.	186.00	1	186.00		
4	Danger Plate, 1 no's. for each pole	No.	99.20	1	99.20		
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.30	27.98		
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3.00	297.60		
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.20	111.93		
8	11 KV pin insulator polymer, 3 Nos. required for each support	No.	248.00	3	744.00		
9	Earthing of Support ( Coil Type )	No.	205.84	1	205.84		
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.26	24.37		
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	1.45	140.24		
12	Black Paint	Ltr	272.80	1.0	272.80		
13	Yellow Colour Paint for Background	Ltr	272.80	2.0	545.60		
Α			Total Cost o	of materials	30,176.92		
В	Stock	, Storage	e & Insurance	i.e 3% of A	905.31		
С			Sub 1	Total (A+B)	31,082.23		
D			Contigency	/ @ 3% of C	932.47		
E		1	ools & Plants	@ 2% of C	621.64		
F		Tra	nsportation (	@ 7.5% of C	2,331.17		
G	Erection Charges @	5% on T	rf/Breaker/W	/PB/ H-Pole	1,365.62		
Н	Erection Charges @ 10% of C (except Trf/Breaker/W	PB/ H-Po	le/HT stay se	t/PSC pole)	376.98		
I	Erection Charges @ 20% of F	SC pole-	Not to be us	ed for 33kv	-		
J			Sur	n of (C to I)	36,710.10		
	<u>Civil &amp; Services</u>						
1	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	0.45	2,925.00		
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.11	731.25		
K							
L	Total Material+Services (I+K)						
М					2,421.98		
N	Sub Total (L+M)				42,788.34		
O P					7,701.90 427.88		
Q							
<u> </u>	Gross Total Material +Services (N+O+P) for 33 KV Pin Points 50,918						

	Standard BoQ for 9mtr PSC Pole					
	No. of 9mtr PSC Poles			1		
	MATERIALS FOR 9mtr PSC Poles					
SI.	Description of Materials Unit Unit Rate Total					
No.	•	0		Quantity	Amount	
1	PSC POLE 9 METER LONG 300 KG	No	3,720.00	1	3,720.00	
2	PSC Pole V cross Arm Back Clamp	EA	99.20	1	99.20	
3	11 KV V cross Arm (10.2 K.g. each )	No.	1,004.40	1	1,004.40	
3	Top bracket 100x50X6 mm GI channel (2kg each)	No.	186.00	1	186.00	
5	Danger Plate, 1 no's. for each pole	No.	99.20	1	99.20	
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.30	27.98	
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3.00	297.60	
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.20	111.93	
9	11 KV pin insulator polymer, 3 Nos. required for each support	No.	248.00	3	744.00	
10	Earthing of Support ( Coil Type )	No.	205.84	1	205.84	
11	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.26	24.37	
12	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	1.45	140.24	
13	Black Paint	Ltr	272.80	1.0	272.80	
14	Yellow Colour Paint for Background	Ltr	272.80	2.0	545.60	
Α			Total Cost of	of materials	7,479.17	
В	Stock,	Storage	& Insurance	i.e 3% of A	224.38	
С			Sub <sup>-</sup>	Гotal (A+B)	7,703.54	
D			Contigency	/ @ 3% of C	231.11	
Е		To	ools & Plant	s @ 2% of C	154.07	
F		Tran	sportation (	@ 7.5% of C	577.77	
G	Erection Charges @					
H	Erection Charges @ 10% of C (except Trf/Breaker/WP	•			387.19	
	Erection Charges @ 20% of P	SC pole-			766.32	
J			Sui	m of (C to I)	9,820.00	
	<u>Civil &amp; Services</u>	1	1	<u> </u>		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	0.38	2,437.50	
К	Total Civil & Services					
L	Total (J+K)				2,437.50 12,257.50	
М	Other overheads (Including 6% supervision charges) of L				735.45	
N	Sub Total (L+M)				12,992.95	
0	Total GST @ 18% of (N)				2,338.73	
P	Total CESS @1% of (N)				129.93	
Q					15,461.61	
_ ۷	GIOSS TOTAL INIGIELIAL TSELVICES (INTOTP) TOL 55 NV PIN POINTS					

	ANNEXURE-2 DT Plinth, Boundary Wall Fencing						
SI. No.	Description	Amount (in cr.)					
1	DT Plinth (250kVA)	190	0.6				
2	DT Plinth (500kVA)	160	0.6				
3	Boundary Wall	160	1.9				
4	Fencing	1.9					
	Total	5.0					

	Standard estimate for a DTR Plinth for	r <b>250</b> K	VA Trf.		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction of Plinth with Brick, Mortar, 12 mm cement plaster for 250KVA transformer as per TPCODL drawing. Scope of work includes excavation of earth, supply of Civil material, machinery for construction of plinth as per TPCODL Drawing desposal of extra malba as per EIC instruction.	No.	25,000.00	1	25,000.00
Α			Total Civil	& Services	25,000.00
В	Other overheads ( Includin	ng 6% s	upervision ch	arges) of A	1,500.00
С	Sub Total (A+B)				
D	Total GST @ 18% of (C)				
E Total CESS @ 1% of (C)					265.00
F	F Gross Total Material +Services (C+D+E)				

Standard estimate for a DTR Plinth upto 500KVA Trf.						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	Construction of Plinth with Brick, Mortar, 12 mm cement plaster for 500KVA transformer as per TPCODL drawing. Scope of work includes excavation of earth, supply of Civil material, machinery for construction of plinth as per TPCODL Drawing desposal of extra malba as per EIC instruction.	No.	30,360.00	1	30,360.00	
Α			Total Civil	& Services	30,360.00	
В	Other overheads ( Includir	ng 6% s	upervision ch	arges) of A	1,821.60	
С	Sub Total (A+B)					
D	Total GST @ 18% of (C)					
Е	E Total CESS @ 1% of (C)					
F	Gross Total Material +Services (C+D+E)					

	Standard estimate for Boundary Wall Fencing								
SI. No.	Description of Materials	Unit	Quantity for 1 No's DSS	No. of DSS Requirment	Unit Rate	Total Quantity	Total Amount		
1	Boundary wall fencing with 2Mtr Height Sqmtr. 20 1 4,620.00 20								
Α					<b>Total Civil</b>	& Services	92,400.00		
В		Other	overheads	( Including 6% s	upervision ch	arges) of A	5,544.00		
С					Sub	Total (A+B)	97,944.00		
D	Total GST @ 18% of (C)						17,629.92		
Е	E Total CESS @ 1% of (C)						979.44		
F Gross Total Material +Services (C+D+E)						1,16,553.36			

	Standard estimate for Fencing								
SI. No.	Description of Materials  Unit  Quantity for 1 No's DSS  No. of DSS Unit Rate Quantity Requirment Quantity								
1	Supply and Erection of GI Fencing with Gate Sqmtr. 20 1 3,600.00 20								
Α					<b>Total Civil</b>	& Services	72,000.00		
В		Other	overheads	( Including 6% s	upervision ch	arges) of A	4,320.00		
С					Sub	Total (A+B)	76,320.00		
D	D Total GST @ 18% of (C)						13,737.60		
E Total CESS @ 1% of (C)						@ 1% of (C)	763.20		
F Gross Total Material +Services (C+D+E)					90,820.80				

	ANNEXURE-3 Unsafe to Safe			
SI. No.	DESCRIPTION OF WORK	Unit	Quantity (in km)	Amount (in cr.)
1	Conversion of LT Bare/ deteriorated LT AB Cable to LT AB Cable (4X95 sq.mm)	Km	8.5	0.8
2	Conversion of LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX70 sq.mm)	Km	14	1.2
3	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX50 sq.mm)	Km	18	1.2
4	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX35 sq.mm)	Km	14	0.8
5	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (2CX35 sq.mm+1CX35 sq.mm)	Km	11	0.5
	Total		65.5	4.50

Conve	rsion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span usin	ng - 4C×9	95 mm² (3P+1N	)+1C×95 mn	n²(M)+1CX16
	mm²(Street Light)				
AB Co	able LT Line Length In KM with 33 Mtr. Span Ref. Drawing No TPCODL)			1	
	MATERIALS FOR Conversion of LT Bare	to LT Al	B Cable		
SI. No.	Description of Materials	Unit	Unit Rate	Total	Total
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	<b>Quantity</b> 10	Amount 37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp ( 1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp	NO.	37.20	,	180.00
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×95 mm² (3P+1N)+1C×95 mm²(M)+1CX16 mm²(Street Light)	K.M	3,68,640.00	1.05	3,87,072.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80
12	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap- 1.5 to 16 sq.mm	No.	40.06	30	1,201.80
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	3	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, $0.59$ Kg/Mtr. Flat of $0.510$ mtr length 1 no's = $(1x0.59x0.510)$	KG	93.00	3	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
Α	Total Cost of materials				
В	Stock, Storage & Insurance i.e 3% of A				15,860.85
С	Sub Total (A+B)				5,44,555.83
D			Contigency		16,336.67
E			Tools & Plants		10,891.12
F	Erection Charges (		ransportation @		40,841.69
G H					- 49 0E7 24
- 11	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)  Fraction Charges @ 20% of PSC pole. Not to be used for 33ky				48,957.24

Erection Charges @ 20% of PSC pole- Not to be used for 33kv

7,663.20

SI. No.	Description of Materials					
J	Sum of (C to I)					
	<u>Civil &amp; Services</u>	1 1		<u> </u>		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	Fixing of LT 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	5	11,250.00	
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00	
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00	
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00	
5	Dismantling of ACSR/AAAC 34/55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00	
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00	
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00	
					66,896.00	
K	Total Civil & Services					
L	Total (J+K)				<b>7,36,141.74</b> 44,168.50	
M	Other overheads (Including 6% supervision charges) of L					
N	Sub Total (L+M)					
0	- ' '					
P						
Q	Q Gross Total Material +Services (N+O+P) for LT AB Cable Line					

# Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×70 mm² (3P+1N)+1C×70 mm²(M)+1CX16 mm²(Street Light)

AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.-TPCODL-.....)

1

### MATERIALS FOR Conversion of LT Bare to LT AB Cable

-	MATERIALS FOR Conversion of ET dute to ET AD Cubic					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00	
2	LT Stay set Complete	Set	644.80	5	3,224.00	
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00	
4	LT stay Clamp ( 1.40Kg/pair)	Pair	136.40	5	682.00	
5	LT Stay insulator	No.	37.20	5	186.00	
6	LT Accessories with Eye hook and Clamp				-	
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00	
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20	
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80	
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60	
7	4C×70 mm² (3P+1N)+1C×70 mm²(M)+1CX16 mm²(Street Light)	K.M	3,05,000.00	1.05	3,20,250.00	
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00	
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00	
10	Insulated piercing connector.Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48	
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80	
12	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80	
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00	
14	Coil Earthing	No's	205.84	5	1,029.20	
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66	
16	Danger plate (LT)	No	99.20	10	992.00	
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84	
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00	
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00	
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00	
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60	
22	Black Paint	Ltr	272.80	10	2,728.00	
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00	
Α			Total Cost o		4,61,872.98	
В						
С	Sub Total (A+B)					
D	Contigency @ 3% of C				14,271.87	
E	Tools & Plants @ 2% of C				9,514.58	
F	Transportation @ 7.5% of C				35,679.69	
G	Erection Charges				-	
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				42,074.57	
<u> </u>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20	
J			Sur	n of (C to I)	5,84,933.08	

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
	<u>Civil &amp; Services</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT 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	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
К			Total Civil	& Services	66,896.00
L	Total (J+K)				
М	<u> </u>				
N	·				
0					
P					
Q	Q Gross Total Material +Services (N+O+P) for LT AB Cable Line				

# Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×50 mm² (3P+1N)+1C×50 mm²(M)+1CX16 mm²(Street Light)

AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.-TPCODL-.....)

	MATERIALS FOR Conversion of LT Bare	to LT AB	<u>Cable</u>		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp ( 1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×50 mm² (3P+1N)+1C×50 mm²(M)+1CX16 mm²(Street Light)	K.M	2,26,000.00	1.05	2,37,300.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80
12	Insulated piercing connector. Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	and the second s		Total Cost o	_	3,78,922.98
В	Stor	ck, Stora	ge & Insurance		11,367.69
C	Sub Total (A+B)				
D	Contigency @ 3% of C				<b>3,90,290.67</b> 11,708.72
E	Tools & Plants @ 2% of C				7,805.81
F	Transportation @ 7.5% of C				29,271.80
G	Erection Charges (				-
Н	Erection Charges @ 10% of C (except Trf/Breaker/V				33,530.72
ī	Erection Charges @ 20% of				7,663.20
J	- 445 3				
J Sum of (C to I) 4,8 <u>Civil &amp; Services</u>					

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT 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	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
К			Total Civil	& Services	66,896.00 5,47,166.92
L	Total (J+K)				
M					
N	· '				
O P					
Q	Grass Tatal Material ±Ser	vices (N±			5,799.97 <b>6,90,196.35</b>
<u> </u>	Gross Total Material +Services (N+O+P) for LT AB Cable Line				

## Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×35 mm² (3P+1N)+1C×35 mm²(M)+1CX16 mm²(Street Light)

AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.-TPCODL-.....)

1

### MATERIALS FOR Conversion of LT Bare to LT AB Cable

No.	SI.	Description of Materials	Unit	Unit Rate	Total	Total
2		• •				
3   7/12 SWG GI stay wire, Grade -2   Kg   93.00   60.00   5.580.00   4   LT stay Clamp (1.40Kg/pair)   Pair   136.40   5   682.00   5   LT Stay Insulator   No.   37.20   5   186.00   6   LT Accessories with Eye hook and Clamp   No.   37.20   5   186.00   6   LT Accessories with Eye hook and Clamp   No.   74.40   18   1,339.00   6   LT Accessories with Eye hook and Clamp   No.   74.40   18   1,339.00   6   LT Experiment of the Type Insulator   No.   74.40   18   1,339.00   6   LT Experiment of the Type Insulated Cable   No.   74.40   18   1,339.00   6   LT Experiment of Type Insulator   No.   74.40   18   1,339.00   6   LT Experiment of Type Insulator   No.   74.40   18   1,339.00   6   LT Experiment of Type Insulator   No.   80.60   18   1,450.80   6   LT Experiment of Type Insulator   No.   80.60   18   1,450.80   6   LT Experiment of Type Insulator   No.   80.60   18   1,450.80   7   4C×35 mm² (3P+1N)+1C×35 mm² (M)+1CX16 mm² (Street Light)   K.M   1,69,000.00   1.05   1,77,450.00   8   WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.   No.   2,740.40   5   13,702.00   9   WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.   No.   4,960.00   2   9,920.00   10   Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-   No.   51.77   4   207.08   6   to 35 sq.mm   No.   40.06   40   1,602.40   11   Insulated piercing connector.Type-C-main 10 to 50 sq.mm & Tap-   No.   34.21   30   1,026.30   12   Sto 16 sq.mm   No.   1,302.00   5   6,510.00   13   Pipe Earthing (each 5th pole to earth)   No.   1,302.00   5   6,510.00   14   Coli Earthing   No.   Si with Coli earthing   No.   99.20   10   992.00   15   No-8 Gi wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting   Kg   93.00   2.62   243.66   16   Danger plate (LT)   No.   99.20   10   992.00   17   Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of   No.   99.20   10   992.00   18   2C X 45q, mm. Armoured Aluminium Cable - XLPE Insulated   Mtr.   36.48   250   9,120.00   19   2C X 10sq, mm. Armoured Aluminium				·	l	·
A   T stay Clamp ( 1.40Kg/pair)						
S					<del> </del>	
6. LT Accessories with Eye hook and Clamp 6.1. Pole clamp for EYE hook for (KIPE Aerial bunched Cable) 6.1. Pole clamp for EYE hook for (KIPE Aerial bunched Cable) 6.1. Pole clamp for EYE hook for (KIPE Aerial bunched Cable) 6.1. Stypension Clamp suitable for messenger XIPE Aerial bunched Cable 6.1. Suspension Clamp with EYE hook for ABC 7 4C×35 mm² (3P+1N)+1C×35 mm² (M)+1CX16 mm² (Street Light) 8 4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar. 9 8 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar. 10 Insulated piercing connector. Type-B-main 25 to 150 sq.mm & Tap-15 to 16 sq.mm 11 Insulated piercing connector. Type-C-main 16 to 95 sq.mm & Tap-15 to 16 sq.mm 12 Insulated piercing connector. Type-D-main 10 to 50 sq.mm & Tap-15 to 16 sq.mm 13 Pipe Earthing (each 5th pole to earth) 14 Coil Earthing 15 Coil Earthing 16 Danger plate (LT) 17 No. 99.20 18 Danger plate (LT) 18 Danger plate (LT) 19 Danger plate (LT) 10 Danger plate (LT) 10 Danger plate (LT) 10 Danger plate (LT) 11 Danger plate (LT) 12 Danger plate (LT) 13 Pipe Earthing (each 5th pole to earth) 14 Coil Earthing 15 Danger plate (LT) 17 No. 99.20 18 Coil Carthing 18 Coil Carthing 19 Danger plate (LT) 10 Danger plate (LT) 10 Danger plate (LT) 11 Danger plate (LT) 12 Danger plate (LT) 13 Pipe Earthing (each Sth pole to earth) 14 Coil Earthing 15 Danger plate (LT) 15 Danger plate (LT) 17 No. 99.20 18 Coil Carthing 18 Coil Carthing 19 Coil Carthing 10 Danger plate (LT) 10 Danger plate (LT) 11 Danger plate (LT) 12 Danger plate (LT) 13 Danger plate (LT) 14 Danger plate (LT) 15 Danger plate (LT) 15 Danger plate (LT) 16 Danger plate (LT) 17 Danger plate (LT) 18 Danger plate (LT) 19 Danger plate (LT) 20 D	-		Pair			
6.i.         Pole clamp for EYE hook for (XLPE Aerial bunched Cable)         Pair         248.00         39         9,672.00           6.ii.         EYE hook for XLPE Aerial bunched Cable         No.         74.40         18         1,339.20           6.iii.         Dead End Clamp suitable for messenger XLPE Aerial bunched Cable         No.         80.60         18         1,450.80           6.iv.         Suspension Clamp with EYE hook for ABC         Pair         421.60         21         8,853.60           7         4C×35 mm² (3P+1N)+1C×35 mm² (M)+1CX16 mm² (Street Light)         K.M         1,690,000.00         1.05         1,77,450.00           8         4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.         No.         2,740.40         5         13,702.00           9         8 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.         No.         4,960.00         2         9,920.00           10         Insulated piercing connector.Type-B-main 12 to 150 sq.mm & Tap-	<b>—</b>		No.	37.20	5	186.00
6.ii.         EYE hook for XLPE Aerial bunched Cable         No.         74.40         18         1,339.20           6.iii.         Dead End Clamp suitable for messenger XLPE Aerial bunched Cable         No.         80.60         18         1,450.80           6.iv.         Suspension Clamp with EYE hook for ABC         Pair         421.60         21         8,853.60           7         4C×35 mm² (3P+1N)+1C×35 mm² (M)+1CX16 mm² (Street Light)         K.M         1,69,000.00         1.05         1,77,450.00           8         4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.         No.         2,740.40         5         13,702.00           9         8 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.         No.         4,960.00         2         9,920.00           10         Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-1.5 to 150 sq.mm & Tap-1.5 to 16 sq.mm         No.         51.77         4         207.08           11         Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 10 sq.mm         No.         40.06         40         1,602.40           12         15 to 16 sq.mm         No.         1,302.00         5         6,510.00           13         Pipe Earthing (each 5th pole to earth)         No.         1,302.00         5         6,510.00		-				-
6.iii. Dead End Clamp suitable for messenger XLPE Aerial bunched Cable No. 80.60 18 1,450.80 6.iv. Suspension Clamp with EYE hook for ABC Pair 421.60 21 8,853.60 7 4C×35 mm² (3P+1N)+1C×35 mm² (M)+1CX16 mm² (Street Light) K.M 1,69,000.00 1.05 1,77,450.00 8 4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar. No. 2,740.40 5 13,702.00 9 8 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar. No. 4,960.00 2 9,920.00 10 Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap- 6 to 35 sq.mm 11 Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap- 1.5 to 16 sq.mm 12 Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap- 1.5 to 10 sq.mm 13 Pipe Earthing (each 5th pole to earth) No. 1,302.00 5 6,510.00 14 Coil Earthing (each 5th pole to earth) No. 1,302.00 5 6,510.00 15 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing Kg 93.00 2.62 243.66 90 with Coil earthing No 99.20 10 99.20.00 16 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510) 17 Colomb for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510) 18 2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated Mtr. 36.48 250 9,120.00 19 2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated Mtr. 69.27 200 13,854.00 20 4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated Mtr. 69.27 200 13,854.00 21 GI Nut, Bolt & Washer of different sizes (0.5 Kg/ Pole) Kg 96.72 5.00 483.60 22 Black Paint Ltr 272.80 10 2,728.00 23 Yellow Colour Paint for Background Ltr 272.80 10 2,728.00 24 Selow Colour Paint for Background Ltr 272.80 10 2,728.00 25 Sub Total (A+B) 3,27,788.93 26 Contigency @ 3% of C 9,833.67 26 Sub Total (A+B) 3,27,788.93 27 C Sub Total (A+B) 3,27,788.93 27 C Sub Total (A+B) 3,27,788.93						
6.iv.         Suspension Clamp with EYE hook for ABC         Pair         421.60         21         8,853.60           7         4C×35 mm² (3P+1N)+1C×35 mm² (M)+1CX16 mm² (Street Light)         K.M         1,69,000.00         1.05         1,77,450.00           8         4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.         No.         2,740.40         5         13,702.00           9         8 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.         No.         4,960.00         2         9,920.00           10         Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm         No.         51.77         4         207.08           11         Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm         No.         40.06         40         1,602.40           12         Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap-1.5 to 10 sq.mm         No.         34.21         30         1,026.30           13         Pipe Earthing (each 5th pole to earth)         No.         1,302.00         5         6,510.00           14         Coil Earthing         No's         205.84         5         1,029.20           15         No-8 Gli wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing         Kg         93.00         2.62	6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
7         4C×35 mm² (3P+1N)+1C×35 mm² (M)+1CX16 mm² (Street Light)         K.M         1,69,000.00         1.05         1,77,450.00           8         4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.         No.         2,740.40         5         13,702.00           9         8 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.         No.         4,960.00         2         9,920.00           10         Insulated piercing connector. Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm         No.         51.77         4         207.08           11         Insulated piercing connector. Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm         No.         40.06         40         1,602.40           12         Insulated piercing connector. Type-D-main 10 to 50 sq.mm & Tap-1.5 to 16 sq.mm         No.         34.21         30         1,026.30           13         Pipe Earthing (each 5th pole to earth)         No.         1,302.00         5         6,510.00           14         Coil Earthing         (each 5th pole to earth)         No.         1,302.00         5         6,510.00           15         No 8 Gli wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing         No         93.00         2.62         243.66           16         Danger plate (LT)         No         99.20	6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
8 4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar. No. 2,740.40 5 13,702.00 9 8 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar. No. 4,960.00 2 9,920.00 10 Insulated piercing connector. Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm 11 Insulated piercing connector. Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm 12 Insulated piercing connector. Type-D-main 10 to 50 sq.mm & Tap-1.5 to 10 sq.mm 13 Pipe Earthing (each 5th pole to earth) No. 1,302.00 5 6,510.00 14 Coil Earthing (each 5th pole to earth) No. 1,302.00 5 6,510.00 15 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing No's 205.84 5 1,029.20 16 Danger plate (LT) No. 99.20 10 992.00 17 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510) 18 2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated Mtr. 36.48 250 9,120.00 19 2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated Mtr. 54.50 100 5,450.00 20 4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated Mtr. 69.27 200 13,854.00 21 GI Nut, Bolt & Washer of different sizes (0.5 Kg/ Pole) Kg 96.72 5.00 483.60 22 Black Paint Ltr 272.80 10 2,728.00 23 Yellow Colour Paint for Background Ltr 272.80 10 2,728.00 24 Cyllow Colour Paint for Background Ltr 272.80 20 5,456.00 25 Sub Total (A+B) 3,27,788.93 26 Contigency @ 3% of C 9,833.67 27 Transportation @ 7.5% of C 24,584.17	6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
9 8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar. No. 4,960.00 2 9,920.00  10 Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-15 to 16 sq.mm  11 Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap-15 to 10 sq.mm  12 Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap-15 to 10 sq.mm  13 Pipe Earthing (each 5th pole to earth) No. 1,302.00 5 6,510.00  14 Coil Earthing (each 5th pole to earth) No. 1,302.00 5 6,510.00  15 No-8 Gl wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing No 99.20 10 992.00  16 Danger plate (LT) No 99.20 10 992.00  17 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)  18 2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated Mtr. 36.48 250 9,120.00  19 2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated Mtr. 54.50 100 5,450.00  20 4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated Mtr. 69.27 200 13,854.00  21 Gl Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole) Kg 96.72 5.00 483.60  22 Black Paint Sey Short (a.4.Bb) 3,27.788.93  D Contigency @ 3% of C Short (A.4.Bb) 3,27.788.93  D Contigency @ 3% of C C 5,555.78  F Tronsportation @ 7.5% of C 24,584.17	7	4C×35 mm² (3P+1N)+1C×35 mm²(M)+1CX16 mm²(Street Light)	K.M	1,69,000.00	1.05	1,77,450.00
Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
10   6 to 35 sq.mm	9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
1.5 to 16 sq.mm	10		No.	51.77	4	207.08
Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap-1.5 to 10 sq.mm   No.   34.21   30   1,026.30	11	1	No.	40.06	40	1,602.40
13   Pipe Earthing (each 5th pole to earth)   No.   1,302.00   5   6,510.00     14   Coil Earthing   No's   205.84   5   1,029.20     15   No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing   Kg   93.00   2.62   243.66     16   Danger plate (LT)   No   99.20   10   992.00     17   Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)   KG   93.00   3.01   279.84     18   2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated   Mtr.   36.48   250   9,120.00     19   2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated   Mtr.   54.50   100   5,450.00     20   4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated   Mtr.   69.27   200   13,854.00     21   GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)   Kg   96.72   5.00   483.60     22   Black Paint   Ltr   272.80   10   2,728.00     23   Yellow Colour Paint for Background   Ltr   272.80   20   5,456.00     A   Total Cost of materials   3,18,241.68     B   Stock, Storage & Insurance i.e 3% of A   9,547.25     C   Sub Total (A+B)   3,27,788.93     D   Contigency @ 3% of C   9,833.67     E   Tools & Plants @ 2% of C   6,555.78     Transportation @ 7.5% of C   24,584.17	12	Insulated piercing connector. Type-D-main 10 to 50 sq.mm & Tap-	No.	34.21	30	1,026.30
14         Coil Earthing         No's         205.84         5         1,029.20           15         No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing         Kg         93.00         2.62         243.66           16         Danger plate (LT)         No         99.20         10         992.00           17         Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)         KG         93.00         3.01         279.84           18         2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated         Mtr.         36.48         250         9,120.00           19         2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated         Mtr.         54.50         100         5,450.00           20         4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated         Mtr.         69.27         200         13,854.00           21         GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)         Kg         96.72         5.00         483.60           22         Black Paint         Ltr         272.80         20         5,456.00           A         Total Cost of materials         3,18,241.68           B         Sub Total (A+B)         3,27,788.93           C	13	·	No.	1,302.00	5	6,510.00
No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing   Kg   93.00   2.62   243.66	14		No's		5	·
17       Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)       KG       93.00       3.01       279.84         18       2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated       Mtr.       36.48       250       9,120.00         19       2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated       Mtr.       54.50       100       5,450.00         20       4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated       Mtr.       69.27       200       13,854.00         21       GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)       Kg       96.72       5.00       483.60         22       Black Paint       Ltr       272.80       10       2,728.00         23       Yellow Colour Paint for Background       Ltr       272.80       20       5,456.00         A       Total Cost of materials       3,18,241.68         B       Stock, Storage & Insurance i.e 3% of A       9,547.25         C       Sub Total (A+B)       3,27,788.93         D       Contigency @ 3% of C       9,833.67         F       Tools & Plants @ 2% of C       6,555.78         Transportation @ 7.5% of C       24,584.17	15		Kg	93.00	2.62	243.66
17       0.510mtr length 1 no's = (1x0.59x0.510)       KG       93.00       3.01       279.84         18       2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated       Mtr.       36.48       250       9,120.00         19       2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated       Mtr.       54.50       100       5,450.00         20       4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated       Mtr.       69.27       200       13,854.00         21       GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)       Kg       96.72       5.00       483.60         22       Black Paint       Ltr       272.80       10       2,728.00         23       Yellow Colour Paint for Background       Ltr       272.80       20       5,456.00         A       Total Cost of materials       3,18,241.68         B       Sub Total (A+B)       3,27,788.93         D       Contigency @ 3% of C       9,833.67         E       Tools & Plants @ 2% of C       6,555.78         F       Transportation @ 7.5% of C       24,584.17	16	Danger plate (LT)	No	99.20	10	992.00
19       2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated       Mtr.       54.50       100       5,450.00         20       4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated       Mtr.       69.27       200       13,854.00         21       GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)       Kg       96.72       5.00       483.60         22       Black Paint       Ltr       272.80       10       2,728.00         23       Yellow Colour Paint for Background       Ltr       272.80       20       5,456.00         A       Total Cost of materials       3,18,241.68         B       Sub Total (A+B)       3,27,788.93         C       Sub Total (A+B)       3,27,788.93         D       Contigency @ 3% of C       9,833.67         E       Tools & Plants @ 2% of C       6,555.78         Transportation @ 7.5% of C       24,584.17	17		KG	93.00	3.01	279.84
20       4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated       Mtr.       69.27       200       13,854.00         21       GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)       Kg       96.72       5.00       483.60         22       Black Paint       Ltr       272.80       10       2,728.00         23       Yellow Colour Paint for Background       Ltr       272.80       20       5,456.00         A       Total Cost of materials       3,18,241.68         B       Sub Total (A+B)       3,27,788.93         C       Sub Total (A+B)       3,27,788.93         D       Contigency @ 3% of C       9,833.67         E       Tools & Plants @ 2% of C       6,555.78         F       Transportation @ 7.5% of C       24,584.17	18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
21       GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)       Kg       96.72       5.00       483.60         22       Black Paint       Ltr       272.80       10       2,728.00         23       Yellow Colour Paint for Background       Ltr       272.80       20       5,456.00         A       Total Cost of materials       3,18,241.68         B       Stock, Storage & Insurance i.e 3% of A       9,547.25         C       Sub Total (A+B)       3,27,788.93         D       Contigency @ 3% of C       9,833.67         E       Tools & Plants @ 2% of C       6,555.78         F       Transportation @ 7.5% of C	19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
22         Black Paint         Ltr         272.80         10         2,728.00           23         Yellow Colour Paint for Background         Ltr         272.80         20         5,456.00           A         Total Cost of materials         3,18,241.68           B         Stock, Storage & Insurance i.e 3% of A         9,547.25           C         Sub Total (A+B)         3,27,788.93           D         Contigency @ 3% of C         9,833.67           E         Tools & Plants @ 2% of C         6,555.78           F         Transportation @ 7.5% of C         24,584.17	20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
22         Black Paint         Ltr         272.80         10         2,728.00           23         Yellow Colour Paint for Background         Ltr         272.80         20         5,456.00           A         Total Cost of materials         3,18,241.68           B         Sub Total (A+B)         3,27,788.93           D         Contigency @ 3% of C         9,833.67           E         Tools & Plants @ 2% of C         6,555.78           F         Transportation @ 7.5% of C         24,584.17	21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
A         Total Cost of materials         3,18,241.68           B         Stock, Storage & Insurance i.e 3% of A         9,547.25           C         Sub Total (A+B)         3,27,788.93           D         Contigency @ 3% of C         9,833.67           E         Tools & Plants @ 2% of C         6,555.78           F         Transportation @ 7.5% of C         24,584.17	22	Black Paint		272.80	10	2,728.00
B Stock, Storage & Insurance i.e 3% of A 9,547.25 C Sub Total (A+B) 3,27,788.93 D Contigency @ 3% of C 9,833.67 E Tools & Plants @ 2% of C 6,555.78 F Transportation @ 7.5% of C 24,584.17	23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
B       Stock, Storage & Insurance i.e 3% of A       9,547.25         C       Sub Total (A+B)       3,27,788.93         D       Contigency @ 3% of C       9,833.67         E       Tools & Plants @ 2% of C       6,555.78         F       Transportation @ 7.5% of C       24,584.17	Α					
C         Sub Total (A+B)         3,27,788.93           D         Contigency @ 3% of C         9,833.67           E         Tools & Plants @ 2% of C         6,555.78           F         Transportation @ 7.5% of C         24,584.17						9,547.25
D         Contigency @ 3% of C         9,833.67           E         Tools & Plants @ 2% of C         6,555.78           F         Transportation @ 7.5% of C         24,584.17	С					3,27,788.93
E         Tools & Plants @ 2% of C         6,555.78           F         Transportation @ 7.5% of C         24,584.17		· · ·				9,833.67
F Transportation @ 7.5% of C 24,584.17	Е					6,555.78
	F					24,584.17
	G	Erection Charges (	@ 5% on	Trf/Breaker/W	'PB/ H-Pole	-

SI.	Description of Materials	Unit	Unit Rate	Total	Total	
<i>No.</i>	Erection Charges @ 10% of C (except Trf/Breaker/\	MDR/H-D	ole / I T Stay se	Quantity	<b>Amount</b> 27,280.55	
<del>                                     </del>	Erection Charges @ 10% of C (except 117/Breaker) of C (except 117/Brea				7,663.20	
<u> </u>	Erection charges & 20% of	1 30 por		n of (C to I)	4,03,706.29	
<u> </u>	Civil & Services			(0 00 ./	4,00,700.25	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	Fixing of LT 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	5	11,250.00	
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00	
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00	
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00	
5	Dismantling of ACSR/AAAC 34/55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00	
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00	
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00	
К						
L	·					
М	, , ,					
N				Total (L+M)	4,98,838.43	
0			Total GST @		89,790.92	
P	0 7:14:110			@ 1% of (P)	4,988.38 <b>5,93,617.73</b>	
Q	Q Gross Total Material +Services (N+O+P) for LT AB Cable Line					

### Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 2C×35 mm² (1P+1N)+1C×25 mm²(M)

AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.-TPCODL-.....)

	MATERIALS FOR Conversion of LT Bare to LT AB Cable						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00		
2	LT Stay set Complete	Set	644.80	5	3,224.00		
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00		
4	LT stay Clamp ( 1.40Kg/pair)	Pair	136.40	5	682.00		
5	LT Stay insulator	No.	37.20	5	186.00		
6	LT Accessories with Eye hook and Clamp				-		
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00		
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20		
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80		
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60		
7	2C×35 mm² (1P+1N)+1C×35 mm²(M)	K.M	85,140.00	1.05	89,397.00		
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00		
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00		
10	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	2	103.54		
11	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	20	801.20		
12	Insulated piercing connector. Type-D-main 10 to 50 sq.mm & Tap-1.5 to 10 sq.mm	No.	34.21	20	684.20		
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00		
14	Coil Earthing	No's	205.84	5	1,029.20		
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66		
16	Danger plate (LT)	No	99.20	10	992.00		
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84		
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	500	18,240.00		
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00		
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27				
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60		
22	Black Paint	Ltr	272.80	10	2,728.00		
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00		
Α			Total Cost	of materials	2,24,207.84		
В	Sto	ck, Stora	ge & Insurance	i.e 3% of A	6,726.24		
С			Sub	Total (A+B)	2,30,934.07		
D			Contigenc	y @ 3% of C	6,928.02		
Е	Tools & Plants @ 2% of C				4,618.68		
F		T	ransportation (	@ 7.5% of C	17,320.06		
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-		
Н	Erection Charges @ 10% of C (except Trf/Breaker/V	VPB/ H-F	ole/ LT Stay se	t/PSC Pole)	17,595.06		
1	Erection Charges @ 20% of	PSC pol	e- Not to be us	ed for 33kv	7,663.20		
J			Su	m of (C to I)	2,85,059.09		
	<u>Civil &amp; Services</u>						

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	Fixing of LT 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	5	11,250.00	
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00	
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00	
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00	
5	Dismantling of ACSR/AAAC 34/55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/site store	KM	6,300.00	1.00	6,300.00	
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00	
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00	
К						
L	Total (J+K)					
M	Other overheads (Including 6% supervision charges) of L  Sub Total (L+M)					
<b>N</b>				18% of (O)	<b>3,73,072.40</b> 67,153.03	
P				@ 1% of (P)	3,730.72	
Q	Gross Total Material +Ser	vices (N+			4,43,956.15	

	ANNEXURE-4 LT Bare to AB Cable					
SI. No.	DESCRIPTION OF WORK	Unit	Quantity (in km)	Amount (in cr.)		
1	Conversion of LT Bare to LT AB Cable (4X95 sq.mm)	km	24	2.2		
2	Conversion of LT Bare to LT AB Cable (4CX70 sq.mm)	km	60	4.9		
3	Conversion LT Bare to LT AB Cable (4CX50 sq.mm)	km	104	7.2		
4	Conversion LT Bare to LT AB Cable (4CX35 sq.mm)	km	60	3.6		
5	Conversion LT Bare to LT AB Cable (2CX35 sq.mm+1CX35 sq.mm)	km	48	2.1		
	Total			20.0		

## Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×95 mm² (3P+1N)+1C×95 mm²(M)+1CX16 mm²(Street Light)

AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.-TPCODL-.....)

	MATERIALS FOR Conversion of LT Bare to LT AB Cable						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00		
2	LT Stay set Complete	Set	644.80	5	3,224.00		
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00		
4	LT stay Clamp ( 1.40Kg/pair)	Pair	136.40	5	682.00		
5	LT Stay insulator	No.	37.20	5	186.00		
6	LT Accessories with Eye hook and Clamp				-		
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00		
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20		
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80		
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60		
7	4C×95 mm² (3P+1N)+1C×95 mm²(M)+1CX16 mm²(Street Light)	K.M	3,68,640.00	1.05	3,87,072.00		
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00		
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00		
10	Insulated piercing connector. Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48		
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80		
12	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap- 1.5 to 16 sq.mm	No.	40.06	30	1,201.80		
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00		
14	Coil Earthing	No's	205.84	5	1,029.20		
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	3	243.66		
16	Danger plate (LT)	No	99.20	10	992.00		
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3	279.84		
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00		
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00		
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00		
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60		
22	Black Paint	Ltr	272.80	10	2,728.00		
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00		
Α			Total Cost	of materials	5,28,694.98		
В	Stock, Storage & Insurance i.e 3% of A				15,860.85		
С				Total (A+B)	5,44,555.83		
D				cy @ 3% of C	16,336.67		
E			Tools & Plan		10,891.12		
F			Transportation		40,841.69		
G	Erection Charge				- 48,957.24		
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pol						

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
<u> </u>	Erection Charges @ 20%	of PSC po			7,663.20	
J	Civil & Services		30	um of (C to I)	6,69,245.74	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	Fixing of LT 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	5	11,250.00	
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00	
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00	
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00	
5	Dismantling of ACSR/AAAC 34/55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/site store	KM	6,300.00	1.00	6,300.00	
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00	
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00	
			Total Civ	il & Sandoos	66,896.00	
K L	Total Civil & Services Total (J+K)					
M	Other overheads ( Ir	ncluding 6	5% supervision		<b>7,36,141.74</b> 44,168.50	
N	3 3.61116443 ( 11	. 5. 5. 5. 11 15		Total (L+M)	7,80,310.25	
0				@ 18% of (O)	1,40,455.84	
P				6 @ 1% of (P)	7,803.10	
Q	Gross Total Material +Se	ervices (N			9,28,569.19	

# Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×70 mm² (3P+1N)+1C×70 mm²(M)+1CX16 mm²(Street Light)

AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.-TPCODL-.....)

1

### MATERIALS FOR Conversion of LT Bare to LT AB Cable

INATERIALS FOR CONVESSION OF ET BUTE TO ET AB CUBIC					
SI.	Description of Materials	Unit	Unit Rate	Total	Total
No.				Quantity	Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp ( 1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×70 mm² (3P+1N)+1C×70 mm²(M)+1CX16 mm²(Street Light)	K.M	3,05,000.00	1.05	3,20,250.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector. Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48
11	Insulated piercing connector. Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80
12	Insulated piercing connector. Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
Α			Total Cost o	f materials	4,61,872.98
В	Sto	ck, Stora	ge & Insurance	i.e 3% of A	13,856.19
С				otal (A+B)	4,75,729.17
D				@ 3% of C	14,271.87
E			Tools & Plants		9,514.58
F		Tı	ransportation @		35,679.69
G					-
Н	Erection Charges @ 10% of C (except Trf/Breaker/\				42,074.57
ī	Erection Charges @ 20% of				7,663.20
J		•		n of (C to I)	5,84,933.08
	<u>Civil &amp; Services</u>				

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT 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	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
			<b>*</b>		00.000.00
K	Total Civil & Services				66,896.00
L	Total (J+K)  Other everbeads (Including 6% supervision charges) of L				6,51,829.08
M N	Other overheads (Including 6% supervision charges) of L  Sub Total (L+M)				39,109.74 <b>6,90,938.83</b>
0	Total GST @ 18% of (O)				
P	Total CESS @ 1% of (P)				
Q	Gross Total Material +Serv	vices (N+		- , ,	6,909.39 <b>8,22,217.20</b>

# Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×50 mm² (3P+1N)+1C×50 mm²(M)+1CX16 mm²(Street Light)

AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.-TPCODL-.....)

	MATERIALS FOR Conversion of LT Bare to LT AB Cable						
SI.	Description of Materials	1111	Marit Darka	Total	Total		
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount		
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00		
2	LT Stay set Complete	Set	644.80	5	3,224.00		
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00		
4	LT stay Clamp ( 1.40Kg/pair)	Pair	136.40	5	682.00		
5	LT Stay insulator	No.	37.20	5	186.00		
6	LT Accessories with Eye hook and Clamp				-		
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00		
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20		
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80		
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60		
7	4C×50 mm² (3P+1N)+1C×50 mm²(M)+1CX16 mm²(Street Light)	K.M	2,26,000.00	1.05	2,37,300.00		
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00		
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00		
10	Insulated piercing connector. Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48		
11	Insulated piercing connector. Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80		
12	Insulated piercing connector. Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80		
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00		
14	Coil Earthing	No's	205.84	5	1,029.20		
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66		
16	Danger plate (LT)	No	99.20	10	992.00		
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84		
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00		
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00		
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00		
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60		
22	Black Paint	Ltr	272.80	10	2,728.00		
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00		
A	Tenew colour runneror background	20.	Total Cost o		3,78,922.98		
В	Sto	ck. Stora	ge & Insurance		11,367.69		
C		, = = =		otal (A+B)	3,90,290.67		
D			Contigency		11,708.72		
E			Tools & Plants		7,805.81		
F		Tı	ransportation @		29,271.80		
G	Erection Charges				-		
Н	Erection Charges @ 10% of C (except Trf/Breaker/V				33,530.72		
ı	Erection Charges @ 20% of				7,663.20		
J			Sun	n of (C to I)	4,80,270.92		
	<u>Civil &amp; Services</u>						

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT 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	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
К	Total Civil & Services				
L	Total (J+K)				
M	Other overheads (Including 6% supervision charges) of L				
<b>N</b>	Sub Total (L+M) Total GST @ 18% of (O)				
P			Total CESS (		1,04,399.45 5,799.97
Q	Gross Total Material +Serv	vices (N+		- , ,	6,90,196.35

# Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×35 mm² (3P+1N)+1C×35 mm²(M)+1CX16 mm²(Street Light)

AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.-TPCODL-.....)

1

# MATERIALS FOR Conversion of LT Bare to LT AB Cable

	INTERIALS FOR CONVESSION OF ET BATC			T-4-4	Takad
SI.	Description of Materials	Unit	Unit Rate	Total	Total
No.	0 Mars 1 200 M- DCC D-1-	NI-	2 720 00	Quantity	Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp ( 1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp	Dain	240.00	20	0.672.00
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×35 mm² (3P+1N)+1C×35 mm²(M)+1CX16 mm²(Street Light)	K.M	1,69,000.00	1.05	1,77,450.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00 2		9,920.00
10	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77 4		207.08
11	Insulated piercing connector. Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06 40		1,602.40
12	Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap-1.5 to 10 sq.mm	No.	34.21 30		1,026.30
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	Kg	93.00 2.62		243.66
16	Danger plate (LT)	No	99.20	992.00	
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	99.20 10 93.00 3.01		279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
			69.27		•
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.		200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00 <b>3,18,241.68</b>
A	Total Cost of materials				
В	Stock, Storage & Insurance i.e 3% of A				
C	Sub Total (A+B)				
D	Contigency @ 3% of C				
E	Tools & Plants @ 2% of C Transportation @ 7.5% of C				
F	Frankley Charres				24,584.17
G	Erection Charges @ 10% of C (avent Tri/Presider W				- 27 200 55
H	Erection Charges @ 10% of C (except Trf/Breaker/V		<u>-</u>		27,280.55
<del>                                     </del>	Erection Charges @ 20% of	22C DOI			7,663.20
J	Chill 9 Comitee		Sun	n of (C to I)	4,03,706.29
	<u>Civil &amp; Services</u>				

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	Fixing of LT 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	5	11,250.00	
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00	
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00	
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00	
5	Dismantling of ACSR/AAAC 34/ 55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00	
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.		8.10	90	729.00	
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00	
К	Total Civil & Services					
L	Total (J+K)					
M	Other overheads (Including 6% supervision charges) of I					
<b>N</b>	Sub Total (L+M)					
P	Total GST @ 18% of (O) Total CESS @ 1% of (P)					
Q	Gross Total Material +Serv	vices (N+			4,988.38 <b>5,93,617.73</b>	

AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.-

AD	Cable LT Line Length in KM with 33 Mtr. Span Ref. Drawing No TPCODL)			1	
	MATERIALS FOR Conversion of LT Bare	to LT AL	3 Cable		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp ( 1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	2C×35 mm² (1P+1N)+1C×35 mm²(M)	K.M	85,140.00	1.05	89,397.00
8	WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar. No. 2,740.40		5	13,702.00	
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar. No. 4,960.00		2	9,920.00	
10	Insulated piercing connector. Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	2	103.54
11	Insulated piercing connector. Type-C-main 16 to 95 sq.mm & Tap- 1.5 to 16 sq.mm	No.	40.06	20	801.20
12	ated piercing connector.Type-D-main 10 to 50 sq.mm & Tap- b 10 sq.mm		684.20		
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing			243.66	
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00 3.01		279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	500	18,240.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27		
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
Α	3			of materials	2,24,207.84
В	Stock, Storage & Insurance i.e 3% of A				
С	Sub Total (A+B)				
D	Contigency @ 3% of C				
E	Tools & Plants @ 2% of C				
F	Transportation @ 7.5% of C				
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				
Н	Erection Charges @ 10% of C (except Trf/Breaker/V				17,595.06
ı	Erection Charges @ 20% of	PSC pol	e- Not to be us	sed for 33kv	7,663.20
J			Su	m of (C to I)	2,85,059.09
	<u>Civil &amp; Services</u>				

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	Fixing of LT 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	5	11,250.00	
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00	
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00	
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00	
5	Dismantling of ACSR/AAAC 34/55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00	
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00	
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00	
K	Total Civil & Services					
L	Total (J+K)					
M	Other overheads (Including 6% supervision charges) of L  Sub Total (L+M)					
N 0					<b>3,73,072.40</b> 67,153.03	
P	Total GST @ 18% of (O) Total CESS @ 1% of (P)					
Q	Gross Total Material +Serv	vices (N+		- ' '	3,730.72 <b>4,43,956.15</b>	

#### **Automation & Technology**

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	"IMPLEMENTATION OF VIDEO MANAGEMENT SYSTEM FOR	
	REAL-TIME OPERATIONS"	

# 1.0 Background

TPCODL has been in the forefront, in adoption of latest technology in the power utility sector pan Odisha. Together with its culture of Consumer Service Excellence, Continuous Learning, Performance Orientation, Innovation and Empowerment, it has been able to set benchmarks in accelerated reduction of tripping, equipment failure, enhance consumer satisfaction and improve employee productivity.

One of the significant challenges that the utilities face is restricting the fault at minimum possible section of the electrical network and clearing the fault in minimum possible time. To achieve this feature utility works round the clock to minimize equipment failure, equipment down time and faster restoration thus ensuring reliability and enhanced MTTR. All the utility across the globe moving towards deployment of technology to make the Grid smarter in order to ensure operation excellence and serve the consumer with green and continuous power supply with any interruption. To achieve the TPCODL Vision and Mission, TPCODL deploying the latest technology for automation of Primary Substation for Centralised monitoring and control of entire distribution network for faster decision making and corrective action for restoration of the network ensuring. TPCODL already deployed Substation Automation System in FY 20-21 and till now integrated 52 Nos. of R-APDRP stations and 112 Nos. of ODSSP stations from a centralized location in Bhubaneshwar and unmanned 58 Nos. of Substations.

In FY 21-22, 22 Nos. of 33/11 kV Primary substations are SCADA enabled and in a process of integration with SCADA/ADMS System being commissioned. In FY22-23, 45 Nos. 33/11 kV Primary Substations are in process of SCADA enablement and expected to be commissioned by end of FY22-23.

# 2.0 Existing Systems in Place

#### 2.1 SCADA/DMS System at Bhubaneswar and Cuttack Town

The SCADA/DMS System was implemented in Bhubaneswar and Cuttack Town of TPCODL under R-APDRP (Part-A) Scheme in the year 2016. Some major components and functionalities of SCADA/DMS System are as below:

- a. Independent SCADA Control Centre (SCADA CC) at Bhubaneswar and Cuttack
- b. Disaster Recovery (DR) Centre at Berhampur for Data Recovery
- c. DF8000 SCADA/DMS System have the following functions:
  - SCADA Applications
  - Information Storage and Retrieval (ISR)
- d. Integration with R-APDRP Customer Care, GIS, Billing System & SLDC

In addition to SCADA / DMS implementation, the Remote Terminal Units were also installed at 56 nos. of 33 / 11 kV Substations. These RTUs was integrated over MPLS / VPN link with the respective Control

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Centres (CC) located in Bhubaneswar, Cuttack and Puri. The protection BCPUs of 33 kV and 11 kV feeders are integrated to the respective RTUs on IEC61850. The Digital Input / Output (Status, Open/Close/Reset/Tap Change control, Protection Alarms) of the respective bay are acquired through these BCPUs on SCADA System. For monitoring of the Analog measurement, separate Multifunction Meters are used, which are integrated to the Station RTU over MODBUS (Serial) Protocol. The Communication link for integration of these RTUs is MPLS network of the Network Bandwidth Service Provider (i.e. Airtel).

In addition to BCPUs of the 33 kV and 11 kV feeders, some of the installed FRTUs of RMU and data concentrators of FPI of the 33 kV/11 kV network are also integrated with the respective SCADA System. The FRTUs and data concentrators of FPIs are communicating over GPRS/SIM modems for remote monitoring and control through respective SCADA System as applicable.

Currently appx. 190 Nos. of 33/11 kV Substations are integrated with the SCADA System at Bhubaneswar & Cuttack for remote monitoring & control from Centralize Power System Control Center (CPSCC).

### 2.2 Deployment of New SCADA/ADMS System with MCC & BCC:

The new SCADA/ADMS System with a concept of MCC and BCC is being commissioned and expected to Go-live by March 2023 with SCADA functionality. The Newly deployed SCADA/ADMS system will have centralized monitoring & control of entire distribution network pf TPCODL. The proposed system has capacity to handle more than 500 Primary Substation and is based on Concept of Main Control Centre & Backup Control Centre working in Synchronization with shared operational philosophy in real-time. The deployed System Consist of Cyber Security infrastructure for addressing the cyber Vulnerabilities, automatic backups of servers for faster restoration of system in case of any failures, Network management Systems for health monitoring of OT equipment, Patch management & antivirus system for regular patch and definitions updates, Reporting and Analytics utility for analysis & MIS reporting. The deployed System provides a platform for training the workforce for different operational situations by simulation of different scenarios. The proposed System will provide the better visibility of the network, better situational awareness, security and enhanced operational safety.

Both the SCADA/DMS Systems will be operational and running in parallel till all the Substations are migrated and tested successfully in new SCADA/ADMS System.

#### 2.3 SCADA Enabled Sub-station

Out of 371 Nos. of Substations, 190 Nos. of sub-Stations are SCADA enabled and remotely monitored and controlled from Centralised SCADA System.

TPCODL distribution area is spread over in 5 Circles, 20 Distribution Divisions and 64 Sub-divisions with 371 numbers of 33/11 kV Primary Sub-Stations. The substations are implemented under various schemes and broadly categorized as under:

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Circle Name	Total No. of S/s	RAPDRP Scheme	ODSSP Scheme	PNP Scheme	Conventional Substation
BBSR-I	71	30	31		10
BBSR-II	90		30	4	56
Cuttack	75	22	22		31
Dhenkanal	70		27		43
Paradeep	65		24		41
Total	371	52	134	4	181

Table # 1 : 33/11 kV Primary Substations in TPCODL Network

Details of Substation Automation and its integration with SCADA System are as below

#### 2.3.1 Sub-station Automation System under RAPDRP Scheme

56 Nos. of substations under RAPDRP and PNP Nabakalebar scheme are automated and equipped with 33/11 kV CRPs, Numerical Relays, VCBs, Battery Charger and Multi-Function Meters (MFMs). All these devices are integrated at sub-station level RTU. The numerical relays and Multifunction meters are communicating with RTU over IEC 61850/IEC-103 and Modbus protocol respectively. Equipment status, alarms and control are through BCPUs over IEC61850 and status of auxiliary system are provisioned through hardwiring to RTU. These RTUs are communicating to respective control Centre SCADA System i.e. Bhubaneswar and Cuttack over IEC60870-5-104 using service provider MPLS network.

#### 2.3.2 Sub-station Automation System under ODSSP Scheme

The ODSSP scheme focused on supply of quality power to consumers and intends to address the problem of low voltage in rural areas. The scheme focusses on construction of 33/11 kV Sub-stations in the state; over 134 Nos. of 33/11 kV sub stations has been planned to commission under three phases in TPCODL Distribution network. All 134 Nos. 33/11 kV Substation are integrated with centralised SCADA System and being operated from Power System Control Centre, Bhubaneswar.

## 2.3.3 SCADA Enablement of 33/11 kV Primary Substations (Conventional Type Substations)

In TPCODL distribution network approx. 181 Nos. of 33/11 kV Primary Substations (*Refer Table # 1 : 33/11 kV Primary Substations in TPCODL Network*) are Conventional type (Old Substations Commissioned with mechanical and electromechanical Protection and Switchgear system). These Substations are not SCADA enabled and feeders are equipped with electromechanical or non-communicable static relays. These conventional type substations are locally monitored and controlled manually from CRP/Switchgear/Field panels under the coordination of Power System Control Centre.

It is planned to integrate these substations to SCADA/ADMS System for Centralized Monitoring and Control of entire distribution network in phased manner.

**Phase # 1**: Under FY 21-22 Capex Scheme, 22 Nos. of 33/11 kV Primary substations are SCADA enabled and in a process of integration with SCADA/ADMS System being commissioned.

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	Detailed Project Report	
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**Phase # 2**: Under FY22-23 Capex Scheme, 45 Nos. of 33/11 kV Primary Substations are in a process of SCADA enablement and expected to be commissioned by end of FY22-23.

Balance 114 Nos., 33/11 kV Conventional Substations are planned to be SCADA enabled in subsequent financial years i.e. FY23-24, FY24-25. SCADA enablement of all Substations are expected to be completed by FY24-25.

# 3.0 Purpose and Necessity

#### 3.1 SCADA Enablement of 114 Nos. 33/11 kV Primary Substations (Conventional Type Substations)

To automate appx. 181 nos. of Conventional type sub-stations for centralize remote monitoring and control, phase wise implementation plan is as below:

SI. No.	Phases	Total No. of Substations	Execution Timeline	Present Status
1	Phase#1	22	FY 2021-22	Capex Approved and Job Completed
2	Phase#2	45	FY 2022-23	Capex Approved and Job is in Progress
3	Phase#3	50	FY 2023-24	Capex Planned FY23-24
4	Phase#4	64	FY 2024-25	Capex Planned FY24-25

Table # 2A: 33/11 kV Primary Substations SCADA Enablement Plan

As per the above table this proposal is for SCADA enablement of 50 Nos. of 33/11 kV Primary Substations (Conventional Type) in FY23-24 under Phase # 3.

Balance 64 Nos. of 33/11 kV Primary Substations (Conventional Type) will be SCADA enabled in FY24-25 under Phase # 4.

It is also proposed to replace the existing old and depleted low-capacity DC system by New Substation DC system to cater the load of existing electrical and protection equipment as well as substation automation system, which in turn will enhance the reliability and availability of the system. New Battery Charger (FC & FCBC) with Batteries are considered along with the SCADA enablement of conventional substations to maintain the DC Supply and adequate Backup for the substation equipment and automation system.

#### 3.2 Remote Monitoring of RMUs

Standalone RMUs are being installed and commissioned across the distribution network to improve the reliability of the network. So, FRTUs with GPRS/3G/4G/5G modems are proposed to be installed at RMUs locations for remote monitoring and control. This enables centralized visibility of Secondary Distribution

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network at Centralised Power System Control Centre (PSCC) for faster decision-making and restoration of the network. The Automation of RMU are essential for implementation of ADMS applications for localization of fault, for faster isolation and restoration of the secondary distribution network.

To automate RMUs progressively and its integration with SCADA/ADMS system is planned in phased manner as per the table below :

SI. No.	Phases	Approximate No. of RMUs to be Automated	Execution Timeline	Present Status
1	Phase # 1	50	FY 2023-24	Capex Planned FY23-24
2	Phase # 2	50	FY 2024-25	Capex Planned FY24-25
3	Phase # 3	50	FY 2025-26	Capex Planned FY25-26
4	Phase # 4	50	FY 2026-27	Capex Planned FY26-27
5	Phase # 5	50	FY 2027-28	Capex Planned FY27-28

Table # 3 : Secondary Distribution Network Automation Plan (RMU)

As per the above table this proposal is for SCADA enablement of 50 Nos. of RMUs in FY23-24 under Phase # 1. SCADA enablement of RMUs will be completed and integrated with SCADA/ADMS system progressively till FY2027-28 as per the Table # 3.

#### 3.3 Operational Video Management System (OVMS)

Operational Video Management System (OVMS) is maybe first of its kind advanced video monitoring and management system envisaged to assist operational team (PSCC) in day to day remote operation and monitoring by providing live video feed of the switching devices, transformers etc. This system will require minimal effort by operational team to navigate as the same is tightly integrated with the SCADA system.

In addition to the above, the OVMS also provides the following functions for operational safety:

- a) Helmet Detection: Detects if the person working or entering the switchyard is wearing safety helmet or not. Any person detected without helmet will trigger an alarm.
- b) Thermal Detection: Detects fire in the region specified and raises alarm.
- c) Adaptive Motion: Detects and tracks objects that enter a scene and then triggers an alarm then the objects enter a user-defined zone. This behaviour is primarily used in outdoor environments with light traffic to reduce the number of false alarms caused by environmental changes.
- d) Camera Sabotage: Detects contrast changes in the field of view. An alarm is triggered if the lens is obstructed with spray paint, a cloth, or a lens cap. Any unauthorized repositioning of the camera also triggers an alarm.

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For real-time Video monitoring of Substation Operations are planned in phased manner as per the table below:

SI. No.	Phases	Approximate No. of 33/11 kV Primary Substation	Execution Timeline	Present Status
1	Phase # 1	10	FY 2023-24	Capex Planned FY23-24
2	Phase # 2	90	FY 2024-25	Capex Planned FY24-25
3	Phase # 3	90	FY 2025-26	Capex Planned FY25-26
4	Phase # 4	90	FY 2026-27	Capex Planned FY26-27
5	Phase # 5	90	FY 2027-28	Capex Planned FY27-28

Table # 4: Implementation Plan of OVMS

As per the above table this proposal is for Operational Video management system at 10 nos. of 33/11 kV Critical Primary Substations along with Centralised System at Control Centre in FY23-24 under Phase # 1. On successful commissioning and observation of the performance of the system deployed, same will further be installed at all Substations progressively as per the plan mentioned in the above Table # 4.

#### 3.4 Communication, Network Management & Cyber Security Bridge System

- Enhancement of Software licences in Network Management System for monitoring of Operational Technology equipment at Substation and Control Centre
- Implementation of IPS and IDS System at Main Control Centre and Backup Control Centre.
- Establishment of Communication link between TPCODL Technology Centre and Backup Control Centre (MCC & BCC).

Enhancement of the Software license in Network Management System, installation of IPS & IDS and Establishment of Communication link will be completed in FY23-24.

#### 4.0 Statutory Compliance Requirement

All statutory requirement complied as and when required for the proposed CAPEX plan.

The communication infrastructure proposed for the integration of SCADA & Substation Automation System are from the services of Network Bandwidth Service Provider (NBSP). All statutory compliance with respect to communication infrastructure will be managed by NBSP in consultation with TPCODL.

The proposed SAS System will have the provision to comply all the guidelines issued of CERT-IN, NCIIPC during the implementation.

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# 5.0 Proposal for the Capex Investment

TPCODL has identified a number of challenges related to Safety, 33KV/11KV/0.415KV network, Automation infrastructure and Technology usage. These challenges are planned to be addressed through a systematic investment plan by TPCODL. The proposed "Capex Plan" represents a justified and efficient level of total capital investment estimated by TPCODL to meet the service obligation; improving safety, reliability of network and level of service standards.

Summary of Capex requirement for FY 2023-24:

SI. No.	Activity Planned	Capex Proposed (FY 2023-24)
1	SCADA Enablement of Conventional Substation – 50 Nos. of 33/11 kV Primary Substations	8.00 Cr
1.a	Substation Automation System for 50 Nos. of 33/11 kV Primary Substations (Conventional Type)	4.30 Cr.
1.b	DC System for 50 Nos. of 33/11 kV Primary Substations (Conventional Type)	1.70 Cr.
1.c	Operational Video Management System (OVMS) – 10 Nos. of 33/11 kV Critical Primary Substations	0.50 Cr.
1.d	Communication, Network Management & Cyber Security Bridge System	1.5 Cr.
2	FRTUs for RMUs and Communication for RMUs	1.00 Cr
	Total Cost in INR for FY23-24	9.00 Cr

Table # 5 : CAPEX Proposal for FY23-24

# 6.0 Scope of the Proposal

#### 6.1 SCADA Enablement of Conventional Substation

In TPCODL there are approx. 181 Nos. of 33/11 kV conventional Sub-stations and are planned to automate these substations in 4 phases as mentioned in the table below:

SI. No.	Phases	No. of Substation	Execution Plan
1	Phase#1	22	FY2021-22
2	Phase#2	45	FY2022-23
3	Phase#3	50	FY2023-24
4	Phase#4	64	FY2024-25
	Total No. of Substation to be Covered	181	

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#### Table # 2B: 33/11 kV Primary Substations SCADA Enablement Plan

As per the above table this proposal is for SCADA enablement of 50 Nos. of 33/11 kV Primary Substations (Conventional Type) in FY23-24 under Phase # 3.

It is also proposed to replace the existing old and depleted low-capacity DC system by New Substation DC system to cater the load of existing electrical and protection equipment as well as substation automation system, which in turn will enhance the reliability and availability of the system. New Battery Charger (FC & FCBC) with Batteries are considered along with the SCADA enablement of conventional substations to maintain the DC Supply and adequate Backup for the substation equipment and automation system.

### 6.2 Remote Monitoring of RMUs

As per the above table (Refer *Table # 3: Secondary Distribution Network Automation Plan (RMU))* this proposal is for SCADA enablement of 30 Nos. of RMUs in FY23-24 under Phase # 1.

#### 6.3 Operational Video Management System (OVMS)

Technology initiative undertaken to facilitate control room engineers/operators by visualizing the real-time status of equipment while carrying out any remote operation.

As per the above table (Refer *Table # 4 : Implementation Plan of OVMS*) this proposal is for Operational Video management system at 10 Nos. of 33/11 kV Primary Substations along with Centralised System at Control Centre in FY23-24 under Phase # 1

#### 6.4 Communication, Network Management & Cyber Security Bridge System

Integration of Conventional substation with the Control center requires NBSP Services for data exchange with SCADA System.

Similarly, high bandwidth (100 MBPS) communication link will be established between Main Control Center & Back-Up Control Center and NBSP NoC to respective Control center (MCC & BCC).

Enhancement of Software licences in Network Management System for monitoring of Operational Technology equipment at Substation and Control Centre

Implementation of IPS and IDS System at Main Control Centre and Backup Control Centre

#### 7.0 Cost Estimation and Execution Timelines

SI. No.	Activity Planned	Discovered / Estimated Cost	Execution Timelines	Remarks
1	SCADA Enablement of Conventional Substation –	8.00 Cr	FY 2023-24	Substation Automation System / DC System

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	50 Nos. of 33/11 kV Primary			
	Substations			
1.a	Substation Automation System for 50 Nos. of 33/11 kV Primary Substations (Conventional Type)	4.30 Cr.	FY 2023-24	Appx. INR 7,00,000.00 for RTU System and 2 Mbps MPLS Link INR 75,000.00 per Substation
1.b	DC System for 50 Nos. of 33/11 kV Primary Substations (Conventional Type)	1.70 Cr.	FY 2023-24	Appx. INR 3,00,000.00 per Substation
1.c	Operational Video Management System (OVMS) for 10 Nos. 33/11 kV Primary Substations	0.5 Cr.	FY 2023-24	Appx. INR 5,00,000.00 per Substation and Integration with SCADA System
1.d	Communication, Network Management & Cyber Security Bridge System	1.5 Cr.	FY 2023-24	Real-time Network Monitoring and Cyber Security Compliance as per the Guidelines of CERT-IN
2	Remote Monitoring of RMUs – 30 Nos. of RMU Locations	1 Cr	FY 2023-24	Appx. INR 3,000,00.00 for FRTU and INR 24,000.00 for Modem, per RMU locations

Table # 6 : Cost Estimation for CAPEX Proposal of FY23-24

# 8.0 Benefits

#### 8.1 Tangible and Intangible

Centralized operation would ensure optimum resource utilization of the hardware and software and functionalities used in the SCADA System. Other benefits include:

- i. This will ensure efficient operation & monitoring under steady state, dynamic & transient condition of the system.
- ii. To achieve improvement in operations considering complex Load- Demand cycle changes to bring in better and holistic visibility while making critical decisions.
- iii. Optimize on unscheduled power interchange, maximize utilization of the assets
- iv. Better Inventory management, low maintenance cost
- v. Ease of Operation and Operational flexibility
- vi. Multi-skilling of operational and maintenance personals
- vii. Enhanced operational safety
- viii. Better Control on Cyber Security Management, optimization of cyber security measures implementation.

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- ix. N-2 Communication redundancy will be provided at critical location for communication by using advanced MPLS Technology.
- x. Improved reliability of service.

#### 8.2 Benefits to Customer

- i. Reduction in restoration time of outage
- ii. Improved reliability of service
- iii. Better control of power quality and enhanced use of reactive power sources
- iv. Useful feedback information to the customer in terms of expected outage duration time etc.
- v. Monitoring the potential quality problems and also the reliability problems due to supply interruptions.

#### 8.3 Indirect Savings/Improvements

- i. Reduction in overall maintenance and inventory carrying cost.
- ii. Strengthening of existing operational technology infrastructure.
- iii. Detection and protection of operational system from Cyber Security vulnerabilities.
- iv. Improvement in reliability of power supply to consumers.

#### 8.4 Cost Benefit

SCADA Enablement of Primary and Secondary distribution network will enable centralize operation through PSCC lead to optimization of resources and cost to company.

Currently all the substations are operated by the substation operators locally and there are 7 nos. of substation operators, operating each substation.

- i. For each substation 3 manpower can be optimized & redeployed which result in saving of INR 2.52 L/Substation per year.
- ii. Due to improvement in reliability, unserved unit will be available for distribution, which is contributing 2 % of total load.

# 9.0 Revenue Return/Pay Back Period

#### 10.0 Recommendation and Conclusion

The above Capex proposal for SCADA enablement of Primary Substations, Secondary Distribution Network (RMU) and Real time Video Management system for primary substations will facilitate Centralized monitoring and Control, enabling Power System Control centre faster decision making and restoration with utmost safety.

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Above Capex proposal also includes efficient monitoring of Operation Technology Communication Infrastructure along with resilient secured communication network.

#### Annexure-6 Summary of Costing for Sick Equipment replacement (33kV & 11kV) SI Quantity Amount **Total Cost** Annexure Description Unit no. (in nos.) (in Rs.) (in cr.) No. 33kV Isolator with Earth Annexure-1 EΑ 8 0.17 16,75,668.47 switch 6.1 33kV Isolator without Earth Annexure-EΑ 0.10 11 10,41,758.33 switch 6.2 11kV Isolator with Earth Annexure-12 EΑ 13,75,791.41 0.14 switch 6.3 11kV Isolator without Earth Annexure-0 EΑ 0.00 switch 6.4 Annexure-33kV IND OG CRP 5 0.23 5 EΑ 22,55,994.69 6.5 Annexure-5 0.27 33kV IND TRF CRP EΑ 27,18,460.61 6.6 Annexure-7 33kV BKR EΑ 12 46,92,274.20 0.47 6.7 Annexure-8 11kV IND CRP EΑ 0.35 35,35,351.51 6.8 Annexure-0 11kV IND VCB EΑ 0.00 6.9 Annexure-10 11kV OD VCB EΑ 15 1,04,03,036.38 1.04 6.10 Annexure-16 0.16 11 33kV OD C.T EΑ 15,92,993.17 6.11 Annexure-5 12 33kV OD P.T EΑ 4,67,417.72 0.05 6.12 Annexure-6 0.04 13 11kV OD C.T EΑ 4,42,251.52 6.13

EΑ

EΑ

EΑ

EΑ

EΑ

**Total** 

5

1

2

1

3

14

15

17

18

11kV OD P.T

630kVA CSS

4W 11kV RMU (LLVV)

6W 11kV RMU (LLVVVV)

16 | 5W 11kV RMU (LLVVV)

Annexure-

6.14 Annexure-

6.15 Annexure-

6.16 Annexure-

6.17 Annexure-

6.18

0.04

80.0

0.36

0.22

1.28

₹ 5.00

3,84,331.32

8,22,471.19

35,82,116.13

22,36,386.19

1,28,18,355.01

	BOQ for 33 KV, 1250 A Isolato	r with Ed	arth Switch		
	Materials for 33 KV, 1250 A Isola	ator with	Earth Switch		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI (Polymer)	Set	1,25,103.60	1	1,25,103.60
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for Isolator Body)= 10x2.36	KG	93.00	23.60	2,194.80
Α	f materials	1,28,600.40			
В	Sto	ck, Stora	ge & Insurance		3,858.01
С				Total (A+B)	1,32,458.41
D				@ 3% of C	3,973.75
E F		т	Tools & Plants	_	2,649.17
G G	Erection Charges				9,934.38
Н	Erection Charges @ 10% of C (except Trf/Breaker/WP				13,111.74
I	Erection Charges @ 20% of	PSC pol	e- Not to be us	ed for 33kv	-
J			Sur	n of (C to I)	1,62,127.45
	<u>Civil &amp; Servio</u>	<u>es</u>			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	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 flataround pipe.	No.	3,700.00	1	3,700.00
К		•	Total Civil	& Services	3,700.00
	<u>Dismantling Po</u>	rtion			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV Isolator with Earth Switch	SET	225.00	1	225.00
L			Total D	Dismantling	225.00
М			To	otal (J+K+L)	1,66,052.45
N	Other overheads (Including 6% supervision charges)	of M (fo	r 33 KV Isolator	with Earth switch)	9,963.15
0			Sub 1	Γotal (L+M)	1,76,015.60
Р			Total GST @		31,682.81
Q			Total CESS (	@ 1% of (O)	1,760.16
R	Gross Total Material +Services (O+P+Q) fo	or 33 KV	Isolator with Ea	arth Switch	2,09,458.56

	BOQ for 33 KV, 1250 A Isolator withou	ut Earth	Switch		
	Materials for 33 KV, 1250 A Isolator with				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	1	53,003.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for Isolator Body)= 10x2.36	KG	93.00	23.60	2,194.80
A Total Cost of materials  B Stock, Storage & Insurance i.e 3% of A				56,499.80	
В	Stock	, Storage			1,694.99
С				otal (A+B)	58,194.79
D				@ 3% of C	1,745.84
E			ools & Plants	_	1,163.90
F G	Erection Charges @		nsportation (		4,364.61
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/				5,685.37
<u> </u>	Erection Charges @ 20% of P				-,
<u> </u>	Erection charges @ 20% of F	3C pole-		n of (C to I)	71,154.52
Ļ	Civil & Services		<u> </u>	0. (0.10.1)	71,134.32
	I	1			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
	Description of Materials  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 .	Unit No.	<i>Unit Rate</i> 3,700.00	Total Quantity	Total Amount 3,700.00
No.	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		3,700.00	Quantity	Amount
<b>No.</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		3,700.00	Quantity 1	<b>Amount</b> 3,700.00
<b>No.</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 .		3,700.00	Quantity 1	<b>Amount</b> 3,700.00
1 K SI.	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 .  Dismantling Portion	No.	3,700.00 Total Civil	Quantity  1  & Services  Total	3,700.00 3,700.00
No.	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 .  Dismantling Portion  Description of Materials	No.	3,700.00  Total Civil  Unit Rate  225.00	Quantity  1 & Services  Total Quantity	3,700.00  3,700.00  Total Amount
1 K SI. No.	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 .  Dismantling Portion  Description of Materials	No.	3,700.00  Total Civil  Unit Rate  225.00  Total C	Quantity  1 & Services  Total Quantity  1	3,700.00  3,700.00  Total Amount  225.00
1 K SI. No. 1	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 .  Dismantling Portion  Description of Materials	No.  Unit  Set	3,700.00  Total Civil  Unit Rate  225.00  Total C	Quantity  1 & Services  Total Quantity  1 Dismantling otal (J+K+L)	3,700.00  3,700.00  Total Amount  225.00  225.00
1 K SI. No. 1 L M	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 .  Dismantling Portion  Description of Materials  Dismantling for 33 KV Isolator without Earth Switch	No.  Unit  Set	3,700.00  Total Civil  Unit Rate  225.00  Total E  To	Quantity  1 & Services  Total Quantity  1 Dismantling Otal (J+K+L) Chout Earth	3,700.00  3,700.00  Total Amount  225.00  225.00  75,079.52
1 K SI. No. 1 L M	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 .  Dismantling Portion  Description of Materials  Dismantling for 33 KV Isolator without Earth Switch	No.  Unit  Set	3,700.00  Total Civil  Unit Rate  225.00  Total C  V Isolator with  Sub Total GST @	Quantity  1  & Services  Total Quantity  1  Dismantling Otal (J+K+L) Chout Earth switch) Total (L+M) 18% of (O)	3,700.00  3,700.00  Total Amount  225.00  225.00  75,079.52  4,504.77  79,584.29  14,325.17
1  K  SI. No.  1  L  N  O	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 .  Dismantling Portion  Description of Materials  Dismantling for 33 KV Isolator without Earth Switch	Unit Set	3,700.00  Total Civil  Unit Rate  225.00  Total C  V Isolator with  Sub T  Total GST @  Total CESS @	Quantity  1  & Services  Total Quantity  1  Dismantling Otal (J+K+L)  Chout Earth switch)  Total (L+M)  18% of (O)  20 1% of (O)	3,700.00  3,700.00  Total Amount  225.00  225.00  75,079.52  4,504.77  79,584.29

	BOQ for 11 KV, 800 A Isolato		arth Switch		
	Materials for 11 KV, 800 A Isol				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11 KV 800 AMP isolator with earth switch with Pl(polymer)	Set	65,534.00	1	65,534.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for Isolator Body)= 10x2.36	KG	93.00	23.60	2,194.80
Α					
В	Sto	ck, Stora	ge & Insurance		2,070.92
С					
D	0 10				
E			Tools & Plants	_	1,422.03
F			ransportation (		5,332.63
G	Erection Charges	@ 5% on	Trf/Breaker/W	'PB/ H-Pole	-
Н	Erection Charges @ 10% of C (except Trf/Breaker/WP		<u> </u>		6,976.07
1	Erection Charges @ 20% of	PSC pol			-
J			Sur	n of (C to I)	86,965.51
	<u>Civil &amp; Serv</u>	ices	<b>.</b>		
SI.	Description of Materials	Unit	Unit Rate	Total	Total
No.				Quantity	Amount
1	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	1	3,700.00
К		•	Total Civil	& Services	3,700.00
	<u>Dismantling P</u>	<u>ortion</u>			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV Isolator with Earth Switch	No.	225.00	1	225.00
L			Total D	ismantling	225.00
М		_		otal (J+K+L)	90,890.51
N	Other overheads (Including 6% supervision charges)	of M (fo	r 11 KV Isolator	with Earth switch)	5,453.43
0			Sub 7	Гotal (L+M)	96,343.94
Р			Total GST @	18% of (O)	17,341.91
Q			Total CESS @	2 1% of (O)	963.44
<u> </u>			solator with Ea		1,14,649.28

	BOQ for 11 KV, 800 A Isolator with	out Farth	Switch		
	Materials for 11 KV, 800 A Isolator with		-		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11 KV 800 AMP isolator without earth switch with Pl(polymer)	Set	53,617.60	1	53,617.60
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for Isolator Body)= 10x2.36	KG	93.00	23.60	2,194.80
Α			Total Cost o	f materials	57,114.40
В	Stock	, Storage	e & Insurance		1,713.43
С				Total (A+B)	58,827.83
D				/ @ 3% of C	1,764.83
E			Tools & Plants		1,176.56
F			nsportation @		4,412.09
G	Erection Charges @	5% on T	rf/Breaker/W	'PB/ H-Pole	-
H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)					5,748.68
I	Erection Charges @ 20% of P	SC pole-	Not to be use	ed for 33kv	-
J			Sur	n of (C to I)	71,929.99
	<u>Civil &amp; Services</u>	_			
SI.	Description of Materials	Unit	Unit Rate	Total	Total
No.	Description of Materials	Ome	Ome nate	Quantity	Amount
1	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	1	3,700.00
К		•	Total Civil	& Services	3,700.00
	Dismantling Portion	<u>1</u>			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV Isolator without Earth Switch	No.	225.00	1	225.00
L			Total D	ismantling	225.00
М				otal (J+K+L)	75,854.99
N	Other overheads (Including 6% supervision charges) of M	(for 11 K	V Isolator wit	hout Earth switch)	4,551.30
	1		Sub 1	Total (L+M)	80,406.29
0					
O P			Total GST @		14,473.13
			Total GST @ Total CESS @		14,473.13 804.06

	BOQ for 33 KV Control & Relay Panel (C	CRP) for L	ine Bay		
	Materials for 33 KV Control & Relay Panel	(CRP) fo	or Line Bay		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV Control & Relay Panel (CRP) for Line Bay	EA	2,63,650.00	1	2,63,650.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (5 Mtr for each CRP)= 5x2.36	KG	93.00	11.80	1,097.40
	Control Cable				-
4	4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50.00	6,944.00
5	7Core x 2.5 mm <sup>2</sup>	Mtr	225.68	50.00	11,284.00
Α		•	Total Cost o	f materials	2,84,277.40
В	Sto	ck, Stora	ige & Insurance	i.e 3% of A	8,528.32
С				Γotal (A+B)	2,92,805.72
D				/ @ 3% of C	8,784.17
E			Tools & Plants		5,856.11
F	Function Chauses		ransportation (		21,960.43
Н	G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole  H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)				1,990.52
	Erection Charges @ 20% of	: DSC nol	e- Not to be us	ed for 33ky	
<del>                                     </del>	Liection charges @ 20% of	F 3C POI		m of (C to I)	3,31,396.95
<b>–</b>	Civil & Services		34.	0. (0.10.1)	3,31,330.33
SI.				Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
1	Erection of 33 KV Control & Relay Panel (CRP) for Line Bay	No.	17,600.00	1	17,600.00
2	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	1	3,700.00
К		-	Total Civil	& Services	21,300.00
	<u>Dismantling Portion</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV CRP	No.	5,000.00	1	5,000.00
L				Dismantling	5,000.00
М				otal (J+K+L)	3,57,696.95
N	Other overheads ( Inclu	uding 6%	•		21,461.82
0				Total (L+M)	3,79,158.77
P			Total GST @ Total CESS (		68,248.58
Q	C	Total B4			3,791.59
R	Gross	s rotariv	laterial +Servic	es (U+P+Q)	4,51,198.94

	BOQ for 33 KV Control & Relay Panel (CRP)	for Tran	sformer Bay		
	Materials for 33 KV Control & Relay Panel (CF	RP) for Ti	ransformer Bay	<u></u>	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV Control & Relay Panel (CRP) for Transformar Bay	EA	3,26,930.10	1	3,26,930.10
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (5 Mtr for each CRP)= 5x2.36	KG	93.00	11.80	1,097.40
	Control Cable				-
4	4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50.00	6,944.00
5	7Core x 2.5 mm <sup>2</sup>	Mtr	225.68	50.00	11,284.00
Α			Total Cost o	f materials	3,47,557.50
В	Sto	ck, Stora	ge & Insurance		10,426.73
С				Total (A+B)	3,57,984.23
D			<u> </u>	/ @ 3% of C	10,739.53
E			Tools & Plants		7,159.68
F	5 11 01		ransportation (		26,848.82
G	Erection Charges	@ 5% on	Trf/Breaker/W	PB/ H-Pole	_
Н	Erection Charges @ 10% of C (except Trf/Breaker/WP	B/ H-Pole	e/HT stay set/P	SC/GI Pipe)	1,990.52
- 1	Erection Charges @ 20% of	PSC pol			-
J			Sur	n of (C to I)	4,04,722.77
1	Civil & Services				
<u> </u>		T	I	1	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
		Unit No.	<b>Unit Rate</b> 17,600.00		
No.	Description of Materials			Quantity	Amount
<b>No.</b>	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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	No.	17,600.00 3,700.00	Quantity 1	<b>Amount</b> 17,600.00
1 2	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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	No.	17,600.00 3,700.00	Quantity  1	Amount 17,600.00 3,700.00
1 2	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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.	17,600.00 3,700.00	Quantity  1	Amount 17,600.00 3,700.00
1 2 K SI.	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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.  Dismantling Portion	No.	17,600.00 3,700.00 Total Civil	Quantity  1  1  & Services	Amount 17,600.00 3,700.00 21,300.00 Total
1 2 K SI. No.	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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.  Dismantling Portion  Description of Materials	No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00	Quantity  1  1  & Services  Total Quantity	Amount  17,600.00  3,700.00  21,300.00  Total Amount
No.  1  2  K  SI. No.  1	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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.  Dismantling Portion  Description of Materials	No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total C	Quantity  1  8 Services  Total Quantity 1	Amount 17,600.00 3,700.00  21,300.00  Total Amount 5,000.00
No.   1	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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.  Dismantling Portion  Description of Materials	No.  No.  Unit  No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total C	Quantity  1  & Services  Total Quantity  1  Dismantling otal (J+K+L)  arges) of M	Amount  17,600.00  3,700.00  21,300.00  Total Amount  5,000.00  5,000.00  4,31,022.77  25,861.37
No.   1     2	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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.  Dismantling Portion  Description of Materials  Dismantling for 33 KV CRP	No.  No.  Unit  No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total Civil  Supervision characters	Quantity  1  & Services  Total Quantity  1  Dismantling otal (J+K+L) arges) of M  Fotal (L+M)	Amount  17,600.00  3,700.00  21,300.00  Total Amount  5,000.00  5,000.00  4,31,022.77  25,861.37  4,56,884.14
No.   1   2	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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.  Dismantling Portion  Description of Materials  Dismantling for 33 KV CRP	No.  No.  Unit  No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total Civil  Sub  Total GST @	Quantity  1  See Services  Total Quantity  1  Dismantling Otal (J+K+L) arges) of M  Total (L+M) 18% of (O)	Amount  17,600.00  3,700.00  21,300.00  Total Amount  5,000.00  5,000.00  4,31,022.77  25,861.37  4,56,884.14  82,239.14
No.   1     2	Description of Materials  Erection of 33 KV Control & Relay Panel (CRP) for Line Bay  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.  Dismantling Portion  Description of Materials  Dismantling for 33 KV CRP  Other overheads (Including Including	No.  No.  Unit  No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total Civil  Supervision characters	Quantity  1  See Services  Total Quantity  1  Dismantling Otal (J+K+L) arges) of M  Total (L+M) 18% of (O) 20 1% of (O)	Amount  17,600.00  3,700.00  21,300.00  Total Amount  5,000.00  5,000.00  4,31,022.77  25,861.37  4,56,884.14

	BOQ for 33 KV, 1250 A Outdoo	or VCB			
	Materials for 33 KV, 1250 A Out	door VC	<u>B</u>		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV, 1250 A Outdoor VCB	EA	2,16,000.00	1	2,16,000.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for each VCB)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
3	4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50.00	6,944.00
4	7Core x 2.5 mm <sup>2</sup>	Mtr	225.68	50.00	11,284.00
Α			Total Cost o	f materials	2,37,724.80
В	Stoo	ck, Stora	ge & Insurance	i.e 3% of A	7,131.74
С			Sub 1	otal (A+B)	2,44,856.54
D			Contigency	@ 3% of C	7,345.70
Е			Tools & Plants	@ 2% of C	4,897.13
F		Т	ransportation @	🦻 7.5% of C	18,364.24
G	Erection Charges (				11,124.00
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPE	3/ H-Pole	e/HT stay set/P	SC/GI Pipe)	2,103.55
ı	Erection Charges @ 20% of	PSC pol	e- Not to be us	ed for 33kv	-
J			Sur	n of (C to I)	2,88,691.16
	<u>Civil &amp; Services</u>	1	<u> </u>		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	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	1	3,700.00
К	The state of the s		Total Civil	& Services	3,700.00
	Dismantling Portion				,
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV VCB	No.	17,600.00	1	17,600.00
L				ismantling	17,600.00
М				otal (J+K+L)	3,09,991.16
N	Other overheads ( Inclu	ding 6%			18,599.47
0				Гotal (L+M)	3,28,590.63
Р			Total GST @		59,146.31
Q			Total CESS (	` '	3,285.91
R	Gross	Total M	aterial +Service	es (O+P+Q)	3,91,022.85

	BOQ for 11 KV Control & Relay Pane	I (CRP) -	<u>Indoor</u>		
	Materials for 11 KV Control & Relay Pa	nel (CRP	) - Indoor		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11 KV Control & Relay Panel (CRP) - Indoor	EA	2,57,301.00	1	2,57,301.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (5 Mtr for each CRP)= 5x2.36	KG	93.00	11.80	1,097.40
	Control Cable				-
3	4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50.00	6,944.00
4	7Core x 2.5 mm <sup>2</sup>	Mtr	225.68	50.00	11,284.00
Α			Total Cost o	f materials	2,77,928.40
В	Sto	ck, Stora	ge & Insurance	i.e 3% of A	8,337.85
С				「otal (A+B)	2,86,266.25
D			<u> </u>	/ @ 3% of C	8,587.99
E			Tools & Plants		5,725.33
F			ransportation (		21,469.97
G	Erection Charges			-	-
H	Erection Charges @ 10% of C (except Trf/Breaker/WP	-	• •		1,990.52
<u> </u>	Erection Charges @ 20% of	PSC pol			-
J	Civil & Services		Sur	n of (C to I)	3,24,040.05
SI				Total	Total
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor	Unit No.	<i>Unit Rate</i> 17,600.00		
No.	Description of Materials			Quantity	Amount
<b>No.</b> 1	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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	No.	17,600.00 3,700.00	Quantity 1	<b>Amount</b> 17,600.00 3,700.00
1 2	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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	No.	17,600.00 3,700.00	Quantity  1	<b>Amount</b> 17,600.00 3,700.00
1 2	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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.	17,600.00 3,700.00	Quantity  1	<b>Amount</b> 17,600.00 3,700.00
No. 1 2 K SI.	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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.  Dismantling Portion	No.	17,600.00 3,700.00 Total Civil	Quantity  1  1  & Services	3,700.00  21,300.00  Total
No.  1  2  K  SI. No.	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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.  Dismantling Portion  Description of Materials	No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00	Quantity  1  1  & Services  Total Quantity	Amount 17,600.00 3,700.00  21,300.00  Total Amount
No.  1  2  K  SI. No.  1	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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.  Dismantling Portion  Description of Materials	No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total C	Quantity  1  Services  Total Quantity 1	Amount 17,600.00 3,700.00  21,300.00  Total Amount 5,000.00
No.  1  2  K  SI.  No.  1  L	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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.  Dismantling Portion  Description of Materials	No.  No.  Unit  No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total C	Quantity  1  Services  Total Quantity  1  Dismantling otal (J+K+L)	Amount 17,600.00 3,700.00  21,300.00  Total Amount 5,000.00 5,000.00
No.   1	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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.  Dismantling Portion  Description of Materials  Dismantling for 11 KV CRP	No.  No.  Unit  No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total E  supervision characters	Quantity  1  Services  Total Quantity  1  Dismantling otal (J+K+L)	Amount 17,600.00 3,700.00  21,300.00  Total Amount 5,000.00 5,000.00 3,50,340.05
No.   1     2	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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.  Dismantling Portion  Description of Materials  Dismantling for 11 KV CRP	No.  No.  Unit  No.	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total E  supervision characters	Quantity  1  8 Services  Total Quantity  1  Dismantling otal (J+K+L) arges) of M  Total (L+M)	Amount 17,600.00 3,700.00  21,300.00  Total Amount 5,000.00 5,000.00 3,50,340.05 21,020.40
No.   1     2	Description of Materials  Erection of 11 KV Control & Relay Panel (CRP) - Indoor  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.  Dismantling Portion  Description of Materials  Dismantling for 11 KV CRP  Other overheads (Including Installation of Including Installation of Including Welding of GI flat around pipe.	No.  No.  Unit  No.  uding 6%	17,600.00  3,700.00  Total Civil  Unit Rate  5,000.00  Total Civil  Supervision characters	Quantity  1  8 Services  Total Quantity  1  Dismantling otal (J+K+L) arges) of M  Total (L+M) 18% of (O) 2 1% of (O)	Amount 17,600.00 3,700.00 21,300.00 Total Amount 5,000.00 5,000.00 3,50,340.05 21,020.40 3,71,360.45

	BOQ for 11 KV, Indoor	· VCB					
	Materials for 11 KV, Indo						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	11 KV Indoor VCB with CR panel without PT, CT (CTR- 600-300-150/1-1. 30VA, STC 25KA/3see, class: 0.5. 5P10) for feeder protection	EA	4,27,800.00	1	4,27,800.00		
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00		
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (5 Mtr for each VCB)= 5x2.36	KG	93.00	11.80	1,097.40		
Α			Total Cost of	f materials	4,30,199.40		
В	St	ock, Stoi	rage & Insurance	i.e 3% of A	12,905.98		
С			Sub 7	Γotal (A+B)	4,43,105.38		
D				/ @ 3% of C	13,293.16		
E			Tools & Plants	_	8,862.11		
F			Transportation (		33,232.90		
G	Erection Charges				22,031.70		
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ F		<u> </u>		113.03		
1	Erection Charges @ 20% c	of PSC po					
J			Sur	m of (C to I)	5,20,638.29		
	<u>Civil &amp; Services</u>			· · · · · · · · · · · · · · · · · · ·			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	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	1	3,700.00		
К		-	Total Civil	& Services	3,700.00		
	<u>Dismantling Portion</u>	<u>n</u>					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	Dismantling for 11 KV VCB	No.	17,600.00	1	17,600.00		
L			Total [	Dismantling	17,600.00		
М			To	otal (J+K+L)	5,41,938.29		
N	Other overheads ( Inc	luding 69	% supervision ch	arges) of M	32,516.30		
0			Sub <sup>-</sup>	Total (L+M)	5,74,454.58		
Р			Total GST @		1,03,401.83		
Q					5,744.55		
R	[sros	Gross Total Material +Services (O+P+Q) 6,83					

BOQ for 11 KV, Outdoor VCB																		
	<u>Materials for 11 KV, Outdoo</u>	or VCB																
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount													
	11KV Outdoor VCB with outdoor CR panel, without PT & 2Core.																	
1	CT (CTR-600-300-150/1-1A, STC 25KA/3Sec., class: 0.5 & 5P10)	EA	4,14,160.00	1	4,14,160.00													
	feeder protection																	
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00													
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for each	KG	93.00	23.60	2,194.80													
	VCB)= 10x2.36				,													
	Control Cable				-													
3	4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50.00	6,944.00													
4	7Core x 2.5 mm <sup>2</sup>	Mtr	225.68	50.00	11,284.00													
Α			Total Cost o		4,35,884.80													
В	Sto	ck, Stora	ige & Insurance		13,076.54													
С				Γotal (A+B)	4,48,961.34													
D				/ @ 3% of C	13,468.84													
<u>E</u>			Tools & Plants		8,979.23													
F	5 0		ransportation (		33,672.10													
G	Erection Charges	@ 5% or	1 Trf/Breaker/W	/PB/ H-Pole	21,329.24													
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-	Pole/HT	stay set/PSC po	ole/GI Pipe)	2,103.55													
ı	Erection Charges @ 20% of	PSC po	le- Not to be us	ed for 33kv	-													
J			Sur	m of (C to I)	5,28,514.30													
	<u>Civil &amp; Services</u>																	
SI.	Description of Materials	Unit	Unit Rate	Total	Total													
No.	Description of Materials	Onit Onit Rate	Unit	Unit Rate	Omt Nate	Omit Kate	Omit Kate	Offic Nate	Unit Rate	Omit Kate	. Offic Rate	Onit Rate	Omit Rate	Onit Rate	Omt Rate	Omt Rate	Quantity	Amount
1	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	1	3,700.00													
К		•	Total Civil	& Services	3,700.00													
	<u>Dismantling Portion</u>																	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount													
1	Dismantling for 11 KV VCB	No.	17,600.00	1	17,600.00													
L			Total D	Dismantling	17,600.00													
М			To	otal (J+K+L)	5,49,814.30													
N	Other overheads ( Incl	uding 6%	supervision ch	arges) of M	32,988.86													
0	,		•	Total (L+M)	5,82,803.16													
P			Total GST @		1,04,904.57													
Q			Total CESS (		5,828.03													
R	Gross	Total M		- ' '	6,93,535.76													
<u> </u>	Gross Total Material +Services (O+P+Q)																	

	Annexure-6.11				
BOQ for 33 KV, Outdoor CT					
	<u>Materials for 33 KV, Outdoor</u>	<u>CT</u>			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV Oil cooled CT with CTR ( 600-300-150/5-5) A,MCT 0.5 Class, protection 5P10, STC 25KA/3 sec & ISF <5	EA	35,340.00	1	35,340.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
4	4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50.00	6,944.00
Α			Total Cost o	f materials	45,780.80
В	Sto	ck, Stora	ige & Insurance	i.e 3% of A	1,373.42
С			Sub 1	Γotal (A+B)	47,154.22
D				/ @ 3% of C	1,414.63
Е			Tools & Plants	s @ 2% of C	943.08
F			ransportation (		3,536.57
G	Erection Charges				-
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				4,581.32
I	Erection Charges @ 20% of	PSC pol	e- Not to be us	ed for 33kv	-
J			Sur	m of (C to I)	57,629.82
	<u>Civil &amp; Services</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	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	1	3,700.00
К			Total Civil	& Services	3,700.00
	<u>Dismantling Portion</u>			<u> </u>	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV CT	No.	17,600.00	1	17,600.00
L				Dismantling	17,600.00
M	Ohlo an according to the United	ıdine Coʻ		otal (J+K+L)	78,929.82
N 0	Other overheads ( Inclu	uumg 6%	•	Total (L+M)	4,735.79 <b>83,665.61</b>
P			Total GST @		15,059.81
Q			Total CESS (	` '	836.66
R	Gross	Total M	laterial +Servic	es (O+P+Q)	99,562.07

	BOQ for 33 KV, Outdoor PT	-			
	Materials for 33 KV, Outdoor	_			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	1	31,520.80
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
3	4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50.00	6,944.00
Α			Total Cost o	f materials	41,961.60
В	Sto	ck, Stora	ge & Insurance		1,258.85
С				Total (A+B)	43,220.45
D				/ @ 3% of C	1,296.61
E			Tools & Plants		864.41
F			ransportation @		3,241.53
G	Erection Charges (	<u>@ 5% on</u>	Trf/Breaker/W	PB/ H-Pole	-
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-I	Pole/HT	stay set/PSC po	ole/GI PIPE)	4,187.94
	Erection Charges @ 20% of	PSC pol			-
J			Sur	n of (C to I)	52,810.94
	<u>Civil &amp; Services</u>	1	<b>.</b>		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	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	1	3,700.00
К			Total Civil	& Services	3,700.00
	<u>Dismantling Portion</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV PT	No.	17,600.00	1	17,600.00
L	-	•		Dismantling	17,600.00
М				otal (J+K+L)	74,110.94
N	Other overheads ( Inclu	ıding 6%	supervision cha	arges) of M	4,446.66
0			Sub	Гotal (L+M)	78,557.60
Р	P Total GST @ 18% of (O)				
Q			Total CESS (	@ 1% of (O)	785.58
R Gross Total Material +Services (O+P+Q)					93,483.54

	BOQ for 11 KV, Outdoor CT				
	Materials for 11 KV, Outdoor C	T			
SI. No.	Description of Materials	<u>.</u> Unit	Unit Rate	Total Quantity	Total Amount
1	11 KV Oil cooled CT with CTR (600-300-150/5-5) A, MCT 0.5 Class, protection 5P10, STC 25KA/3 sec & ISF <5	EA	19,096.00	1	19,096.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
3	4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50.00	6,944.00
Α			Total Cost o	f materials	29,536.80
В	Stock	, Storage	e & Insurance	i.e 3% of A	886.10
С			Sub	Γotal (A+B)	30,422.90
D			Contigency	/ @ 3% of C	912.69
E		-	Tools & Plants	s @ 2% of C	608.46
F		Tra	nsportation (	@ 7.5% of C	2,281.72
G	Erection Charges @	5% on T	rf/Breaker/W	/PB/ H-Pole	-
н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Po	ole/HT st	ay set/PSC po	ole/GI Pipe)	2,908.18
ı	Erection Charges @ 20% of F	SC pole-	Not to be us	ed for 33kv	-
J			Sui	m of (C to I)	37,133.95
	<u>Civil &amp; Services</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	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	1	3,700.00
K			Total Civil	& Services	3,700.00
	<u>Dismantling Portion</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV CT	No.	17,600.00	1	17,600.00
L			Total [	Dismantling	17,600.00
М			To	otal (J+K+L)	58,433.95
N	Other overheads ( Includ	ing 6% s	upervision ch	arges) of M	3,506.04
0	,		·	Total (L+M)	61,939.99
P			Total GST @		11,149.20
Q			Total CESS (	` '	619.40
R	Gross T	otal Ma	terial +Servic		73,708.59
1					

POO for 11 KV, Outdoor PT					
	BOQ for 11 KV, Outdoor PT	<del></del>			
	<u>Materials for 11 KV, Outdoor P</u>	<u>/</u> 	<u> </u>	1 1	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11KV,1 -Phase oil cooled PT ( $11000V/V3/110V/V3$ ) CLASS 0.5 / 3P, with O/P burden of 30VA	EA	21,080.00	1	21,080.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
4	4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50.00	6,944.00
Α			Total Cost o	of materials	31,520.80
В	Stock	, Storage	& Insurance	i.e 3% of A	945.62
С				Гotal (A+B)	32,466.42
D				/ @ 3% of C	973.99
E			Tools & Plants		649.33
F			nsportation (		2,434.98
G	Erection Charges @				-
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pc				3,112.54
	Erection Charges @ 20% of P	SC pole-			-
J			Sur	n of (C to I)	39,637.26
	<u>Civil &amp; Services</u>		ı		
SI.	Description of Materials	Unit	Unit Rate	Total	Total
No.	- coorpion of materials	0	- Cint Hate	Quantity	Amount
1	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	1	3,700.00
К			<b>Total Civil</b>	& Services	3,700.00
	<u>Dismantling Portion</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV PT	No.	17,600.00	1	17,600.00
L			Total D	Dismantling	17,600.00
М			To	otal (J+K+L)	60,937.26
N	Other overheads ( Includi	ing 6% sı	upervision ch	arges) of M	3,656.24
0			Sub	Total (L+M)	64,593.50
Р					11,626.83
Q			Total CESS (	@ 1% of (O)	645.93
R	Gross T	otal Mat	erial +Servic	es (O+P+Q)	76,866.26

	Standard BoQ and Estimate for 11k	V RMU			
Supply I	Portion				
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of 11kV RMU				
а	No. of 11kV 4Way RMU (LLVV)	nos.	1		
1.1	Supply of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	1	5,57,710.00	5,57,710.00
Erection	Sub Total (Supply Portion) (in Rs.)  n Portion				5,57,710.00
Liectioi	reaction			Rate	Amount
SI. No.	Description of items	Unit	Quantity	(in Rs.)	(in Rs.)
1	Erection, Commissioning, Wiring and Testing of 11kV RMU				, ,
1.1	Erection of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	1	9,639.00	9,639.00
	Sub Total (Erection Portion) (in Rs.)				9,639.00
6: 'l D.					
Civil Po	rtion			Rate	Amount
SI. No.	Description of items	Unit	Quantity	(in Rs.)	(in Rs.)
1	Dismantling of RMU	Nos.	1	7,633.80	7,633.80
	Sub Total (Civil Portion) (in Rs.)				7,633.80
Α	Sub Total (Supply Portion)				5,57,710.00
В	Stock, Storage & Insurance @ 3 % of A				16,731.30
C	Sub Total (A+B)				5,74,441.30
D	Contingency @ 3 % of C				17,233.24
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				43,083.10
G	Erection Charges @ 10% of earthing items				-
Н	Total (C+D+E+F+G)				6,34,757.64
I	Sub Total (Erection Portion + Civil Portion)				17,272.80
J	Total Cost (H+I)				
K	Κ Other Overhead /(including Supervision Charges) @ 6 % of J				
L	L Total Estimated Capital Cost i.e. (J+K)				
М	M GST @ 18% of L				
M1	CESS @ 1% of L				6,911.52
N	Grand Total (L+M+M1)				8,22,471.19

	Standard BoQ and Estimate 11k\	/ RMU			
Supply	Portion				
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of 11kV RMU				
а	No. of 11kV 5Way RMU (LLVVV)	nos.	1		
1.1	Supply of 11kV RMU 5 Way, 2 Iso & 3 Brk 630A (LLVVV)	Nos.	1	12,32,372.00	12,32,372.00
Funation	Sub Total (Supply Portion) (in Rs.)				12,32,372.00
	Portion Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning, Wiring and Testing of 11kV RMU				•
1.1	Erection of 11kV RMU 5 Way, 2 Iso & 3 Brk 630A (LLVVV)	Nos.	1	9,639.00	9,639.00
	Sub Total (Erection Portion) (in Rs.	)			9,639.00
Civil Po	rtion	<u> </u>	1 1	Dete	America
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Dismantling of RMU	Nos.	1	7,633.80	7,633.80
	Sub Total (Civil Portion) (in Rs.)		1	,	7,633.80
Α	Sub Total (Supply Portion)				12,32,372.00
В	Stock, Storage & Insurance @ 3 % of A				36,971.16
С	Sub Total (A+B)				12,69,343.16
D	Contingency @ 3 % of C				38,080.29
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				95,200.74
G	Erection Charges @ 10% of earthing items				-
Н	Total (C+D+E+F+G)				14,02,624.19
I	Sub Total (Erection Portion + Civil Portion)				17,272.80
J	J Total Cost (H+I)				
K	K Other Overhead /(including Supervision Charges) @ 6 % of J				
L	L Total Estimated Capital Cost i.e. (J+K)				
М	GST @ 18% of L				2,70,916.35
M1	CESS @ 1% of L				15,050.91
N	Grand Total (L+M+M1)				17,91,058.07

	Standard BoQ and Estimate for 11k	V RMU			
Supply	Portion				
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of 11kV RMU				
а	No. of 11kV 6Way RMU (LLVVVV)	nos.	1		
1.1	Supply of 11kV RMU 6 Way, 2 Iso & 4 Brk 630A (LLVVV)	Nos.	1	15,42,562.00	15,42,562.00
Frection	Sub Total (Supply Portion) (in Rs.)  n Portion				15,42,562.00
	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning, Wiring and Testing of 11kV RMU				
1.1	Erection of 11kV RMU 6 Way, 2 Iso & 4 Brk 630A (LLVVVV)	Nos.	1	9,639.00	9,639.00
	Sub Total (Erection Portion) (in Rs.)		1		9,639.00
Civil Po	 rtion				
	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Dismantling of RMU	Nos.	1	7,633.80	7,633.80
	Sub Total (Civil Portion) (in Rs.)				7,633.80
Α	Sub Total (Supply Portion)				15,42,562.00
В	Stock, Storage & Insurance @ 3 % of A				46,276.86
С	Sub Total (A+B)				15,88,838.86
D	Contingency @ 3 % of C				47,665.17
Е	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				1,19,162.91
G	Erection Charges @ 10% of earthing items				-
Н	Total (C+D+E+F+G)				17,55,666.94
I	Sub Total (Erection Portion + Civil Portion)				17,272.80
J	J Total Cost (H+I)				
K Other Overhead /(including Supervision Charges) @ 6 % of J					1,06,376.38
L Total Estimated Capital Cost i.e. (J+K)					18,79,316.12
М	GST @ 18% of L				3,38,276.90
M1	CESS @ 1% of L				18,793.16
N	Grand Total (L+M+M1)				22,36,386.19

	Standard BoQ and Estimate for 630	kVA CS	S		
Supply	Portion				
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of 630kVA CSS				
а	No. of 630kVA CSS	nos.	1		
1.1	Supply of 630kVA CSS	Nos.	1	29,34,734.00	29,34,734.00
Fraction	Sub Total (Supply Portion) (in Rs.)  n Portion				29,34,734.00
	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning, Wiring and Testing of 630kVA CSS				
1.1	Erection of 630kVA CSS	Nos.	1	38,168.00	38,168.00
	Sub Total (Erection Portion) (in Rs.)		1		38,168.00
Civil Po	 rtion				
	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Dismantling of CSS	Nos.	1	9,000.00	9,000.00
	Sub Total (Civil Portion) (in Rs.)		•		9,000.00
Α	Sub Total (Supply Portion)				29,34,734.00
В	Stock, Storage & Insurance @ 3 % of A				88,042.02
С	Sub Total (A+B)				30,22,776.02
D	Contingency @ 3 % of C				90,683.28
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				2,26,708.20
G	Erection Charges @ 10% of earthing items				-
Н	Total (C+D+E+F+G)				33,40,167.50
1	Sub Total (Erection Portion + Civil Portion)				47,168.00
J	J Total Cost (H+I)				
K Other Overhead /(including Supervision Charges) @ 6 % of J					2,03,240.13
L Total Estimated Capital Cost i.e. (J+K)					
М	GST @ 18% of L				6,46,303.61
M1	CESS @ 1% of L				35,905.76
N	Grand Total (L+M+M1)				42,72,785.00

	ANNEXURE-7 LVRT			
SI. No.	DESCRIPTION OF WORK	Quantity (in nos.)	Unit Price (in Rs.)	Amount (in cr.)
1	7/11kV 1000 kVA Line Voltage Regulator DTR	8	50,39,765.36	4.0
	Total			4.0

	7/11kV 1000 kVA Line Voltage Regulator DTR						
	Nos. 1						
SI.	MATERIALS OF 11kV LVRT			Total	Total		
No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
	SUPPLY OF FOLLOWING EQUIPMENT & MA	TERIALS		, ,			
	WPB 160x152 (11Mtr. Long, 30.44KG/Mtr.)	Nos.	26,516.95	2	53,033.90		
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	45.888	3,487.49		
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	3.9648	368.73		
4	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's (Each 2x0.59x0.510)	Kg	76.00	0.60	45.74		
5	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5x7 mtr. For mesh formation, 12 Mtr. For LA and 2.5 mtr. For raising, 5x2 mtr. for DTR Nutral, (1.3+4.5) mtr. For DTR Body, 0.500 mtr for LTDB, 3 mtr. for Fencing, 2X2 mtr. for ICOG) ( Each 55.3x 2.36= 130.51 Kg)	KG	93.00	130.51	12,137.24		
6	1000 KVA , 7/11 KV Line Voltage Regulator Transformer	Nos.	19,50,000.00	1	19,50,000.00		
	Supply of 11kV, 3Core, 120 sqmm, Aluminium UG cable for 3Core (Set)	Mtr.	817.16	100	81,716.00		
8	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 120 sqmm, HT UG cable for 3Core (Set)	Set	10,546.20	8	84,369.60		
9	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 120 sqmm, HT UG cable for 3Core (Set)	Set	14,577.44	8	1,16,619.52		
10	11 kV RMU VCB ICOG	Set	2,84,742.00	2	5,69,484.00		
11	Disc insulator (B&S)70 KN polymer	No	1,426.00	6	8,556.00		
12	H W fitting (B&S)70KN(3bolted)	Set	434.00	6	2,604.00		
13	Lightning Arrester(12KV,10KA) Station Class 2	Nos.	4,402.00	6	26,412.00		
14	11KV pin insulator polymer	No	248.00	6	1,488.00		
15	HT stay set complete	Set	1,302.00	2	2,604.00		
16	HT stay Clamp (1.9Kg/pair)	Pair	155.00	2	310.00		
	HT stay insulator TYPE-C	No	62.00	2	124.00		
18	7/10 SWG GI stay wire, Grade -2 (15Kg./ Set)	Kg	93.00	30	2,790.00		
	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	10	13,020.00		
20	GI Nuts & Bolts of Assorted size (25 Kg/ DSS DP)	Kg	96.72	25	2,418.00		
-	GI Barbed wire/Anticlimbing device (3Kg /Pole)	Kg	99.20	6	595.20		
22	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87		
23	Danger plate 11kv	No	99.20	2	198.40		
24	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97		
25	Name plate	No	99.20	1	99.20		
$\overline{}$	Structure Numbering and Marking				-		
26.i	Yellow Colour Paint for Background	Ltr	272.80	2	545.60		
	Black Colour Paint for numbering	Ltr	272.80	1	272.80		
Α	<u>-</u>		Total Cost	of materials	29,33,579.25		
В	St	ock, Stor	age & Insurance	i.e 3% of A	88,007.38		
С			Sub	Total (A+B)	30,21,586.63		
D	D Contigency @ 3% of C						
E			Tools & Plant	s @ 2% of C	54,517.23		
F			Transportation	@ 7.5% of C	2,26,619.00		
G	Erection Charge	s @ 5% o	n Trf/Breaker/V	VPB/ H-Pole	1,32,484.67		
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/	H-Pole/H	T stay set/GI Pip	e/PSC Pole)	6,129.35		
ı							
J		·	Su	m of (C to I)	35,31,984.48		
	Civil and Services Works (As per Technical Specification)						
1	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.450Cu.mtr	Cu.mtr	6,500.00	0.9	5,850.00		

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount			
2	Couping ratio 1:1.5:3 (500mmX500mmX450mm) = 0.113Cu.mtr	Cu.mtr	6,500.00	0.226	1,469.00			
3	Fixing of stay set with 0.5Cum cement concrete foundation 1:3:6 size ( 900mmx600mmx900mm) using 40mm BHG metal with all labor and material except stay set , stay wire , stay insulator .	No.	2,250.00	2	4,500.00			
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing		3,700.00	10	37,000.00			
5	Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method.	Mtr.	94.50	100	9,450.00			
6	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	8	15,206.40			
7	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	8	15,206.40			
8	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			0	-			
1.1	Earth work excavation of soil (1mtr. width X 1mtr. depth)			0	-			
1.1.a	Earth work excavation of <b>soil</b>	Cum	700.00	35	24,500.00			
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	1,720.00	15	25,800.00			
1.2	Back filling with excavated soil outside and above the trench	Cum	202.00	50	10,100.00			
9	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	1463.4	64	93,657.60			
	Construction of 3-way/4-way/5way RMU Plinth with Brick, Mortar, 12 mm cement plaster as per drawing. Scope of work includes excavation of earth for foundation and supply of raw material i.e. sand, cement, bricks and removal of extra malba if any as per site requirement including labour required for the same as per site requirement & With respect to TPCODL drawing.	EA	23,145.30	2	46,290.60			
6	Construction of Plinth with Brick, Mortar, 12 mm cement plaster upto 1000KVA transformer as per TPCODL drawing. Scope of work includes excavation of earth, supply of Civil material, machinery for construction of plinth as per TPCODL Drawing desposal of extra malba as per EIC instruction.	No.	30,360.00	1	30,360.00			
7	Supply and Erection of GI Fencing with Gate Sqmtr. 3,600.00 40							
K	Total Civil & Services							
L	Total (J+K)							
М	Other overheads (Including 6% supervision charges) of L							
N				Total (L+M)	42,35,096.94			
0			Total GST @		7,62,317.45			
Р				@ 1% of (N)	42,350.97			
Q	Gross Total Material +Services (N+O+P) 50,39,765.							

# **ANNEXURE-8**

# **33kV NETWORK INFRASTRUCTURE**

SI. No.	Proposal	Costing (in cr.)	Annexure Nos.
1	Proposal for mitigation of Overloading issue	₹ 18.7	Annexure- 8.1 to 8.10
2	Proposal for mitigation of Low Voltage Issue	₹ 26.3	Annexure- 8.11 to 8.19
	TOTAL	₹ 45.0	

# <u>Summary of proposal details for mitigation of Overloading issue:</u>

SI. No.	Circle	Division	Name of 33kV Feeder	Proposal Details	Costing in Cr	Annexure No.
1	BBSR-1	BCDD-2	Vipul	Installation of 4nos. of 33kV RMUs at 33/11kV Kalinga Nagar PSS for mitigating overloading issue of 33kV Vipul Feeder by splitting the 33kV bus along with laying of 33kV UG cable.	₹2	Annexure- 8.1
2	BBSR-1	NED	Kakatpur	Augmentation of 33kV line from DIGHALO GSS to Kakatpur PSS from 100/148sqmm to 232sqmm conductor for 26km length with LILO arrangement at Chharichak PSS.	₹7.24	Annexure- 8.2
3	Cuttack	CED	Badachana	Augmentation of existing Badachana feeder for 4Ckm from 80sq.mm, AAAC to 232sq.mm from Chandikhole 132/33kV GSS to 33/11kV Badachana PSS.	₹1	Annexure- 8.3
4	Cuttack	AED	Khuntuni	Augmentation of existing Khuntuni Feeder for 4.5Ckm from 100 sq.mm, AAAC to 232 sq.mm from 132/33kV, Khuntuni GSS to 33/11kV, Khuntuni PSS along with installation 2nos. 4Way RMUs to sectionalise the 33kV bus of Khuntuni PSS	₹2.08	Annexure- 8.4
5	Cuttack	CED	Choudwar	Augmentation of existing Choudwar Feeder for 0.8Ckm from 100 sq.mm, AAAC to 232 sq.mm from 132/33kV, Choudwar GSS, to 33/11kV, Choudwar PSS.	₹0.23	Annexure- 8.5
6	BBSR-2	KHD	Nuagaon	Installation of bus sectionalizer at 33/11kV Jatani PSS to mitigate overloading issue of 33kV Nuagaon feeder emanating from 132/33kV Argul GSS.	₹1.58	Annexure- 8.6

SI. No.	Circle   Division   33kV   Proposal Details		Costing in Cr	Annexure No.		
7	Dhenkanal	Sq.mm. XLPE U/G cable along 1no. 33kV 4-way RMU (LLV mitigate overloading of 33kV 4 feeder and ensure reliabiles)		Laying of 0.575km 33kV 1CX630 Sq.mm. XLPE U/G cable along with 1no. 33kV 4-way RMU (LLVV) to mitigate overloading of 33kV Angul-1 feeder and ensure reliability of 33kV Angul-1 & Ganesh Sponge feeders.	₹1.28	Annexure- 8.7
8	8 Paradeep JED Balikuda Augmentation of 3.35Ckm 33kV Balikuda feeder from & 100 sq.mm. AAAC to 23		Augmentation of 3.35Ckm existing 33kV Balikuda feeder from 80sqmm & 100 sq.mm. AAAC to 232 sq.mm. AAAC.	₹1.16	Annexure- 8.8	
9	Paradeep	PDP	Gorada	Augmentation of 8Ckm existing 33kV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC along 33kV Gorada feeder.	₹2.03	Annexure- 8.9
KED-1 &		Installation of 1no. 4-Pole and stringing of 0.1Ckm 148sqmm conductor from Danpur 4Pole to Danpur PSS for bifurcation of 33kV Danpur New feeder	₹0.08	Annexure- 8.10		
TOTAL					₹ 18.7	

# <u>Summary of proposal details for mitigation of Low Voltage Issue:</u>

SI. No.	Circle	Division	Proposal Details	Costing in Cr	Annexure No.
1	BBSR-1	BCDD-2	Installation of 3nos. 33kV RMU along with laying of 33kV UG cable at 33/11kV Barmunda PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.	₹1.31	Annexure- 8.11
2	BBSR-1	Installation of 4nos. 33kV RMU along with laying of		₹1.76	Annexure- 8.12
3	BBSR-1	BCDD-2	Installation of 3nos. 33 kV RMU along with laying of 33kV UG cable at 33/11kV CS Pur-1 PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.	₹1.42	Annexure- 8.13
4	Installation of 2nos. 33 kV RMU along with laying of 33kV UG cable at 33/11kV College PSS for mitigating		₹ 0.87	Annexure- 8.14	
5	Installation of 3nos. 33 kV RMU along with laying of		₹1.45	Annexure- 8.15	
6	Paradeep	PDP	Construction of 33kV interlinking line from Chikinia PSS to Raghunathpur PSS for mitigating low voltage issue by diverting load of 33kV Kandarpur/	₹ 5.06	Annexure- 8.16

SI. No.	Circle	Division	Proposal Details	Costing in Cr	Annexure No.
			Jagatsinghpur feeder to 33kV Tirtol-Jagatsinghpur Feeder.		
7	7 Cuttack CED Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS and 1no. 5MVA AVR Unit at Kulakapasi PSS with augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS 14.5km.		₹8.50	Annexure- 8.17	
8	BBSR-II	BAED	Augmentation of 33kV Bhusandpur feeder for 5.5Ckm line between Bharat Electricals to Jankia PSS and construction of 2nos. 33kV RMU with laying of UG cable at Jankia PSS.	₹1.89	Annexure- 8.18
9	BBSR-II	NYED	Installation of 1no. 26.5/33kV, 1no. 5MVA AVR Unit at Bolagarh PSS and 1no. 5MVA AVR Unit at Hatabasta PSS.	₹ 4.06	Annexure- 8.19
		₹ 26.30			

# Mitigation of 33kV Feeder Overloading Issue

## 1.0 Proposal for overloading mitigation of 33kV Vipul Feeder:

**Proposal:** Installation of 4nos. of 33kV RMUs at 33/11kV Kalinga Nagar PSS for mitigating overloading issue of 33kV Vipul Feeder by splitting the 33kV bus along with laying of 33kV UG cable.

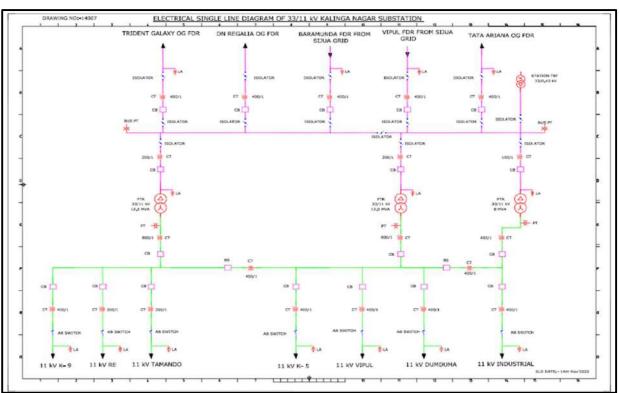
**Objective:** To ensure reliable power supply to the end consumers by splitting the 33kV bus at PSS for mitigating overloading issues.

#### **Existing Scenario:**

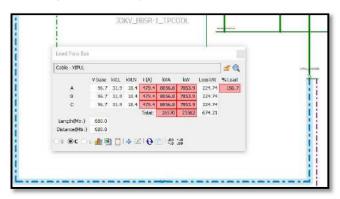
- At present, 33kV Vipul feeder is emanating from 132/33kV Ranasinghpur GSS and feeding power supply to 6nos. high value consumer along with 33/11kV Kalinga Nagar PSS. Total length of the 33kV feeder is 8.66km and the peak loading at Summer'22 is 21.71MVA.
- At present 3 nos. of 33kV feeder connectivity is available at Kalinga Nagar PSS, but due to unavailability of bus splitting arrangement, load divertion is not operationable at Kalinga Nagar PSS. All the PTR loads of 33/11kV Kalinga Nagar PSS are fed power supply through 33kV Vipul Feeder.
- Considering load growth for 5years (10% load growth per year for 2years, 6% load growth per year for next 3years) 33kV feeder is overloaded as mentioned below.

#### Existing Summer'22 Loading and projected load at 33kV Vipul Feeder:

33kV Feeder Name	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	Feeder Overloading Status
Vipul	17.49	21.71	124.13%	Overload	26.27	31.29	178.92%	Overload



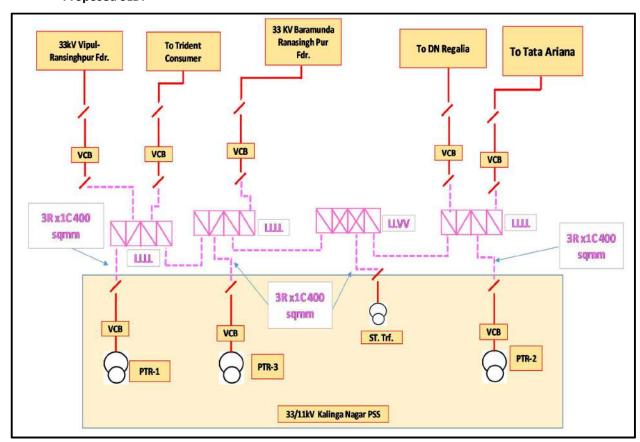
# Load Flow Study of existing scenario in Cyme Software:



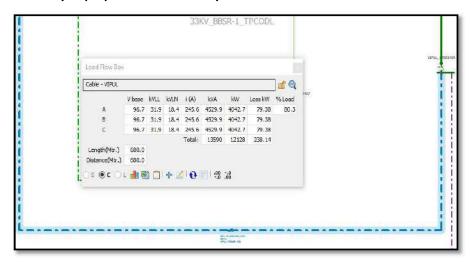
# **Proposed Scenario:**

- Installation of 4nos. of 33kV, 4 Way RMUs at kalinga Nagar PSS for bus splitting arrangement.
- Overloading mitigation of 33kV Vipul feeder by bifurcating the load as shown in the below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Vipul	17.49	13.12	15.62	89.32%	OK
Gothapatna	26.51	8.43	10.04	37.89%	OK
Barmunda	20	4.72	5.62	28.10%	ОК



#### Load Flow Study of proposed scenario in Cyme Software:



#### **Detailed Scope of Work:**

- Laying of 33kV UG Cable of length of 185mtr, 1Cx630sqmm from 33kV line VCB & 33kV consumer
   VCB to proposed RMU.
- Installation of 3nos. of 33kV 4 Way (LLLL) RMU & 1 no. of 33kV 4 way (LLVV) RMU at Kalinga nagar
   PSS.
- Laying of 33kV UG Cable of length of 85mtr using 1Cx400sqmm, 33kV UG cable from proposed RMU to PTR VCB & proposed RMU to station transformer.

# BoQ:

	TP CENTRAL ODISHA DISTRIBUTION LIMITED						
Name of the Division :	BCDD-II						
Name of the Sub-Division	:- Khandagiri						
Name of the Work :-	Mitigation of 33kV Feeder Overloading: Installation of 4 Nos. of 33 KV RMU at Kalinga Nagar PSS for operation & mitigation of overloding issue of 33KV Vipul fe						
Scope:-	Part-A:-  1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx6 UG cable. (From33 KV Line VCB & 33 KV Consumer VCB to 2. Installation of 3 Nos. of 33 KV 4 Way (LLLL) RMU & 1 no. (LLVV) RMU at Kalinga nagar PSS.  Part-B:- Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 cable. (From Proposed RMU to PTR VCB & Proposed RMU Transformer)	Proposed RMU). of 33 KV 4 way mm2, 33KV UG					
Names of Schemes: -	TPCODL CAPEX (FY 23-24)	TPCODL CAPEX (FY 23-24)					
	ABSTRACT OF ESTIMATE						
SI. No. Part Description An		Amount					

Total estin		Total Amount (In Cr)	1.58
		Total Amount	1,58,10,953.61
2	В	Part-B:- Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm2, 33KV UG cable.(From Proposed RMU to PTR VCB & from Proposed RMU to station Transformer)	7,11,352.42
1	А	Part-A:- 1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm2, 33KV UG cable.(From33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU). 2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.	1,50,99,601.19

Cost Estimate: ₹ 1.58cr. (For detailed BoQ refer Annexure-8.1).

- Mitigating overloading issues of 33kV Vipul Feeder.
- Ensuring reliability of power supply for consumers & connected PSS.

#### 2.0 Proposal for overloading mitigation of 33kV Kakatpur Feeder:

**Proposal:** Augmentation of 33kV line from DIGHALO GSS to Kakatpur PSS from 100/148sqmm to 232sqmm conductor for 29.5km length with LILO arrangement at Chharichak PSS to mitigate overloading.

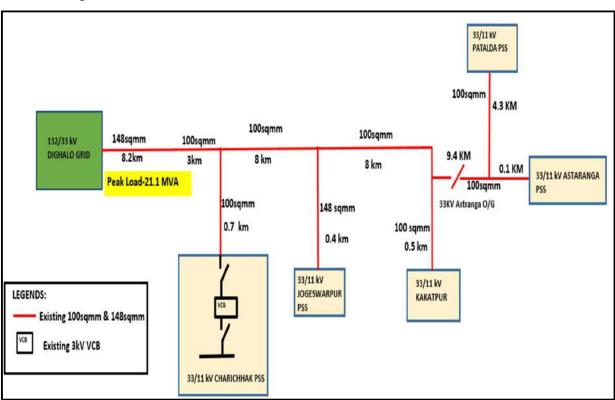
**Objective:** To ensure reliable power supply by mitigating overloading and strengthening of the existing network.

#### **Existing Scenario:**

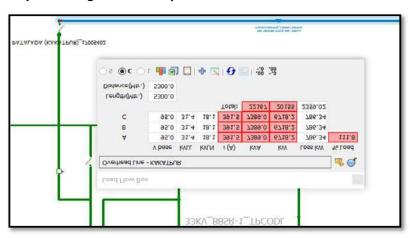
- At present, 33kV Kakatpur feeder is emanating from Dighalo Grid, having mixed type conductor 148/100sqmm with a length of 43km.
- Present peak load of Kakatpur 33kV feeder is 21.14 MVA, w.r.t., the current carrying capacity of conductor 15.54 MVA.
- Considering present scenario, there is overloading of the feeder and low voltage in some areas.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

#### Existing Summer'22 Loading and projected load at 33kV Kakatpur Feeder:

33kV Feeder Name	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	Feeder Overloading Status
Kakatpur	15.54	21.14	136.05%	Overload	22.87	25.72	165.53%	Overload



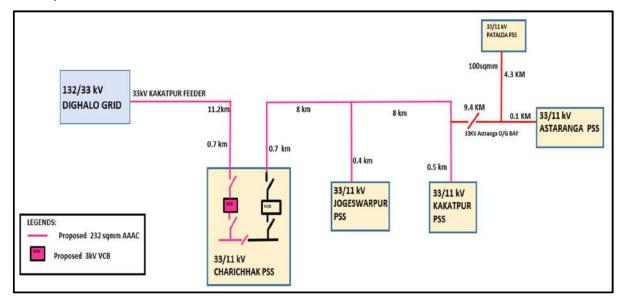
#### Load Flow Study of existing scenario in Cyme Software:



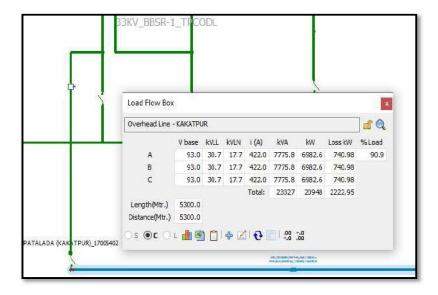
#### **Proposed Scenario:**

- Installation of 33kV VCB and provision of LILO arrangement is proposed at Charichhak PSS to reduce frequent interruptions.
- 33kV Kakatpur feeder augmentation is proposed from Dighalo Grid to Kakatpur PSS for a length of 26km.
- Overloading mitigation of 33kV Kakatpur feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Kakatpur	26.51	22.87	25.72	97%	ОК



# Load Flow Study of proposed scenario in Cyme Software:



# **Detailed Scope of Work:**

- Augmentation of Kaktapur feeder from 100/148 sq.mm OH conductor to 232sqmm conductor for 26km length.
- Construction of additional 33kV bay at Charichhak PSS.

#### BoQ:

	ANNEXURE-8.2						
	TP CENTRAL ODISHA DISTRIBUTION LIMITED						
Name of the	Division :-	NED					
Name of the Si	ub-Division : -	KAKATPUR					
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for augmentation of 33 kV line from DIGHALO GSS to Kakatpur PSS with LILO arrangement at Charichhak PSS to mitigate overloading and low Voltage issue.					
Scop	oe:-	PART A: Replacement of 100 sqmm conductor with 232sqmm along with Intermediate H- Poles from Dighalo GSS to Kakatpur PSS of Ckt. Line length - 26 Ckm PART B: Installation of 33kV Isolator- 3 no.s and 33kv VCB- 1 no.s at CHARICHHAK PSS.					
Names of S	ichemes: -	TPCODL CAPEX (FY 23-24)					
	1	ABSTRACT OF ESTIMATE					
SI. No.	Part	Description	Amount				
1 A		PART A: Replacement of 100 sqmm conductor with 232sqmm along with Intermediate H- Poles from Dighalo GSS to Kakatpur PSS of Ckt. Line length - 26 Ckm	6,88,13,541.59				

		Total Amount	7,24,44,438.66
2	В	PART B: Installation of 33kV Isolator- 3 no.s and 33kv VCB- 1 no.s at CHARICHHAK PSS.	36,30,897.07

Cost Estimate: ₹ 7.24cr. (For detailed BoQ refer Annexure-8.2).

- Ensuring reliable power supply by mitigating overloading.
- VCB and LILO arrangement is proposed at Charichhak PSS to reduce frequent interruptions.

# 3.0 Proposal for overloading mitigation of 33kV Badachana Feeder:

**Proposal:** Augmentation of existing Badachana feeder for 4Ckm from 80sq.mm, AAAC to 232sq.mm from Chandikhole 132/33kV GSS to 33/11kV Badachana PSS.

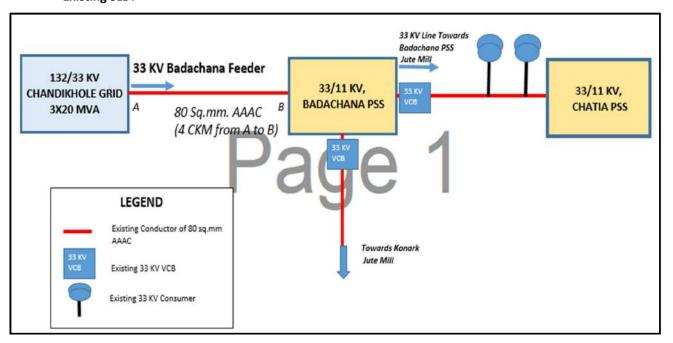
**Objective:** To ensure reliable power supply by mitigating overloading and strengthening of the existing network.

#### **Existing Scenario:**

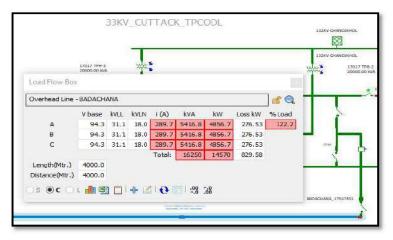
- At present, 33kV Badachana feeder is emanating from Chandikhole Grid, having conductor size of 80sq.mm, AAAC for a length of 4 Ckm.
- Present peak load of Badachana 33kV feeder is 15.2 MVA, w.r.t., the current carrying capacity of conductor 13.5MVA.
- Considering present scenario, there is overloading issue on the existing 33kV Badachana feeder.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

# Existing Summer'22 Loading and projected load at 33kV Badachana Feeder:

33kV Feeder Name	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 FY' 27- 28	Feeder Overloading Status FY' 27-28
Badachana	13.5	15.2	112.59%	Overload	16.44	18.49	136.99%	Overload



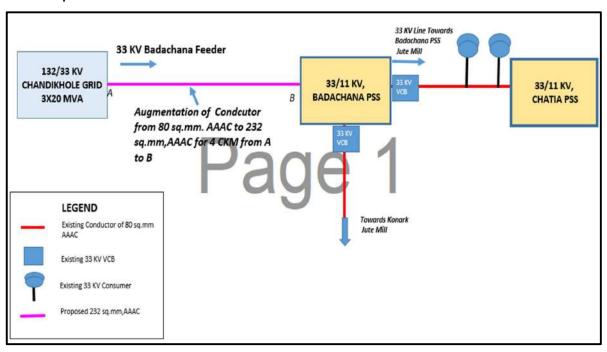
#### Load Flow Study of existing scenario in Cyme Software:



#### **Proposed Scenario:**

- 33kV Badachana feeder augmentation is proposed from Chandikhole Grid to Badachana PSS for a length of 4km.
- Overloading issue mitigation of 33kV Badachana feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Badachana	26.51	16.44	18.49	69.76%	ОК



#### **Load Flow Study of proposed scenario in Cyme Software:**



#### **Detailed Scope of Work:**

Augmentation of existing Badachana Feeder for 4Ckm from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33kV Grid to 33/11kV Badachana PSS for providing reliable power supply by mitigating overloading issue.

#### BoQ:

	TP CENTRAL ODISHA DISTRIBUTION LIMITED							
Name of the	Division :-	CED						
Name of the Si	ub-Division : -	BADACHANA						
Name of th	ne Work :-	Mitigation of 33kV Feeder Overloading: Proposal for conductor augmentation of 33 KV Badachana feeder of 4 CKM from 80 sq.mm, O/H, AAA conductor to 232 sq.mm, AAA conductor to mitigate overloading issue.						
Scop	oe:-	Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.						
Names of S	schemes: -	TPCODL CAPEX(FY 23-24)						
		ABSTRACT OF ESTIMATE						
Sl. No.	Part	Description	Amount					
1	А	Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 92,30,072 KV, GSS to 33/11 KV, Badachana PSS.						
		Total Amount	92,30,071.27					
		Total Amount (In Cr) 0.92						
Total estimated cost is Rs. 0.92 Crore. (On TPCODL Capex Scheme)								

Cost Estimate: ₹ 0.92cr. (For detailed BoQ refer Annexure-8.3).

- Mitigating overloading issue of 33kV Badachana feeder.
- Ensuring reliability of power supply.

# 4.0 Proposal for overloading mitigation of 33kV Khuntuni Feeder:

**Proposal:** Augmentation of existing Khuntuni Feeder for 4.5Ckm from 100 sq.mm, AAAC to 232 sq.mm from 132/33kV, Khuntuni GSS to 33/11kV, Khuntuni PSS along with installation 2nos. 4Way RMUs to sectionalise the 33kV bus of Khuntuni PSS.

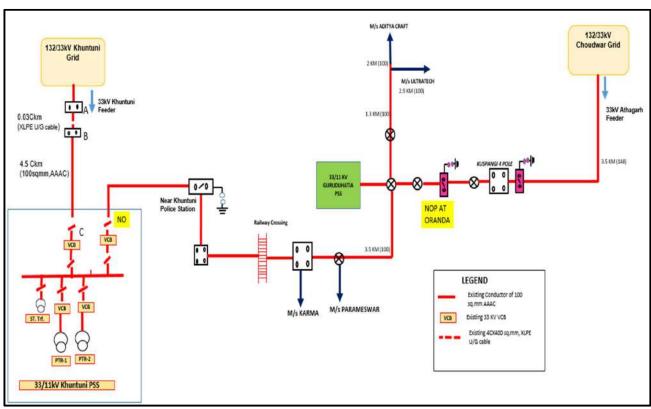
**Objective:** To ensure reliable power supply by mitigating overloading issue and strengthening of the existing network.

#### **Existing Scenario:**

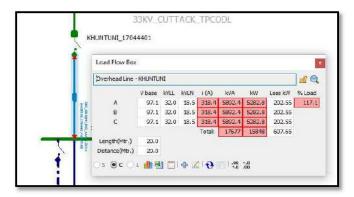
- At present, length of feeder from Khuntuni Grid to Khuntuni PSS, having conductor of 100 sq.mm, AAAC for a total length of 4.5Ckm.
- Present peak load of 33kV Khuntuni feeder is 15.9MVA, w.r.t., the current carrying capacity of conductor 15.5MVA.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

#### Existing Summer'22 Loading and projected load at 33kV Khuntuni Feeder:

33kV Feeder Name	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 FY' 27- 28	Feeder Overloading Status FY' 27-28
Khuntuni	15.5	15.9	102.58%	Overload	17.20	19.34	124.81%	Overload



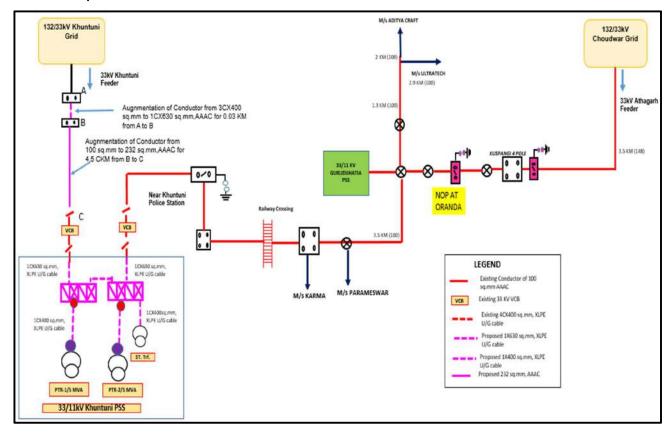
#### Load Flow Study of existing scenario in Cyme Software:



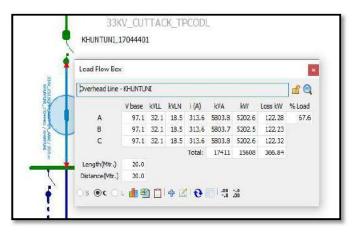
#### **Proposed Scenario:**

- 33kV Khuntuni feeder augmentation is proposed from 132/33kV, Khuntuni GSS to 33/11kV, Khuntuni PSS for a length of 4.5Ckm.
- Installation of 2 nos. 33KV, 4 way RMU proposed in Khuntuni PSS to improve the operational activities.
- Overloading issue mitigation of 33kV Khuntuni feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Khuntuni	26.51	17.20	19.34	72.97%	ОК



# Load Flow Study of proposed scenario in Cyme Software:



# **Detailed Scope of Work:**

Augmentation of existing Khuntuni feeder of 4.5Ckm from 100 sq.mm, AAAC to 232 sq.mm from Khuntuni 132/33kV GSS to 33/11kV Khuntuni PSS for providing reliable power supply by mitigating overloading issue.

#### BoQ:

	TP CENTRAL ODISHA DISTRIBUTION LIMITED							
	Name of the Division :- AED							
Name of Division	Athagarh							
Name o Work :-		Mitigation of 33kV Feeder Overloading: Proposal for augmentation of existing 33 kV Khuntuni Feeder from Khuntuni GSS to Khuntuni PSS for providing reliable power supply.						
Scope:-		1. Augmentation of existing Khuntuni Feeder of 4.5 CKM from 100 s 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PS 2. Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE caspare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PS 3. Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE caspare.	SS. able without S.					
Names Scheme		TPCODL CAPEX (FY 23-24)						
	ı	ABSTRACT OF ESTIMATE	I					
SI. No.	Part	Description	Amount					
1 A		Augmentation of existing Khuntuni Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.	1,09,15,984.25					
2 B		Part-B Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS.	91,30,614.96					

Total	ctimated co	Total Amount (In Cr) ost is Rs. 2.08 Crore. (On TPCODL Capex Scheme)	2.08
		Total Amount	2,08,02,742.28
3	С	Part-C Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.	7,56,143.07

Cost Estimate: ₹ 2.08cr. (For detailed BoQ refer Annexure-8.4).

- Mitigating overloading issue of 33kV Khuntuni feeder.
- Ensuring reliability of power supply.

#### 5.0 Proposal for overloading mitigation of 33kV Choudwar Feeder:

**Proposal:** Augmentation of existing Choudwar Feeder for 0.8Ckm from 100 sq.mm, AAAC to 232 sq.mm from 132/33kV, Choudwar GSS, to 33/11kV, Choudwar PSS.

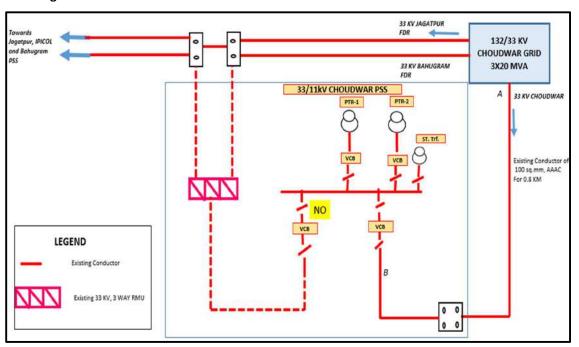
**Objective:** To ensure reliable power supply by mitigating overloading issue and strengthening of the existing network.

#### **Existing Scenario:**

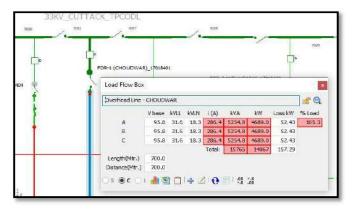
- At present, 33kV Choudwar feeder is emanating from Choudwar Grid, having conductor of 100 sq.mm, AAAC for a length of 0.8Ckm.
- Present peak load of 33kV Choudwar feeder is 15.9MVA, w.r.t., the current carrying capacity of conductor 15.5MVA.
- Considering load growth for 5years (3% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

#### Existing Summer'22 Loading and projected load at 33kV Choudwar Feeder:

33kV Feeder Name	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 FY' 27- 28	Feeder Overloading Status FY' 27-28
Choudwar	15.5	15.9	102.58%	Overload	16.87	18.43	118.92%	Overload



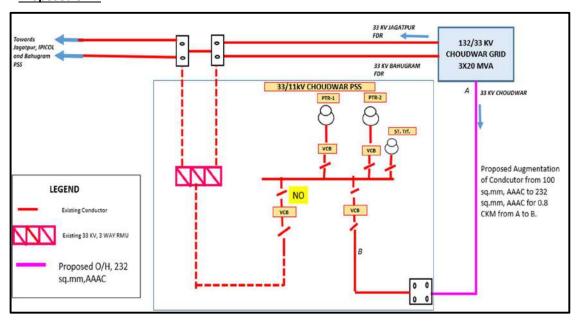
#### Load Flow Study of existing scenario in Cyme Software:



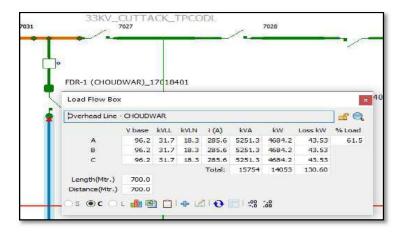
# **Proposed Scenario:**

- 33kV Choudwar feeder augmentation is proposed from 132/33kV, Choudwar GSS to 33/11kV, Choudwar PSS for a length of 0.8Ckm.
- Overloading issue mitigation of 33kV Choudwar feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Choudwar	26.51	16.87	18.43	69.53%	ОК



#### Load Flow Study of existing scenario in Cyme Software:



#### **Detailed Scope of Work:**

Augmentation of existing Choudwar feeder of 0.8Ckm from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33kV GSS to 33/11kV Choudwar PSS for providing reliable power supply by mitigating overloading issue.

#### BoQ:

	TP CENTRAL ODISHA DISTRIBUTION LIMITED							
Na	ame of the	CED						
	Division :-	CED						
_	ne of the Sub- Division : -	Choudwar						
Nam	e of the Work :-	Mitigation of 33kV Feeder Overloading: Proposal for augmentation of existing 33 kV Choudwar Feeder fro GSS to Choudwar PSS for providing reliable power supply.	m Choudwar					
	Scope:-	Augmentation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.						
	Names of chemes: -	TPCODL CAPEX (FY 23-24)						
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1 A		Augmentation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.	22,69,171.09					
		Total Amount	22,69,171.09					
		Total Amount (In Cr)	0.23					
Total	Total estimated cost is Rs. 0.23 Crore. (On TPCODL Capex Scheme)							

Cost Estimate: ₹ 0.23cr. (For detailed BoQ refer Annexure-8.5).

- Mitigating overloading issue of 33kV Choudwar feeder.
- Ensuring reliability of power supply.

#### 6.0 Proposal for overloading mitigation of 33kV Nuagaon Feeder:

**Proposal:** Installation of bus sectionalizer at 33/11kV Jatani PSS to mitigate overloading issue of 33kV Nuagaon feeder emanating from 132/33kV Argul GSS.

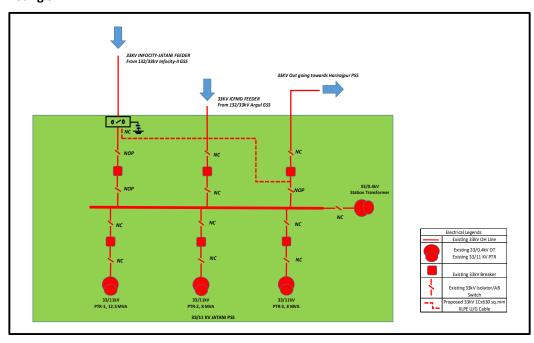
**Objective:** To ensure reliable power supply to the end consumers by splitting the 33kV bus at PSS for mitigating overloading issues.

#### **Existing Scenario:**

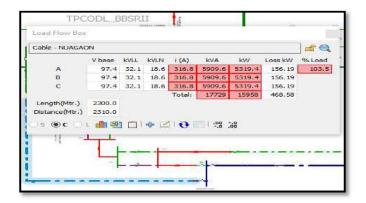
- At present, 33 KV Nuagaon feeder is emanating from 132/33kV Argul GSS and feeding power supply to 33/11kV Nuagaon, Jatani PSS. Total length of this feeder is 25.84Ckm and the peak load is 14.49MVA.
- 33kV Infocity-Jatani feeder is emanating from 132/33kV Infocity-II GSS and feeding power supply to Industrial consumers, Harirajpur and Bharatipur PSS with peak load of 11.70MVA.
- The conductor size from 132/33kV Argul GSS is 148 Sq.mm. and 3Cx300 sq.mm XLPE U/G. Due to low size conductor/cable along with unavailability of proper bus section arrangement at Jatani PSS overloading issue experienced at Nuagaon feeder.
- Considering load growth for 5 years (10% load growth per year for 2years and 6% load growth for next 3 years) 33kV feeder is overloaded as mentioned below.

#### Existing Summer'22 Loading and projected load at 33kV Nuagaon Feeder:

33kV Feeder Name	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 FY' 27- 28	Feeder Overloading Status FY' 27-28
Nuagaon	15.43	14.49	93.88%	ОК	17.53	20.06	129.98%	Overload
Infosys- Jatani	20	11.70	58.51%	ОК	14.16	16.87	84.33%	ОК



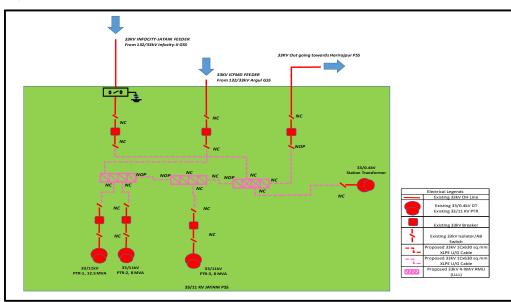
#### Load Flow Study of existing scenario in Cyme Software:



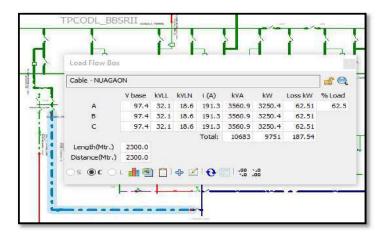
# **Proposed Scenario:**

- 2nos. 33kV 4-Way RMU (LLLL) and 1no. 4-Way RMU (LLVV) are proposed to sectionalize bus at Jatani PSS.
- After Bus sectionalization at Jatani PSS Nuagaon feeder will feed the load of PTR-1 and PTR-2 of Jatani
  PSS and Nuagaon PSS. 33kV Infosys-Jatani feeder will feed PTR-3 load of Jatani PSS along with 33kV
  consumers and 33kV Kurki I.E feeder (proposal under deposit work) will feed 33kV industrial
  consumers along with 33/11kV Harirajpur and Bharatipur PSS.
- Overloading issue mitigation of 33kV Nuagaon feeder by bus sectionalization as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Nuagaon	15.43	10.83	12.90	83.59%	ОК
Infosys-Jatani	20	12.60	15.00	75.01%	ОК
Kurki I.E	17.49	8.26	9.84	56.28%	ОК



#### **Load Flow Study of proposed scenario in Cyme Software:**



# **Detailed Scope of Work:**

Installation 2nos. 33kV 4-Way RMU (LLLL) and 1no. 4-Way RMU (LLVV) along with UG cable at Jatani PSS for sectionalize 33kV bus to mitigate overloading issue of Nuagaon feeder.

#### BOQ:

	TP (	CENTRAL ODISHA DISTRIBUTION LIMITED						
	Name of the Division :-	кно						
	Name of the Sub-Division : -	- Jatani						
	Mitigation of 33kV Feeder Overloading:  Name of the Work :- Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV  Bus to mitigate overloading issue of Nuagaon feeder.							
	Scope of work:-	PART A- Installation 3 Nos. 33kV 4-Way RMU at Jatan sectionalize 33kV Bus to mitigate overloading issue o						
	Names of Schemes: -	TPCODL CAPEX (FY 23-24)						
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1	А	Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of Nuagaon feeder.	₹1,58,44,670.47					
		Total Amount	₹ 1,58,44,670.47					
	Total Amount (In Cr) 1.58							
Total	Total estimated cost is Rs. 1.58 Crore. (On TPCODL Capex Scheme)							

Cost Estimate: ₹ 1.58cr. (For detailed BoQ refer Annexure-8.6).

- Mitigating overloading issues of 33kV Nuagaon Feeder.
- Ensuring reliability of power supply for consumers & connected PSS.

# 7.0 Proposal for overloading mitigation of 33kV Angul-1 Feeder:

**Proposal:** Laying of 0.575km 33kV 1CX630sq.mm. XLPE U/G cable along with 1no. 33kV 4-way RMU (LLVV) to mitigate overloading of 33kV Angul-1 feeder and ensure reliability of 33kV Angul-1 feeder.

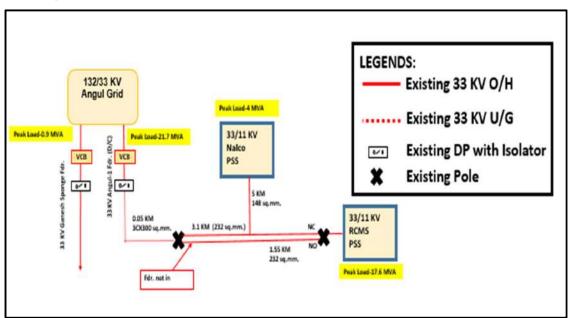
**Objective:** To maintain reliable power supply along with overloading mitigation of 33 KV Angul-1 feeder and strengthening of existing network.

#### **Existing Scenario:**

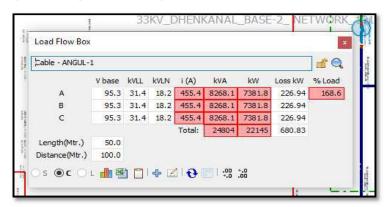
- At present, 33 KV Angul-1 feeder is emanating from 132/33kV Angul Grid providing supply to 33/11kV Nalco & RCMS PSS. Peak load of Nalco & RCMS PSS are 4 MVA & 17.6 MVA respectively.
- Peak load of 33kV Angul-1 feeder is 21.71 MVA, w.r.t., the conductor current carrying capacity of 17.08MVA.
- 33kV Angul-1 feeder is Double circuit but 33/11kV Nalco & RCMS PSS are availing supply through circuit-1. Circuit-2 is not in service due to unavailability of 33kV feeder bay at Angul 132/33kV GSS.
- Considering load growth for 5years (8% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

#### Existing Summer'22 Loading and projected load at 33kV Angul-1 Feeder:

33kV Feeder Name	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 FY' 27- 28	Feeder Overloading Status FY' 27-28
Angul-1	17.08	21.71	127.13%	Overload	25.33	31.91	186.80%	Overload



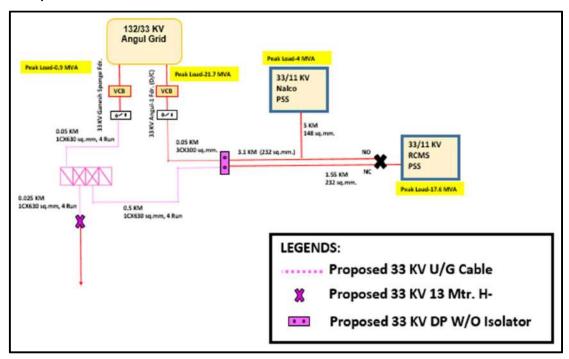
#### Load Flow Study of existing scenario in Cyme Software:



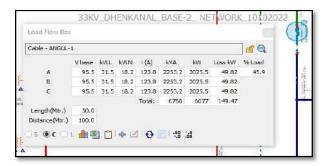
#### **Proposed Scenario:**

- Laying of 0.575km 33kV 1CX630 Sq.mm. XLPE U/G cable along with 1no. 33kV 4-way RMU (LLVV), using existing 33kV Ganesh Sponge feeder bay to link with circuit-2 of Angul-1 33kV feeder.
- After load distribution between two circuits of 33 KV Angul-1 feeder overloading issue will be solved
  as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Angul-1	17.08	5.25	6.61	38.71%	ОК
Angul-1 ckt-2	26.51	20.08	25.29	95.41%	ОК



#### Load Flow Study of proposed scenario in Cyme Software:



#### **Detailed Scope of Work:**

- Laying of 575mtr. 33kV 1CX630 Sq.mm. XLPE U/G Cable in open trench method.
- Installation of 1no. 33kV 4-way RMU (LLVV).
- Installation of 1no. 33kV DP without Isolator along with 1no. cut point for simultaneous operation of spare cable near Angul GSS.

#### BOQ:

		TP CENTRAL ODISHA DISTRIBUTION LIMITED						
Name Divisio		ANED						
Name Sub-Di	of the vision : -	Angul						
Name of the Work:  Mitigation of 33kV Feeder Overloading:  Proposal for Simultaneous operation of spare cable near Angul GSS to ensure reliable of 33 KV Angul-1 feeder.								
1. Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method.  Scope:-  2. Installation of 01 NO. 33 KV 4-way RMU(LLVV).  3. Installation of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultaneous operation of spare cable near Angul GSS.								
Names Schem	-	TPCODL CAPEX (FY 23-24)						
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1	А	PART A:  1. Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method. 2. Installation of 01 NO. 33 KV 4-way RMU (LLVV).	1,23,91,476.92					
2	Part B:-  2 B 1. Installation of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultaneous operation of spare cable near Angul GSS.							
		Total Amount	1,27,87,382.49					
		Total Amount (In Cr)	1.28					
Total e	estimated	cost is Rs. 1.28 Crore. (On TPCODL Capex Scheme)						

Cost Estimate: ₹ 1.28cr. (For detailed BoQ refer Annexure-8.7).

#### **Benefit:**

• Ensuring reliable power supply by mitigating overloading issue.

# 8.0 Proposal for overloading mitigation of 33kV Balikuda Feeder:

**Proposal:** Augmentation of 3.35Ckm existing 33kV Balikuda feeder from 80sqmm & 100 sq.mm. AAAC to 232 sq.mm. AAAC.

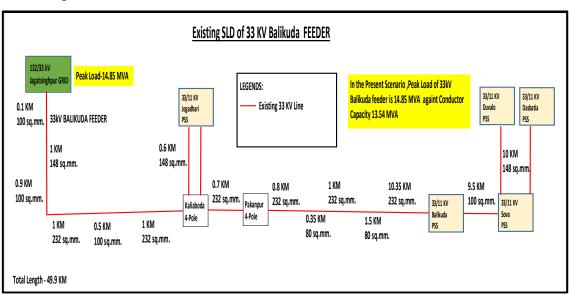
**Objective:** To maintain reliable power supply by mitigating overloading and strengthening the existing network.

#### **Existing Scenario:**

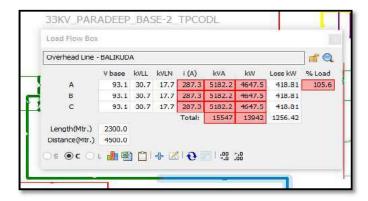
- At present, Balikuda 33kV feeder is emanating from Jagatsinghpur Grid, having mixed type conductor (80/100/148/232) sq.mm with a total length of 49.9Ckm.
- Peak load of 33kV Balikuda feeder is 14.86 MVA, w.r.t., the conductor current carrying capacity of 13.54MVA.
- In the present scenario, there is overloading of the feeder. Thus, feeder is not capable to meet the future load demand of the entire area.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

#### Existing Summer'22 Loading and projected load at 33kV Balikuda Feeder:

33kV Feeder Name	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 FY' 27- 28	Feeder Overloading Status FY' 27-28
Balikuda	13.54	14.86	109.73%	Overload	16.07	18.08	133.50%	Overload



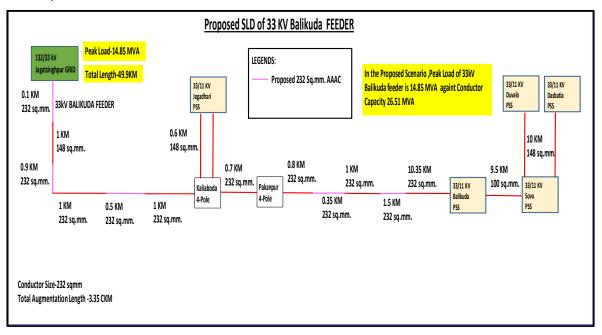
#### Load Flow Study of existing scenario in Cyme Software:



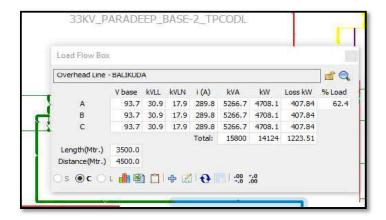
#### **Proposed Scenario:**

- Augmentation of 3.35Ckm from 80/100 sq.mm to 232 sq.mm along Balikuda feeder to strengthen the feeder capacity to 26.51MVA.
- Overloading mitigation of 33kV Balikuda feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Balikuda	26.51	16.07	18.08	68.19%	ОК



#### Load Flow Study of proposed scenario in Cyme Software:



#### **Detailed Scope of Work:**

- Augmentation of 3.35Ckm existing 33kV Balikuda feeder from 80 & 100 sq.mm. AAAC to 232 sq.mm.
   AAAC.
- Installation of 18 nos. interposing pole with accessories for 1Ckm existing line of 33kV Balikuda feeder.

#### BOQ:

		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name of the Division :- JED						
	Name of the Sub- Division : -					
Name of the Work:  Mitigation of 33kV Overloading: Proposal for augmentation of existing 33 kV line from Jagatsinghpur GSS to Bali PSS to mitigate overloading issue & providing reliable power supply.						
Scope	Part A:-  1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 23 sq.mm. AAAC for 33 KV Balikuda Fdr.  2. Installation of interposing pole for 1 KM existing line of 33 KV Balikuda Feeder.					
Name: Schem		TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1 A		Part A:- 1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr. 2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.	1,16,12,733.39			
		Total Amount	1,16,12,733.39			
		Total Amount (In Cr)	1.16			
Total estimated cost is Rs. 1.16 Crore. (On TPCODL Capex Scheme)						

Cost Estimate: ₹ 1.16cr. (For detailed BoQ refer Annexure-8.8).

#### Benefit:

• Ensuring reliable power supply by mitigating overloading issue.

## 9.0 Proposal for overloading mitigation of 33kV Gorada Feeder:

**Proposal:** Augmentation of 8Ckm existing 33kV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC along 33kV Gorada feeder.

**Objective:** To ensure reliable power supply by mitigating overloading issue.

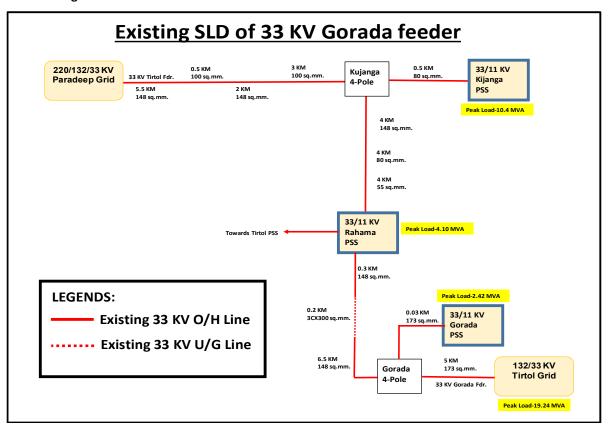
#### **Existing Scenario:**

- At present, 33kV Gorada feeder is emanating from 132/33kV Tirtol/Bodhei Grid and feeding supply to 33/11kV Gorada, Rahama & Kujanga PSS. 33/11kV Kujanga PSS is having connectivity with 220/132/33 KV Paradeep Grid (3X20 MVA). However, 1no. 20MVA PTR is out of service for which the total load is fed from Gorada feeder instead of Tirtol feeder during peak load condition.
- The peak load of 33kV Gorada feeder is 19.25MVA, which is overloaded, w.r.t conductor current carrying capacity of 10.62MVA.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

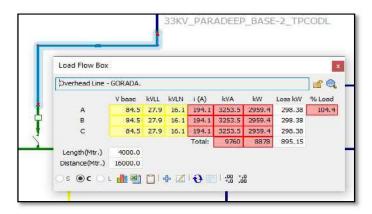
#### Existing Summer'22 Loading and projected load at 33kV Gorada Feeder:

33kV Feeder Name	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 FY' 27- 28	Feeder Overloading Status FY' 27-28
Gorada	10.62	19.25	181.22%	Overload	20.82	23.42	220.48%	Overload

**Existing SLD:** 



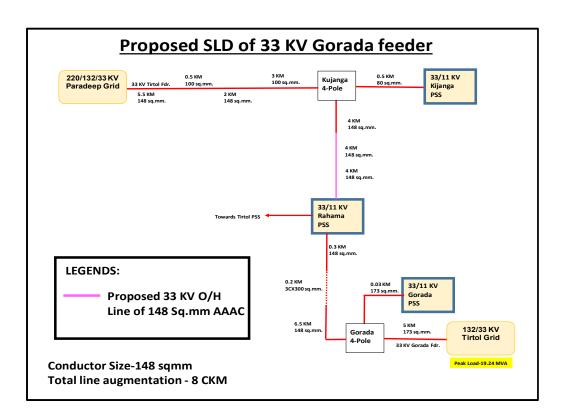
#### Load Flow Study of existing scenario in Cyme Software:



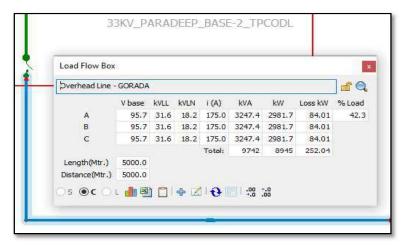
#### **Proposed Scenario:**

- 33kV Gorada feeder augmentation from 55/80 sq.mm to 148 sq.mm for a length of 8Ckm to strengthen the feeder capacity to 20MVA & enabling double source arrangement for Kujanga PSS.
- Overloading mitigation of 33kV Gorada feeder by conductor augmentation as shown below.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Gorada	20	9.57	10.76	53.81%	ОК
Tirtol	15.54	11.25	12.65	81.42%	ОК



#### Load Flow Study of proposed scenario in Cyme Software:



#### **Detailed Scope of Work:**

Augmentation of 8Ckm length along existing 33kV Gorada feeder from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC.

#### BoQ:

	TP CENTRAL ODISHA DISTRIBUTION LIMITED								
Name of the	e Division :-	PDP							
Name of the S	ub-Division : -	Kujanga							
Name of the Work :- Proposal for augmentation of existing 33 kV line from Rahama PSS to Kujanga PSS to improve reliability using N-1 connectivity.									
Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm to 148 sq.mm. AAAC for 33 KV Gorada Fdr.									
Names of S	Schemes: -	TPCODL CAPEX (FY 23-24)							
		ABSTRACT OF ESTIMATE							
SI. No.	Part	Description	Amount						
1 A		Part A:- Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Feeder. 2,02,60,704							
	Total Amount 2,02,60,70								
		Total Amount (In Cr)	2.03						
Total estimate	d cost is Rs. 2.0	03 Crore. (On TPCODL Capex Scheme)	_						

Cost Estimate: ₹ 2.03cr. (For detailed BoQ refer Annexure-8.9).

- Ensuring reliable power supply by mitigating overloading issue.
- Reduction in energy losses along with improvement of voltage regulation.

# 10.0 Proposal for overloading mitigation of 33kV Danpur Feeder:

**Proposal:** Installation of 1no. 4-Pole and stringing of 0.1Ckm 148sqmm conductor from Danpur 4Pole to Danpur PSS for bifurcation of 33kV Danpur New feeder to mitigate overloading issue.

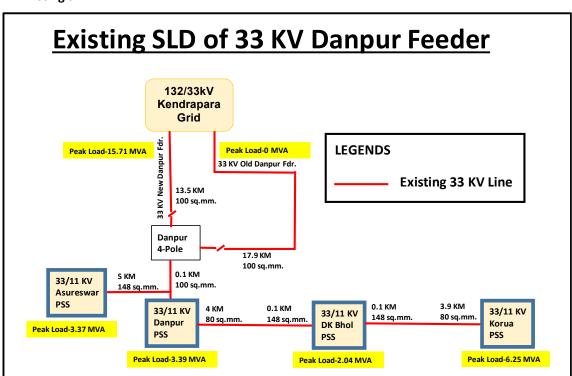
**Objective:** To ensure reliable power supply by mitigating overloading and strengthening of the existing network.

#### **Existing Scenario:**

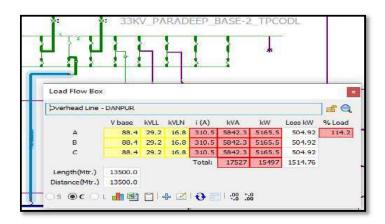
- At present, 33kV Danpur New feeder is emanating from 132/33kV Duhuria/Kendrapara Grid providing supply to 33/11kV Danpur, DK Bhola, Korua & Asureswar PSS. However, Danpur Old feeder is in standby position due to unavailability of double source connectivity at Danpur PSS.
- Peak load of 33kV Danpur New feeder is 15.71 MVA against conductor current carrying capacity of 15.54 MVA.
- Considering load growth for 5years (5% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

# Existing Summer'22 Loading and projected load at 33kV Danpur Feeder:

33kV Feeder Name	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 FY' 27- 28	Feeder Overloading Status FY' 27-28
Danpur	15.54	15.71	101.12%	Overload	17.33	20.06	129.06%	Overload



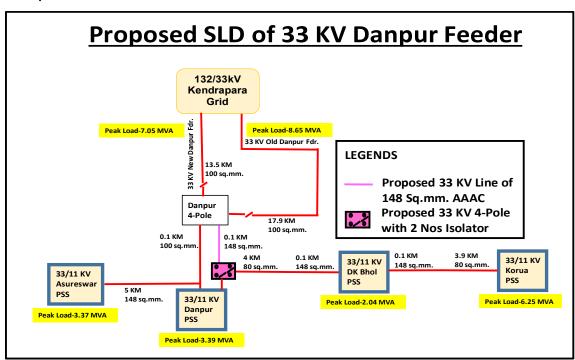
#### Load Flow Study of existing scenario in Cyme Software:



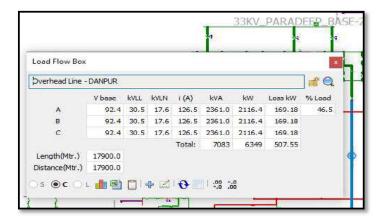
#### **Proposed Scenario:**

- Construction of 1no. 4-pole with Isolator arrangement and stringing of 0.1Ckm 148sqmm conductor from Danpur 4Pole to Danpur PSS proposed for feeder bifurcation.
- Double source supply will be assured for 33/11kV Danpur PSS.
- Overloading mitigation of 33kV Danpur New feeder as shown in below table.

33kV Feeder Name  Feeder Capacity (MVA)		Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Danpur New	15.54	7.79	9.02	58.02%	ОК
Danpur Old	15.54	9.54	11.04	71.04%	ОК



## Load Flow Study of proposed scenario in Cyme Software:



# **Detailed Scope of Work:**

Construction of 1no. 4-pole with Isolator arrangement and stringing of 0.1Ckm 148sqmm conductor from Danpur 4Pole to Danpur PSS.

### BoQ:

		TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-		KED-1 & KED-2	
Name Divisio	of the Sub- n : -	Danpur & Marsaghai	
Name of the Work		Mitigation of 33kV Feeder Overloading: Proposal for Installation of 1no. 33kV 4-Pole and stringing of 0.1Ckm 148sqmm conductor for bifurcation of 33 KV Danpur New feeder to mitigate overloading issue.	
Scope:-		Part A: -  1. Installation of 1no. 33kV 4-pole with Isolator and stringing of 0.1Ckm  148sqmm conductor for feeder bifurcation.	
Names of Schemes:		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
SI. No.	Part	Description	Amount
1	А	Part A: -  1. Installation of 1no. 33kV 4-pole with Isolator and stringing of 0.1Ckm 148sqmm conductor for feeder bifurcation.	7,96,491.85
		Total Amount	7,96,491.85
		Total Amount (In Cr)	0.08

Cost Estimate: ₹ 0.08cr. (For detailed BoQ refer Annexure-8.10).

### **Benefit:**

• Ensuring reliable power supply by mitigating overloading issue.

# Mitigation of 33kV Feeder Low Voltage Issue

## 1.0 Proposal for low voltage mitigation of Baramunda PSS

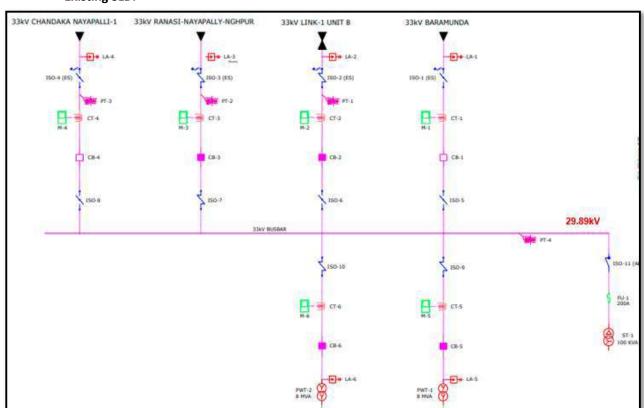
**Proposal:** Installation of 3nos. 33kV RMU along with laying of 33kV UG cable at 33/11kV Barmunda PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

**Objective:** To ensure reliable power supply by splitting the 33kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

### **Existing Scenario:**

- At present, 33/11kV Barmunda PSS is getting power supply from 33kV Ransinghpur-Nayapalli feeder emanating from 132/33kV Ranasinghpur GSS. However, there are 3 nos. additional 33kV sources (33kV Nayapalli feeder from Chandaka GSS, 33kV Barmunda feeder from Unit-8 GSS and 33kV Barmunda feeder form Ransinghur GSS) available at 33kV bus of Barmunda PSS but due to non-availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result low voltage issue of about 29.89kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

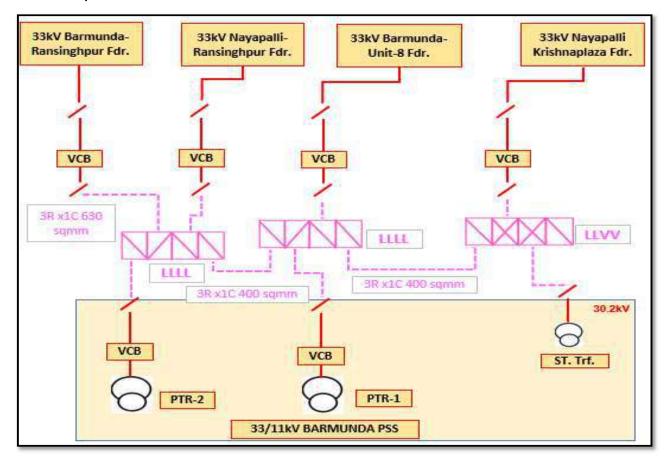
### **Existing SLD:**



# **Proposed Scenario:**

• 3nos. of 33kV RMU proposed at 33/11kV Barmunda PSS with 33kV UG cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.2kV.

## **Proposed SLD:**



# **Detailed Scope of Work:**

- Installation of 3nos. 33kV RMU (1no LLVV, 2no LLLL).
- Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.

TP CENTRAL ODISHA DISTRIBUTION LIMITED		
Name of the Division :-	BCDD-2	
Name of the Sub- Division : -	Barmunda	
Name of the Work :-	Mitigation of Low Voltage issue: Proposal for Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL) with 33kV cable at Barmunda PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.	
Scope:-	<ol> <li>Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.</li> <li>Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.</li> </ol>	
Names of Schemes: -	TPCODL CAPEX (FY 23-24)	

ABSTRACT OF ESTIMATE			
SI. No.	Part	Description	Amount
1	А	1. Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL).  2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.	1,21,44,970.19
2	В	Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.	9,51,008.85
		Total Amount	1,30,95,979.04
		Total Amount (In Cr.)	₹ 1.31
Total estimated cost is Rs. 1.31 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.31 Cr. (For detailed BoQ refer Annexure -8.11)

- Mitigation of low voltage issues at Barmunda PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity .

## 2.0 Proposal for low voltage mitigation of Bharatpur PSS

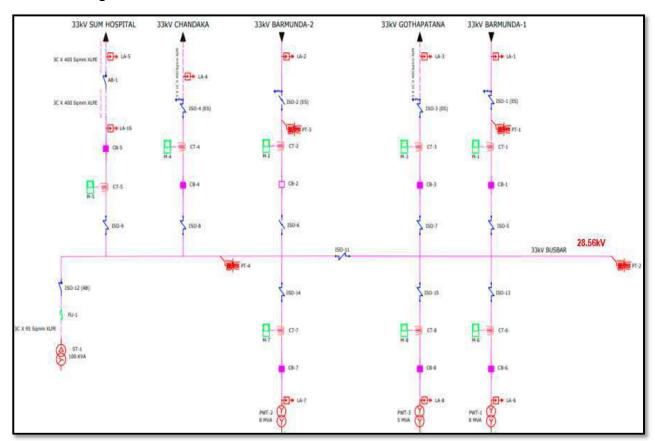
**Proposal:** Installation of 4nos. 33kV RMU along with laying of 33kV UG cable at 33/11kV Bharatpur PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

**Objective:** To ensure reliable power supply by splitting the 33 kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

## **Existing Scenario:**

- At present, 33/11kV Bharatpur PSS is getting power supply from 33kV Ransinghpur-Barmunda feeder emanating from 132/33kV Ranasinghpur GSS. However, there are 3 nos. of additional 33kV sources (33kV Nayapalli feeder from Ransinghpur GSS, 33kV Gothapatna feeder form Mendhasal GSS and Proposed 33kV Bharatpur feeder from Nayapalli GSS) available at 33kV bus of Bharatpur PSS but due to non- availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result in low voltage issue of about 28.56kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

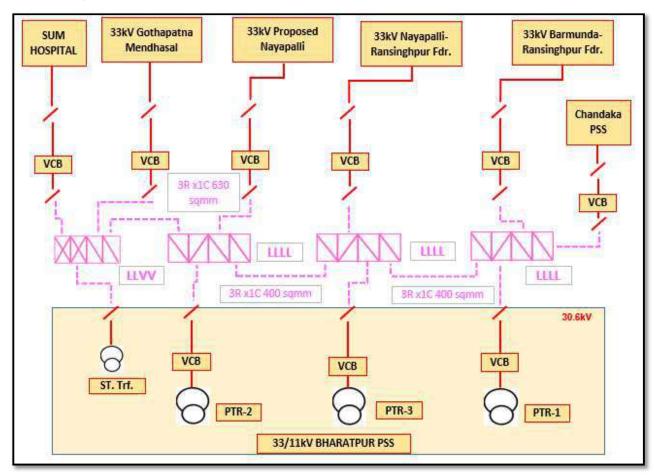
### **Existing SLD:**



#### **Proposed Scenario:**

 4nos. 33kV RMU proposed at 33/11kV Bharatpur PSS with 33kV UG Cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.6kV.

# **Proposed SLD:**



# **Detailed Scope of Work:**

- Construction of 4nos. 33kV RMU (1no LLVV, 3no LLLL).
- Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.

TP CENTRAL ODISHA DISTRIBUTION LIMITED		
Name of the Division :-	BCDD-2	
Name of the Sub- Division : -	Bharatpur	
Name of the Work :-	Mitigation of Low Voltage issue: Proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.	
Scope:-	<ol> <li>Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.</li> <li>Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.</li> </ol>	
Names of Schemes: -	TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE		

SI. No.	Part	Description	Amount
1	А	<ol> <li>Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.</li> </ol>	₹ 1,63,40,241.08
2	В	Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80
		Total Amount	₹ 1,76,08,252.88
		Total Amount (In Cr.)	₹ 1.76

Cost Estimate: ₹ 1.76 Cr. (For detailed BoQ refer Annexure -8.12)

- Mitigation of low voltage issues at Bharatpur PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

# 3.0 Proposal for low voltage mitigation of CS Pur-1 PSS

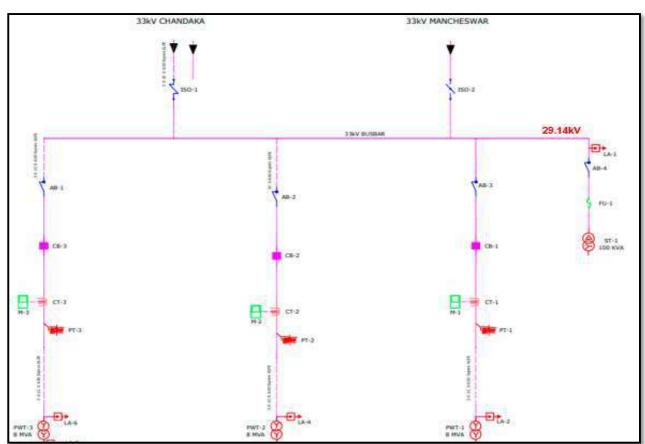
**Proposal:** Installation of 3nos. 33 kV RMU along with laying of 33kV UG cable at 33/11kV CS Pur-1 PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

**Objective:** To ensure reliable power supply by splitting the 33 kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

### **Existing Scenario:**

- At present, 33/11V CS Pur-1 PSS is getting power supply with 33kV CS Pur-1 feeder emanating from 132/33kV Chandaka GSS. However, there are 2 no's of aditional 33kV sources (33kV Railway Fdr-9 from Mancheswar-A GSS and Proposed 33kV CS Pur-1 feeder from Nayapalli GSS) available at 33kV bus of CS Pur-1 PSS but due to non- availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result low voltage issue of about 29.14kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

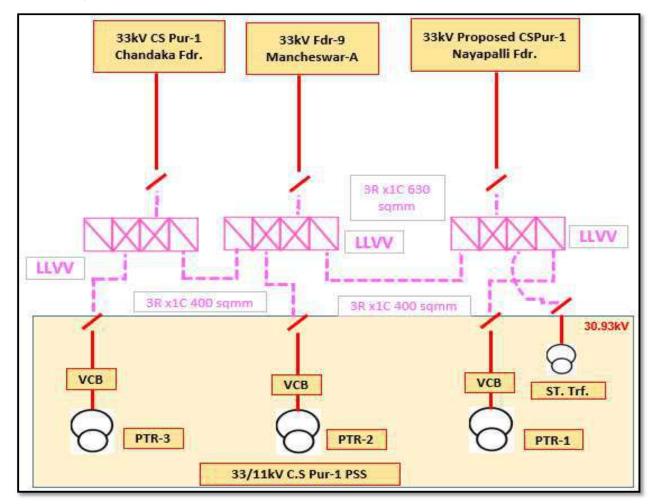
### **Existing SLD:**



## **Proposed Scenario:**

 Installation of 3nos. 33kV RMU proposed at 33/11kV CS Pur-1 PSS with 33kV UG cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.93kV.

# **Proposed SLD:**



# **Detailed Scope of Work:**

- Installation of 3nos. 33 kV RMU (3no LLVV).
- Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.

TP CENTRAL ODISHA DISTRIBUTION LIMITED		
Name of the Division :-	BCDD-2	
Name of the Sub- Division : -	CS Pur-I	
Name of the Work :-	Mitigation of Low Voltage issue: Proposal for Construction of 3No's 33 kV RMU (3no - LLVV) with cable at CS Pur-I PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.	
Scope:-	<ol> <li>Installation of 3nos. 33 kV RMU (3no - LLVV).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.</li> <li>Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.</li> </ol>	
Names of Schemes: -	TPCODL CAPEX (FY 23-24)	

ABSTRACT OF ESTIMATE			
SI. No.	Part	Description	Amount
1	А	<ol> <li>Installation of 3nos. 33 kV RMU (3no - LLVV).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur- 1 PSS for connectivity of 33kV feeders with proposed RMU.</li> </ol>	₹ 1,28,82,057.43
2	В	Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80
		Total Amount	₹ 1,41,50,069.23
		Total Amount (In Cr.)	₹ 1.42
Total estimated cost is Rs. 1.42 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.42 Cr. (For detailed BoQ refer Annexure -8.13)

- Mitigation of low voltage issues at C.s.pur-1 PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

# 4.0 Proposal for low voltage mitigation of College PSS

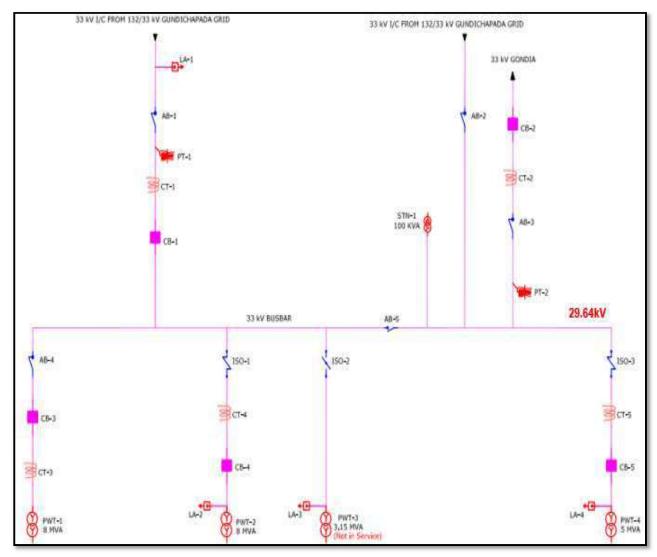
**Proposal:** Installation of 2nos. 33 kV RMU along with laying of 33kV UG cable at 33/11kV College PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

**Objective:** To ensure reliable power supply by splitting the 33kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

## **Existing Scenario:**

- At present, 33/11kV College PSS is getting power supply from 33kV Dhenkanal feeder emanating from 132/33kV Gundichapada GSS. However, there are 2nos. additional 33kV sources (33kV Gondia feeder from Gundichapada GSS and Proposed 33kV feeder from Gondia GSS) available at 33kV bus of College PSS but due to non-availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result low voltage issue of about 29.64kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

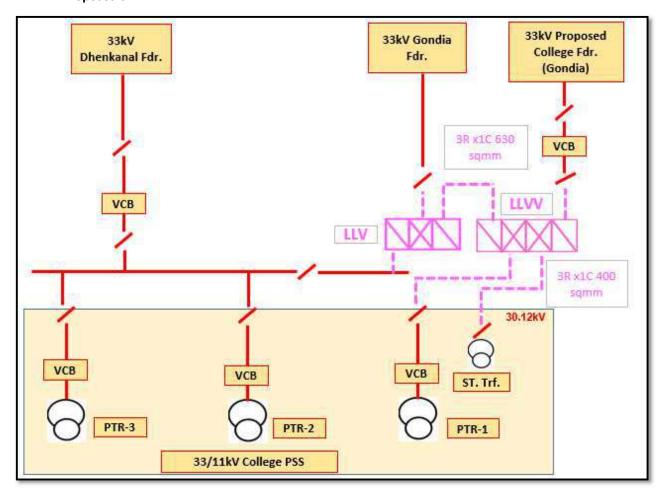
# **Existing SLD:**



## **Proposed Scenario:**

 Installation of 2nos. 33kV RMU proposed at 33/11kV College PSS with 33kV UG Cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.12kV.

## **Proposed SLD:**



## **Detailed Scope of Work:**

- Installation of 2nos. 33kV RMU (1no LLV, 1no LLVV).
- Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU
- Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.

TP CENTRAL ODISHA DISTRIBUTION LIMITED		
Name of the Division :-	DED	
Name of the Sub-Division : -	Dhenkanal	
Name of the Work :-	Mitigation of Low Voltage issue:  Proposal for Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV) with cable at College PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.	

		Total Amount (In Cr.)	₹ 0.87
		Total Amount	₹ 86,53,314.81
2	В	Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.	₹ 9,51,008.85
1	А	<ol> <li>Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU</li> </ol>	₹ 77,02,305.96
Sl. No.	Part	Description	Amount
		ABSTRACT OF ESTIMATE	
Names of S	Schemes: -	TPCODL CAPEX (FY 23-24)	
Scope:-		<ol> <li>Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at College PSS fo 33kV feeders with proposed RMU</li> <li>Laying of 33kV 3R 1Cx400 sqmm cable at College PSS fo proposed RMU with PTR.</li> </ol>	r connectivity of

Cost Estimate: ₹ 0.87 Cr. (For detailed BoQ refer Annexure -8.14)

- Mitigation of low voltage issues at College PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

# 5.0 Proposal for low voltage mitigation of Tangi PSS

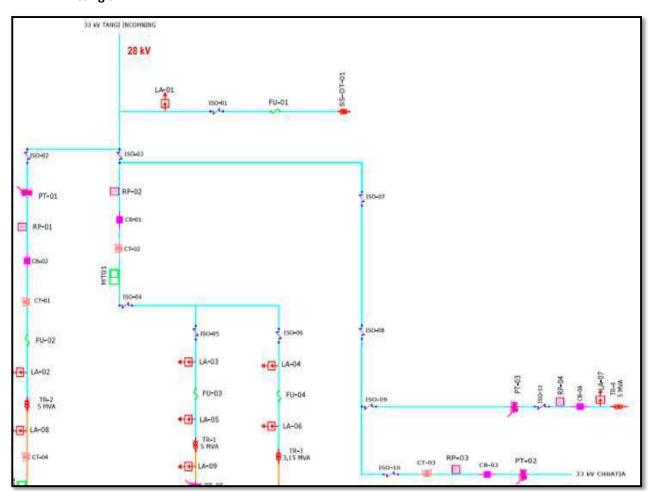
**Proposal:** Installation of 3nos. 33 kV RMU along with laying of 33kV UG cable at 33/11 kV Tangi PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

**Objective:** To ensure reliable power supply by splitting the 33 kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

### **Existing Scenario:**

- At present, 33/11kV Tangi PSS is getting power supply from 33kV Tangi feeder emanating from 132/33kV Choudwar GSS. However, there are 2 nos. of additional 33kV sources (33kV Chhatia feeder from Badachana GSS and 33kV Industrial feeder from Mania GSS) available at 33kV bus of Tangi PSS but due to non-availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result low voltage issue of about 28kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

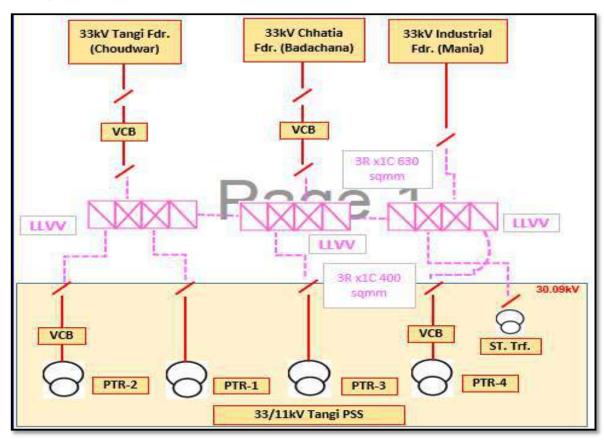
## **Existing SLD:**



### **Proposed Scenario:**

• 3nos. 33kV RMU proposed at 33/11kV Tangi PSS with 33kV UG cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.09kV.

# **Proposed SLD:**



# **Detailed Scope of Work:**

- Construction of 3nos. 33kV RMU (3nos. LLVV).
- Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.

TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name of the Divi	ision :-	CED		
Name of the Sub- Division : -		Tangi		
		Mitigation of Low Voltage issue:		
Name of the Wo	rk :-	Proposal for Construction of 3No's 33 kV RMU (3no - LLVV) with cable		
		at Tangi PSS to split PSS load at multiple feeders for mitigate low		
		voltage issue and improve reliability.		
		1. Construction of 3No's 33 kV RMU (3no - LLVV).		
		2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity		
Scope:-		of 33kV feeders with proposed RMU.		
		3. Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity		
		of proposed RMU with PTR.		
Names of Schemes: -		TPCODL CAPEX (FY 23-24)		
,	ABSTRACT OF ESTIMATE			
SI. No.	Part	Description	Amount	

		Total Amount (In Cr.)	₹ 1.45
		Total Amount	₹ 1,44,67,072.18
2	В	Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.	₹ 15,85,014.75
1	А	<ol> <li>Construction of 3No's 33 kV RMU (3no - LLVV).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.</li> </ol>	₹ 1,28,82,057.43

Cost Estimate: ₹ 1.45 Cr. (For detailed BoQ refer Annexure -8.15)

- Mitigation of low voltage issues at Tangi PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

## 6.0 Proposal for low voltage mitigation of Raghunathpur PSS

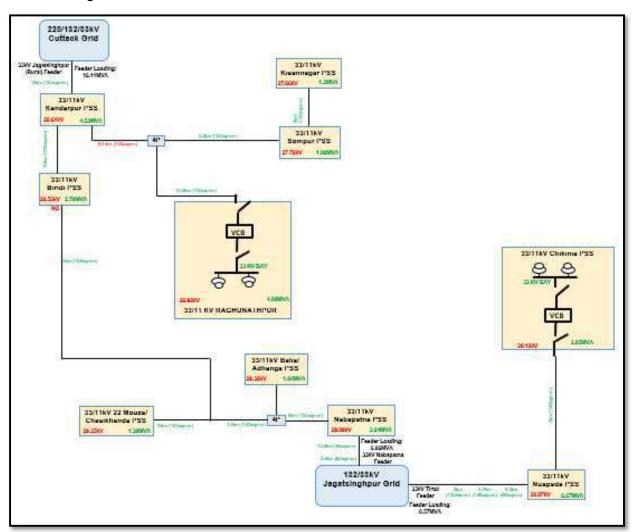
**Proposal:** Construction of 33kV interlinking line from Chikinia PSS to Raghunathpur PSS for mitigating low voltage issue by diverting load of 33kV Kandarpur/ Jagatsinghpur feeder to 33kV Tirtol-Jagatsinghpur Feeder.

**Objective:** To ensure reliable power supply by diverting load from 33kV Kandarpur/ Jagatsinghpur feeder, mitigate low voltage and provide N-1 connectivities.

## **Existing Scenario:**

- At present, 33/11kV Kandarpur, Somapur, Kisannagar, Raghunathpur and Biridi PSS are getting power supply from 33kV Kandarpur/ Jagatsinghpur feeder emanating from 132/33kV Cuttack GSS.
   Total feeder length is about 48Ckm with 100sqmm conductor and 3Cx400sqmm cable with a peak load of 16.11MVA. This results in low voltage at Somapur, Kisannagar, Raghunathpur and Biridi PSS of about 27.26kV at 33kV tail end side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

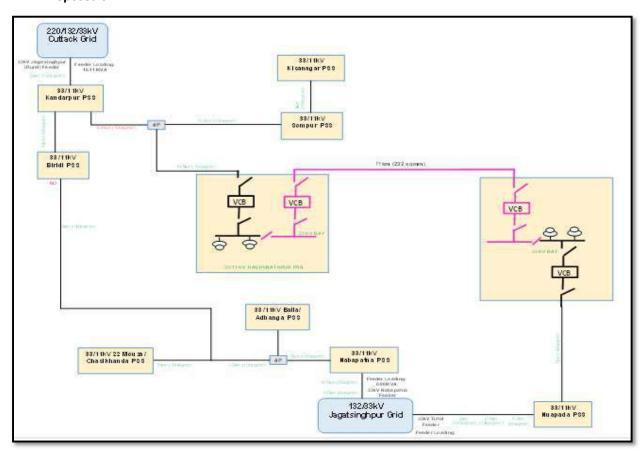
### **Existing SLD:**



## **Proposed Scenario:**

- 33kV interlinking line from Chikinia PSS to Raghunathpur PSS of 11km length has been proposed with 33kV bay at Raghunathpur and Chikinia PSS.
- This proposal will improve PSS voltage to 29.8kV at Raghunathpur PSS.

## **Proposed SLD:**



## **Detailed Scope of Work:**

- Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.
- Construction for 1no. 33kV Outdoor Bay at Raghunathpur PSS.
- Construction for 1no. 33kV Outdoor Bay at Chikinia PSS.

TP CENTRAL ODISHA DISTRIBUTION LIMITED		
Name of the Division :-	PDP	
Name of the Sub- Division : -	JED	
Name of the Work :-	Proposal for Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS to mitigate low voltage issue.	
Scope:-	<ol> <li>Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.</li> <li>Construction for 1no. 33kV Outdoor Bay at Raghunathpur PSS.</li> <li>Construction for 1no. 33kV Outdoor Bay at Chikinia PSS.</li> </ol>	
Names of Schemes: -	TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE		

SI. No.	Part	Description	Amount				
1	Δ	Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.	₹ 4,33,13,544.18				
2	В	Construction for 1 no. 33kV Outdoor Bay at Raghunathpur PSS.	₹ 36,30,897.07				
3	С	Construction for 1 no. 33kV Outdoor Bay at Chikinia PSS.	₹ 36,30,897.07				
		Total Amount	₹ 5,05,75,338.31				
		Total Amount (In Cr.)	₹ 5.06				
Total estimated cost is Rs. 5.06 Crore. (Under TPCODL Capex Scheme)							

Cost Estimate: ₹ 5.06 Cr. (For detailed BoQ refer Annexure -8.16)

- Improvement of low voltage issues at Somapur, Kisannagar, Raghunathpur and Biridi PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

# 7.0 Proposal for low voltage mitigation of Niali PSS and Kulakapasi PSS

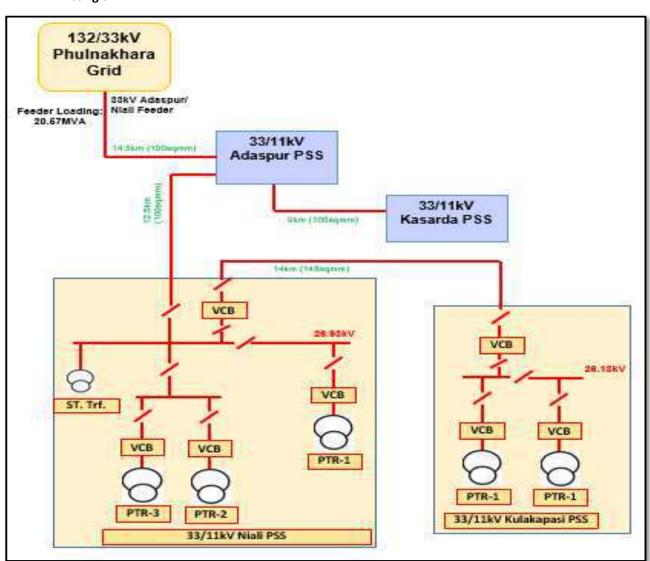
**Proposal:** Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS and 1no. 5MVA AVR Unit at Kulakapasi PSS with augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS 14.5km.

**Objective:** To ensure reliable power supply by improving voltage at PSS.

## **Existing Scenario:**

- At present, 33/11kV Adaspur, Kasarda, Niali and Kulakapasi PSS is getting power supply with 33kV Niali feeder emanating from 132/33kV Phulnakhara GSS. Total feeder length is about 45km with 100sqmm,148sqmm conductor and 3Cx400sqmm cable with a peak load of 20.67MVA. It will result in low voltage at Niali (26.92kV) and Kulakapasi PSS (26.13kV) at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

### **Existing SLD:**

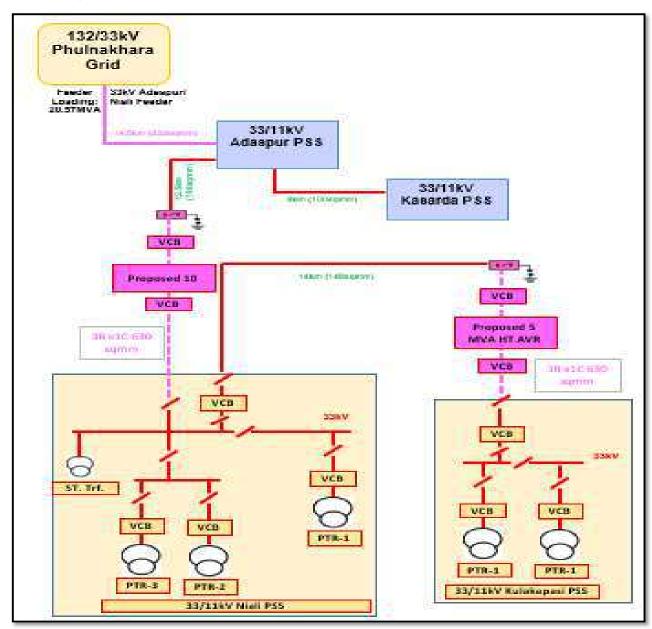


### **Proposed Scenario:**

 Installation of 1no. 26.5/33kV 10MVA AVR Unit at Niali PSS and 1no. 5MVA AVR Unit at Kulakapasi PSS with augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS 14.5km is proposed.

• This proposal will improve PSS voltage to 33kV at Niali PSS and Kulakapasi PSS.

# **Proposed SLD:**



# **Detailed Scope of Work:**

- Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS.
- Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Kulakapasi PSS.
- Augmentation of 33kV Niali feeder from Phulnakhara GSS to Adaspur PSS with 232sqmm AAAC -14.5km.

TP CENTRAL ODISHA DISTRIBUTION LIMITED					
Name of the Division :-	CED				
Name of the Sub- Division : -	Niali				

AVR Unit at Kulakapasi				
AVR Unit at Niali PSS.				
NVP Unit at Kulakanaci DCC				
AVR Unit at Kulakapasi PSS.				
3. Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur				
PSS with 232sqmm AAAC - 14.5km.				
Amount				
VR Unit				
₹ 3,02,91,503.23				
R Unit at   <b>₹ 2.01.67.764.79</b>				
R Unit at ₹ 2,01,67,764.78				
R Unit at  ₹ 2,01,67,764.78				
R Unit at ₹ 2,01,67,764.78				
₹ 2,01,67,764.78				
₹ 2,01,67,764.78				
)				

Cost Estimate: ₹ 8.50 Cr. (For detailed BoQ refer Annexure -8.17)

- Mitigation of low voltage issues at Niali PSS and Kulakapasi PSS.
- Ensuring reliability of power supply.

# 8.0 Proposal for low voltage mitigation of Chhanagiri PSS and Jankia PSS

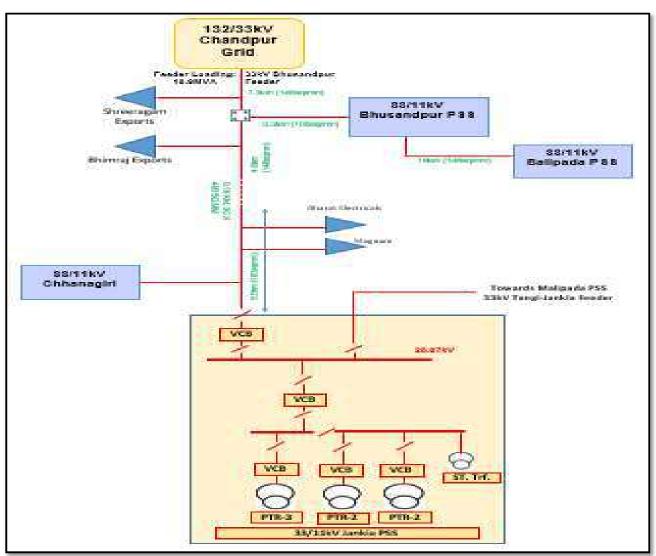
**Proposal:** Augmentation of 33kV Bhusandpur feeder for 5.5Ckm line between Bharat Electricals to Jankia PSS and construction of 2nos. 33kV RMU with laying of UG cable at Jankia PSS.

**Objective:** To ensure reliable power supply by improving voltage at PSS.

### **Existing Scenario:**

- At present, 33/11kV Bhusandpur, Chhanagiri and Jankia PSS are getting power supply from 33kV Bhusandpur feeder emanating from 132/33kV Chandpur GSS. Total feeder length is about 44Ckm with 100sqmm, 148sqmm, 173sqmm conductor and 3Cx400sqmm cable with a peak load of 16MVA. This results in low voltage at Jankia (28.07kV) and Chhanagiri PSS (28.08kV) at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

## **Existing SLD:**

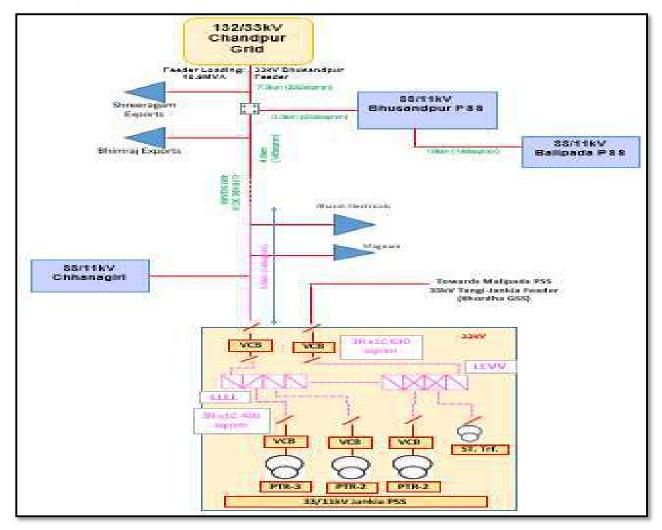


#### **Proposed Scenario:**

 Conductor augmentation of 5.5Ckm line between 33kV Bharat Electricals consumer to Jankia PSS is proposed. (10Ckm conductor augmentation from Chandpur GSS to Bhusandpur PSS is proposed under deposit scheme.)

• This proposal will improve PSS voltage to 33kV at Jankia PSS and Chhanagiri PSS.

# **Proposed SLD:**



### **Detailed Scope of Work:**

- Augmentation of 5.5Ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.
- Construction of 2nos. 33 kV RMU (1no LLVV, 1no LLLL).
- Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.

TP CENTRAL ODISHA DISTRIBUTION LIMITED						
Name of the Division :- BAED						
Name of the Sub- Division : -	Tangi					
Name of the Work :-	Proposal for Augmentation of 33kV Bhusandpur fdr. 5.5 ckm line between Bharat Electricals and Jankia PSS and Construction of 2No's 33 kV RMU with UG cable at Jankia PSS to mitigate low voltage issue and improve reliability.					

Scope:-		<ol> <li>Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.</li> <li>Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.</li> <li>Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.</li> </ol>				
Names	of Schemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
Sl. No.	Part	Description	Amount			
1 A		Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.	₹ 96,41,075.51			
2 B		<ol> <li>Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.</li> </ol>	₹ 79,49,699.30			
3 C		Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80			
		Total Amount	₹ 1,88,58,786.61			
		Total Amount (In Cr.)	₹ 1.89			
Total es	timated cost is	Rs. 1.89 Crore. (Under TPCODL Capex Scheme)				

Cost Estimate: ₹ 1.89 Cr. (For detailed BoQ refer Annexure -8.18)

- Improvement of low voltage issues at Chhanagiri PSS and Jankia PSS.
- Ensuring reliability of power supply.

## 9.0 Proposal for low voltage mitigation of Bolagarh PSS and Hatabasta PSS

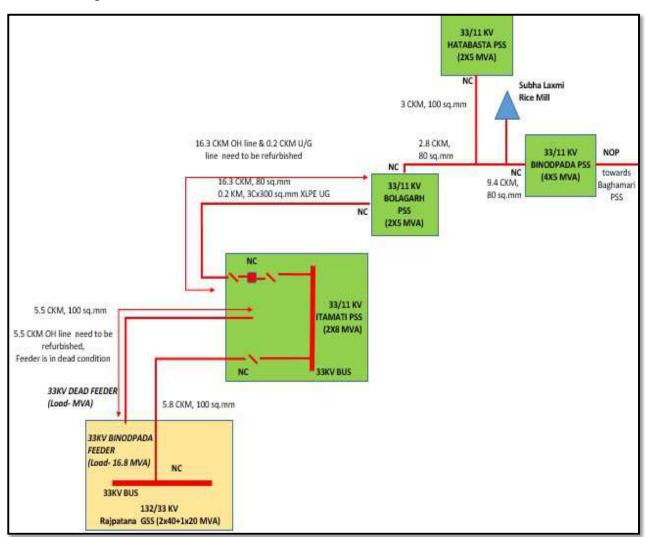
**Proposal:** Installation of 1no. 26.5/33kV, 1no. 5MVA AVR Unit at Bolagarh PSS and 1no. 5MVA AVR Unit at Hatabasta PSS.

**Objective:** To ensure reliable power supply by improving voltage at PSS.

## **Existing Scenario:**

- At present, 33/11kV Itamati, Binodpada, Bolagarh and Hatabasta PSS is getting power supply with 33kV Binodpada feeder emanating from 132/33kV Rajpatna GSS. Total feeder length is about 40km with 100sqmm, 80sqmm conductor and 3Cx300sqmm cable with a peak load of 16.68MVA. It will result low voltage at Binodpada (23.05kV), Bolagarh (25.15kV) and Hatabasta PSS (24.55kV) at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

### **Existing SLD:**

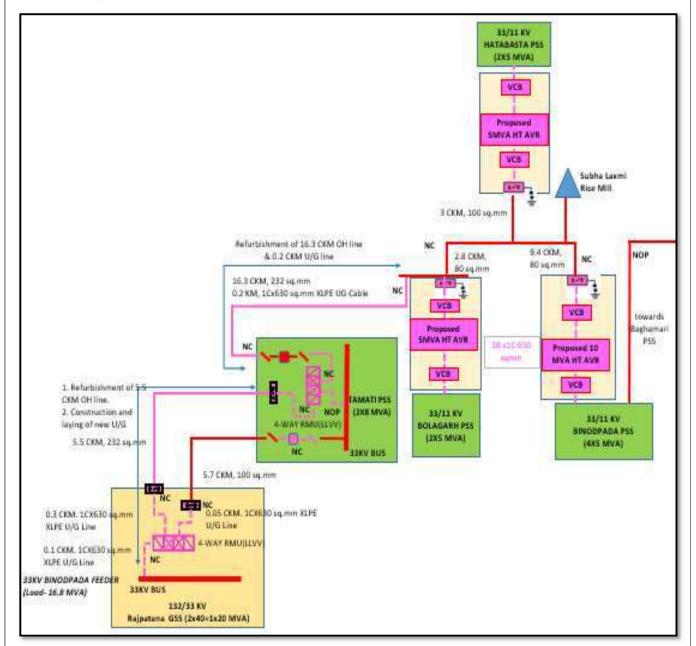


# **Proposed Scenario:**

• Installation of 1no. 26.5/33kV, 1no. 5MVA AVR Unit at Bolagarh PSS and 1no. 5MVA AVR Unit at Hatabasta PSS is proposed.

• This proposal will improve PSS voltage to 33kV at Binodpada PSS, Bolagarh PSS and Hatabasta PSS.

# **Proposed SLD:**



## **Detailed Scope of Work:**

- Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS.
- Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta PSS.

TP CENTRAL ODISHA DISTRIBUTION LIMITED						
Name of the Division :-	NYED					
Name of the Sub- Division : -	Itamati					
Name of the Work :-	Proposal for Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS and 5MVA AVR Unit at Hatabasta PSS to mitigate low voltage issue.					

Scope:-		1. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh I 2. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta		
Names of Schemes: -		TPCODL CAPEX (FY 23-24)		
		ABSTRACT OF ESTIMATE		
Sl. No. Part		Description	Amount	
1	А	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS.	₹ 2,01,67,764.78	
2	В	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta PSS.	₹ 2,01,67,764.78	
		Total Amount	₹ 4,03,35,529.56	
		Total Amount (In Cr.)	₹ 4.04	

Cost Estimate: ₹ 4.04 Cr. (For detailed BoQ refer Annexure -8.19)

- Improvement of low voltage issues at Bolagarh PSS and Hatabasta PSS.
- Ensuring reliability of power supply.

		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Nam						
Name	of the Sub-Division : -					
Na	me of the Work :-	Mitigation of 33kV Feeder Overloading: Installation of 4 Nos. of 33 KV RMU at Kalinga Nagar PSS for BUS Spliting operation & mitigation of overloding issue of 33KV Vipul feeder.				
	Scope:-	Part-A:-  1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm2, 33KV UG cable.(From33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU).  2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.  Part-B:-  Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm2, 33KV UG cable.(From Proposed RMU to PTR VCB & Proposed RMU to station Transformer)				
Na	mes of Schemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1 A		Part-A:-  1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm2, 33KV UG cable.(From33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU).  2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.	1,50,99,601.19			
2 B		Part-B:- Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm2, 33KV UG cable.(From Proposed RMU to PTR VCB & from Proposed RMU to station Transformer)				
		Total Amount	1,58,10,953.61			
		Total Amount (In Cr)	1.58			

### Part-A:-

- 1. Laying of 33 KV UG Cable of length 185 Mtr. using 1Cx630 mm2, 33KV UG cable.(From33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU).
- 2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.

# Standard BoQ and Estimate for 33kV, 1C 630sqmm UG Cable along with 33kV RMU

# **Supply Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	185		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.			
	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation				
1.1	UG Cable (SC rating of cable in kA- 59.4kA and SC rating of	Mtr.	555	1,337.13	7,42,107.15
	Armour in kA-20kA)				
1,2	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type	C - 4		E 24E 00	26 225 00
1.2	suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	5	5,245.00	26,225.00
	Supply of Indoor termination kits Heat Shrinkable type				
1.3	suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for	Set	11	4,894.00	53,834.00
	1Core				
2	Supply of 33kV RMU				
d	No. of 33kV 4Way RMU (LLVV)	nos.	1		
f	No. of 33kV 4Way RMU (LLLL)	nos.	3		
2.1	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.2	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	3	19,59,421.00	58,78,263.00
3	Earthing				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	52.80	93.00	4,910.40
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	8	1,302.00	10,416.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type,	Mtr.		22.00	-
4.2	fibre armoured laid along UG cable. Supply of HDPE PLB duct of size 32/26mm for laying of OFC	Mtr.	0.0	77.99	-
	Cables. Supply of Straight through connectors (Plastic coupler) and				
4.3	accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	8	7,535.00	60,280.00
	Supply of Standard FRTU 4Way with FRTU networking				
	Equipment consisting of Fibre Optic switch (Mono mode				
4.5	along wilh associate LIU unit for connection of FO Cable. for	Nos.	4	2,19,420.00	8,77,680.00
	3 Way & 4 way RMU.				
	Sub Total (Supply Portion) (in	Rs.)			99,88,979.55
Erectio	n Portion				
				Rate	Amount
SI. No.	Description of items	Unit	Quantity	(in Rs.)	(in Rs.)

## Part-A:-

- 1. Laying of 33 KV UG Cable of length 185 Mtr. using 1Cx630 mm2, 33KV UG cable.(From33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU).
- 2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.

	mation of 5 floor of 55 kt 4 truy(LLLL) fittle & 1 flor of 55 kt 4	· •••		at Kaninga nagai	. 55.
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	555	94.50	52,447.50
1.2	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	5	2,081.70	10,408.50
1.3	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	11	2,081.70	22,898.70
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.2	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	3	8,000.00	24,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	8.0	1,225.07	9,800.56
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	4.0	6,124.36	24,497.44
	Sub Total (Erection Portion) (in	Rs.)			1,52,052.70
Civil Po	ortion				
SI. 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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	155.4	700.00	1,08,780.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	66.6	1,720.00	1,14,552.00
1.2	Back filling with excavated soil outside and above the trench	Cum	222	202.00	44,844.00

## Part-A:-

1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm2, 33KV UG cable.(From33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU).

2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.

2. 11131	allation of 5 Nos. of 55 KV 4 Way(LLLL) KIVIO & 1 No. of 55 KV 4	T Way (E	LV V / INIVIO	at italiinga nagai	1 33.
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of	Mtr	0	2,643.67	-
	cable in open trench (1mtr. width)				
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	4	23,145.30	92,581.20
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 .	Set	8	3,700.00	29,600.00
4	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	40	1,463.40	58,536.00
	Sub Total (Civil Portion) (in R	4,48,893.20			
A	Sub Total (Supply Portion)				99,88,979.55
В	Stock, Storage & Insurance @ 3 % of A		2,99,669.39		
С	Sub Total (A+B)				1,02,88,648.94
D	Contingency @ 3 % of C				3,08,659.47
E	Tools & Plants Charges @ 2% of C (considered for earthing ite	ms)			101.15
F	Transportation @ 7.5% of C				7,71,648.67
G	Erection Charges @ 10% of earthing items				505.77
н	Total (C+D+E+F+G)				1,13,69,564.00
ı	Sub Total (Erection Portion + Civil Portion)				6,00,945.90
J	Total Cost (H+I)				1,19,70,509.90
К	Other Overhead /(including Supervision Charges) @ 6 % of J	7,18,230.59			
L	Total Estimated Capital Cost i.e. (J+K)				1,26,88,740.49
М	GST @ 18% of L				22,83,973.29
M1	CESS @ 1% of L				1,26,887.40
N	Grand Total (L+M+M1)				1,50,99,601.19

# Part-B:-

Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm2, 33KV UG cable.(From Proposed RMU to PTR VCB & from Proposed RMU to station Transformer)

# Standard BoQ and Estimate for 33kV, 1C 400sqmm UG Cable along with 33kV RMU

# **Supply Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	85		
b	Length of 33kV 1C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	255	970.92	2,47,584.60
1.2	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	4	8,517.56	34,070.24
1.3	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	4	6,488.92	25,955.68
	Sub Total (Supply Portion) (in Rs.)				

# **Erection Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)	
1	Erection, Commissioning & Testing of 33kV new line by					
	3X1Core, 400sqmm, XLPE UG cable without spare					
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruted type) UG cable in trefoil formation by open trench method.	Mtr.	255	94.50	24,097.50	
1.2	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	4	2,081.70	8,326.80	
1.3	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	4	2,081.70	8,326.80	
	Sub Total (Erection Portion) (in Rs.)					

# **Civil Portion**

SI. 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)				

# Part-B:-

Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm2, 33KV UG cable.(From Proposed RMU to PTR VCB & from Proposed RMU to station Transformer)

from Proposed RMU to station Transformer)							
1.1.a	Earth work excavation of <b>soil</b>	Cum	71.4	700.00	49,980.00		
1.1.b	Earth work excavation of hard rock	Cum	30.6	1,720.00	52,632.00		
1.2	Back filling with excavated soil outside and above the trench		20,604.00				
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.) Mtr 32 1,463.40						
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	3	1,012.00	3,036.00		
	Sub Total (Civil Portion) (in Rs.)						
Α	Sub Total (Supply Portion)						
В	Stock, Storage & Insurance @ 3 % of A						
С	Sub Total (A+B)						
D	Contingency @ 3 % of C						
Ε	Tools & Plants Charges @ 2% of C (considered for earthing items)						
F	Transportation @ 7.5% of C						
G	Erection Charges @ 10% of earthing items						
Н	Total (C+D+E+F+G)						
- 1	Sub Total (Erection Portion + Civil Portion)						
J	Total Cost (H+I)						
К	Other Overhead /(including Supervision Charges) @ 6 % of J						
L	Total Estimated Capital Cost i.e. (J+K)						
М	GST @ 18% of L						
M1	CESS @ 1% of L						
N	Grand Total (L+M+M1)						

		ANNEXURE-8.2						
		TP CENTRAL ODISHA DISTRIBUTION LIMITED						
Nam	Name of the Division :- NED							
Name	of the Sub-Division : -	KAKATPUR						
Name of the Work :- Scope:-		Mitigation of 33kV Feeder Overloading: Proposal for augmentation of 33 kV line from DIGHALO GSS to Kakatpur PSS with LILO arrangement at Charichhak PSS to mitigate overloading and low Voltage issue.  PART A: Replacement of 100 sqmm conductor with 232sqmm along with Intermediate H-Poles from Dighalo GSS to Kakatpur PSS of Ckt. Line length-23Ckm PART B: Installation of 33kV Isolator- 3 no.s and 33kv VCB- 1 no.s at CHARICHHAK PSS.						
						Naı	mes of Schemes: -	TPCODL CAPEX (FY 23-24)
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1	А	PART A: Replacement of 100 sqmm conductor with 232sqmm along with Intermediate H- Poles from Dighalo GSS to Kakatpur PSS of Ckt. Line length - 23 Ckm	6,88,13,541.59					
2	В	PART B: Installation of 33kV Isolator- 3 no.s and 33kv VCB- 1 no.s at CHARICHHAK PSS.	36,30,897.07					
		Total Amount	7,24,44,438.66					
		Total Amount (In Cr)	7.24					

# Part A:-

1)Augmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Charichhak PSS of length -23Ckm.

33kV Line Length with 40 Mtr	Span using 232 SQ.MMAAA Conductor
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No. of 33 KV DP required Without Isolator	24
(Ref. Drawing No TPCODL-HVD-0004)	24
MATERIALS FOR 33 KV DP Without Isolate	<u>or</u>

	MATERIALS FOR 33 KV DP WITHOUT ISOLATOR						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	13 Mtr. Long H-Pole	No	56,735.71	48	27,23,314.29		
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	1491.36	1,13,343.36		
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	95.1552	8,849.43		
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	1679.328	1,27,628.93		
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	1482.624	1,12,679.42		
6	Danger Plate, 2 no's.	No.	99.20	48	4,761.60		
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	14.4432	1,343.22		
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	48	7,440.00		
9	H.T. Stay set (Complete )	Set	1,302.00	48	62,496.00		
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	96	5,952.00		
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	720	66,960.00		
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	24	31,248.00		
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	283.2	26,337.60		
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	144	14,284.80		
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	57.7728	5,372.87		
16	33KV pin insulator polymer	No.	595.20	72	42,854.40		
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	144	89,280.00		
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	144	2,05,344.00		
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	144	2,05,344.00		
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	294.264	28,461.21		
21	Black Paint	Ltr	272.80	24	6,547.20		
22	Yellow Colour Paint for Background	Ltr	272.80	48	13,094.40		
Α			Total Cost	of materials	39,02,936.73		
В	Sto	ck, Stora	ge & Insurance	e i.e 3% of A	1,17,088.10		
С							
D	D Contigency @ 3% of C						
Е							
F	F Transportation @ 7.5% of C						
G							
Н	H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)						
	2 (10. 1)						
J	Sum of (C to I)						

# Civil & Services

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
	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	48	1,08,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	26.4	1,71,600.00

	ANNEXURE-8.2				
Part 1)Au	A:- gmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Cha	richhak F	SS of length -	23Ckm.	
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	5.4	35,100.00
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	24	88,800.00
K			Total Civi	l & Services	4,03,500.00
L				Total (J+K)	51,69,847.85
М	Other overheads (Including 6% supervision charges)	of L (for 3	3 KV DP Witho	out Isolator)	3,10,190.87
N			Sub	Total (L+M)	54,80,038.72
0			Total GST @	18% of (N)	9,86,406.97
P				@ 1% of (N)	54,800.39
Q	Gross Total Material +Services (N+0	D+P) for 3		- , ,	65,21,246.08
<u> </u>	No. of 33 KV DP required With Isolator (Ref. Drawing No TPCODL-HVD-0004)	7+171013	S KV DF WILL	6	03,21,240.00
	MATERIALS FOR 33 KV DP With Isolator	<u>.                                    </u>			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	12	6,80,828.57
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	93.00	23.7888	2,212.36
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.	99.20	12	1,190.40
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	3.6108	335.80
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	12	1,860.00
15	H.T. Stay set (Complete )	Set	1,302.00	12	15,624.00
16 17	H.T. Stay Insulator Type-C (2 No's.)  7/8 SWG Stay Wire 15kg /stay	No. K.g.	62.00 93.00	24 180	1,488.00 16,740.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	12	15,624.00
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	93.00	339.84	31,605.12
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	36	3,571.20
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	14.4432	1,343.22
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	18	2,31,012.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	6	3,18,018.00
24	33KV pin insulator polymer	No.	595.20	18	10,713.6

Part	ANNEXURE-8.2					
. u.t.	A:-					
1)Au	gmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Cha	richhak F	SS of length -2	23Ckm.		
25	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	36	22,320.00	
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	36	51,336.00	
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	36	51,336.00	
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	132.9	12,854.09	
29	Black Paint	Ltr	272.80	6	1,636.80	
30	Yellow Colour Paint for Background	Ltr	272.80	12	3,273.60	
Α				of materials	16,59,312.74	
В	Sto	ck, Stora	ge & Insurance	e i.e 3% of A	49,779.38	
С	Sub Total (A+B)					
D			Contigenc	y @ 3% of C	51,272.76	
Е			Tools & Plant	s @ 2% of C	34,181.84	
F		Tı	ransportation	@ 7.5% of C	1,28,181.91	
G	Erection Charges	@ 5% on	 Trf/Breaker/V	/PB/ H-Pole	35,062.67	
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				95,496.26	
<u>''</u>	Erection Charges @ 20% of except 111/15/2002 (17/15/2002)				33,430.20	
	Election Charges @ 20% of	P3C p01			-	
J	Civil O Complete		Su	m of (C to I)	20,53,287.58	
	<u>Civil &amp; Services</u>			Takad	Takal	
SI.	Description of Materials	Unit	<b>Unit Rate</b>	Total	Total	
No.	Fixing of 22K// line Complete stay set includes 1\ Turn Byelde Assembly 2\ Stay Bod 8			Quantity	Amount	
	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod &					
1	Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including	No	2 250 00	12	27 000 00	
1	excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size	No.	2,250.00	12	27,000.00	
	(500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)					
	(Excavation of earth will be done of Size 500x500x1500 fillin.)					
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	
	Construction Earthing chamber including installation of earthing pipe. Making earthing					
4	chamber including excavation , soil treatment with bentonide powder , calculation of	No.	3,700.00	12	44,400.00	
4	earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding	INO.	3,700.00	12	44,400.00	
	of GI flat around pipe .					
K			Total Civi	l & Services	1,23,075.00	
L	L Total (J+K)					
	Other overheads ( Including 6% supervision charge	es) of L (fo	or 33 KV DP W			
М	Other overheads ( Including 6% supervision charge	es) of L (f		ith Isolator)	1,30,581.75	
	Other overheads ( Including 6% supervision charge	es) of L (f		ith Isolator) Total (L+M)	1,30,581.75 <b>23,06,944.33</b>	
M N O	Other overheads ( Including 6% supervision charge	es) of L (f	Sub Total GST @	ith Isolator)  Total (L+M)  18% of (N)	<b>23,06,944.33</b> 4,15,249.98	
М <b>N</b> О			Sub Total GST @	ith Isolator)  Total (L+M)  18% of (N)  1% of (N)	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44	
M N O	Gross Total Material +Services (I		Sub Total GST @	ith Isolator)  Total (L+M)  18% of (N)  1% of (N)	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44	
М <b>N</b> О	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle		Sub Total GST @	ith Isolator)  Total (L+M)  18% of (N)  1% of (N)	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44	
М <b>N</b> О	Gross Total Material +Services (I	N+O+P) f	Sub Total GST @	ith Isolator)  Total (L+M)  18% of (N)  1% of (N)  ith Isolator	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44	
М О Р <b>Q</b>	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle  (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree	N+O+P) f	Sub Total GST @	ith Isolator)  Total (L+M)  18% of (N)  1% of (N)  ith Isolator	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75	
M O P Q	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle  (Ref. Drawing No TPCODL-HVD-0002)	N+O+P) f	Sub Total GST @	ith Isolator)  Total (L+M)  18% of (N)  2 1% of (N)  ith Isolator  18	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75	
M O P Q SI. No.	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials	N+O+P) f	Sub Total GST @ Total GST or 33 KV DP W	ith Isolator)  Total (L+M)  18% of (N)  1% of (N)  ith Isolator  18  Total  Quantity	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount	
M O P Q	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials  13 Mtr. Long H-Pole	N+O+P) f	Sub Total GST @ Total GST or 33 KV DP W	ith Isolator)  Total (L+M)  18% of (N)  2 1% of (N)  ith Isolator  18	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount	
M O P Q SI. No.	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials  13 Mtr. Long H-Pole  Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7	N+O+P) f	Sub Total GST @ Total GST or 33 KV DP W	ith Isolator)  Total (L+M)  18% of (N)  1% of (N)  ith Isolator  18  Total  Quantity	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount 10,21,242.86	
M N O P Q SI. No. 1	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials  13 Mtr. Long H-Pole  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)	N+O+P) f  ee Angle  Unit  No  K.g.	Sub Total GST @ Total GST or 33 KV DP W  Unit Rate 56,735.71 76.00	ith Isolator)  Total (L+M)  18% of (N)  18 17 of (N)  Ith Isolator  18  Total Quantity  18  585.072	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount 10,21,242.86 44,465.47	
M N O P Q SI. No. 1	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials  13 Mtr. Long H-Pole  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)  Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required =	N+O+P) f  ee Angle  Unit	Sub Total GST @ Total GST or 33 KV DP W  Unit Rate 56,735.71	ith Isolator)  Total (L+M)  18% of (N)  18 17 of (N)  Total Quantity  18	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount 10,21,242.86 44,465.47	
M N O P Q SI. No. 1 2 3	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials  13 Mtr. Long H-Pole  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)  Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	N+O+P) f  ee Angle  Unit  No  K.g.  K.g.	Sub Total GST @ Total GST or 33 KV DP W  Unit Rate 56,735.71 76.00 93.00	Total (L+M)  18% of (N)  18% of (N)  18 18  Total Quantity  18  585.072  95.1552	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount 10,21,242.86 44,465.47 8,849.43	
M N O P Q SI. No. 1	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials  13 Mtr. Long H-Pole  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)  Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)  Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length	N+O+P) f  ee Angle  Unit  No  K.g.	Sub Total GST @ Total GST or 33 KV DP W  Unit Rate 56,735.71 76.00	ith Isolator)  Total (L+M)  18% of (N)  18 17 of (N)  Ith Isolator  18  Total Quantity  18  585.072	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount 10,21,242.86 44,465.47 8,849.43	
M N O P Q SI. No. 1 2 3	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials  13 Mtr. Long H-Pole  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)  Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	N+O+P) f  ee Angle  Unit  No  K.g.  K.g.	Sub Total GST @ Total GST or 33 KV DP W  Unit Rate 56,735.71 76.00 93.00	Total (L+M)  18% of (N)  18% of (N)  18 18  Total Quantity  18  585.072  95.1552	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount 10,21,242.86 44,465.47 8,849.43 8,003.78	
M O P Q SI. No. 1 2 3 4 5	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials  13 Mtr. Long H-Pole  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)  Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)  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)	N+O+P) f  Pe Angle  Unit  No  K.g.  K.g.  No.	Sub Total GST @ Total GST or 33 KV DP W  Unit Rate 56,735.71 76.00 93.00 76.00 99.20	Total (L+M) 18% of (N) 18% of (N) 18 18 18 Total Quantity 18 585.072 95.1552 105.313	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount 10,21,242.86 44,465.47 8,849.43 8,003.78 1,785.60	
M N O P Q SI. No. 1 2 3	Gross Total Material +Services (I  No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree  Description of Materials  13 Mtr. Long H-Pole  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)  Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)  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)  Danger Plate, 1 no's.	N+O+P) f  ee Angle  Unit  No  K.g.  K.g.	Sub Total GST @ Total GST or 33 KV DP W  Unit Rate 56,735.71 76.00 93.00 76.00	Total (L+M) 2 18% of (N) 2 1% of (N) 3 1% of (N) 4 18 Isolator 18  Total Quantity 18 585.072 95.1552 105.313	1,30,581.75 23,06,944.33 4,15,249.98 23,069.44 27,45,263.75  Total Amount 10,21,242.86 44,465.47	

	ANNEXURE-8.2				
Part A	A:-				
1)Au	gmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Cha	richhak F	PSS of length -	23Ckm.	
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	21.6648	2,014.83
9	33KV pin insulator polymer	No.	595.20	54	32,140.80
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	108	66,960.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	108	1,54,008.00
12	Earthing of Support ( Coil Type )	EA	205.84	18	3,705.12
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	4.716	438.59
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	108	1,54,008.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	87.822	8,494.14
16	Black Paint Valley Colour Paint for Paging and	Ltr	272.80	18 36	4,910.40
17	Yellow Colour Paint for Background	Ltr	272.80	of materials	9,820.80
Α	Cha	alı Ctara			15,26,708.33
В	510	ock, Stora	ige & Insurance		45,801.25
С				Total (A+B)	15,72,509.58
D				y @ 3% of C	47,175.29
E			Tools & Plant		31,450.19
F	Funda of annual		ransportation	_	1,17,938.22
G	Erection Charges				52,594.01
H	Erection Charges @ 10% of C (except Trf/Breaker/				52,062.94
<u> </u>	Erection Charges @ 20% of	f PSC pol			-
J	Civil O Complete		Su	m of (C to I)	18,73,730.23
SI.	<u>Civil &amp; Services</u>	1	I	Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	9.9	64,350.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	2.025	13,162.50
К			Total Civi	l & Services	77,512.50
L				Total (J+K)	19,51,242.73
М	Other overheads (Including 6% supervision charges) of L (for 33 K'	V Cut Poi	nt with 180 De	gree Angle)	1,17,074.56
N				Total (L+M)	20,68,317.30
0				18% of (N)	3,72,297.11
Р				@ 1% of (N)	20,683.17
Q	Gross Total Material +Services (N+O+P) for 33 K	V Cut Poi	int with 180 D	egree Angle	24,61,297.58
	No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No TPCODL-HVD-0003)			12	
CI	MATERIALS FOR 33 KV Cut Point with 90 Degre	<u>e Angle</u> 	I	T-4-1	Takal
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	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., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	780.096	59,287.30
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	126.8736	11,799.24
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	140.4173	10,671.71
5	Danger Plate, 1 no's.	No.	99.20	12	1,190.40
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.6108	335.80
	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	36	3,571.20
7		ľ			
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	14.4432	1,343.22
		KG No.	93.00 595.20	14.4432 48	
8	4 no's = (4x0.59x0.510)				1,343.22 28,569.60 44,640.00

	ANNEXURE-8.2				
Part A	A;-				
1)Au	gmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Cha	richhak I	PSS of length -	23Ckm.	
12	Earthing of Support ( Coil Type )	No.	205.84	12	2,470.08
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.144	292.39
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	72	1,02,672.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	12	1,860.00
16	H.T. Stay set (Complete )	Set	1,302.00	12	15,624.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	12	744.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	180	16,740.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	135.72	13,126.84
20	Black Paint	Ltr	272.80	12	3,273.60
21	Yellow Colour Paint for Background	Ltr	272.80	24	6,547.20
Α				of materials	11,08,259.16
В	Sto	ck, Stora	ge & Insurance		33,247.77
С			Sub	Total (A+B)	11,41,506.93
D			Contigenc	y @ 3% of C	34,245.21
Е			Tools & Plant	s @ 2% of C	22,830.14
F		Т	ransportation	@ 7.5% of C	85,613.02
G	Erection Charges	@ 5% on	Trf/Breaker/V	VPB/ H-Pole	35,062.67
Н	Erection Charges @ 10% of C (except Trf/Breaker/	WPB/ H-I	Pole/HT stay se	t/PSC pole)	40,423.65
1	Erection Charges @ 20% of	PSC pol	e- Not to be us	sed for 33kv	-
J			Su	m of (C to I)	13,59,681.62
	<u>Civil &amp; Services</u>			l	
SI. 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	6.60	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
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, 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
К	,		Total Civi	l & Services	78,675.00
L				Total (J+K)	14,38,356.62
М	Other overheads (Including 6% supervision charges) of L (for 33 I	(V Cut Po	oint with 90 De	• •	86,301.40
N				Total (L+M)	15,24,658.01
0			Total GST @	18% of (N)	2,74,438.44
Р				@ 1% of (N)	15,246.58
Q	Gross Total Material +Services (N+O+P) for 33 I	KV Cut Po	oint with 90 De	egree Angle	18,14,343.04
	33 Kv Line Length In KM with 40 Mtr. Span			23	
	(Ref. Drawing No TPCODL-HVD-0001)				
	<u>MATERIALS FOR 33 KV Pin Points</u>		T		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	322	1,82,68,900.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	322	6,30,862.40
3	Top bracket 100x50x6mm GI channel ( 300mm each)	No.	186.00	322	59,892.00
4	Danger Plate, 1 no's.	No.	99.20	322	31,942.40
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	96.89	9,010.75
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	966.00	95,827.20
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	387.56	36,043.01
8	33KV pin insulator polymer	No.	595.20	966	5,74,963.20
9	Earthing of Support ( Coil Type )	No.	205.84	322	66,280.48
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	84.36	7,845.85

ANNEXURE-8.2						
Part /		richhak I	PSS of length -	23Ckm.		
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	466.90	45,158.57	
12	232 sq.mm AAA conductor	K.M.	1,94,060.00		1,37,91,844.20	
14	Black Paint	Ltr	272.80	322.0	87,841.60	
15	Yellow Colour Paint for Background	Ltr	272.80		1,75,683.20	
Α			Total Cost	of materials	3,38,82,094.86	
В	Sto	ck, Stora	ge & Insurance		10,16,462.85	
С				Total (A+B)	3,48,98,557.70	
D				y @ 3% of C	10,46,956.73	
Е			Tools & Plant		6,97,971.15	
F			ransportation		26,17,391.83	
G	Erection Charges				9,40,848.35	
Н	Erection Charges @ 10% of C (except Trf/Breaker/	WPB/ H-I	Pole/HT stay se	et/PSC pole)	16,08,159.07	
ı	Erection Charges @ 20% o	F PSC pol	e- Not to be us	sed for 33kv	-	
J			Su	m of (C to I)	4,18,09,884.84	
	<u>Civil &amp; Services</u>	1				
SI.	Description of Materials	Unit	Unit Rate	Total	Total	
No.				Quantity	Amount	
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	177.10	11,51,150.00	
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	36.23	2,35,462.50	
3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	69.00	6,21,000.00	
K	K Total Civil & Services					
L	L Total (J+K)					
М	M Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)					
N	Sub Total (L+M)					
0			Total GST @	9 18% of (N)	83,60,378.49	
P				@ 1% of (N)	4,64,465.47	
Q	Gross Total Material +Sei	vices (N-			5,52,71,391.14	
	6% Supervision Charges Summary	-				
1	Other overheads (Including 6% supervision charges)	of L (for 3	3 KV DP Witho	out Isolator)	3,10,190.87	
2	Other overheads ( Including 6% supervision charg	es) of L (f	or 33 KV DP W	ith Isolator)	1,30,581.75	
3	Other overheads (Including 6% supervision charges) of L (for 33 K				1,17,074.56	
4	Other overheads (Including 6% supervision charges) of L (for 33	KV Cut Po	oint with 90 De	gree Angle)	86,301.40	
5	Other overheads (Including 6% supervision				26,29,049.84	
			(6% supervisi		32,73,198.43	
	Gross Total Summary		<b>( (</b>	0-17		
1						
2						
3						
4						
5						
Q						
R						
S	Inspection Fee of Drawing Checking and Approval (For each drawing					
Т			sion by electric	•	6,88,13,541.59	
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+					

#### **ANNEXURE-8.2** Cost of Construction for 1 no. of 33kV Outdoor Bay arrangement Consisting of 1 VCB and 2 isolator). No. of Bus isolator requirement 3 No. of VCB Requirement SI. Total Total Unit **Unit Rate Description of Materials** No. Quantity Amount T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm 1 Nos. 26,600.00 26,600.00 channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 2 Nos 31,920.00 1 31,920.00 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT T-1A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos of 3 Nos. 23,560.00 2 47,120.00 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT T-2A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 4 Nos. 28,120.00 2 56,240.00 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT 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, Nos. 15,200.00 1 15,200.00 Nominal Unit Wt - 0.2 MT) G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel 13,300.00 4 53,200.00 Nos. jointed by plates) for 33kV Bus Stringing, Nominal Unit Wt - 0.175 MT) Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment 7 KG 76.00 990 75,240.00 Structures per set - 0.33 MT) Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of 8 KG 76.00 200 15,200.00 Equipment Structures per set - 0.2 MT) GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 9 KG 76.00 285 21.660.00 MT) GI Spikes with cone and GI (2 nos) base plate 10mm (50x3000 mm GI pipe) 10 Nos. 3,641.92 14,567.67 (Unit Wt=0.035 MT) 11 GI Pipe Earthing 40mm. 3 Mtr. Long No. 1,302.00 8 10,416.00 50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB, 10 12 KG 93.00 188.8 17,558.40 metre mesh formation )= 20x2.36 13 400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc. ΚM 2,61,640.00 0.1 26,164.00 33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with 1,25,103.60 14 Set 3,75,310.80 earth switch with PI(Polymer) 33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor 6,69,600.00 CT (CTR- 600-300-150/1-1A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for EΑ 6,69,600.00 1 feeder protection 33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, 16 EΑ 31,520.80 3 94,562.40 with O/P burden of 100VA Lightning Arrester(30KV,10KA) (Station Class,class-2) EΑ 12,834.00 12 1,54,008.00 17 Mtr 409.20 150 61,380.00 Control Cable 10Core x 2.5 mm<sup>2</sup> 150 74,958.00 19 Control Cable 16Core x 2.5 mm<sup>2</sup> Mtr 499.72 Control Cable 4Core x 2.5 mm<sup>2</sup> Mtr 138.88 50 6,944.00 21 Control Cable 7Core x 2.5 mm<sup>2</sup> Mtr 43.68 50 2,184.00 25,668.00 22 Disc insulator (B&S) 90 KN polymer No. 1,426.00 18 H W fitting(B&S) 90KN,4 Bolt 18 23 No. 620.00 11,160.00 24,105.60 24 8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop No. 1,339.20 18 25 PG Clamp for 232 sq.mm AAA conductor NO. 276.00 48 13,248.00 26 GI Nut, Bolt & Washer of different sizes (13.718 Kg each Strcutures) K.g. 96.72 54.872 5,307.22 1.091.20 27 Black Paint Ltr 272.80 4 272.80 8 2,182.40 28 Yellow Colour Paint for Background Ltr **Total Cost of materials** 19,32,795.69 Α Stock, Storage & Insurance i.e 3% of A В 57,983.87 C Sub Total (A+B) 19,90,779.56 D Contigency @ 3% of C 59,723.39 Ε Tools & Plants @ 2% of C 39,815.59 F Transportation @ 7.5% of C 1,49,308.47

Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pale/HT stay set/PSC pole/GI Earthing)  1		ANNEXURE-8.2						
Frection Charges @ 10% of C (except Trf/Breaker/WP8   H-Poke/HT day set/PSC poler/OI Earthing)   1,29,036.31   1	Cost	of Construction for 1 no. of 33kV Outdoor Bay arrangement Consisting of 1 \	/CB and	2 isolator).				
The control of the provided in the provided processor of the provided provided processor of the provided provided processor of the provided processor of the provided proces	G	Erection	n Charge	s @ 5% on Trf/B	reaker/Joist	34,484.40		
Supplying and laying in position cement concrete of specified grade excluding the cost of centering, shuttering, finishing and reinforcement. All work up to plinth level: 1:15:34 (a cement: 15 coarse sand (aone-III): 3 graded stone aggregate 20 mm nominal size).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass of grade fee-5000 or more.  See a 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 (cum 482.00 7.28 3,508.96 (cum 482.00 7.28 3,508.96 (cum 482.00 7.28 4) (cum 482.00 7.28 3,508.96 (cum 482.00 7.28 4) (cum 482.00 7.29 4) (cum 482.00 7.29 4) (cum 482.00 7.29 4) (cum 482.00 7.29 7) (cum 482.00 7.29	Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Earthing)						
Comparison of Materials   Comparison of Comparison	ı	Erection Charges @ 20% o	of PSC p	ole- Not to be us	ed for 33kv	_		
Description of Materials   Secription of Materials   VCB Foundation   VCB Foundation   VCB Foundation   VCB Foundation   A will excavate the cable trench depth upto 2.5 MTR & remove the debris   Susing necessary tools & machinery for excavation of cable trench & other chid works   Siling available excavated earth (excluding rock) in trenches, plinth, sides of compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.   Supplying and filling in plinth with river sand under floors, including   Cum   1020.00   0.34   348.08   Supplying and filling in plinth with river sand under floors, including   Cum   1020.00   0.34   348.08   Supplying and filling in plinth with river sand under floors, including   Cum   1020.00   0.34   348.08   Supplying and filling in plinth with river sand under floors, including   Cum   1020.00   0.34   348.08   Supplying and filling in plinth with river sand under floors, including   Cum   1020.00   0.34   348.08   Supplying and filling in position rement concrete of specified grade   excluding the cost of centering and shuttering and shuttering   Fall work up to plinth level : 1.13.6 (1 Cennent : 3 coarse sand (zone-ill) : 6 graded stone aggregate 40 mm   cominal size).   Providing and laying in position specified grade of reinforced cement   Cum   5130.00   0.46   2,334.15   Center III. 1.5 (1 Center III. 1.5 (1 Center III. 1.5 (2 Center	J			Su	m of (C to I)	24,03,147.72		
No. Description of Materials  A VCB Foundation  A VCB Foundation  A WCB Foundation  A WCB Foundation  A Will exavate the cable trench depth upto 2.5 MTR & remove the debris civil works  B will exavate the cable trench depth upto 2.5 MTR & remove the debris  civil works  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.  3 Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.  4 excluding the cost of centering and shuttering - All work up to plinth level: 1:3-6 (I centert: 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size).  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: 1:1-3.5 (I center: 1:2 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size).  Providing and shyling in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level: 1:1-3.5 (I center: 1:1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  5 testel reinforcement for R.C.C. work including straightening, cutting, beending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.  6 Ta PT Foundation  8 Aw ille excavate the cable trench depth upto 2.5 MTR & remove the debris cutting the cost of centering shuttering read deposited layer by ramming and watering as directed by Engineer-in-charge.  3 Supplying and filling in plinth with river sand under floors, including watering, ramming, consoli	<u> </u>	<u>Civil &amp; Services</u>	ı	1	I <b>-</b> I			
A VCB Foundation BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other (www. other & ot	l	Description of Materials	Unit	Unit Rate				
1 using necessary tools & machinery for excavation of cable trench & other civid works 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.  3 watering, ramming, consolidating and dressing complete. Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level: 1:13.6 (1 Cement: 1.3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size).  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: 1:15.3 (1 cement: 1.5 coarse sand (zone-III): 9 graded stone aggregate 40 mm nominal size).  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: 1:15.3 (1 cement: 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically received bases of grade fe-5000 or more.  T. & PT Foundation  B. Awill excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other cludworks.  Thermo-compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.  Supplying and filling in plinth with river sand under floors, including watering, remaining, consolidating and deressing complete.  Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of c		VCB Foundation			Quantity	Amount		
2 foundations etc. in layers not exceeding 20cm in depth, consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.  3 Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.  Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level: 1:36 (1 Cement: 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size).  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: 1:1.53 (1 cement: 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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-5000 or more.  B CT & PT Foundation  B Aw 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  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.  Providing and laying in position rement concrete of specified grade  Providing and laying in position rement concrete of specified grade  Providing and laying in position specified grade or reinforced cement concrete, excluding the cost of centering and shuttering. All work up to plinth level: 1.5 at (1 cement: 1.5 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size).  Providing and laying in position cament concrete of specified grade  Prov	1	using necessary tools & machinery for excavation of cable trench & other	Cum	482.00	7.28	3,508.96		
watering, ramming, consolidating and dressing complete.  Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level: 13:5:36 (1 Cement: 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size).  Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and concrete, excluding the cost of centering, shuttering, finishing and concrete, excluding the cost of centering, shuttering, finishing and form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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-SODO or more.  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-SODO or more.  Cum 482.00 7.97 3,840.94 in the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works  Supplying 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.  Providing and laying in position specified grade watering, ramming, consolidating and dressing complete.  Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering and shuttering. All work up to plinth level: 13:36 (1 Cement: 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size).  Centering and shuttering including struitting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass son all heights: Foundations, footings, bases of columns, etc. for mass son all pelgts: Found	2	foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by	Cum	200.00	4.00	800.00		
4 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).  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 : 1:15:53 (Lement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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-5000 or more.  B CT R.PT Foundation  B Aw IIII excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works  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.  Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.  Providing and laying in position specified grade of reinforced cement concrete of specified grade excluding the cost of centering and shuttering. All work up to plinth level: 1:1:5:5 (Lement: 1.5 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, bases of columns, etc. for mass and (zone-III): 3 graded stone aggregate 20 mm nominal size).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass and (zone-III): 3 graded stone aggregate 20 mm nominal size).  Centering and shuttering including strutting, propping etc. and removal of form fo	3		Cum	1020.00	0.34	348.08		
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).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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-S000 or more.  B. CT & PT Foundation  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  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.  Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.  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).  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).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  Steel reinforcement for R.C.C. work including stratightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-S000 or more.  Centering and shuttering schedule-  Excavation (2.15x2.15x1.85mtr) & r	4	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	Cum	5130.00	0.46	2,334.15		
form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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-5000 or more.  B CT & PT Foundation  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  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.  Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.  Providing and laying in position ement 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).  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: 1:3:5 (1 Cement: 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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-5000 or more.  Column as per Drawing Schedule-  Cum 482.00 5131 24.73130	5	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	Cum	6500.00	2.83	18,362.50		
bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.  CT& PT Foundation  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  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.  Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.  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-ill): 6 graded stone aggregate 40 mm nominal size).  Cum  Froviding 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-ill): 3 graded stone aggregate 20 mm nominal size).  Cum  Cum  6500.00  2.36  15,356.25  Cum  6500.00  2.36  15,356.25  Sqm  301.00  14.94  4,496.94  concrete.  Steel reinforcement for R.C.C. work including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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.  Column as per Drawing Schedule-  Cum  6500.00  122.43  13,344.87  Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools  Cum  6500.00  148.00  151.31  148.200  151.31  148.200  151.31  148.200  151.31	6	form for all heights: Foundations, footings, bases of columns, etc. for mass	Sqm	301.00	13.25	3,988.25		
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  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.  Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.  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).  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).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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.  Column as per Drawing Schedule-  Cum 482.00 51.31 224.731.30	7	bending, placing in position and binding all complete: Thermo-Mechanically	Kg	109.00	140.00	15,260.00		
using necessary tools & machinery for excavation of cable trench & other civil works  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.  Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.  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).  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).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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.  Column as per Drawing Schedule-  Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools  Cum 482.00 51.31 24.731.30	В				0.00	-		
foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.  Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.  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).  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).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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.  C Column as per Drawing Schedule-  Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools  Cum 200.00 4.50  Cum 482.00 51.31 24.731.30	1	using necessary tools & machinery for excavation of cable trench & other	Cum	482.00	7.97	3,840.94		
watering, ramming, consolidating and dressing complete.  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).  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).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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.  Column as per Drawing Schedule-  Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools  Cum 900.00 0.36 1,862.19  Cum 6500.00 0.36 1,862.19  Cum 6500.00 0.36 1,862.19  Cum 6500.00 0.36 1,862.19	2	foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by	Cum	200.00	4.50	900.00		
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).  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).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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.  C Column as per Drawing Schedule-  Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools  Cum 5130.00  0.36  1,862.19  Cum 6500.00  2.36  15,356.25  Cum 6500.00  2.36  15,356.25	3	1 , , , , , , , , , , , , , , , , , , ,	Cum	900.00	0.36	326.70		
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).  Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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.  C Column as per Drawing Schedule-  Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools  Cum 482 00 51 31 24 731 30	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	Cum	5130.00	0.36	1,862.19		
form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.  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.  C Column as per Drawing Schedule-  Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools  Cum 482 00 51 31 24 731 30	5	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	Cum	6500.00	2.36	15,356.25		
bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.  C Column as per Drawing Schedule- Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools  Cum 482 00 51 31 24 731 30	6	form for all heights: Foundations, footings, bases of columns, etc. for mass	Sqm	301.00	14.94	4,496.94		
C Column as per Drawing Schedule-  Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools  Cum 482 00 51 31 24 731 30	7	bending, placing in position and binding all complete: Thermo-Mechanically	Kg	109.00	122.43	13,344.87		
1	С	Column as per Drawing Schedule-			0.00	-		
	1		Cum	482.00	51.31	24,731.30		

i	ANNEXURE-8.2	ANNEXURE-8.2						
Cost o	of Construction for 1 no. of 33kV Outdoor Bay arrangement Consisting of 1 $^{ m V}$	/CB and 2	2 isolator).					
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			
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 1	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	Isolator							
1 1 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 1	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	No.	3700.00	8	29,600.00			
K Total Civil & Services								
L								
M N								
0				9 18% of (N)	<b>30,51,174.01</b> 5,49,211.32			
P				@ 1% of (N)	30,511.74			
Q	Gras	ss Total I	Material +Servic	es (N+O+P)	36,30,897.07			

		ANNEXURE-8.3						
	TP CENTRAL ODISHA DISTRIBUTION LIMITED							
N	lame of the Division :-	CED						
Nar	me of the Sub-Division : -	BADACHANA						
Mitigation of 33kV Feeder Overloading:  Name of the Work :- Proposal for conductor augmentation of 33 KV Badachana feeder of 4 CKM from 80 sq.m  O/H, AAA conductor to 232 sq.mm, AAA conductor to mitigate overloading issue.								
Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 23. from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.								
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)						
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1	А	Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.	92,30,071.27					
		Total Amount	92,30,071.27					
		Total Amount (In Cr)	0.92					
Total	estimated cost is Rs. 0.92	Crore. (On TPCODL Capex Scheme)						

Augn	nentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Ch	andikhole 132	/33 KV, GSS	to 33/11 KV,
Bada	chana PSS.			
	No. of 33 KV DP required Without Isolator (Ref. Drawing No TPCODL-HVD-0004)		3	
	MATERIALS FOR 33 KV DP Without Isolator			
SI. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	31,200.00	6	1,87,200.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =( 2x9.56x3.25)	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)	93.00	11.8944	1,106.18
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)	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)	76.00	185.328	14,084.93
	Danger Plate, 2 no's.	99.20	6	595.20
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	93.00	1.8054	167.90
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	155.00	6	930.00
	H.T. Stay set (Complete )	1,302.00	6	7,812.00
	H.T. Stay Insulator Type-C (2 No's.)	62.00	12	744.00
	7/8 SWG Stay Wire 15kg /stay	93.00	90	8,370.00
13	Gi Pipe Earthing 40mm. 3 Mtr. Long 50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	1,302.00 93.00	3 35.4	3,906.00 3,292.20
14	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	18	1,785.60
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	93.00	7.2216	671.61
16	33KV pin insulator polymer	595.20	9	5,356.80
17	H W fitting(B&S) 90KN,4 Bolt	620.00	18	11,160.00
18	Disc insulator (B&S) 90 KN polymer	1,426.00	18	25,668.00
19	PG Clamp for 232 sq.mm AAA conductor	1,426.00	18	25,668.00
	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	96.72	36.783	3,557.65
	Black Paint	272.80	3	818.40
22	Yellow Colour Paint for Background	272.80	6	1,636.80
Α		Total Cost o		3,34,652.81
В	Stock, Stora	ge & Insurance		10,039.58
С			Total (A+B)	3,44,692.39
D			/ @ 3% of C	10,340.77
E		Tools & Plants		6,893.85
F		ansportation (		25,851.93
G	Erection Charges @ 5% on			9,640.80
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT	stay set/GI Pipe	e/PSC pole)	12,946.15
I	Erection Charges @ 20% of PSC pole	e- Not to be us	ed for 33kv	-
J		Sur	n of (C to I)	4,10,365.89
	<u>Civil &amp; Services</u>			
SI. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
	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.)	2,250.00	6	13,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	3.3	21,450.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	6,500.00	0.675	4,387.50

	ANNEXURE-8.3			
_	nentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Ch	andikhole 132	/33 KV, GSS	to 33/11 KV,
<b>Вааа</b> 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	3,700.00	11,100.00	
К	around pipe .	Total Civi	& Services	50,437.50
L		Total Civi	Total (J+K)	4,60,803.39
M	Other overheads (Including 6% supervision charges) of L (for 3	3 KV DP Witho	· · ·	27,648.20
N	Other overheads ( moduling over super vision charges) or 2 (roll o		Total (L+M)	4,88,451.60
0		Total GST @		87,921.29
P		Total CESS (	` '	4,884.52
Q	Gross Total Material +Services (N+O+P) for 3		- , ,	5,81,257.40
ų.	GIOSS TOTAL MATERIAL + SELVICES (N+O+F) 101 3	S KV DF WILLIN	Julisolatoi	3,81,237.40
	No. of 33 KV DP required With Isolator(Ref. Drawing No TPCODL-HVD-0004)		1	
	MATERIALS FOR 33 KV DP With Isolator			
SI.			Total	Total
No.	Description of Materials	Unit Rate	Quantity	Amount
	WDD 160:452 /1284tr Long 20 44VC /84tr )	21 200 00		
2	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel	31,200.00 76.00	2 82.216	62,400.00
	required =( 2x9.56x4.3)			•
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)  Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's	93.00	3.9648	368.73
4	channel required =( 1x7.14x4.3)	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)	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)	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)	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)	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)	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)	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)	76.00	9.56	726.56
12	Danger Plate, 2 no's.	99.20	2	198.40
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	93.00	0.6018	55.97
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	155.00	2	310.00
15	H.T. Stay set (Complete )	1,302.00	2	2,604.00
16	H.T. Stay Insulator Type-C (2 No's.)	62.00	4	248.00
17	7/8 SWG Stay Wire 15kg /stay	93.00	30	2,790.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long 50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr.	1,302.00	2	2,604.00
19	For mesh formation and 2.5 mtr. For raising)= 24x2.36	93.00	56.64	5,267.52
20	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	6	595.20
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	93.00	2.4072	223.87
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	12,834.00	3	38,502.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	53,003.00	1	53,003.00
	33KV pin insulator polymer	595.20	3	1,785.60
	H W fitting(B&S) 90KN,4 Bolt	620.00	6	3,720.00
26	Disc insulator (B&S) 90 KN polymer	1,426.00	6	8,556.00

	ANNEXURE-8.3			
_	nentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Ch chana PSS.	andikhole 132	2/33 KV, GSS	to 33/11 KV,
27	PG Clamp for 232 sq.mm AAA conductor	1,426.00	6	8,556.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	96.72	22.15	2,142.35
	Black Paint	272.80	1	272.80
30	Yellow Colour Paint for Background	272.80	2	545.60
Α		Total Cost o		2,25,480.70
В	Stock, Stora	ge & Insurance	e i.e 3% of A	6,764.42
С		Sub	Total (A+B)	2,32,245.12
D		Contigenc	y @ 3% of C	6,967.35
Е		Tools & Plant	s @ 2% of C	4,644.90
F	Ті	ransportation (	@ 7.5% of C	17,418.38
G	Erection Charges @ 5% on	Trf/Breaker/W	/PB/ H-Pole	3,213.60
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT	stay set/GI Pol	e/PSC pole)	15,916.04
- 1	Erection Charges @ 20% of PSC pol			-
J	•		m of (C to I)	2,80,405.40
-	Civil & Services		(/	, ,
SI.			Total	Total
No.	Description of Materials	Unit Rate	Quantity	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.)	2,250.00	2	4,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	1.1	7,150.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 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.	3,700.00	2	7,400.00
К		Total Civi	l & Services	20,512.50
L			Total (J+K)	3,00,917.90
М	Other overheads (Including 6% supervision charges) of L (f	or 33 KV DP W	ith Isolator)	18,055.07
N		Sub	Total (L+M)	3,18,972.97
0		Total GST @	18% of (N)	57,415.14
Р		Total CESS	@ 1% of (N)	3,189.73
Q	Gross Total Material +Services (N+O) f	or 33 KV DP W	ith Isolator	3,79,577.84
	No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)		4	
	MATERIALS FOR 33 KV Cut Point with 180 Degree Angle	1		
SI.	Description of Materials	Unit Rate	Total	Total
No.	Description of Muterials	om nute	Quantity	Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	31,200.00	4	1,24,800.00
,	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)	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)	93.00	21.1456	1,966.54
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)	76.00	23.40288	1,778.62
	Danger Plate, 1 no's.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	93.00	4.8144	447.74
9	= (4x0.59x0.510)  33KV pin insulator polymer	595.20	12	7,142.40
J	JUNY PHI HISUIGIUI PUIVIIICI	353.20	14	7,142.40

	ANNEXURE-8.3			
	nentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Ch	andikhole 132	/33 KV, GSS	to 33/11 KV,
	chana PSS.			
	H W fitting(B&S)90KN,4 Bolt	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer Earthing of Support ( Coil Type )	1,426.00 205.84	24 4	34,224.00 823.36
12	Earthing of Support (Coll Type )	205.64	4	623.30
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	1,426.00	24	34,224.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	96.72	19.516	1,887.59
16	Black Paint Vollage Colour Paint for Paginground	272.80	4 8	1,091.20
17	Yellow Colour Paint for Background	272.80 Total Cost of		2,182.40
A	Charle Chara			2,37,125.66
В	Stock, Stora	ge & Insurance		7,113.77
С			Total (A+B)	2,44,239.43
D			y @ 3% of C	7,327.18
E		Tools & Plant	_	4,884.79
F		ransportation (		18,317.96
G	Erection Charges @ 5% on	Trf/Breaker/W	/PB/ H-Pole	6,427.20
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-F	Pole/HT stay se	t/PSC pole)	11,569.54
- 1	Erection Charges @ 20% of PSC pol	e- Not to be us	ed for 33kv	-
J		Sui	m of (C to I)	2,92,766.10
	<u>Civil &amp; Services</u>			
SI.	Description of Materials	Unit Rate	Total	Total
No.	- Court of The Cou		Quantity	Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	2.2	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	6,500.00	0.45	2,925.00
К		Total Civi	& Services	17,225.00
L			Total (J+K)	3,09,991.10
М	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Poi	nt with 180 De	gree Angle)	18,599.47
N		Sub	Total (L+M)	3,28,590.57
0		Total GST @		59,146.30
P		Total CESS	- , ,	3,285.91
Q	Gross Total Material +Services (N+O) for 33 KV Cut Poi	nt with 180 De	gree Angle	3,91,022.78
	No. of 22 M/ Cut Point with 00 Power April			
	No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No TPCODL-HVD-0003)		4	
	MATERIALS FOR 33 KV Cut Point with 90 Degree Angle			
SI.	<u></u>		Total	Total
No.	Description of Materials	Unit Rate	Quantity	Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	31,200.00	4	1,24,800.00
	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4			
2	No's of Channel = (4x 9.56x1.7)	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)	93.00	42.2912	3,933.08
	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306		46.555=-	<u> </u>
4	Mtr., 4 No's of Channel = (4x 9.56x0.306)	76.00	46.80576	3,557.24
5	Danger Plate, 1 no's.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	93.00	4.8144	447.74
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	595.20	16	9,523.20
10	H W fitting(B&S)90KN,4 Bolt	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	1,426.00	24	34,224.00
12	Earthing of Support ( Coil Type )	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	93.00	1.048	97.46

	ANNEXURE-8.3			
_	nentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Ch chana PSS.	andikhole 132	/33 KV, GSS	to 33/11 KV,
14	PG Clamp for 232 sq.mm AAA conductor	1,426.00	24	34,224.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	155.00	4	620.00
16	H.T. Stay set (Complete )	1,302.00	4	5,208.00
17	H.T. Stay Insulator Type-C (2 No's.)	62.00	4	248.00
18	7/8 SWG Stay Wire 15kg /stay	93.00	60	5,580.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	96.72	45.24	4,375.61
20	Black Paint	272.80	4	1,091.20
21	Yellow Colour Paint for Background	272.80 Total Cost of	8	2,182.40
Α	Charl. Chara			2,67,276.86
В	Stock, Stora <sub>k</sub>	ge & Insurance		8,018.31
С			Total (A+B)	2,75,295.17
D			y @ 3% of C	8,258.86
E		Tools & Plant	s @ 2% of C	5,505.90
F	Т	ransportation (	@ 7.5% of C	20,647.14
G	Erection Charges @ 5% on	Trf/Breaker/W	/PB/ H-Pole	6,427.20
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-F	Pole/HT stay se	t/PSC pole)	13,474.55
ı	Erection Charges @ 20% of PSC pol	e- Not to be us	ed for 33kv	-
J		Sui	m of (C to I)	3,29,608.81
	<u>Civil &amp; Services</u>			
SI.			Total	Total
No.	Description of Materials	Unit Rate	Quantity	Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	2.20	14,300.00
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 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, 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.)	2,250.00	4	9,000.00
К		Total Civi	l & Services	26,225.00
L			Total (J+K)	3,55,833.81
-	Other overheads ( Including 6% supervision charges) of L (for 33 KV Cut Po	int with 00 Do	· · ·	
M	Other overheads ( including 6% supervision charges) of L (for 33 kV Cut PC			21,350.03
N		Sub	Total (L+M)	3,77,183.84
0		Total GST @	18% of (N)	67,893.09
Р		Total CESS (	@ 1% of (N)	3,771.84
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Po	oint with 90 De	gree Angle	4,48,848.77
	, ,			, -,-
	33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No TPCODL-HVD-0001)		4	
	MATERIALS FOR 33 KV Pin Points			
SI.	Description of Materials	Unit Rate	Total	Total
No.		Omit Kate	Quantity	Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	31,200.00	56	17,47,200.00
	33 KV V cross Arm (GI) 22Kg each	1,959.20	56	1,09,715.20
3	Top bracket 100x50x6mm GI channel ( 2kg each)	186.00	56	10,416.00
4	Danger Plate, 1 no's.  Pools Claren for donors Plate 25 V2 more flats 0.50 V2 Mar. Flat of 0.510 mars largeth 1 no's -	99.20	56	5,555.20
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	93.00	16.85	1,567.09
6	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	168.00	16,665.60
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	93.00	67.40	6,268.35
8	33KV pin insulator polymer	595.20	168	99,993.60
9	Earthing of Support ( Coil Type )	205.84	56	11,527.04

	ANNEXURE-8.3						
_	nentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Ch chana PSS.	andikhole 132	//33 KV, GSS	to 33/11 KV,			
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing 93.00 14.67						
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	96.72	81.20	7,853.66			
12	232 sq.mm AAA conductor	1,94,060.00	12.36	23,98,581.60			
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	648.42	500	-			
14 15	Black Paint Yellow Colour Paint for Background	272.80 272.80	56.0 112.0	15,276.80 30,553.60			
A	Tellow Colour Family for Background	Total Cost of		44,62,538.24			
В	Stock Stora	ge & Insurance					
-	Stock, Stora			1,33,876.15			
С			Total (A+B)	45,96,414.38			
D			y @ 3% of C	1,37,892.43			
E		Tools & Plant		91,928.29			
F	Ti	ransportation (	@ 7.5% of C	3,44,731.08			
G	Erection Charges @ 5% on	Trf/Breaker/W	/PB/ H-Pole	89,980.80			
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-F	ole/HT stay se	t/PSC pole)	2,79,679.84			
1	Erection Charges @ 20% of PSC pol	e- Not to be us	ed for 33kv	-			
J		Su	m of (C to I)	55,40,626.82			
	<u>Civil &amp; Services</u>						
SI.	Description of Materials	Unit Rate	Total	Total			
No.	Description of waterials	Onit Rate	Quantity	Amount			
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	30.80	2,00,200.00			
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	6,500.00	6.30	40,950.00			
	Dismantalling of 80sqmm Conductor	9,000.00	12.00	1,08,000.00			
K		Total Civi	l & Services	3,49,150.00			
L			Total (J+K)	58,89,776.82			
М	Other overheads (Including 6% supervision charges)	of L (for 33 KV	Pin Points)	3,53,386.61			
N		Sub	Total (L+M)	62,43,163.43			
0		Total GST @	18% of (N)	11,23,769.42			
Р		Total CESS	@ 1% of (N)	62,431.63			
Q	Gross Total Material +Services (N+	O+P) for 33 K\	/ Pin Points	74,29,364.48			
	6% Supervision Charges Summary						
1	Other overheads (Including 6% supervision charges) of L (for 3			27,648.20			
2	Other overheads (Including 6% supervision charges) of L (f			18,055.07			
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Poi			18,599.47			
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Po			21,350.03			
5	Other overheads (Including 6% supervision charges)			3,53,386.61			
		(6% supervisi	on charges)	4,39,039.38			
	Gross Total Summary						
1	Gross Total Material +Services (N+O+P) for			5,81,257.40			
2	Gross Total Material +Services (N+O)			3,79,577.84			
3	Gross Total Material +Services (N+O) for 33 KV Cut Po			3,91,022.78			
4	Gross Total Material +Services (N+O+P) for 33 KV Cut P			4,48,848.77			
5	Gross Total Material +Services (N-			74,29,364.48			
Q	Inspection Fee of Over Head Line (I		· ·				
R	Inspection Fee of Over Head Line (HT)						
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the in						
Т		ion by electric					
U	Gross Total Material, Services and Insp	ection Fees (F	P+Q+R+S+T)	92,30,071.27			

		ANNEXURE-8.4								
	TP CENTRAL ODISHA DISTRIBUTION LIMITED									
Nan	me of the Division :-	AED								
Name	of the Sub-Division : -	AED,ATHAGARH								
Na	Name of the Work:- Mitigation of 33kV Feeder Overloading: Proposal for augmentation of existing 33 kV Khuntuni Feeder from Khur Khuntuni PSS for providing reliable power supply.									
	m, AAAC to 232 without spare and without spare.									
Na	ames of Schemes: -	TPCODL CAPEX(FY 23-24)								
		ABSTRACT OF ESTIMATE								
SI. No.	Part	Description	Amount							
1	А	Augmenation of existing Khuntuni Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.	1,09,15,984.25							
2	Part-B Laving of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable		91,30,614.96							
3	С	Part-C Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.	7,56,143.07							
		Total Amount	2,08,02,742.28							
		Total Amount (In Cr)	2.08							

	ANNEXURE-8.4					
Augn	nenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132	/33 KV, I	(huntuni GSS t	o 33/11 KV,	Khuntuni PSS.	
No. of 33 KV DP required Without Isolator (Ref. Drawing No TPCODL-HVD-0004)  4						
	MATERIALS FOR 33 KV DP Without Isolate	<u>or</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	8	2,49,600.00	
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	248.56	18,890.56	
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	15.8592	1,474.91	
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	279.888	21,271.49	
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	247.104	18,779.90	
6	Danger Plate, 2 no's.	No.	99.20	8	793.60	
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	2.4072	223.87	
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	8	1,240.00	
9	H.T. Stay set (Complete )	Set	1,302.00	8	10,416.00	
	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	16	992.00	
	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00	
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00	
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	47.2	4,389.60	
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80	
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	9.6288	895.48	
	33KV pin insulator polymer	No.	595.20	12	7,142.40	
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	24	14,880.00	
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	24	34,224.00	
	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00	
	GI Nut, Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	49.044	4,743.54	
21	Black Paint	Ltr	272.80	4	1,091.20	
22	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40	
Α			Total Cost o	of materials	4,46,203.74	
В	Sto	ck, Stora	ge & Insurance	e i.e 3% of A	13,386.11	
С			Sub	Total (A+B)	4,59,589.85	
D			Contigency	y @ 3% of C	13,787.70	
E			Tools & Plant	, -	9,191.80	
F		Tı	ransportation (		34,469.24	
G	Erection Charges		<u> </u>		12,854.40	
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				17,261.54	
	<u> </u>				17,201.34	
_	Erection Charges @ 20% of	rsc poi		m of (C to I)	- E 47 154 53	
J	<u>Civil &amp; Services</u>		Sui	01 (C tO 1)	5,47,154.52	
CI	CIVIL & SCIVICES			Total	Total	
SI. No.	Description of Materials	Unit	Unit Rate	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	No.	2,250.00	8	18,000.00	
_	, , , , , , , , , , , , , , , , , , , ,	l	,	1 1	-,	

	CIVII & SEIVICES						
SI. 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	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		

	ANNEXURE-8.4				
Augn	nenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132,	/33 KV, F	Khuntuni GSS t	o 33/11 KV,	Khuntuni PSS.
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	4	14,800.00
К			Total Civi	& Services	67,250.00
L				Total (J+K)	6,14,404.52
М	Other overheads (Including 6% supervision charges) of	of L (for 3	33 KV DP Witho	out Isolator)	36,864.27
N			Sub	Total (L+M)	6,51,268.79
0			Total GST @	18% of (N)	1,17,228.38
Р			Total CESS	@ 1% of (N)	6,512.69
Q	Gross Total Material +Services (N+C	)+P) for 3	33 KV DP With	out Isolator	7,75,009.86
	No. of 33 KV DP required With Isolator(Ref. Drawing No TPCODL-HVD-0004)			2	
	MATERIALS FOR 33 KV DP With Isolator				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
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	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	93.00	7.9296	737.45
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.	99.20	4	396.80
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	1.2036	111.93
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	4	620.00
15	H.T. Stay set (Complete )	Set	1,302.00	4	5,208.00
	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	8	496.00
	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00
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	93.00	113.28	10,535.04
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	4.8144	447.74
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	6	77,004.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	2	1,06,006.00
24	33KV pin insulator polymer	No.	595.20	6	3,571.20
	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	12	7,440.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	12	17,112.00

	ANNEXURE-8.4				
Augn	nenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132	/33 KV, H	Khuntuni GSS t	o 33/11 KV,	Khuntuni PSS.
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	12	17,112.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	44.3	4,284.70
29	Black Paint	Ltr	272.80	2	545.60
30	Yellow Colour Paint for Background	Ltr	272.80	4	1,091.20
Α			Total Cost o	of materials	4,50,961.39
В	Sto	ck, Stora	ge & Insurance	e i.e 3% of A	13,528.84
С			Sub 1	Total (A+B)	4,64,490.23
D				y @ 3% of C	13,934.71
E			Tools & Plants		9,289.80
 F		Tı	ransportation (		34,836.77
G	Erection Charges		•	_	6,427.20
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				31,832.09
	Erection Charges @ 10% of C(CACCP) (11) Breaker) W1 b) 11				31,032.09
<u> </u>	Election charges @ 20% of	1 F3C p01			
J	Civil & Services		Sui	m of (C to I)	5,60,810.80
SI.				Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
	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				
1	excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size	No.	2,250.00	4	9,000.00
	(500mmx500mmx800mm) using 20mm BHG metal with all labour and material		,		-,
	(Excavation of earth will be done of size 500X500X1500 mm.)				
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
	Construction Earthing chamber including installation of earthing pipe. Making earthing				
4	chamber including excavation , soil treatment with bentonide powder , calculation of	No.	2 700 00	4	14 900 00
4	earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding	INO.	3,700.00	4	14,800.00
	of GI flat around pipe .				
K			Total Civi	l & Services	41,025.00
L				Total (J+K)	6,01,835.80
М	Other overheads (Including 6% supervision charge	es) of L (f	or 33 KV DP W	ith Isolator)	36,110.15
N			Sub <sup>*</sup>	Total (L+M)	6,37,945.95
0			Total GST @	18% of (N)	1,14,830.27
Р			Total CESS (	@ 1% of (N)	6,379.46
Q	Gross Total Material +Service	s (N+O) f	or 33 KV DP W	ith Isolator	7,59,155.68
N	o. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)			4	
	MATERIALS FOR 33 KV Cut Point with 180 Degre	<u>e Angle</u>	Ι	ı	
SI.	Description of Materials	Unit	Unit Rate	Total	Total
No.	,			Quantity	Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
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.	93.00	21.1456	1,966.54
4	Straight Cross Arm Top Channel $100 \times 50 \times 6$ mm, $9.56$ KG/mtr, each channel length $0.306$ Mtr., $2$ No's of Channel = $(2 \times 9.56 \times 0.306)$	K.g.	76.00	23.40288	1,778.62
5	Danger Plate, 1 no's.	No.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74
9	33KV pin insulator polymer	No.	595.20	12	7,142.40
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00

	ANNEXURE-8.4						
Augn	nenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132	/33 KV, K	(huntuni GSS t	o 33/11 KV,	Khuntuni PSS.		
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00		
12	Earthing of Support ( Coil Type )	EA	205.84	4	823.36		
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46		
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00		
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	19.516	1,887.59		
16	Black Paint	Ltr	272.80	4	1,091.20		
17	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40		
<u>A</u>		.1 .61	Total Cost o		2,37,125.66		
В	510	ck, Stora	ge & Insurance		7,113.77		
С				Total (A+B)	2,44,239.43		
D				y @ 3% of C	7,327.18		
E			Tools & Plant		4,884.79		
F			ransportation (		18,317.96		
G	Erection Charges				6,427.20		
Н	Erection Charges @ 10% of C (except Trf/Breaker/				11,569.54		
ı	Erection Charges @ 20% of	PSC pol			-		
J			Su	m of (C to I)	2,92,766.10		
	<u>Civil &amp; Services</u>						
SI.	Description of Materials	Unit	Unit Rate	Total	Total		
No.	bescription of waterials		Oill Nate	Quantity	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		
К	Total Civil & Services						
L	L Total (J+K)						
М	( 0 1 0 7 ( 0 7 )						
N				Total (L+M)	3,28,590.57		
0			Total GST @		59,146.30		
P	Gross Total Material +Services (N+O) for 33 K	/ Cut Dai	Total CESS	- , ,	3,285.91		
Q	GIOSS TOTAL IMATERIAL TSELVICES (14TO) 101 55 K	Cut Foi	III WILII 180 DE	gree Angle	3,91,022.78		
	No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No TPCODL-HVD-0003)			4			
	MATERIALS FOR 33 KV Cut Point with 90 Degree	e Angle					
SI.				Total	Total		
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount		
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00		
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	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.	93.00	42.2912	3,933.08		
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.	99.20	4	396.80		
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93		
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40		
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74		
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	16	9,523.20		
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00		
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00		
12	Earthing of Support ( Coil Type )  No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil	No. K.g.	93.00	1.048	823.36 97.46		
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00		
τ++	pro-claimpror 202 34.11111 AAA CONTRACTOR	I NO.	1,420.00	44	34,224.00		

	ANNEXURE-8.4				
Augn	nenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132	/33 KV, K	(huntuni GSS t	o 33/11 KV,	Khuntuni PSS.
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	4	620.00
16	H.T. Stay set (Complete )	Set	1,302.00	4	5,208.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	45.24	4,375.61
20	Black Paint	Ltr	272.80	4	1,091.20
21	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
Α			Total Cost o	of materials	2,67,276.86
В	Stoo	k, Storag	ge & Insurance	i.e 3% of A	8,018.31
С			Sub <sup>-</sup>	Total (A+B)	2,75,295.17
D			Contigency	y @ 3% of C	8,258.86
E			Tools & Plant	s @ 2% of C	5,505.90
F		Tı	ransportation (	@ 7.5% of C	20,647.14
G	Erection Charges			_	6,427.20
Н	Erection Charges @ 10% of C (except Trf/Breaker/\				13,474.55
				-	13,474.33
<u> </u>	Erection Charges @ 20% of	PSC poi			-
J	Civil & Services		Sui	m of (C to I)	3,29,608.81
SI. 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 (300mm/300mm/2200mm) = 0.53cd.mit	Cu.mtr	6,500.00	0.45	2,925.00
	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod &	Cu.iiiti	0,300.00	0.43	2,923.00
_	Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including			_	
3	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	4	9,000.00
К			Total Civi	& Services	26,225.00
L				Total (J+K)	3,55,833.81
М	Other overheads (Including 6% supervision charges) of L (for 33 I	(V Cut Po	int with 90 De	gree Angle)	21,350.03
N			Sub	Total (L+M)	3,77,183.84
0			Total GST @	18% of (N)	67,893.09
Р			Total CESS (	@ 1% of (N)	3,771.84
Q	Gross Total Material +Services (N+O+P) for 33 I	KV Cut Po	oint with 90 De	egree Angle	4,48,848.77
	33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No TPCODL-HVD-0001)			4.5	
	MATERIALS FOR 33 KV Pin Points				
SI.				Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	63	19,65,600.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	63	1,23,429.60
3	Top bracket 100x50x6mm GI channel ( 2kg each)	No.	186.00	63	11,718.00
4	Danger Plate, 1 no's.	No.	99.20	63	6,249.60
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	18.96	1,762.97
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	189.00	18,748.80
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	75.83	7,051.89
8	33KV pin insulator polymer	No.	595.20	189	1,12,492.80
9	Earthing of Support ( Coil Type )	No.	205.84	63	12,967.92
40	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	16.51	1,535.06
10					
10	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	91.35	8,835.37

	ANNEXURE-8.4						
Augn	nenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132	/33 KV, I	(huntuni GSS t	o 33/11 KV,	Khuntuni PSS.		
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-		
14	Black Paint	Ltr	272.80	63.0	17,186.40		
15	Yellow Colour Paint for Background	Ltr	272.80	126.0	34,372.80		
Α			Total Cost o	of materials	50,20,355.52		
В	Sto	ck, Stora	ge & Insurance	e i.e 3% of A	1,50,610.67		
С			Sub	Total (A+B)	51,70,966.18		
D			Contigenc	y @ 3% of C	1,55,128.99		
E			Tools & Plant	s @ 2% of C	1,03,419.32		
F		Т	ransportation (	@ 7.5% of C	3,87,822.46		
G	Erection Charges	@ 5% on	Trf/Breaker/W	VPB/ H-Pole	1,01,228.40		
Н	Erection Charges @ 10% of C (except Trf/Breaker/	WPB/ H-F	Pole/HT stay se	et/PSC pole)	3,14,639.82		
- 1	Erection Charges @ 20% of	PSC pol	e- Not to be us	sed for 33kv	-		
J			Su	m of (C to I)	62,33,205.17		
	<u>Civil &amp; Services</u>			ļ			
SI.	Description of Materials	Unit	Unit Rate	Total	Total		
No.	<u> </u>			Quantity	Amount		
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	34.65	2,25,225.00		
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	7.09	46,068.75 1,21,500.00		
К	Dismantalling of 100/80sqmm Conductor km 9,000.00 13.50  Total Civil & Services						
L Total (J+K)							
M							
N							
0							
P				@ 1% of (N)	12,92,059.23 71,781.07		
Q	Gross Total Material +Ser	vices (N+		- , ,	85,41,947.16		
~			.,		00,12,517.120		
	6% Supervision Charges Summary			1			
1	Other overheads (Including 6% supervision charges)	of L (for 3	3 KV DP Witho	out Isolator)	36,864.27		
2	Other overheads (Including 6% supervision charge				36,110.15		
3	Other overheads (Including 6% supervision charges) of L (for 33 K	√ Cut Poi	nt with 180 De	gree Angle)	18,599.47		
4	Other overheads (Including 6% supervision charges) of L (for 33 I	(V Cut Po	int with 90 De	gree Angle)	21,350.03		
5	Other overheads (Including 6% supervision	charges)	of L (for 33 KV	/ Pin Points)	4,06,307.94		
		Total	(6% supervisi	on charges)	5,19,231.85		
	<u>Gross Total Summary</u>						
1	Gross Total Material +Services (N+				7,75,009.86		
2	Gross Total Material +Service				7,59,155.68 3,91,022.78		
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle						
4	Gross Total Material +Services (N+O+P) for 33				4,48,848.77		
5	Gross Total Material +Se	•			85,41,947.16		
Q	Inspection Fee of Over He						
R	Inspection Fee of Over Head						
S	Inspection Fee of Drawing Checking and Approval (For each drawing						
T			ion by electric	· ·			
U	Gross Total Material, Services	and Ins	pection Fees (F	P+Q+R+S+T)	1,09,15,984.25		

# Part-B

Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS.

# **Supply Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	90		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.	30		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-	Mtr.	360	1,337.13	4,81,366.80
	20kA)				
1.2	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	5,245.00	62,940.00
1.3	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	18	4,894.00	88,092.00
2	Supply of 33kV RMU				
а	No. of 33kV 3Way RMU (LLV+M)	nos.			
b	No. of 33kV 4Way RMU (LLVV+M)	nos.			
С	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.	2		
е	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)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	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: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	26.40	93.00	2,455.20
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	4	1,302.00	5,208.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	4	7,535.00	30,140.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2	2,19,420.00	4,38,840.00

# Part-B

Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS.

Frection Portion  Si. No. Description of items	Fua atia		,			57,79,570.00
Si. No. Description of items Unit Canality Rate (in Rs.) Amount (in Rs.)  Frection, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XPE UG cable without spare XIVE insulation (extructed type) UG cable (with one single 1core, 630sqmm, XLPE Cable as spare) in trefoil formation by open trench method.  1.1 Experimental of Extractive type) UG cable (with one single 1core, 630sqmm, XLPE Cable as spare) in trefoil formation by open trench method.  1.2 Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits  1.3 Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  1.4 Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  1.5 Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 630sqmm, HT UG cable kits  1.5 Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 630sqmm, MT UG cable kits  1.5 Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 630sqmm, MT UG cable kits  1.6 Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench. Mtr. 90 2,300.00 2,07,000.00 PD 4,000 PD						
1 Ferction, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method.  1.2 Ferction of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits  1.3 Foreign of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits  1.4 Ferction of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  1.5 Foreign of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  1.6 Ferction of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  1.7 Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, HT UG cable kits  1.8 Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PNB PE80) for laying of individual run of UG cable at main road and unaccessable place.  1.6 Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench. Mtr. 0.00 300.00 -  2 Ferction, Commissioning, Wiring and Testing of 33kV RMU  2.1 Erection of RMU 33kV 3WAY 630A WITH METERING UNIT (LLV+M) Nos. 0 15,000.00 -  2.2 Erection of RMU 33kV 3WAY 630A WITH METERING UNIT (LLV+M) Nos. 0 15,000.00 -  2.3 Erection of RMU 33kV 3WAY 630A (2ISLTR+2 BKR) (LLV) Nos. 0 8,000.00 -  2.4 Erection of RMU 33kV 3WAY 630AMP (3 ISOLATORS) (LLL) 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 3WAY 630AMP (3 ISOLATORS) (LLL) Nos. 0 8,000.00 -  2.7 Erection of RMU 33kV 3WAY 630AMP (3 ISOLATORS) (LLL) Nos. 0 8,000.00 -  2.8 Erection of RMU 33kV 3WAY 630AMP (3 ISOLATORS) (LLL) Nos. 0 8,000.00 -  2.9 Erection of Straight through connector (Pla			Unit	Quantity		
1.1. KJPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XIPE cable as spare) in trefoil formation by open trench method.  1.2. Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits  1.3. Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  1.4. Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 830sqmm, KT UG cable kits  Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 830sqmm, XLPE insulation (extruted type) UG cable including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PNB FE80) for laying of individual run of UG cable at main road and unaccessable place.  1.6. Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.  2.7. Erection of RMU 33kV 3WAY 630A WITH METERING UNIT (LLV+M)  2.8. Erection of RMU 33kV 3WAY 630A WITH METERING UNIT (LLV+M)  2.9. Erection of RMU 33kV 3WAY 630A (2ISLTR+ 1BKR) (LLV)  2.9. Erection of RMU 33kV 3WAY 630A (2ISLTR+ 2BKR) (LLV)  2.9. Erection of RMU 33kV 3WAY 630A (2ISLTR+ 2BKR) (LLV)  2.9. Erection of RMU 33kV 3WAY 630AMP (3 ISOLATORS) (LLL)  3.0. RTU and OFC for RMU 33kV 3WAY 630AMP (4 ISOLATORS) (LLLL)  3.1. SRTU and OFC for RMU 33kV 3WAY 630AMP (4 ISOLATORS) (LLLL)  3.2. Erection of SMU 33kV 3WAY 630AMP (5 ISOLATORS) (LLLL)  3.3. RTU and OFC for RMU 33kV 3WAY 630AMP (5 ISOLATORS) (LLLL)  3.4. Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  3.5. Erection of Connector and accessories for OFC connection at RMU 33kV 3WAY 630AMP (5 ISOLATORS) (LLLL)  3.6. Erection of Connector and accessories for OFC connection at Scalad along 11kV UG cable. through open trench or HDD  3.6. Erection of Connector and accessories for OFC connection at Scalad along 11kV UG cable. through open trench or	1					
suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits  Frection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  Frection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  Set 12 2,081.70 24,980.40  Frection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  Set 18 2,081.70 37,470.60  Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 38uns, 630sqmm, K1PE insulation (extruted type) UG cable including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessable place.  1.6 Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.  Mtr. 0.00 300.00 -  2 Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) Nos. 0 15,000.00 -  2.1 Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) Nos. 0 15,000.00 -  2.2 Erection of RMU 33KV 3WAY 630A (2ISLTR+1BKR) (LLV) Nos. 0 8,000.00 -  2.3 Erection of RMU 33KV 3WAY 630A (2ISLTR+2 BKR) (LLV) Nos. 0 8,000.00 -  2.6 Erection of RMU 33KV 3WAY 630AWP (3 ISOLATORS) (LLLL) Nos. 0 8,000.00 -  2.6 Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV) Nos. 0 8,000.00 -  3 FRTU and OFC for RMU SCADA Automation laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PlB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.2 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  3.3 Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3,28,115.00	1.1	XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench</b>	Mtr.	270	94.50	25,515.00
for 33kV, 1Core, 630sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits  Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessable place.  1.6 Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.  Mtr. 0.00 300.00 -  Erection, Commissioning, Wiring and Testing of 33kV RMU  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 (ZISLTR+ 1BKR) (LLV) Nos. 0 8,000.00 -  2.4 Erection of RMU 33KV 3WAY 630A (ZISLTR+ 1BKR) (LLV) Nos. 0 8,000.00 -  2.5 Erection of RMU 33KV 3WAY 630A (ZISLTR+ 2BKR) (LLLV) Nos. 0 8,000.00 -  2.6 Erection of RMU 33KV 3WAY 630A (ZISLTR+ 2BKR) (LLLV) Nos. 0 8,000.00 -  3 FRTU and OFC for RMU SCADA Automation  Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3. Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  Erection of connection.  Erection of connector and accessories for OFC connection at RMU,  Erection of Connector and accessories for OFC connection at RMU,  Erection of Connector and accessories for OFC connection at RMU.  Erection of Connector and accessories for OFC connection at RMU.  Erection of Connector and accessories for OFC connection at RMU.  Erection of Connector and accessories for OFC connection at RMU.  Erection of Connector and accessories for OFC connection at RMU.  Erection of Connector and accessories for OFC connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3,28,115.00	1.2		Set	0	2,400.00	-
Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, NT UG cable kits  Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XIPE insulation (extruted type) UG cable including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessable place.  1.6 Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench. Mtr. 0.00 300.00 -  2 Erection, Commissioning, Wiring and Testing of 33kV RMU  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 3WAY 630A (2ISLTR+2 BKR) (LLV) Nos. 2 8,000.00 16,000.00  2.5 Erection of RMU 33KV 3WAY 630AMP (4 ISOLATORS) (ILLL) Nos. 0 8,000.00 -  3 FRTU and OFC for RMU 36A Automation Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3. Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection. Set 4.0 1,225.07 4,900.28 Erection of end Connector and accessories for OFC connection at RMU, Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.) 3,28,115.00	1.3	· · · · · · · · · · · · · · · · ·	Set	12	2,081.70	24,980.40
1.Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessable place.  1.6 Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench. Mtr. 0.00 300.00 -  2 Erection, Commissioning, Wiring and Testing of 33kV RMU  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 3WAY 630A (2ISLTR+2 BKR) (LLVV) Nos. 2 8,000.00 16,000.00  2.5 Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV) Nos. 0 8,000.00 -  3.6 Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLLL) Nos. 0 8,000.00 -  3.7 FRTU and OFC for RMU SAVA Automation Nos. 0 8,000.00 -  3.8 FRTU and OFC for RMU SCADA Automation FRTU and OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.1 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection. Set 4.0 1,225.07 4,900.28  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.) 3,28,115.00	1.4	· · · · · · · · · · · · · · · · · · ·	Set	18	2,081.70	37,470.60
2 Erection, Commissioning, Wiring and Testing of 33kV RMU  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 FRTU and OFC for RMU SCADA Automation  Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.1 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3,28,115.00	1.5	1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable including looping at cable terminations and straight through joints by <b>HDD method with</b> HDPE pipe (110mm dia, PN8 PE80) for laying	Mtr.	90	2,300.00	2,07,000.00
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) (LLLL) 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  Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.2 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3,28,115.00	1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	0.00	300.00	-
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 4WAY 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 Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.2 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3,28,115.00	2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.3 Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)  2.4 Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)  2.5 Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)  2.6 Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)  3.7 FRTU and OFC for RMU SCADA Automation  Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.2 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Monomode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  8 8,000.00  - 8,000.00  - 8,000.00  - 0,00  -	2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.4 Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)  2.5 Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)  2.6 Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)  3.7 FRTU and OFC for RMU SCADA Automation  Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC  Cables.laid along 11kV UG cable. through open trench or HDD  3.2 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  3.3 Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  2 8,000.00  8,000.00  - 0  8,000.00  8,000.00  - 0  8,000.00  - 0  8,000.00  - 0  8,000.00  - 0  8,000.00  - 0  8,000.00  - 0  8,000.00  - 0  8,000.00  - 0  8,000.00  - 0  8,000.00  - 0  8,000.00  - 0  8,000.00  8,000.00  8,00	2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.5 Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)  2.6 Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)  3 FRTU and OFC for RMU SCADA Automation  Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.2 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3,28,115.00	2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.6 Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)  Ros. 0 8,000.00 -  FRTU and OFC for RMU SCADA Automation  Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.2 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3,28,115.00	2.4	, , ,	Nos.	2	,	16,000.00
3.1 Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.2 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  3.3 Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3.2 A Set						-
Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD  3.2 Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.  3.3 Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3.2 Early 12.00  6.124.36  12.248.72  3.28,115.00		, , , ,	Nos.	0	8,000.00	-
accessories for OFC connection.  3.3 Erection of end Connector and accessories for OFC connection at RMU,  Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  Set 0.0 1,225.07 4,900.28  1,225.07 4,900.28  3,124.36 12,248.72	3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC	Mtr.	0.0	82.00	-
RMU, Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3.4 Set 4.0 1,225.07 4,900.28  4,900.28  3.6,124.36 12,248.72	3.2	· · · · · · · · · · · · · · · · · ·	Set	0.0	612.54	-
FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.  Sub Total (Erection Portion) (in Rs.)  3,28,115.00	3.3		Set	4.0	1,225.07	4,900.28
Sub Total (Erection Portion) (in Rs.) 3,28,115.00	3.4	FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3	Nos.	2.0	6,124.36	12,248.72
		Sub Total (Erection Portion) (in Rs.	.)			3,28,115.00
Civil Portion						

# Part-B Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY

RMU at Khuntuni PSS. Rate Amount SI. No. Description of items Unit Quantity (in Rs.) (in Rs.) Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable 1.1 Earth work excavation of soil (1mtr. width X 1.2mtr. depth) 1.1.a Earth work excavation of soil 75.6 700.00 Cum 52,920.00 1.1.b Earth work excavation of hard rock Cum 32.4 1,720.00 55,728.00 108 1.2 Back filling with excavated soil outside and above the trench Cum 202.00 21,816.00 Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. 1.3 Mtr 0 2,643.67 Civil works for Prefabricated RCC foundation with supply of all 2 materials Prefabricated RCC foundation of 33kV RMU Nos. 2 23,145.30 46,290.60 2.1 Supply of GI Fencing with Gate around each RMU sqmtr 3,600.00 Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth 3.700.00 14,800.00 Set 4 resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.) 96 1,40,486.40 5 Mtr 1,463.40 Supply and Erection of Cable Route Marker along the cable route at 6 Nos. 1,012.00 an interval of 30mtrs with civil works Sub Total (Civil Portion) (in Rs.) 3,32,041.00 Sub Total (Supply Portion) 57,79,570.00 Α Stock, Storage & Insurance @ 3 % of A 1,73,387.10 В C Sub Total (A+B) 59,52,957.10 D Contingency @ 3 % of C 1,78,588.71 Tools & Plants Charges @ 2% of C (considered for earthing items) Ε 50.58 Transportation @ 7.5% of C F 4,46,471.78 Erection Charges @ 10% of earthing items 252.89 G Н Total (C+D+E+F+G) 65,78,321.06 Sub Total (Erection Portion + Civil Portion) Ι 6,60,156.00 Total Cost (H+I) J 72,38,477.06 Other Overhead /(including Supervision Charges) @ 6 % of J 4,34,308.62 Κ L Total Estimated Capital Cost i.e. (J+K) 76,72,785.68 GST @ 18% of L Μ 13,81,101.42 CESS @ 1% of L M1 76,727.86 Grand Total (L+M+M1) 91,30,614.96 Ν

# Part-C

Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.

# Supply Portion

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	60		
ь	Length of 33kV 1C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	180	970.92	1,74,765.60
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	8,517.56	76,658.04
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	6,488.92	58,400.28
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.		357.60	-
2	Supply of 33kV RMU				
a	No. of 33kV 3Way RMU (LLV+M)	nos.			
Ь	No. of 33kV 4Way RMU (LLVV+M)	nos.			
С	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.			
е	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)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	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  Forthing Conductors FOVC many (2.4kg /mats.) CLEIct for a surjument				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	0.00	93.00	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,302.00	-
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	0	7,535.00	-
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	0	2,19,420.00	-

# **ANNEXURE-8.4** Part-C Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare. **Sub Total (Supply Portion) (in Rs.)** 3,09,823.92 **Erection Portion** Rate Amount Sl. No. Description of items Unit Quantity (in Rs.) (in Rs.) Erection, Commissioning & Testing of 33kV new line by 3X1Core, 1 400sqmm, XLPE UG cable without spare Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE 94.50 180 17,010.00 1.1 insulation (extruted type) UG cable in trefoil formation by open trench Mtr.

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
Civil Po	ortion	ı			
	Sub Total (Erection Portion) (in Rs.)				54,480.60
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	0.0	6,124.36	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	0.0	1,225.07	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3	FRTU and OFC for RMU SCADA Automation			·	
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	_
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	_
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	_
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	_
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	
2	Erection, Commissioning, Wiring and Testing of 33kV RMU	14161.		300.00	
1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	0	300.00	
1.5	Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) including looping at cable terminations and straight through joints by <b>HDD method with</b> HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessable place.	Mtr.	0	2,300.00	-
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, aluminium UG cable kits	Set	0	2,400.00	-
1.1	method.	ivitr.	180	94.50	17,010.00

SI No	Description of items	Unit	Quantity	Rate	Amount
SI. NO.			Quantity	(in Rs.)	(in Rs.)

#### **ANNEXURE-8.4** Part-C Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare. 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 Earth work excavation of soil (1mtr. width X 1.2mtr. depth) 1.1 Earth work excavation of soil 700.00 1.1.a Cum 50.4 35,280.00 1,720.00 37,152.00 1.1.b Earth work excavation of hard rock Cum 21.6 1.2 Back filling with excavated soil outside and above the trench Cum 72 202.00 14,544.00 Damage of asphalt/tar road and other utilities and reconstructing to bring 1.3 Mtr 2,643.67 to its original shape after laying of cable in open trench (1mtr. width) Civil works for Prefabricated RCC foundation with supply of all 2 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 Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth 4 Set 0 3,700.00 resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. 5 Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.) Mtr 72 1,463.40 1,05,364.80 Supply and Erection of Cable Route Marker along the cable route at an 6 Nos. 1,012.00 interval of 30mtrs with civil works **Sub Total (Civil Portion) (in Rs.)** 1,92,340.80 **Sub Total (Supply Portion)** 3,09,823.92 Α Stock, Storage & Insurance @ 3 % of A В 9,294.72 Sub Total (A+B) C 3,19,118.64 Contingency @ 3 % of C 9,573.56 D Ε Tools & Plants Charges @ 2% of C (considered for earthing items) Transportation @ 7.5% of C F 23,933.90 G Erection Charges @ 10% of earthing items Total (C+D+E+F+G) Н 3,52,626.09 Sub Total (Erection Portion + Civil Portion) 2,46,821.40 Total Cost (H+I) 5,99,447.49 J Other Overhead /(including Supervision Charges) @ 6 % of J 35,966.85 Κ Total Estimated Capital Cost i.e. (J+K) L 6,35,414.34 GST @ 18% of L Μ 1,14,374.58 M1 CESS @ 1% of L 6,354.14 Grand Total (L+M+M1) Ν 7,56,143.07

		ANNEXURE-8.5			
		TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	CED			
Na	ame of the Sub-Division : -	CHOUDWAR			
	Mitigation of 33kV Feeder Overloading:  Name of the Work:-  Proposal for augmentation of existing 33 kV Choudwar Feeder from Choudwar GSS to Choudwar PSS for providing reliable power supply.				
	Scope:-	Augmenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.r sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.	nm, AAAC to 232		
	Names of Schemes: -	TPCODL CAPEX (FY 23-24)			
		ABSTRACT OF ESTIMATE			
SI. No.	Part	Description	Amount		
1	А	Augmenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.	22,69,171.09		
		Total Amount	22,69,171.09		
		Total Amount (In Cr)	0.23		
Total	estimated cost is Rs. 0.23 C	rore. (On TPCODL Capex Scheme)			

### ANNEYLINE OF

	ANNEXURE-8.5					
	nenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm f dwar PSS.	rom Cho	udwar 132/33	KV, GSS to 3	33/11 KV,	
CHOU	No. of 33 KV DP required Without Isolator	l				
	(Ref. Drawing No TPCODL-HVD-0004)			1		
	MATERIALS FOR 33 KV DP Without Isolator					
	MATERIALS TON 33 RV DI WILIIOUL ISOIULOI					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	2	62,400.00	
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	62.14	4,722.64	
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	3.9648	368.73	
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	69.972	5,317.87	
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	61.776	4,694.98	
6	Danger Plate, 2 no's.	No.	99.20	2	198.40	
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97	
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	2	310.00	
9	H.T. Stay set (Complete )	Set	1,302.00	2	2,604.00	
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00	
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	30	2,790.00	
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00	
13	50x6mm GI Flat for earthing, $2.36kg/mtr.$ , $(2.5 mtr.$ For mesh formation and $2.5 mtr.$ For raising)= $5x2.36$	KG	93.00	11.8	1,097.40	
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	6	595.20	
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87	
16	33KV pin insulator polymer	No.	595.20	3	1,785.60	
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	6	3,720.00	
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	6	8,556.00	
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	6	8,556.00	
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	12.261	1,185.88	
21	Black Paint	Ltr	272.80	1	272.80	
22	Yellow Colour Paint for Background	Ltr	272.80	2	545.60	
Α			Total Cost o		1,11,550.94	
В	Sto	ck, Stora	ge & Insurance	e i.e 3% of A	3,346.53	
С			Sub <sup>-</sup>	Total (A+B)	1,14,897.46	
D			Contigence	y @ 3% of C	3,446.92	
Е			Tools & Plant	s @ 2% of C	2,297.95	
F		Т	ransportation (	@ 7.5% of C	8,617.31	
G	Erection Charges	@ 5% on	Trf/Breaker/W	/PB/ H-Pole	3,213.60	
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				4,315.38	
1	Erection Charges @ 10% of C (except 117/bleaker/WPB/ n-Pole/h1 stay set/di Pipe/P3C pole)  Erection Charges @ 20% of PSC pole- Not to be used for 33kv					
					1 26 700 62	
J	Civil & Services		Sui	iii 01 (C t0 1)	1,36,788.63	
	<u>Civii a services</u>					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
	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					
1	excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size	No.	2,250.00	2	4,500.00	
	(500mmx500mmx800mm) using 20mm BHG metal with all labour and material	100.	2,230.00		4,500.00	
l	(Excavation of earth will be done of size 500X500X1500 mm.)					
		l .				

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
					-

	ANNEXURE-8.5				
	nenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm f dwar PSS.	rom Cho	udwar 132/33	KV, GSS to 3	33/11 KV,
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	1	3,700.00
К			Total Civi	l & Services	16,812.50
L				Total (J+K)	1,53,601.13
М	Other overheads (Including 6% supervision charges)	of L (for 3	3 KV DP Witho	out Isolator)	9,216.07
N			Sub	Total (L+M)	1,62,817.20
0			Total GST @	18% of (N)	29,307.10
Р			Total CESS	- , ,	1,628.17
Q	Gross Total Material +Services (N+C	)+P) for 3	3 KV DP With	out Isolator	1,93,752.47
	No. of 33 KV DP required With Isolator(Ref. Drawing No TPCODL-HVD-0004)			1	
	MATERIALS FOR 33 KV DP With Isolator				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	2	62,400.00
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	93.00	3.9648	368.73
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.	99.20	2	198.40
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	2	310.00
15	H.T. Stay set (Complete )	Set	1,302.00	2	2,604.00
	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	30	2,790.00
	Gi Pipe Earthing 40mm. 3 Mtr. Long 50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5	No.	1,302.00	2	2,604.00
19	mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	93.00	56.64	5,267.52
20	GI barbed wire anticlimbing device 3 Kg. Per support  Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8	Kg	99.20	6	595.20
21	no's = (8x0.59x0.510) Lightning Arrester(30KV,10KA) (Station Class,class-2)	KG EA	93.00	2.4072 3	223.87 38,502.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	1	53,003.00
	33KV pin insulator polymer	No.	595.20	3	1,785.60
	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	6	3,720.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	6	8,556.00

	ANNEXURE-8.5				
Augn	nenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm j	from Cho	udwar 132/33	KV, GSS to 3	33/11 KV,
	dwar PSS.				
	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	6	8,556.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	22.15	2,142.35
	Black Paint	Ltr	272.80		272.80
30	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
Α			Total Cost o		2,25,480.70
В	Sto	ock, Stora	ge & Insurance		6,764.42
С				Total (A+B)	2,32,245.12
D				y @ 3% of C	6,967.35
Е			Tools & Plant	s @ 2% of C	4,644.90
F		Tr	ransportation (	@ 7.5% of C	17,418.38
G	Erection Charges	@ 5% on	Trf/Breaker/W	/PB/ H-Pole	3,213.60
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-	Pole/HT	stay set/GI Pol	e/PSC pole)	15,916.04
ı	Erection Charges @ 20% of	f PSC pole	e- Not to be us	ed for 33kv	_
J		<u> </u>	Sui	m of (C to I)	2,80,405.40
	<u>Civil &amp; Services</u>				
SI.				Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
				quantity	Amount
	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				
1	excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size	No.	2,250.00	2	4,500.00
	(500mmx500mmx800mm) using 20mm BHG metal with all labour and material				
<u> </u>	(Excavation of earth will be done of size 500X500X1500 mm.)	6	6 500 00	4.4	7.450.00
	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  Construction Earthing chamber including installation of earthing pipe.Making earthing	Cu.mtr	6,500.00	0.225	1,462.50
	chamber including excavation, soil treatment with bentonide powder, calculation of				
4	earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding	No.	3,700.00	2	7,400.00
	of GI flat around pipe .				
К	or or national apper		Total Civi	l & Services	20,512.50
L				Total (J+K)	3,00,917.90
<u>-</u>	Other overheads ( Including 6% supervision charge	es) of L (fo	or 33 KV DP W		18,055.07
N	Other overheads ( medding 070 super vision charg	cs, o. z (		Total (L+M)	3,18,972.97
0			Total GST @	, ,	57,415.14
P				@ 1% of (N)	3,189.73
Q	Gross Total Material +Service	s (N+O) f			3,79,577.84
					3,73,377.04
	In af 22 VIV Cut Daint with 100 Danuar Angle (Bef Dunwing No. TROOM VIVD 0002)			1	
^	lo. 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	<u>Angle</u>			
SI.				Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
	WDD 150-152 (1284tr Long 20 44VC/84tr)	N-	24 200 00		21 200 00
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr.,	No	31,200.00	1	31,200.00
2		K.g.	76.00	32.504	2,470.30
	2 No's of Channel = (2x 9.56x1.7) Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required =				
3	(8x2.36x0.280)	K.g.	93.00	5.2864	491.64
	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length				
4	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.	99.20	1	99.20
	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's =	VC		0.3000	
6	(1x0.59x0.510)	KG	93.00	0.3009	27.98
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3	297.60
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4	KG	93.00	1.2036	111.93
	no's = (4x0.59x0.510)	NG	33.00	1.2030	
	33KV pin insulator polymer	No.	595.20	3	1,785.60
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	6	3,720.00

	ANNEXURE-8.5				
Auan	nenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm j	from Choi	udwar 132/33	KV. GSS to 3	33/11 KV.
	idwar PSS.		0_,00	,	, ,,
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	6	8,556.00
12	Earthing of Support ( Coil Type )	EA	205.84	1	205.84
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.262	24.37
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	6	8,556.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	4.879	471.90
16	Black Paint	Ltr	272.80	2	272.80
17 <b>A</b>	Yellow Colour Paint for Background	Ltr	272.80 Total Cost of		545.60 <b>59,281.42</b>
В	Str	ock Stora	ge & Insurance		1,778.44
C	5.00	ock, Stora		Total (A+B)	61,059.86
D				y @ 3% of C	1,831.80
E			Tools & Plant		1,221.20
F		т.	ransportation (		4,579.49
G	Erection Charges				1,606.80
Н	Erection Charges @ 10% of C (except Trf/Breaker/			-	2,892.39
'' <u>'</u>	Erection Charges @ 10% of C (except 117) Breakly				2,092.39
<u>'</u>	Erection charges & 20% 0	1 1 3C poi		m of (C to I)	73,191.53
<u> </u>	Civil & Services		Jui	iii oi (c to i)	73,191.33
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
NO.				Quantity	
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	0.55	3,575.00
2 <b>K</b>	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.1125 8 Services	731.25 <b>4,306.25</b>
L			TOTAL CIVI	Total (J+K)	77,497.78
<u>-</u> М	Other overheads (Including 6% supervision charges) of L (for 33 K	V Cut Poir	nt with 180 De		4,649.87
N				Total (L+M)	82,147.64
0			Total GST @	18% of (N)	14,786.58
Р			Total CESS	@ 1% of (N)	821.48
Q	Gross Total Material +Services (N+O) for 33 K	V Cut Poi	nt with 180 De	egree Angle	97,755.69
	No. of 33 KV Cut Point with 90 Degree Angle				
	(Ref. Drawing No TPCODL-HVD-0003)			1	
	MATERIALS FOR 33 KV Cut Point with 90 Degree	<u>Angle</u>		I	
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	1	31,200.00
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	65.008	4,940.61
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	10.5728	983.27
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	11.70144	889.31
5	Danger Plate, 1 no's.	No.	99.20	1	99.20
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.3009	27.98
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3	297.60
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.2036	111.93
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	4	2,380.80
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	6	3,720.00
11	Disc insulator (B&S)90 KN polymer  Earthing of Support ( Coil Type )	No.	1,426.00 205.84	6	8,556.00 205.84
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	No. K.g.	93.00	0.262	24.37
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	6	8,556.00
	•				

	ANNEXURE-8.5				
Augn	nenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm f	rom Cho	udwar 132/33	KV, GSS to 3	33/11 KV,
1 -	dwar PSS.			,	·-, ···,
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	1	155.00
16	H.T. Stay set (Complete )	Set	1,302.00	1	1,302.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	1	62.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	15	1,395.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	11.31	1,093.90
20	Black Paint	Ltr	272.80	1	272.80
21	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
Α_				of materials	66,819.22
В	Stoo	ck, Storag	ge & Insurance		2,004.58
С				Total (A+B)	68,823.79
D				y @ 3% of C	2,064.71
E			Tools & Plant	s @ 2% of C	1,376.48
F		Tı	ransportation (	@ 7.5% of C	5,161.78
G	Erection Charges				1,606.80
Н	Erection Charges @ 10% of C (except Trf/Breaker/	WPB/ H-P	Pole/HT stay se	t/PSC pole)	3,368.64
ı	Erection Charges @ 20% of	f PSC pol	e- Not to be us	ed for 33kv	-
J			Sui	m of (C to I)	82,402.20
	<u>Civil &amp; Services</u>				-
SI.				Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
				,	
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	0.55	3,575.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr  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.	6,500.00 2,250.00	0.11	731.25 2,250.00
К			Total Civi	l & Services	6,556.25
L				Total (J+K)	88,958.45
М	Other overheads (Including 6% supervision charges) of L (for 33 l	KV Cut Po	oint with 90 De	gree Angle)	5,337.51
	Other overheads ( morauming oversuper vision on a ges) of 2 (101 33 )	- Cut i C		Total (L+M)	
N					94,295.96
0			Total GST @	18% of (N)	16,973.27
Р			Total CESS	@ 1% of (N)	942.96
Q	Gross Total Material +Services (N+O+P) for 33 I	KV Cut Po	int with 90 De	egree Angle	1,12,212.19
	33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No TPCODL-HVD-0001)			0.8	
	MATERIALS FOR 33 KV Pin Points				
SI.	Description of Materials	Unit	Unit Rate	Total	Total
No.	, ,			Quantity	Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	11	3,49,440.00
3	33 KV V cross Arm (GI) 22Kg each Top bracket 100x50x6mm GI channel ( 2kg each)	No.	1,959.20 186.00	11 11	21,943.04 2,083.20
4	Danger Plate, 1 no's.	No.	99.20	11	1,111.04
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.37	313.42
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	33.60	3,333.12
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	13.48	1,253.67
8	33KV pin insulator polymer	No.	595.20	34	19,998.72
9	Forthing of Company / Coll Towns	No.	205.84	11	2,305.41
	Earthing of Support ( Coil Type )	140.			
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	2.93	272.90

	ANNEXURE-8.5							
_	nenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm j dwar PSS.	rom Cho	udwar 132/33	KV, GSS to 3	33/11 KV,			
12								
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		4,79,716.32			
14	Black Paint	Ltr	272.80	11.2	3,055.36			
15	Yellow Colour Paint for Background	Ltr	272.80	22.4	6,110.72			
Α			Total Cost o	of materials	8,92,507.65			
В	Sto	ck, Stora	ge & Insurance	i.e 3% of A	26,775.23			
С			Sub <sup>-</sup>	Total (A+B)	9,19,282.88			
D			Contigency	y @ 3% of C	27,578.49			
Е			Tools & Plant	s @ 2% of C	18,385.66			
F		Т	ransportation (	@ 7.5% of C	68,946.22			
G	Erection Charges	@ 5% on	Trf/Breaker/W	/PB/ H-Pole	17,996.16			
Н	Erection Charges @ 10% of C (except Trf/Breaker/	WPB/ H-F	Pole/HT stay se	t/PSC pole)	55,935.97			
ı	Erection Charges @ 20% o	PSC pol	e- Not to be us	ed for 33kv	-			
J			Sui	m of (C to I)	11,08,125.36			
	<u>Civil &amp; Services</u>							
SI.	Description of Materials	Unit	Unit Rate	Total	Total			
No.	, ,	0,,,,,		Quantity	Amount			
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	6.16	40,040.00			
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.26	8,190.00			
К	Dismantalling of 80sqmm Conductor	km	9,000.00	2.40  8 Services	21,600.00 <b>69,830.00</b>			
<u> </u>			Total Civi	Total (J+K)	•			
М	Other overheads (Including 6% supervision	charges)	of L (for 33 K)		11,77,955.36 70,677.32			
N	Other overheads (medding oversupervision	charges	•	Total (L+M)	12,48,632.69			
0			Total GST @		2,24,753.88			
P			Total CESS (		12,486.33			
Q	Gross Total Material +Ser	vices (N+	O+P) for 33 K\	/ Pin Points	14,85,872.90			
<u> </u>			-					
	6% Supervision Charges Summary							
1	Other overheads (Including 6% supervision charges)	of L (for 3	3 KV DP Witho	out Isolator)	9,216.07			
2	Other overheads (Including 6% supervision charg	es) of L (f	or 33 KV DP W	ith Isolator)	18,055.07			
3	Other overheads (Including 6% supervision charges) of L (for 33 K	/ Cut Poi	nt with 180 De	gree Angle)	4,649.87			
4	Other overheads (Including 6% supervision charges) of L (for 33	(V Cut Po	int with 90 De	gree Angle)	5,337.51			
5	Other overheads (Including 6% supervision	charges)	of L (for 33 KV	Pin Points)	70,677.32			
		Total	(6% supervisi	on charges)	1,07,935.84			
	Gross Total Summary							
1	Gross Total Material +Services (N+				1,93,752.47 3,79,577.84			
2								
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle							
4								
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points							
Q								
R	Inspection Fee of Over Head							
S	Inspection Fee of Drawing Checking and Approval (For each drawing	of the ir	stallation)- Rs.	750/- each				
Т			ion by electric					
U	Gross Total Material, Services	and Ins	pection Fees (P	P+Q+R+S+T)	22,69,171.09			

		ANNEXURE-8.6							
		TP CENTRAL ODISHA DISTRIBUTION LIMITED							
	Name of the Division :-	me of the Division :- KHD							
	Name of the Sub-Division : -	Jatani							
	Name of the Work :-	Mitigation of 33kV Feeder Overloading: Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize mitigate overloading issue of nuagaon feeder.	33kV Bus to						
	Scope of work:-	PART A- Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for secto mitigate overloading issue of Nuagaon feeder.	tionalize 33kV Bus						
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)							
		ABSTRACT OF ESTIMATE							
SI. No.	Part	Description	Amount						
1	А	Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of Nuagaon feeder.	₹ 1,58,44,670.47						
		Total Amount	₹ 1,58,44,670.47						
		Total Amount (In Cr)	1.58						
Tota	l estimated cost is Rs. 1.58 Cror	e. (On TPCODL Capex Scheme)	•						

PART A- Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of Nuagaon feeder.

# **Supply Portion**

SI. No.	Description of items	Unit	nit Quantity Rate (in Rs.)		t   Quantity		Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories						
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	450				
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA-59.4kA and SC rating of Armour in kA-20kA)	Mtr.	1350	1,337.13	18,05,125.50		
1.3	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	21	5,245.00	1,10,145.00		
1.4	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	33	4,894.00	1,61,502.00		
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	1182.00	357.60	4,22,683.20		
2	Supply of 33kV RMU						
а	No. of 33kV 4Way RMU (LLVV)	nos.	1				
b	No. of 33kV 4Way RMU (LLLL)	nos.	2				
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00		
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	2	19,59,421.00	39,18,842.00		
3	Earthing						
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	39.60	93.00	3,682.80		
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	6	1,302.00	7,812.00		
4	FRTU and OFC for RMU SCADA Automation						
4.1	Supply of end Connector and accessories for OFC connection at RMU.	Set	6	7,535.00	45,210.00		
4.2	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3	2,19,420.00	6,58,260.00		
	Sub Total (Supply Portion) (in Rs.)						

# **Erection Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by				
	3X1Core, 630sqmm, XLPE UG cable without spare				
	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs,				
1 1	630sqmm, XLPE insulation (extruted type) UG cable (with	Mtr.	1350	94.50	1,27,575.00
1.1	one single 1core, 630sqmm, XLPE cable as spare) in trefoil	I IVILI .			1,27,373.00
	formation by <b>open trench method</b> .				

1.2	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
1.3	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	33	2,081.70	68,696.10
1.4	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	1182.00	300.00	3,54,600.00
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.2	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	2	8,000.00	16,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.1	Erection of end Connector and accessories for OFC connection at RMU,	Set	6.0	1,225.07	7,350.42
3.2	Erection, Commissioning, Testing of Standard FRTU 4Way		3.0	6,124.36	18,373.08
	Sub Total (Erection Portion) (in	r Rs.)			6,44,310.30
	, , ,	<u> </u>			, ,
Civil Po	ortion				
SI. No.	Description of items	Unit	Quantity	Rate	Amount
				(in Rs.)	(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			(in Ks.)	(III KS.)
1.1	rod, brick, coarse & fine aggregates and labour, T&P, etc for		394	(in ks.)	(III KS.)
1.1	rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench	Cum	394 330.96	700.00	2,31,672.00
1.1 1.1.a	rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)	Cum			
1.1 1.1.a	rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil  Earth work excavation of hard rock  Back filling with excavated soil outside and above the trench		330.96	700.00	2,31,672.00
1.1.a 1.1.b	rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil  Earth work excavation of hard rock  Back filling with excavated soil outside and above the trench  Civil works for Prefabricated RCC foundation with supply of all materials	Cum	330.96 141.84	700.00	2,31,672.00
1.1.a 1.1.b 1.2	rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil  Earth work excavation of hard rock  Back filling with excavated soil outside and above the trench  Civil works for Prefabricated RCC foundation with supply of all materials  Prefabricated RCC foundation of 33kV RMU	Cum	330.96 141.84 472.8	700.00 1,720.00 202.00 23,145.30	2,31,672.00 2,43,964.80 95,505.60 69,435.90
1.1.a 1.1.b 1.2 2	rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil  Earth work excavation of hard rock  Back filling with excavated soil outside and above the trench  Civil works for Prefabricated RCC foundation with supply of all materials	Cum	330.96 141.84 472.8	700.00 1,720.00 202.00	2,31,672.00 2,43,964.80 95,505.60
1.1.a 1.1.b 1.2 2 2.1	rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil  Earth work excavation of hard rock  Back filling with excavated soil outside and above the trench  Civil works for Prefabricated RCC foundation with supply of all materials  Prefabricated RCC foundation of 33kV RMU	Cum Cum Nos.	330.96 141.84 472.8	700.00 1,720.00 202.00 23,145.30	2,31,672.00 2,43,964.80 95,505.60 69,435.90
1.1.a 1.1.b 1.2 2 2.1 3	rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil  Earth work excavation of hard rock  Back filling with excavated soil outside and above the trench  Civil works for Prefabricated RCC foundation with supply of all materials  Prefabricated RCC foundation of 33kV RMU  Supply of GI Fencing with Gate around each RMU  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	Cum Cum Nos.	330.96 141.84 472.8 3 60	700.00 1,720.00 202.00 23,145.30 3,600.00	2,31,672.00 2,43,964.80 95,505.60 69,435.90 2,16,000.00
1.1 1.1.a 1.1.b 1.2 2 2.1 3	rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil  Earth work excavation of hard rock  Back filling with excavated soil outside and above the trench  Civil works for Prefabricated RCC foundation with supply of all materials  Prefabricated RCC foundation of 33kV RMU  Supply of GI Fencing with Gate around each RMU  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.	Cum Cum Nos. sqmtr	330.96 141.84 472.8 3 60	700.00 1,720.00 202.00 23,145.30 3,600.00	2,31,672.00 2,43,964.80 95,505.60 69,435.90 2,16,000.00

	Sub Total (Civil Portion) (in Rs.)	11,39,809.50
Α	Sub Total (Supply Portion)	94,68,526.50
В	Stock, Storage & Insurance @ 3 % of A	2,84,055.80
С	Sub Total (A+B)	97,52,582.30
D	Contingency @ 3 % of C	2,92,577.47
Е	Tools & Plants Charges @ 2% of C (considered for earthing items)	75.87
F	Transportation @ 7.5% of C	7,31,443.67
G	Erection Charges @ 10% of earthing items	379.33
Н	Total (C+D+E+F+G)	1,07,77,058.63
I	Sub Total (Erection Portion + Civil Portion)	17,84,119.80
J	Total Cost (H+I)	1,25,61,178.43
К	Other Overhead /(including Supervision Charges) @ 6 % of J	7,53,670.71
L	Total Estimated Capital Cost i.e. (J+K)	1,33,14,849.14
М	GST @ 18% of L	23,96,672.84
M1	CESS @ 1% of L	1,33,148.49
N	Grand Total (L+M+M1)	1,58,44,670.47

		ANNEXURE-8.7			
		TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	ANED			
Na	nme of the Sub-Division : -	Angul			
	Mitigation of 33kV Feeder Overloading:  Name of the Work:-  Proposal for Simultaneous operation of spare cable near Angul GSS to 6  33 KV Angul-1 feeder.				
	Scope:-	1.Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 r Method. 2.Installation of 01 NO. 33 KV 4-way RMU(LLVV). 3. Installation of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut p simultanous operation of spare cable near Angul GSS.	·		
	Names of Schemes: -	TPCODL CAPEX (FY 23-24)			
		ABSTRACT OF ESTIMATE			
SI. No.	Part	Description	Amount		
1	А	PART A:  1.Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method.  2.Installation of 01 NO. 33 KV 4-way RMU(LLVV).	1,23,91,476.92		
2	В	Part B:-  1. Installation of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultanous operation of spare cable near Angul GSS.	3,95,905.57		
		Total Amount	1,27,87,382.49		
		Total Amount	_,_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		

# PART A:

1.Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method.

2.Installation of 01 NO. 33 KV 4-way RMU(LLVV).

# **Supply Portion**

SI. No.	Description of items		Quantity	Rate (in Rs.)	Amount (in Rs.)	
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (aloing with 1core spare cable) with accessories					
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	575			
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.				
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	2300	1,337.13	30,75,399.00	
1.2	Supply of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG Cable kits for 1Core	Set	4	9,600.00	38,400.00	
1.3	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	5,245.00	62,940.00	
1.4	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	4,894.00	58,728.00	
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	2204.00	357.60	7,88,150.40	
2	Supply of 33kV RMU					
a	No. of 33kV 4Way RMU (LLVV)	nos.	1			
2.1	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00	
3	Earthing					
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	13.20	93.00	1,227.60	
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,302.00	2,604.00	
4	FRTU and OFC for RMU SCADA Automation					
4.1	Supply of end Connector and accessories for OFC connection at RMU.	Set	2	7,535.00	15,070.00	
4.2	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1	2,19,420.00	2,19,420.00	
	Sub Total (Supply Portion) (in	Rs.)			65,97,203.00	

# **Erection Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by				
	3X1Core, 630sqmm, XLPE UG cable with one spare				
	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs,				
	630sqmm, XLPE insulation (extruted type) UG cable (with	Mtr.	2300	94.50	2,17,350.00
1.1	one single 1core, 630sqmm, XLPE cable as spare) in trefoil	IVILI.			2,17,530.00
	formation by <b>open trench method</b> .				

Δ	N	N	EX	u	R	F-	R	7

## PART A:

1.Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method.

2.Insta	illation of 01 NO. 33 KV 4-way RMU(LLVV).				
1.2	Erection of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	4	2,400.00	9,600.00
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	12	2,081.70	24,980.40
1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	2204.00	300.00	6,61,200.00
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.1	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.2	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
	Sub Total (Erection Portion) (i	n Rs.)			9,54,685.30
0: !! 5	<u>.</u>				
Civil Po	ortion 			Rate	Amount
SI. No.	Description of items	Unit	Quantity	(in Rs.)	(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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	483	700.00	3,38,100.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	207	1,720.00	3,56,040.00
1.2	Back filling with excavated soil outside and above the trench	Cum	690	202.00	1,39,380.00
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	100	2,643.67	2,64,367.06
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

# PART A:

1.Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method.

2.Installation of 01 NO. 33 KV 4-way RMU(LLVV).

2.1113ta	mation of or ito: 55 kV 4-way kiloto(EEVV).					
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 .			7,400.00		
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	19,228.00				
	Sub Total (Civil Portion) (in Rs.)					
Α	A Sub Total (Supply Portion)					
В	B Stock, Storage & Insurance @ 3 % of A					
C	C Sub Total (A+B)					
D	Contingency @ 3 % of C					
Е	Tools & Plants Charges @ 2% of C (considered for earthing items)					
F	Transportation @ 7.5% of C				5,09,633.93	
G	Erection Charges @ 10% of earthing items				126.44	
Н	Total (C+D+E+F+G)	75,08,758.33				
ı	Sub Total (Erection Portion + Civil Portion)				23,14,832.06	
J	Total Cost (H+I)				98,23,590.39	
K	Other Overhead /(including Supervision Charges) @ 6 % of J					
L	Total Estimated Capital Cost i.e. (J+K)					
М	GST @ 18% of L				18,74,341.05	
M1	CESS @ 1% of L				1,04,130.06	
N	Grand Total (L+M+M1)		1,23,91,476.92			

## Part B:-

ı. ins	tallatiion of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultar	ious ope	ration of spare	cable near.	Angui GSS.
	No. of 33 KV DP required Without Isolator			1	
	(Ref. Drawing No TPCODL-HVD-0004)  MATERIALS FOR 33 KV DP Without Isolate	or.			
SI.	WATERIALS TON 35 KV DF WILLIOUT ISOIUT	<u>,,                                    </u>		Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
1	13 Mtr. Long H-Pole	No	56,735.71	2	1,13,471.43
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	62.14	4,722.64
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	3.9648	368.73
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	69.972	5,317.87
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	61.776	4,694.98
6	Danger Plate, 2 no's.	No.	99.20	2	198.40
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	2	310.00
9	H.T. Stay set (Complete )	Set	1,302.00	2	2,604.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	30	2,790.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	11.8	1,097.40
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	6	595.20
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87
16	33KV pin insulator polymer	No.	595.20	3	1,785.60
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	6	3,720.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	6	8,556.00
19	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	6	4,612.80
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	12.261	1,185.88
21	Black Paint	Ltr	272.80	1	272.80
22	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
Α			Total Cost	of materials	1,58,679.16
В	Sto	ck, Stora	ige & Insurance	i.e 3% of A	4,760.37
С			Sub <sup>-</sup>	Total (A+B)	1,63,439.54
D				y @ 3% of C	4,903.19
E			Tools & Plant		3,268.79
F		т	ransportation (		12,257.97
	Erection Charges				
G					5,843.78
H .	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				3,909.23
<u> </u>	Erection Charges @ 20% of	PSC pol			-
J			Su	m of (C to I)	1,93,622.49
	<u>Civil &amp; Services</u>		<u> </u>		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount

#### **ANNEXURE-8.7** Part B:-1. Installatiion of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultanous operation of spare cable near Angul GSS. 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 2,250.00 2 4,500.00 No. (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.) Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 1.1 7.150.00 Cu.mtr 6,500.00 0.225 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr 1,462.50 Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth No. 3,700.00 1 3,700.00 resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. **Total Civil & Services** 16,812.50 Κ Total (J+K) L 2,10,434.99 Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) Μ 12,626.10 Ν Sub Total (L+M) 2,23,061.09 Total GST @ 18% of (N) 0 40,151.00 Р Total CESS @ 1% of (N) 2,230.61 Q Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator 2,65,442.70 No. of 33 KV Cut Point with 180 Degree Angle 1 (Ref. Drawing No.- TPCODL-HVD-0002) MATERIALS FOR 33 KV Cut Point with 180 Degree Angle SI. Total Total Unit Unit Rate **Description of Materials** No. Quantity Amount 13 Mtr. Long H-Pole No 56,735.71 56,735.71 1 Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 K.g. 76.00 32.504 2,470.30 Mtr., 2 No's of Channel = (2x 9.56x1.7)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = 93.00 K.g. 5.2864 491.64 (8x2.36x0.280) Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 76.00 5.85072 444.65 K.g. 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306) 99.20 1 99.20 Danger Plate, 1 no's. No. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 KG 93.00 0.3009 27.98 6 no's = (1x0.59x0.510)GI barbed wire anticlimbing device 3 Kg. Per support Kg 99.20 297.60 Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr 1.2036 KG 93.00 111.93 length 4 no's = (4x0.59x0.510)33KV pin insulator polymer 595.20 3 1.785.60 9 Nο. 10 H W fitting(B&S)90KN,4 Bolt 620.00 3,720.00 No. 6 1,426.00 11 Disc insulator (B&S)90 KN polymer No. 6 8,556.00 12 | Earthing of Support (Coil Type) EΑ 205.84 1 205.84 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil 13 K.g. 93.00 0.262 24.37 earthing

14 PG Clamp for 148 sq.mm AAA conductor

Yellow Colour Paint for Background

GI Nut, Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)

15

17

Α

В

C

16 Black Paint

NO.

K.g.

Ltr

Ltr

768.80

96.72

272.80

272.80

Stock, Storage & Insurance i.e 3% of A

**Total Cost of materials** 

Sub Total (A+B)

6

4.879

4,612.80

471.90

272.80

545.60

80,873.93

2,426.22

83,300.15

#### **ANNEXURE-8.7** Part B:-1. Installatiion of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultanous operation of spare cable near Angul GSS. Contigency @ 3% of C 2,499.00 Tools & Plants @ 2% of C Ε 1,666.00 Transportation @ 7.5% of C F 6,247.51 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 2,921.89 G Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) Н 2,486.24 Erection Charges @ 20% of PSC pole- Not to be used for 33kv Τ Sum of (C to I) 99,120.79 J Civil & Services SI. Total Total Unit **Unit Rate Description of Materials** No. Quantity **Amount** Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = $0.5\overline{5}$ Cu.mtr 6,500.00 0.55 3,575.00 Cu.mtr Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr 6,500.00 731.25 2 Cu.mtr 0.1125 **Total Civil & Services** 4,306.25 Κ Total (J+K) 1,03,427.04 L M Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle) 6,205.62 Sub Total (L+M) N 1,09,632.66 Total GST @ 18% of (N) 0 19,733.88 Total CESS @ 1% of (N) Ρ 1,096.33 Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle Q 1,30,462.87 **6% Supervision Charges Summary** Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) 1 12,626.10 2 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle) 6,205.62 Total (6% supervision charges) 18,831.72 **Gross Total Summary** Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator 2,65,442.70 Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle 2 1,30,462.87 3 Gross Total Material & Services (1+2) 3,95,905.57 Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km Q Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km R Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each Т Final decision by electrical Inspector U

Gross Total Material, Services and Inspection Fees (1+Q+R+S+T)

3,95,905.57

		ANNEXURE-8.8	
		TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Na	me of the Division :-	JED	
Nam	e of the Sub-Division : -	BALIKUDA	
N	lame of the Work :-	Mitigation of 33kV Overloading: Proposal for augmentation of existing 33 kV line from Jagatsinghpur G to mitigate overloading issue & providing reliable power supply.	SS to Balikuda PSS
	Scope:-	Part A:-  1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm sq.mm. AAAC for 33 KV Balikuda Fdr.  2. Installation of interposing pole for 1 KM existing line of 33 KV Baliku	
N	lames of Schemes: -	TPCODL CAPEX(FY 23-24)	
		ABSTRACT OF ESTIMATE	
SI. No.	Part	Description	Amount
1	А	Part A:-  1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.  2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.  (To be executed and maintained by TPCODL under CAPEX Scheme).	1,16,12,733.39
		Total Amount	1,16,12,733.39
		Total Amount (In Cr)	1.16

## Part A:-

- 1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.
- 2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.

No. of 33 KV DP required Without Isolator						
	(Ref. Drawing No TPCODL-HVD-0004)	Δ				
	MATERIALS FOR 33 KV DP Without Isolo	ator				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	13 Mtr. Long H-Pole	No	56,735.71	8	4,53,885.71	
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	248.56	18,890.56	
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	15.8592	1,474.91	
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	279.888	21,271.49	
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	247.104	18,779.90	
6	Danger Plate, 2 no's.	No.	99.20	8	793.60	
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	2.4072	223.87	
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	8	1,240.00	
9	H.T. Stay set (Complete )	Set	1,302.00	8	10,416.00	
	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	16	992.00	
	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00	
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00	
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	47.2	4,389.60	
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80	
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	9.6288	895.48	
	33KV pin insulator polymer	No.	595.20	12	7,142.40	
	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	24	14,880.00	
	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	24	34,224.00	
20	PG Clamp for 232 sq.mm AAA conductor GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	NO. K.g.	1,426.00 96.72	24 49.044	34,224.00 4,743.54	
21	Black Paint	Ltr	272.80	4	1,091.20	
22	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40	
Α				t of materials	6,50,489.46	
		tock Sto	rage & Insuran		19,514.68	
В С		, JUCK, JUC		b Total (A+B)	6,70,004.14	
D				ncy @ 3% of C	20,100.12	
E				nts @ 2% of C	13,400.08	
F			Transportatio		50,250.31	
G	Erection Charge	es @ 5% i	<u>'</u>		23,375.11	
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/				17,261.54	
ı	Erection Charges @ 20%			• • •	-	
J Sum of (C to I)						
<u>Civil &amp; Services</u>						
SI. 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	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	

## Part A:-

D

Ε

F

Part .							
	igmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.n stallation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV I			ikuda Fdr.			
	e executed and maintained by TPCODL under CAPEX Scheme).						
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	earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth	No.	3,700.00	4	14,800.00		
	Calculation of earth						
K			Total Ci	vil & Services	67,250.00		
L				Total (J+K)	8,61,641.31		
М	Other overheads ( Including 6% supervision charge	s) of L (fo	r 33 KV DP Wit	hout Isolator)	51,698.48		
N			Su	b Total (L+M)	9,13,339.79		
0			Total GST	@ 18% of (N)	1,64,401.16		
Р			Total GS	T @ 1% of (N)	9,133.40		
Q	Gross Total Material +Services (N	I+O+P) fo	r 33 KV DP Wit	hout Isolator	10,86,874.35		
	No. of 33 KV Cut Point with 180 Degree Angle			4			
	(Ref. Drawing No TPCODL-HVD-0002)						
	MATERIALS FOR 33 KV Cut Point with 180 De	gree Angi	<u>e</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	13 Mtr. Long H-Pole	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	K.g.	76.00	130.016	9,881.22		
	Mtr., 2 No's of Channel = (2x 9.56x1.7) Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required =						
3	(8x2.36x0.280)	K.g.	93.00	21.1456	1,966.54		
	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length						
4	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.	99.20	4	396.80		
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93		
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40		
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr	KG	93.00	4.8144	447.74		
	length 4 no's = (4x0.59x0.510)	<b>.</b>	505.00	10	7,110,10		
9	33KV pin insulator polymer	No.	595.20	12	7,142.40		
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00		
11	Disc insulator (B&S)90 KN polymer	No. EA	1,426.00 205.84	24 4	34,224.00		
12	Earthing of Support ( Coil Type )  No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil	EA	205.84	4	823.36		
13	earthing	K.g.	93.00	1.048	97.46		
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00		
15	I Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point) K.g. 96.72 19.516						
16							
17							
A Total Cost of materials					3,39,268.52		
В	B Stock, Storage & Insurance i.e 3% of A						
С			Sul	b Total (A+B)	3,49,446.57		
			6	@ 20/ -£ C	40.400.40		

Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 11,687.56 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 11,569.54 Н Erection Charges @ 20% of PSC pole- Not to be used for 33kv Sum of (C to I) 4,16,384.50 J

Contigency @ 3% of C

Tools & Plants @ 2% of C

Transportation @ 7.5% of C

10,483.40

6,988.93

26,208.49

Civil & Services

SI.	Description of Materials		Unit Rate	Total	Total
No.			0	Quantity	Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00

## Part A:-

- 1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.
- 2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.

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						
L Total (J+K)						
М	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)					
N	Sub Total (L+M)					
0	Total GST @ 18% of (N)					
Р	P Total GST @ 1% of (N					
Q	Q Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle					
	No. of 33 KV Cut Point with 90 Degree Angle  (Pof. Previous No. TRCODI MVD 2003)					

	(Ref. Drawing No TPCODL-HVD-0003)							
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle								
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount			
1	13 Mtr. Long H-Pole	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. 93.00 42.2912		3,933.08					
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.	99.20	4	396.80			
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93			
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40			
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74			
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	16	9,523.20			
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00			
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00			
12	Earthing of Support ( Coil Type )	No.	205.84	4	823.36			
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46			
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00			
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	4	620.00			
16	H.T. Stay set (Complete )	Set	1,302.00	4	5,208.00			
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00			
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00			
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	45.24	4,375.61			
20	Black Paint	Ltr	272.80	4	1,091.20			
21	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40			
Α			Total Cos	t of materials	3,69,419.72			
В		Stock, Sto	rage & Insuran	ce i.e 3% of A	11,082.59			
С			Sul	b Total (A+B)	3,80,502.31			
D	Contigency @ 3% of C							
Е								
F	Transportation @ 7.5% of C							
G								
H								
Hi.								
<u> </u>								
<u> </u>	Civil & Services			(0 . 0 . 1)	4,53,227.21			
	<u>CIVII &amp; SELVICES</u>							

## Part A:-

- 1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.
- 2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.

SI.	Description of Materials	Unit	Unit Rate Total		Total		
No.	, ,			Quantity	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, 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		
К			Total C	ivil & Services	26,225.00		
L				Total (J+K)	4,79,452.21		
М	Other overheads (Including 6% supervision charges) of L (for 3	33 KV Cut	Point with 90 I	Degree Angle)	28,767.13		
N			Su	b Total (L+M)	5,08,219.34		
0			Total GST	@ 18% of (N)	91,479.48		
Р			Total GS	T @ 1% of (N)	5,082.19		
Q	Gross Total Material +Services (N+O+P) for 3	33 KV Cut	Point with 90	Degree Angle	6,04,781.01		
	33 Kv Line Length In KM with 40 Mtr. Span			3.35			
	(Ref. Drawing No TPCODL-HVD-0001)			3.33			
	MATERIALS FOR 33 KV Pin Points	1	<b>.</b>				
SI.	Description of Materials	Unit	Unit Rate	Total	Total		
No.				Quantity	Amount		
1	13 Mtr. Long H-Pole	No	56,735.71	60	34,04,142.86		
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	60	1,17,552.00		
3	Top bracket 100x50x6mm GI channel ( 300mm each)	No.	186.00	60	11,160.00		
4	Danger Plate, 1 no's.	No.	99.20	60	5,952.00		
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	18.05	1,679.02		
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	180.00	17,856.00		
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	72.22	6,716.09		
8	33KV pin insulator polymer	No.	595.20	180	1,07,136.00		
9	Earthing of Support ( Coil Type )	No.	205.84	60	12,350.40		
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	15.72	1,461.96		
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	87.00	8,414.64		
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	10.35	20,08,812.09		
13	Black Paint	Ltr	272.80	60.0	16,368.00		
14	Yellow Colour Paint for Background	Ltr	272.80	120.0	32,736.00		
Α		•	Total Cos	t of materials	57,52,337.06		
В		Stock, Sto	rage & Insurar	ice i.e 3% of A	1,72,570.11		
С			Su	b Total (A+B)	59,24,907.17		
D				ncy @ 3% of C	1,77,747.22		
E				nts @ 2% of C	1,18,498.14		
F							
G							
H .							
<u> </u>	Erection Charges @ 20%	ot PSC p			70,82,697.92		
SI.	<u>Civil &amp; Services</u> Description of Materials	Unit	Unit Rate	Total	Total		
No.	ביבינו איניינייניינייניינייניינייניינייניינייני	Unit	Omit Kute	Quantity	Amount		
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	33.00	2,14,500.00		
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	6.75	43,875.00		

## Part A:-

- 1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.
- 2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.

	· · · · · · · · · · · · · · · · · · ·					
3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	10.05	90,450.00	
K			Total Ci	vil & Services	3,48,825.00	
L				Total (J+K)	74,31,522.92	
М	Other overheads (Including 6% supervisi	on charge	s) of L (for 33 k	(V Pin Points)	4,45,891.38	
N			Sul	b Total (L+M)	78,77,414.30	
0			Total GST	@ 18% of (N)	14,17,934.57	
Р			Total GS	Γ @ 1% of (N)	78,774.14	
Q	Gross Total Material +S	Services (I	N+O+P) for 33 I	KV Pin Points	93,74,123.02	
	6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charge	s) of L (fo	r 33 KV DP With	nout Isolator)	51,698.48	
2	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)					
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)					
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)					
5		Tot	al (6% supervi	sion charges)	5,52,373.56	
	Gross Total Summary					
1	Gross Total Material +Services (	N+O+P) fo	or 33 KV DP Wit	hout Isolator	10,86,874.35	
2	Gross Total Material +Services (N+O+P) for 3.	3 KV Cut F	Point with 180	Degree Angle	5,46,955.02	
3	Gross Total Material +Services (N+O+P) for	33 KV Cut	Point with 90	Degree Angle	6,04,781.01	
4	Gross Total Material +Services (N+O+P) for 33 KV Pin Points					
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km					
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km					
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each					
Т	T Final decision by electrical Inspector					
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T					

Name of the Division :- PDP  Name of the Sub-Division :- Kujanga  Name of the Work :- Proposal for augmentation of existing 33 kV line from Rahama PSS to Kujanga PSS to improve reliability using N-1 connectivity.  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Names of Schemes: - TPCODL CAPEX (FY 23-24)  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  ABSTRACT OF ESTIMATE  SI. Part Description Amount  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Total Amount (In Cr) 2.03		ANNEXURE-8.9			
Name of the Sub-Division : - Kujanga  Proposal for augmentation of existing 33 kV line from Rahama PSS to Kujanga PSS to improve reliability using N-1 connectivity.  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Names of Schemes: - TPCODL CAPEX (FY 23-24)  ABSTRACT OF ESTIMATE  SI. Part Description Amount  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Total Amount 2,02,60,704.54		TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Work :-  Proposal for augmentation of existing 33 kV line from Rahama PSS to Kujanga PSS to improve reliability using N-1 connectivity.  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Names of Schemes: -  TPCODL CAPEX (FY 23-24)  ABSTRACT OF ESTIMATE  SI. Part Description Amount  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Total Amount 2,02,60,704.54	Name of the Division :-	PDP			
to improve reliability using N-1 connectivity.  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Names of Schemes: - TPCODL CAPEX (FY 23-24)  ABSTRACT OF ESTIMATE  SI. No. Part Description Amount  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Total Amount 2,02,60,704.54	Name of the Sub-Division :	- Kujanga			
Scope:-  1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Names of Schemes: -  TPCODL CAPEX (FY 23-24)  ABSTRACT OF ESTIMATE  SI. Part Description Amount  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Total Amount 2,02,60,704.54	Name of the Work '-				
SI. No. Part Description Amount  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Total Amount 2,02,60,704.54	Scope:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC t				
SI. No. Part Description Amount  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Total Amount 2,02,60,704.54	Names of Schemes: -	TPCODL CAPEX (FY 23-24)			
Part Description Amount  Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.  Total Amount 2,02,60,704.54		ABSTRACT OF ESTIMATE			
1       A       1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.       2,02,60,704.54         Total Amount       2,02,60,704.54	Part	Description	Amount		
	1 A	1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada	2,02,60,704.54		
Total Amount (In Cr) 2.03		Total Amount	2,02,60,704.54		
		Total Amount (In Cr)	2.03		

## Part A:-

1. Au	1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.							
No. of 33 KV DP required Without Isolator								
(Ref. Drawing No TPCODL-HVD-0004)  MATERIALS FOR 33 KV DP Without Isolator								
SI. No.	Description of Materials	<u>Unit</u>	Unit Rate	Total Amount				
1	13 Mtr. Long H-Pole	No	56,735.71	16	9,07,771.43			
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	497.12	37,781.12			
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	31.7184	2,949.81			
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	559.776	42,542.98			
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	494.208	37,559.81			
6	Danger Plate, 2 no's.	No.	99.20	16	1,587.20			
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	4.8144	447.74			
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	16	2,480.00			
	H.T. Stay set (Complete )	Set	1,302.00	16	20,832.00			
	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	32	1,984.00			
	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	240	22,320.00			
13	Gi Pipe Earthing 40mm. 3 Mtr. Long 50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	No. KG	1,302.00 93.00	94.4	10,416.00 8,779.20			
	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	48	4,761.60			
15	Back Clamp for anticlimbing device 25X3 mm. flat, $0.59$ Kg/Mtr. Flat of $0.510$ mtr length 8 no's = $(8x0.59x0.510)$	KG	93.00	19.2576	1,790.96			
	33KV pin insulator polymer	No.	595.20	24	14,284.80			
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	48	29,760.00			
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	48	68,448.00			
19	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	48	36,902.40			
	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	98.088	9,487.07			
	Black Paint Vallow Colour Paint for Background	Ltr	272.80 272.80	8 16	2,182.40			
22	Yellow Colour Paint for Background	Ltr	Total Cost o		4,364.80			
A B	Sto	ck. Stora	ge & Insurance		<b>12,69,433.31</b> 38,083.00			
C		0.1, 0.0. 4		Total (A+B)	13,07,516.31			
D				/ @ 3% of C	39,225.49			
E			Tools & Plants		26,150.33			
F		Tr	ansportation (		98,063.72			
Ğ	Erection Charges				46,750.23			
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				31,273.88			
1	Erection Charges @ 20% of				-			
J				n of (C to I)	15,48,979.96			
	Civil & Services			0. (0 10 ./	23,10,373.30			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount			
	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	16	36,000.00			
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	8.8	57,200.00			
3	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.8	11,700.00			

#### **ANNEXURE-8.9** Part A:- Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr. Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of 3,700.00 8 29,600.00 4 No. resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI around pipe. **Total Civil & Services** Κ 1,34,500.00 Total (J+K) 16,83,479.96 L Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) Μ 1,01,008.80 Ν Sub Total (L+M) 17.84.488.75 Total GST @ 18% of (N) 0 3,21,207.98 Total CESS @ 1% of (N) Ρ 17,844.89 Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator Q 21,23,541.62 No. of 33 KV DP required With Isolator 1 (Ref. Drawing No.- TPCODL-HVD-0004) **MATERIALS FOR 33 KV DP With Isolator** SI. Total Total Unit **Unit Rate Description of Materials** No. Quantity **Amount** 13 Mtr. Long H-Pole No 56,735.71 2 1 1,13,471.43 Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's 2 KG 76.00 82.216 6,248.42 channel required =( 2x9.56x4.3) Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = 3 KG 93.00 3.9648 368.73 (6x2.36x0.280) Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 4 KG 76.00 30.702 2,333.35 Mtr., 1 no's channel required =( 1x7.14x4.3) Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 5 KG 76.00 61.404 4,666.70 2 no's channel required =( 2x7.14x4.3) Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 KG 76.00 122.808 6 9,333.41 Mtr., 4 no's channel required = (4x7.14x4.3)50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle KG 76.00 88.686 6,740.14 required = (4\*4.5\*4.927)Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each 8 KG 76.00 5.712 434.11 channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8) Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos 9 KG 76.00 1.746 132.70 angle required = (1\*4.5\*0.388)Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle 10 KG 76.00 1.53 116.28 required = (1\*4.5\*0.340)Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 11 KG 76.00 9.56 726.56 mtr., 2 no's channel required =( 2x9.56x0.5) 12 Danger Plate, 2 no's. No. 99.20 2 198.40 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's 0.6018 13 KG 93.00 55.97 =(2x0.59x0.510)H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 155.00 310.00 14 Pair 2 1 Pair) 15 H.T. Stay set (Complete ) Set 1,302.00 2 2,604.00 H.T. Stay Insulator Type-C (2 No's.) 62.00 4 248.00 No. 17 7/8 SWG Stay Wire 15kg /stay 93.00 30 2,790.00 K.g. 18 | Gi Pipe Earthing 40mm. 3 Mtr. Long 1,302.00 2 2,604.00 No. 50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 19 KG 93.00 56.64 5,267.52 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36 20 GI barbed wire anticlimbing device 3 Kg. Per support Kg 99.20 6 595.20 Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length KG 2.4072 21 93.00 223.87 8 no's = (8x0.59x0.510)22 Lightning Arrester(30KV,10KA) (Station Class,class-2) EΑ 12,834.00 38,502.00

#### **ANNEXURE-8.9** Part A:- Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr. 33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth 23 Set 53,003.00 1 53,003.00 switch with PI(Polymer) 24 33KV pin insulator polymer No. 595.20 3 1,785.60 3,720.00 H W fitting(B&S) 90KN,4 Bolt No. 620.00 6 26 Disc insulator (B&S) 90 KN polymer No. 1,426.00 6 8,556.00 27 PG Clamp for 148 sq.mm AAA conductor NO. 768.80 6 4,612.80 28 GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator) 96.72 22.15 2,142.35 K.g. 29 Black Paint Ltr 272.80 272.80 1 30 Yellow Colour Paint for Background Ltr 272.80 2 545.60 **Total Cost of materials** 2,72,608.92 Α Stock, Storage & Insurance i.e 3% of A В 8,178.27 C Sub Total (A+B) 2,80,787.19 D Contigency @ 3% of C 8,423.62 Tools & Plants @ 2% of C Ε 5,615.74 F Transportation @ 7.5% of C 21,059.04 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 5,843.78 Н Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole) 15,509.89 Erection Charges @ 20% of PSC pole- Not to be used for 33kv 1 J Sum of (C to I) 3,37,239.26 Civil & Services SI. Total Total Unit **Unit Rate Description of Materials** No. Quantity **Amount** 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 No. 2,250.00 2 4,500.00 (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.) 2 Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6.500.00 1.1 7.150.00 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr Cu.mtr 6,500.00 0.225 1,462.50 Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of 3,700.00 2 7,400.00 No. resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. **Total Civil & Services** Κ 20,512.50 Total (J+K) 3,57,751.76 L Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator) 21,465.11 M Ν Sub Total (L+M) 3,79,216.87 0 Total GST @ 18% of (N) 68,259.04 Р Total CESS @ 1% of (N) 3,792.17 Q Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator 4,51,268.07 No. of 33 KV Cut Point with 180 Degree Angle 8 (Ref. Drawing No.- TPCODL-HVD-0002) MATERIALS FOR 33 KV Cut Point with 180 Degree Angle SI. Total Total **Description of Materials** Unit **Unit Rate** No. Quantity **Amount** 13 Mtr. Long H-Pole No 56,735.71 8 4,53,885.71 1 Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 2 260.032 19,762.43 K.g. 76.00 Mtr., 2 No's of Channel = (2x 9.56x1.7)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = 3 K.g. 93.00 42.2912 3,933.08 (8x2.36x0.280) Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length K.g. 76.00 46.80576 3,557.24 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)

#### **ANNEXURE-8.9** Part A:- Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr. Danger Plate, 1 no's. 99.20 8 793.60 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's KG 93.00 2.4072 223.87 =(1x0.59x0.510)7 99.20 GI barbed wire anticlimbing device 3 Kg. Per support Kg 24 2,380.80 Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 9.6288 8 KG 93.00 895.48 4 no's = (4x0.59x0.510)33KV pin insulator polymer No. 14,284.80 9 595.20 24 10 H W fitting(B&S)90KN,4 Bolt No. 620.00 48 29,760.00 11 Disc insulator (B&S)90 KN polymer No. 1,426.00 48 68,448.00 12 Earthing of Support (Coil Type) EΑ 205.84 8 1,646.72 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil 2.096 13 93.00 194.93 K.g. 14 PG Clamp for 148 sq.mm AAA conductor NO. 768.80 48 36.902.40 15 GI Nut, Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point) 96.72 39.032 3,775.18 K.g. 16 Black Paint Ltr 272.80 8 2,182.40 Yellow Colour Paint for Background 272.80 4,364.80 17 Ltr 16 Α **Total Cost of materials** 6,46,991.44 В Stock, Storage & Insurance i.e 3% of A 19,409.74 C Sub Total (A+B) 6,66,401.18 D Contigency @ 3% of C 19,992.04 Tools & Plants @ 2% of C F 13,328.02 F Transportation @ 7.5% of C 49,980.09 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 23,375.11 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 19,889.89 Н ı Erection Charges @ 20% of PSC pole- Not to be used for 33kv J Sum of (C to I) 7,92,966.33 Civil & Services SI. Total Total **Description of Materials** Unit **Unit Rate** Quantity No. **Amount** Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 4.4 28,600.00 1 2 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr Cu.mtr 6,500.00 0.9 5,850.00 **Total Civil & Services** K 34,450.00 L Total (J+K) 8,27,416.33 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle) Μ 49.644.98 Ν Sub Total (L+M) 8,77,061.31 0 Total GST @ 18% of (N) 1,57,871.04 Total CESS @ 1% of (N) Ρ 8,770.61 Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle 10,43,702.96 Q No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003) MATERIALS FOR 33 KV Cut Point with 90 Degree Angle SI. Total Total **Description of Materials** Unit **Unit Rate** No. Quantity **Amount** No 8 1 13 Mtr. Long H-Pole 56,735.71 4,53,885.71 Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 76.00 520.064 39,524.86 K.g. Mtr., 4 No's of Channel = (4x 9.56x1.7)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = 3 93.00 84.5824 7,866.16 K.g. (16x2.36x0.280) Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 76.00 l 93.61152 7.114.48 K.g. 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306) 99.20 793.60 5 Danger Plate, 1 no's. No. 8 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's KG 93.00 2.4072 223.87 =(1x0.59x0.510)2,380.80 GI barbed wire anticlimbing device 3 Kg. Per support Kg 99.20 24

#### **ANNEXURE-8.9** Part A:- Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr. Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length KG 93.00 9.6288 895.48 4 no's = (4x0.59x0.510)33KV pin insulator polymer (4 No's each 90 Deg. Cut point) No. 595.20 32 19.046.40 29,760.00 H W fitting(B&S)90KN,4 Bolt No. 620.00 48 Disc insulator (B&S)90 KN polymer No. 1,426.00 48 68,448.00 11 12 Earthing of Support (Coil Type) No. 205.84 8 1,646.72 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil 2.096 13 93.00 194.93 K.g. 14 PG Clamp for 148 sq.mm AAA conductor NO. 768.80 48 36,902.40 H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 155.00 8 1,240.00 15 Pair 1 Pair) H.T. Stay set (Complete ) Set 1,302.00 8 10,416.00 17 H.T. Stay Insulator Type-C (2 No's.) No. 62.00 8 496.00 18 7/8 SWG Stay Wire 15kg /stay 93.00 120 11,160.00 K.g. 19 GI Nut, Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point) K.g. 96.72 90.48 8,751.23 272.80 2,182.40 Ltr 8 21 Yellow Colour Paint for Background ltr 272.80 16 4,364.80 **Total Cost of materials** Α 7,07,293.84 В Stock, Storage & Insurance i.e 3% of A 21,218.82 C Sub Total (A+B) 7,28,512.65 D Contigency @ 3% of C 21,855.38 Tools & Plants @ 2% of C Ε 14,570.25 F Transportation @ 7.5% of C 54,638.45 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 23.375.11 Н Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 23,699.90 Erection Charges @ 20% of PSC pole- Not to be used for 33kv 1 J Sum of (C to I) 8,66,651.75 Civil & Services SI. Total Total Unit **Unit Rate** Description of Materials No. Quantity **Amount** 1 Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 4.40 28,600.00 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr Cu.mtr 0.90 6,500.00 5,850.00 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 Nο. 2,250.00 8 18,000.00 (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.) Κ **Total Civil & Services** 52,450.00 Total (J+K) 9,19,101.75 L Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle) 55,146.11 Μ Ν Sub Total (L+M) 9,74,247.86 0 Total GST @ 18% of (N) 1,75,364.61 Р Total CESS @ 1% of (N) 9,742.48 Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle Q 11,59,354.95 33 Kv Line Length In KM with 40 Mtr. Span 8 (Ref. Drawing No.- TPCODL-HVD-0001) **MATERIALS FOR 33 KV Pin Points** SI. Total Total Description of Materials Unit **Unit Rate** No. Quantity Amount 13 Mtr. Long H-Pole No 56,735.71 112 63,54,400.00 1 2 33 KV V cross Arm (GI) 22Kg each 1,959.20 112 2,19,430.40 No. Top bracket 100x50x6mm GI channel ( 300mm each) 186.00 112 20,832.00 No. 4 Danger Plate, 1 no's. No. 99.20 112 11,110.40 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's KG 93.00 33.70 3,134.17 =(1x0.59x0.510)GI barbed wire anticlimbing device 3 Kg. Per support 99.20 336.00 33,331.20 Kg

#### **ANNEXURE-8.9** Part A:- Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr. Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length KG 93.00 134.80 12,536.70 4 no's = (4x0.59x0.510)33KV pin insulator polymer 595.20 336 1,99,987.20 Nο Earthing of Support (Coil Type) No. 205.84 112 23,054.08 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil K.g. 93.00 29.34 2,728.99 earthing 162.40 15,707.33 11 GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point) K.g. 96.72 25,13,529.60 148 sq.mm AAA conductor K.M. 1,01,680.00 24.72 13 Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor EΑ 405.27 14 Black Paint Ltr 272.80 112.0 30,553.60 15 Yellow Colour Paint for Background Ltr 272.80 224.0 61,107.20 **Total Cost of materials** 95,01,442.87 Α Stock, Storage & Insurance i.e 3% of A В 2,85,043.29 Sub Total (A+B) C 97,86,486.16 Contigency @ 3% of C 2,93,594.58 D Tools & Plants @ 2% of C Ε 1,95,729.72 F Transportation @ 7.5% of C 7,33,986.46 G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 3,27,251.60 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 3,24,145.42 Н Erection Charges @ 20% of PSC pole- Not to be used for 33kv 1 Sum of (C to I) 1,16,61,193.94 1 Civil & Services SI. Total Total **Unit Rate Description of Materials** Unit No. Quantity **Amount** Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 61.60 4,00,400.00 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr Cu.mtr 6,500.00 81,900.00 12.60 Dismantalling of 80/100 sqmm Conductor 9,000.00 24.00 2,16,000.00 ΚM Κ **Total Civil & Services** 6,98,300.00 Total (J+K) 1,23,59,493.94 L Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points) 7,41,569.64 N Sub Total (L+M) 1,31,01,063.58 Total GST @ 18% of (N) 0 23,58,191.44 Ρ Total CESS @ 1% of (N) 23,581.91 Gross Total Material +Services (N+O+P) for 33 KV Pin Points 1.54.82.836.94 0 **6% Supervision Charges Summary** Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) 1,01,008.80 1 Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator) 2 21.465.11 3 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle) 49.644.98 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle) 55,146.11 4 5 Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points) 7,41,569.64 Total (6% supervision charges) 9,68,834.62 **Gross Total Summary** Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator 21,23,541.62 1 Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator 2 4,51,268.07 Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle 3 10,43,702.96 4 Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle 11,59,354.95 Gross Total Material +Services (N+O+P) for 33 KV Pin Points 5 1,54,82,836.94 Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km. Q Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km R Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each S Τ Final decision by electrical Inspector

	ANNEXURE-8.9							
1	Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.							
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	2,02,60,704.54						

		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name of the Division :- KED-1 & KED-2						
Name	e of the Sub-Division : -	Danpur & Marsaghai				
Na	ame of the Work :-	Mitigation of 33kV Feeder Overloading: Proposal for Installation of 01 NO. 33 KV 4-Pole for bifurcation of 33 KV Dar to mitigate overloading issue.	npur New feeder			
	Scope:-	Part A:-  1. Installation of 01 NO. 33 KV 4-pole with Isolator and stringing of 0.1Ckm 148sqmm conductor for feeder bifurcation.				
Na	ames of Schemes: -	TPCODL CAPEX(FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1	А	Part A:-  1. Installation of 01 no. 33 KV 4-pole with Isolator and stringing of 0.1Ckm 148sqmm conductor for feeder bifurcation.	7,96,491.85			
		Total Amount	7,96,491.85			
		Total Amount (In Cr)	0.08			

# Part A:-

1. Installation of 01 no. 33 KV 4-pole with Isolator and stringing of 0.1Ckm 148sqmm conductor for feeder bifurcation.

No. of 33 KV 4-Pole 1							
MATERIALS FOR 33 KV 4-Pole							
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00		
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel	KG	76.00	328.864	24,993.66		
	required =( 8x9.56x4.3) Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required =				,		
3	(24x2.36x0.280)	KG	93.00	15.8592	1,474.91		
4	Insulator 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		
5	Isolator Support Cahnnel 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		
6	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		
7	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		
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 2 no's channel required =( 2x7.14x0.8)	KG	76.00	11.424	868.22		
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 2 nos angle required = (2*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., 2 nos angle required = (2*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., 4 no's channel required =( 4x9.56x0.5)	KG	76.00	19.12	1,453.12		
12	Danger Plate, 4 no's.	No.	99.20	4	396.80		
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.2036	111.93		
14	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00		
15	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	93.00	113.28	10,535.04		
16	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80		
17	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	4.8144	447.74		
18	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	6	77,004.00		
19	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with Pl(Polymer)	Set	53,003.00	2	1,06,006.00		
	33KV pin insulator polymer	No.	595.20	6	3,571.20		
21	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	12	7,440.00		
22	Disc insulator (B&S) 90 KN polymer PG Clamp for 148 sq.mm AAA conductor	No.	1,426.00 768.80	12 12	17,112.00 9,225.60		
24	148 sq.mm AAA conductor	K.M.	1,01,680.00	0.309	31,419.12		
25	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	44.3	4,284.70		
26	Black Paint	Ltr	272.80	2	545.60		
27	Yellow Colour Paint for Background	Ltr	272.80	4	1,091.20		
Α	Total Cost of materials 4						
В							
С							
D				y @ 3% of C	14,739.76		
E			Tools & Plants		9,826.50		
F	· -				36,849.39		
G	•				6,427.20		
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				35,741.70		
	Erection Charges @ 20% of	PSC pole			-		
J	61.40.6		Sui	m of (C to I)	5,94,909.79		
<u>Civil &amp; Services</u>							

SI. 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	2.2	14,300.00	
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00	
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	4	14,800.00	
K			Total Civi	& Services	36,525.00	
L				Total (J+K)	6,31,434.79	
М	M Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)					
N Sub Total (L+M)						
O Total GST @ 18% of (N)						
P Total CESS @ 1% of (N)						
Q	Gross Total Material +Services (	N+O+P) fo	or 33 KV DP W	ith Isolator	7,96,491.85	
	6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charges) of	of L (for 3	3 KV DP Witho	ut Isolator)	_	
2	Other overheads (Including 6% supervision charge				37,886.09	
3	Other overheads (Including 6% supervision charges) of L (for 33 KV				-	
4	Other overheads (Including 6% supervision charges) of L (for 33 kg	(V Cut Po	int with 90 Deg	gree Angle)	-	
5	Other overheads (Including 6% supervision	charges)	of L (for 33 KV	Pin Points)	-	
		Total	(6% supervision	on charges)	37,886.09	
Gross Total Summary						
	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator					
1		· · · · · · · · · · · · · · · · · · ·				
2	Gross Total Material +Services	(N+O+P) f	or 33 KV DP W	ith Isolator	7,96,491.85	
2	Gross Total Material +Services Gross Total Material +Services (N+O+P) for 33 K	(N+O+P) f V Cut Poi	or 33 KV DP W nt with 180 De	ith Isolator gree Angle	7,96,491.85	
2 3 4	Gross Total Material +Services Gross Total Material +Services (N+O+P) for 33 K Gross Total Material +Services (N+O) for 33	(N+O+P) f V Cut Poi KV Cut Po	or 33 KV DP W nt with 180 De oint with 90 De	rith Isolator gree Angle gree Angle	7,96,491.85	
2 3 4 5	Gross Total Material +Services  Gross Total Material +Services (N+O+P) for 33 K  Gross Total Material +Services (N+O) for 33  Gross Total Material +	(N+O+P) f V Cut Poi KV Cut Po Services (	or 33 KV DP W nt with 180 De oint with 90 De N+O) for 33 KV	rith Isolator gree Angle gree Angle / Pin Points	7,96,491.85	
2 3 4 5 Q	Gross Total Material +Services Gross Total Material +Services (N+O+P) for 33 K Gross Total Material +Services (N+O) for 33 Gross Total Material + Inspection Fee of Over He	(N+O+P) f V Cut Poi KV Cut Po Services ( ad Line (F	or 33 KV DP W nt with 180 De bint with 90 De N+O) for 33 KV HT) - Rs. 1500/-	rith Isolator agree Angle agree Angle Pin Points upto 1km.	7,96,491.85	
2 3 4 5 Q R	Gross Total Material +Services Gross Total Material +Services (N+O+P) for 33 K Gross Total Material +Services (N+O) for 33 Gross Total Material + Inspection Fee of Over Head	(N+O+P) f V Cut Poi KV Cut Po Services ( ad Line (H Line (HT)	or 33 KV DP W nt with 180 De pint with 90 De N+O) for 33 KV HT) - Rs. 1500/- - Rs. 750/- Ad	rith Isolator Igree Angle Igree Angle If Points In Points In Upto 1km. Iditional Km	7,96,491.85	
2 3 4 5 Q	Gross Total Material +Services Gross Total Material +Services (N+O+P) for 33 K Gross Total Material +Services (N+O) for 33 Gross Total Material + Inspection Fee of Over Head Inspection Fee of Over Head Inspection Fee of Drawing Checking and Approval (For each drawing	(N+O+P) f V Cut Poi KV Cut Po Services ( ad Line (H Line (HT)	or 33 KV DP W nt with 180 De pint with 90 De N+O) for 33 KV HT) - Rs. 1500/- - Rs. 750/- Ad	rith Isolator gree Angle gree Angle / Pin Points - upto 1km. ditional Km 750/- each	7,96,491.85	

		ANNEXURE-8.11 (ABSTRACT)				
		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name o	f the Division :-	BCDD-II				
Name o	f the Sub-Division	Barmunda				
Name o	Proposal for Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL) with 33kV cable a split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.					
Scope:-		<ol> <li>Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.</li> <li>Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.</li> </ol>				
Names o	of Schemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1 A		<ol> <li>Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.</li> </ol>	1,21,44,970.19			
2	В	Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.	9,51,008.85			
		Total Amount	1,30,95,979.04			
		Total Amount (In Cr.)	₹ 1.31			

# Part-A

- 1. Construction of 3No's 33 kV RMU (1no LLVV, 2no LLLL).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.

# **Supply Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	180		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	540	1,337.13	7,22,050.20
1.3	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	5,245.00	62,940.00
1.4	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	24	4,894.00	1,17,456.00
2	Supply of 33kV RMU				
d	No. of 33kV 4Way RMU (LLVV)	nos.	1		
f	No. of 33kV 4Way RMU (LLLL)	nos.	2		
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	2	19,59,421.00	39,18,842.00
3	Earthing				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	39.60	93.00	3,682.80
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	6	1,302.00	7,812.00
4	FRTU and OFC for RMU SCADA Automation				
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	6	7,535.00	45,210.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3	2,19,420.00	6,58,260.00
	Sub Total (Supply Portion) (in	Rs.)			78,71,517.00

# **Erection Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by				
	3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	540	94.50	51,030.00
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

	ANNEXURE-8	3.11			
	struction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL). ng of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for conn	ectivity	of 33kV fee	ders with propose	ed RMU.
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	24	2,081.70	49,960.80
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	2	8,000.00	16,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	6.0	1,225.07	7,350.42
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3.0	6,124.36	18,373.08
	Sub Total (Erection Portion) (i	n Rs.)	l l		1,75,694.70
Civil Po	ortion			Data	Amount
SI. 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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	151.2	700.00	1,05,840.00
1.1.b	Earth work excavation of hard rock	Cum	64.8	1,720.00	1,11,456.00
1.2	Back filling with excavated soil outside and above the trench	Cum	216	202.00	43,632.00
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	3	23,145.30	69,435.90
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	96	1,463.40	1,40,486.40
	Sub Total (Civil Portion) (in I	Rs.)			4,93,050.30
Α	Sub Total (Supply Portion)				78,71,517.00
В	B Stock, Storage & Insurance @ 3 % of A				

# Part-A

- 1. Construction of 3No's 33 kV RMU (1no LLVV, 2no LLLL).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.

2. Laying of 33kV 3k 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed kivio.					
С	Sub Total (A+B)	81,07,662.51			
D	Contingency @ 3 % of C	2,43,229.88			
Е	Tools & Plants Charges @ 2% of C (considered for earthing items)	75.87			
F	Transportation @ 7.5% of C	6,08,074.69			
G	Erection Charges @ 10% of earthing items	379.33			
Н	Total (C+D+E+F+G)	89,59,422.27			
1	Sub Total (Erection Portion + Civil Portion)	6,68,745.00			
J	Total Cost (H+I)	96,28,167.27			
K	Other Overhead /(including Supervision Charges) @ 6 % of J	5,77,690.04			
L	Total Estimated Capital Cost i.e. (J+K)	1,02,05,857.30			
М	GST @ 18% of L	18,37,054.31			
M1	CESS @ 1% of L	1,02,058.57			
N	Gross Total Material and Services (L+M+M1)	1,21,44,970.19			

	ANNEXURE-8.11				
Part-B	_				
	of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connecti	ivity of	proposed F	RMU with PTR.	
Supply	Portion				
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1 1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories			·	·
а	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	90		
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	270	970.92	2,62,148.40
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	8,517.56	76,658.04
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	6,488.92	58,400.28
	Sub Total (Supply Portion) (in Rs.)				
Erectio	n Portion				
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruted type) UG cable in trefoil formation by open trench method.	Mtr.	270	94.50	25,515.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
	Sub Total (Erection Portion) (in	Rs.)			62,985.60
Civil Po	ortion				
SI. 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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	75.6	700.00	52,920.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	32.4	1,720.00	55,728.00
1.2	Back filling with excavated soil outside and above the trench	Cum	108	202.00	21,816.00

	ANNEXURE-8.11					
<u>Part-B</u> Laying	<u>Part-B</u> Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.					
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  1,012.00					
	Sub Total (Civil Portion) (in Rs.)					
Α	A Sub Total (Supply Portion)					
В	Stock, Storage & Insurance @ 3 % of A				11,916.20	
С	Sub Total (A+B)				4,09,122.92	
D	Contingency @ 3 % of C				12,273.69	
Е	Tools & Plants Charges @ 2% of C (considered for earthing ite	ms)			-	
F	Transportation @ 7.5% of C				30,684.22	
G	Erection Charges @ 10% of earthing items				-	
Н	Total (C+D+E+F+G)				4,52,080.83	
I	Sub Total (Erection Portion + Civil Portion)				3,01,850.40	
J	J Total Cost (H+I)				7,53,931.23	
К	K Other Overhead /(including Supervision Charges) @ 6 % of J			45,235.87		
L	L Total Estimated Capital Cost i.e. (J+K)				7,99,167.10	
М	M GST @ 18% of L			1,43,850.08		
M1	CESS @ 1% of L				7,991.67	
N	Grand Total (L+M+M1)				9,51,008.85	

		ANNEXURE-8.12 (ABSTRACT)				
		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name	of the Division :-	BCDD-II				
	Name of the Sub- Division : -					
Name of the Work:- Proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 34 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 34 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to specific proposal for Construction of 4No's 4No's 4No's						
Scope	::-	1. Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU. 3. Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.				
Nar	mes of Schemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1	1. Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.		₹ 1,63,40,241.08			
121 B I		Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80			
		Total Amount	₹ 1,76,08,252.88			
-		Total Amount (In Cr.)	₹ 1.76			

# <u>Part-A</u>

- 1. Construction of 4No's 33 kV RMU (1no LLVV, 3no LLLL).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.

# **Supply Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)	
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories					
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	270			
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.				
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	810	1,337.13	10,83,075.30	
1.3	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	18	5,245.00	94,410.00	
1.4	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	36	4,894.00	1,76,184.00	
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	0.00	357.60	-	
2	Supply of 33kV RMU					
d	No. of 33kV 4Way RMU (LLVV)	nos.	1			
f	No. of 33kV 4Way RMU (LLLL)	nos.	3			
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00	
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	3	19,59,421.00	58,78,263.00	
3	Earthing					
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	52.80	93.00	4,910.40	
3.2	Pipe Earthing 40mm. Gl Pipe	Nos.	8	1,302.00	10,416.00	
4	FRTU and OFC for RMU SCADA Automation					
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	8	7,535.00	60,280.00	
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	4	2,19,420.00	8,77,680.00	
	Sub Total (Supply Portion) (in Rs.)					
Erectio	n Portion					
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)	
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare					

# Part-A

- 1. Construction of 4No's 33 kV RMU (1no LLVV, 3no LLLL).
- 2. Laying of 33kV 3R 1Cx630 sgmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.

2. Layir	ng of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for conn	ectivity	of 33kV fe	eders with propos	ed RMU.
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	810	94.50	76,545.00
1.3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	18	2,081.70	37,470.60
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	36	2,081.70	74,941.20
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
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.	3	8,000.00	24,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	8.0	1,225.07	9,800.56
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	4.0	6,124.36	24,497.44
	Sub Total (Erection Portion) (i	n Rs.)			2,55,254.80
Civil Po	ortion				
SI. 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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	226.8	700.00	1,58,760.00
1.1.b	Earth work excavation of hard rock	Cum	97.2	1,720.00	1,67,184.00
1.2	Back filling with excavated soil outside and above the trench	Cum	324	202.00	65,448.00
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	4	23,145.30	92,581.20

#### <u>Part-A</u>

- 1. Construction of 4No's 33 kV RMU (1no LLVV, 3no LLLL).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.

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 .		8	3,700.00	29,600.00		
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	144	1,463.40	2,10,729.60		
	Sub Total (Civil Portion) (in Rs.)						
Α	A Sub Total (Supply Portion)						
В	Stock, Storage & Insurance @ 3 % of A	3,15,614.48					
С	Sub Total (A+B)	1,08,36,097.18					
D	Contingency @ 3 % of C		3,25,082.92				
E	Tools & Plants Charges @ 2% of C (considered for earthing ite	ems)			101.15		
F	Transportation @ 7.5% of C				8,12,707.29		
G	Erection Charges @ 10% of earthing items				505.77		
Н	Total (C+D+E+F+G)				1,19,74,494.31		
I	Sub Total (Erection Portion + Civil Portion)				9,79,557.60		
J	Total Cost (H+I)				1,29,54,051.91		
К	Other Overhead /(including Supervision Charges) @ 6 % of J		7,77,243.11				
L	Total Estimated Capital Cost i.e. (J+K)		1,37,31,295.03				
М	GST @ 18% of L				24,71,633.10		
M1	CESS @ 1% of L				1,37,312.95		
N	Gross Total Material and Services (L+M+M1)				1,63,40,241.08		

	ANNEXURE-8	3.12			
Part-B					
Laying	of 33kV 3R 1Cx400 sqmm cable at Bhatratpur PSS for connec	tivity o	of proposed	RMU with PTR.	
Supply	Portion				
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	120		
b	Length of 33kV 1C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	360	970.92	3,49,531.20
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	8,517.56	1,02,210.72
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	6,488.92	77,867.04
	Sub Total (Supply Portion) (in	n Rs.)	•		5,29,608.96
Erectio	n Portion				
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruted type) UG cable in trefoil formation by open trench method.	Mtr.	360	94.50	34,020.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
	Sub Total (Erection Portion) (i	83,980.80			
Civil Po	ortion				
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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	100.8	700.00	70,560.00
4.4.1	Earth work excavation of <b>hard rock</b>	Cum	43.2	1,720.00	74,304.00
1.1.b	Latti work excavation of <b>naturock</b>			_,,,_,,,	7 1,50 1.00

#### **ANNEXURE-8.12** Part-B Laying of 33kV 3R 1Cx400 sqmm cable at Bhatratpur PSS for connectivity of proposed RMU with PTR. Back filling with excavated soil outside and above the trench 144 202.00 29,088.00 Cum Supply and erection of GI Pipe of dia. 150mm, Class-B 5 Mtr 96 1,463.40 1,40,486.40 (8Mtr.) Supply and Erection of Cable Route Marker along the cable 4 Nos. 1,012.00 4,048.00 route at an interval of 30mtrs with civil works Sub Total (Civil Portion) (in Rs.) 3,18,486.40 Sub Total (Supply Portion) 5,29,608.96 Stock, Storage & Insurance @ 3 % of A 15,888.27 C Sub Total (A+B) 5,45,497.23 Contingency @ 3 % of C D 16,364.92 Tools & Plants Charges @ 2% of C (considered for earthing items) Ε Transportation @ 7.5% of C 40,912.29 F G Erection Charges @ 10% of earthing items Total (C+D+E+F+G) Н 6,02,774.44 Sub Total (Erection Portion + Civil Portion) 4,02,467.20 Total Cost (H+I) 10,05,241.64 Other Overhead /(including Supervision Charges) @ 6 % of J 60,314.50 Total Estimated Capital Cost i.e. (J+K) 10,65,556.14 Μ GST @ 18% of L 1,91,800.10 10,655.56 CESS @ 1% of L M1 Ν Grand Total (L+M+M1) 12,68,011.80

		ANNEXURE-8.13 (ABSTRACT)						
TP CENTRAL ODISHA DISTRIBUTION LIMITED								
Nam	Name of the Division :- BCDD-II							
-	Name of the Sub- Division : -							
Nam	Name of the Work :- Proposal for Installation of 3No's 33 kV RMU (3no - LLVV) with cable at CS Pur-I PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.							
Scop	e:-	<ol> <li>Installation of 3No's 33 kV RMU (3no - LLVV).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV fee RMU.</li> <li>Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed</li> </ol>						
Nar	nes of Schemes: -	TPCODL CAPEX (FY 23-24)						
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1	А	<ol> <li>Installation of 3No's 33 kV RMU (3no - LLVV).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.</li> </ol>	₹ 1,28,82,057.43					
2	В	Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80					
		Total Amount	₹ 1,41,50,069.23					

**Total Amount (In Cr.)** 

Total estimated cost is Rs. 1.42 Crore. (Under TPCODL Capex Scheme)

₹ 1.42

#### Part-A

- 1. Installation of 3No's 33 kV RMU (3no LLVV).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.

# **Supply Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	150		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA-59.4kA and SC rating of Armour in kA-20kA)	Mtr.	450	1,337.13	6,01,708.50
1.3	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	9	5,245.00	47,205.00
1.4	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	21	4,894.00	1,02,774.00
			Т Т		
2	Supply of 33kV RMU				
d	No. of 33kV 4Way RMU (LLVV)	nos.	3		
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	3	23,35,264.00	70,05,792.00
3	Earthing				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	39.60	93.00	3,682.80
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	6	1,302.00	7,812.00
4	FRTU and OFC for RMU SCADA Automation				
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	6	7,535.00	45,210.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3	2,19,420.00	6,58,260.00
Sub Total (Supply Portion) (in Rs.)					

#### **Erection Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	450	94.50	42,525.00
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

## Part-A

- 1. Installation of 3No's 33 kV RMU (3no LLVV).

z. Lay	ing of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connec	tivity o	f 33kV feed	ers with proposed	d RMU.
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
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	3	8,000.00	24,000.00
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				
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	6.0	1,225.07	7,350.42
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3.0	6,124.36	18,373.08
	Sub Total (Erection Portion) (ir	Rs.)			1,54,699.50
Civil P	ortion	-			
SI. 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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	126	700.00	88,200.00
1.1.b	Earth work excavation of hard rock	Cum	54	1,720.00	92,880.00
1.2	Back filling with excavated soil outside and above the trench	Cum	180	202.00	36,360.00
1.2 <b>2</b>	Back filling with excavated soil outside and above the trench  Civil works for Prefabricated RCC foundation with supply of all materials	Cum	180	202.00	36,360.00
	Civil works for Prefabricated RCC foundation with supply of	Cum Nos.	180	202.00	36,360.00 69,435.90
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Civil works for Prefabricated RCC foundation with supply of all materials  Prefabricated RCC foundation of 33kV RMU  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	Nos.	3	23,145.30	69,435.90
2 2.1	Civil works for Prefabricated RCC foundation with supply of all materials  Prefabricated RCC foundation of 33kV RMU  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 .	Nos. Set	6	23,145.30 3,700.00	69,435.90

#### Part-A

- 1. Installation of 3No's 33 kV RMU (3no LLVV).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.

Α	A Sub Total (Supply Portion)			
В	Stock, Storage & Insurance @ 3 % of A	2,54,173.33		
С	Sub Total (A+B)	87,26,617.63		
D	Contingency @ 3 % of C	2,61,798.53		
Е	Tools & Plants Charges @ 2% of C (considered for earthing items)			
F	Transportation @ 7.5% of C			
G	Erection Charges @ 10% of earthing items			
Н	Total (C+D+E+F+G)	96,43,367.67		
ı	Sub Total (Erection Portion + Civil Portion)	5,69,140.20		
J	Total Cost (H+I)	1,02,12,507.87		
K	Other Overhead /(including Supervision Charges) @ 6 % of J	6,12,750.47		
L	Total Estimated Capital Cost i.e. (J+K)	1,08,25,258.35		
М	GST @ 18% of L	19,48,546.50		
M1	CESS @ 1% of L	1,08,252.58		
N	Gross Total Material and Services (L+M+M1)	1,28,82,057.43		

	ANNEXURE-8.13	3			
	<u>3</u> g of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectiv y Portion	vity of p	proposed RM	IU with PTR.	
SI.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	120		
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	360	970.92	3,49,531.20
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	8,517.56	1,02,210.72
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	6,488.92	77,867.04
	Sub Total (Supply Portion) (in	Rs.)			5,29,608.96
Erecti	on Portion				
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				

SI. No.	Description of items	iption of items Unit Quantity		Rate (in Rs.)	Amount (in Rs.)	
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare					
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruted type) UG cable in trefoil formation by open trench method.	Mtr.	360	94.50	34,020.00	
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40	
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40	
	Sub Total (Erection Portion) (in Rs.)					

## **Civil Portion**

SI. 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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	100.8	700.00	70,560.00
1.1.b	Earth work excavation of hard rock	Cum	43.2	1,720.00	74,304.00
1.2	Back filling with excavated soil outside and above the trench	Cum	144	202.00	29,088.00

#### **ANNEXURE-8.13** Part-B Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR. Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.) Mtr 96 1,463.40 1,40,486.40 Supply and Erection of Cable Route Marker along the cable Nos. 4 1,012.00 4,048.00 route at an interval of 30mtrs with civil works Sub Total (Civil Portion) (in Rs.) 3,18,486.40 Sub Total (Supply Portion) 5,29,608.96 Α Stock, Storage & Insurance @ 3 % of A В 15,888.27 C Sub Total (A+B) 5,45,497.23 Contingency @ 3 % of C D 16,364.92 Ε Tools & Plants Charges @ 2% of C (considered for earthing items) F Transportation @ 7.5% of C 40,912.29 Erection Charges @ 10% of earthing items G Total (C+D+E+F+G) Н 6,02,774.44 Sub Total (Erection Portion + Civil Portion) Τ 4,02,467.20 Total Cost (H+I) 10,05,241.64 J Other Overhead /(including Supervision Charges) @ 6 % of J Κ 60,314.50 Total Estimated Capital Cost i.e. (J+K) 10,65,556.14 GST @ 18% of L 1,91,800.10 M M1 CESS @ 1% of L 10,655.56 Grand Total (L+M+M1) 12,68,011.80 Ν

		ANNEXURE-8.14 (ABSTRACT)				
		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name of	the Division :-	DED				
Name of the Sub-Division :-  Dhenkanal						
Name of	t College PSS to bility.					
Scope:-		Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV).     Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU     Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.				
Name	s of Schemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
Sl. No.	Part	Description	Amount			
1	А	1. Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU	₹ 77,02,305.96			
2	2 B Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.		₹ 9,51,008.85			
		Total Amount	₹ 86,53,314.81			
		Total Amount (In Cr.)	₹ 0.87			
Total est	imated cost is Rs	. 0.87 Crore. (Under TPCODL Capex Scheme)				

#### Part-A

- 1. Installation of 2No's 33 kV RMU (1no LLV, 1no LLVV).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU.

## Supply Portion

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	90		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	270	1,337.13	3,61,025.10
1.3	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core		6	5,245.00	31,470.00
1.4	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	4,894.00	58,728.00
2	Supply of 33kV RMU				
С	No. of 33kV 3Way RMU (LLV)	nos.	1		
<b>d</b> 2.3	No. of 33kV 4Way RMU (LLVV) Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	nos.	1	17,87,101.00	17,87,101.00
	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
3	Earthing				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	26.40	93.00	2,455.20
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	4	1,302.00	5,208.00
4	FRTU and OFC for RMU SCADA Automation				
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	4	7,535.00	30,140.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2	2,19,420.00	4,38,840.00
	Sub Total (Supply Portion) (ir	n Rs.)	•		50,50,231.30

## **Erection Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	270	94.50	25,515.00
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

#### <u>Part-A</u>

- Installation of 2No's 33 kV RMU (1no LLV, 1no LLVV).
   Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU.

2. Layir	ng of 33kV 3R 1Cx630 sqmm cable at College PSS for connect	ivity of	33kV feede	rs with proposed	RMU.
1 1 4 1	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	1	8,000.00	8,000.00
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
3	FRTU and OFC for RMU SCADA Automation				
1 33 1	Erection of end Connector and accessories for OFC connection at RMU,	Set	4.0	1,225.07	4,900.28
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2.0	6,124.36	12,248.72
	Sub Total (Erection Portion) (i	n Rs.)			96,134.60
Civil Po 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			(y	(y
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	75.6	700.00	52,920.00
1.1.b	Earth work excavation of <b>hard rock</b>	Cum	32.4	1,720.00	55,728.00
1.2	Back filling with excavated soil outside and above the trench	Cum	108	202.00	21,816.00
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
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 .		4	3,700.00	14,800.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
	Sub Total (Civil Portion) (in	Rs.)	, · · · ·		2,61,797.80
	C. h. Tatal (C. cal., Dartie)				
	Sub Total (Supply Portion)				50,50,231.30
<b>——</b>	Stock, Storage & Insurance @ 3 % of A				1,51,506.94
С	Sub Total (A+B)				52,01,738.24

## <u>Part-A</u>

- 1. Installation of 2No's 33 kV RMU (1no LLV, 1no LLVV).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU.

Contingency @ 3 % of C	1,56,052.15
Tools & Plants Charges @ 2% of C (considered for earthing items)	50.58
Transportation @ 7.5% of C	3,90,130.37
Erection Charges @ 10% of earthing items	252.89
Total (C+D+E+F+G)	57,48,224.22
Sub Total (Erection Portion + Civil Portion)	3,57,932.40
Total Cost (H+I)	61,06,156.62
Other Overhead /(including Supervision Charges) @ 6 % of J	3,66,369.40
Total Estimated Capital Cost i.e. (J+K)	64,72,526.01
GST @ 18% of L	11,65,054.68
CESS @ 1% of L	64,725.26
Gross Total Material and Services (L+M+M1)	77,02,305.96
	Tools & Plants Charges @ 2% of C (considered for earthing items)  Transportation @ 7.5% of C  Erection Charges @ 10% of earthing items  Total (C+D+E+F+G)  Sub Total (Erection Portion + Civil Portion)  Total Cost (H+I)  Other Overhead /(including Supervision Charges) @ 6 % of J  Total Estimated Capital Cost i.e. (J+K)  GST @ 18% of L  CESS @ 1% of L

	ANNEXURE-8	R.14				
Part-B	727.5.1.2					
	of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivi	ty of pr	oposed RM	U with PTR.		
Supply	Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)	
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories					
а	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	90			
b	Length of 33kV 1C, 400sqmm cable (HDD)	Mtr.				
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	270	970.92	2,62,148.40	
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	8,517.56	76,658.04	
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	6,488.92	58,400.28	
	Sub Total (Supply Portion) (in Rs.)					
Erectio	n Portion			I		
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)	
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare					
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruted type) UG cable in trefoil formation by open trench method.	Mtr.	270	94.50	25,515.00	
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30	
1.4	Erection of Indoor termination kits Heat Shrinkable type					
	suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30	
	suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Sub Total (Erection Portion) (i		9	2,081.70	18,735.30 <b>62,985.60</b>	
	·		9	2,081.70		
	Sub Total (Erection Portion) (i		9	2,081.70		
Civil Pc	Sub Total (Erection Portion) (i		9 Quantity	Rate	62,985.60 Amount	
Civil Pc	Sub Total (Erection Portion) (i	n Rs.)			62,985.60	
Civil Po	Sub Total (Erection Portion) (increase of the supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc	n Rs.)		Rate	62,985.60 Amount	
Civil Pc Sl. No.	Sub Total (Erection Portion) (increase of the state of th	n Rs.)		Rate	62,985.60 Amount	
Civil Pc Sl. No. 1	Sub Total (Erection Portion) (incrition  Description of items  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  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)	n Rs.) Unit	Quantity	Rate (in Rs.)	62,985.60 Amount (in Rs.)	

#### **ANNEXURE-8.14** Part-B Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR. Supply and erection of GI Pipe of dia. 150mm, Class-B Mtr 72 1,463.40 1,05,364.80 (8Mtr.) Supply and Erection of Cable Route Marker along the cable Nos. 3 1,012.00 3,036.00 route at an interval of 30mtrs with civil works Sub Total (Civil Portion) (in Rs.) 2,38,864.80 Sub Total (Supply Portion) Α 3,97,206.72 Stock, Storage & Insurance @ 3 % of A 11,916.20 C Sub Total (A+B) 4,09,122.92 Contingency @ 3 % of C 12,273.69 D Tools & Plants Charges @ 2% of C (considered for earthing items) Ε F Transportation @ 7.5% of C 30,684.22 Erection Charges @ 10% of earthing items G Н Total (C+D+E+F+G) 4,52,080.83 Sub Total (Erection Portion + Civil Portion) 3,01,850.40 Total Cost (H+I) 7,53,931.23 Κ Other Overhead /(including Supervision Charges) @ 6 % of J 45,235.87 Total Estimated Capital Cost i.e. (J+K) L 7,99,167.10 GST @ 18% of L Μ 1,43,850.08 CESS @ 1% of L 7,991.67 M1 Grand Total (L+M+M1) 9,51,008.85

		ANNEXURE-8.15 (ABSTRACT)				
		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Nam	e of the Division :-	CED				
	e of the Sub- ion : -	Tangi				
Nam	e of the Work :-	Mitigation of Low Voltage issue: Proposal for Construction of 3No's 33 kV RMU (3no - LLVV) with cable at Tangi PSS to split PSS load at m mitigate low voltage issue and improve reliability.	nultiple feeders for			
Scope:-		Construction of 3No's 33 kV RMU (3no - LLVV).     Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.     Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.				
Na	Names of Schemes: - TPCODL CAPEX (FY 23-24)					
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1	А	Construction of 3No's 33 kV RMU (3no - LLVV).     Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.	₹ 1,28,82,057.43			
2	В	Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.	₹ 15,85,014.75			
		Total Amount	₹ 1,44,67,072.18			
		Total Amount (In Cr.)	₹ 1.45			

#### Part-A

- 1. Construction of 3No's 33 kV RMU (3no LLVV).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed 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 UG Cable with accessories				
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	150		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	450	1,337.13	6,01,708.50
1.2	Supply of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG Cable kits for 1Core	I		9,600.00	-
1.3	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	9	5,245.00	47,205.00
1.4	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	21	4,894.00	1,02,774.00
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	0.00	357.60	-
2	Supply of 33kV RMU				
а	No. of 33kV 3Way RMU (LLV+M)	nos.			
b	No. of 33kV 4Way RMU (LLVV+M)	nos.			
с	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.	3		
е	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)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	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.	3	23,35,264.00	70,05,792.00
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: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	39.60	93.00	3,682.80
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	6	1,302.00	7,812.00
4	FRTU and OFC for RMU SCADA Automation				

#### Part-A

- 1. Construction of 3No's 33 kV RMU (3no LLVV).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.

	Sub Total (Supply Portion) (in Rs.)				
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3	2,19,420.00	6,58,260.00
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	6	7,535.00	45,210.00
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	1
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-

#### **Erection Portion**

SI No	Description of items	Unit	t Quantity	Rate	Amount
31. 140.	Description of items	Oilit	Qualitity	(in Rs.)	(in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	450	94.50	42,525.00
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	21	2,081.70	43,715.70
1.5	Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable including looping at cable terminations and straight through joints by <b>HDD method with</b> HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessable place.	Mtr.	0	2,300.00	-
1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	0.00	300.00	-
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
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.	3	8,000.00	24,000.00

#### <u>Part-A</u>

1. Construction of 3No's 33 kV RMU (3no - LLVV).

2. Layi	struction of 3No's 33 kV RMU (3no - LLVV). ng of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectiv	ity of 3	3kV feeders	s with proposed RI	MU.
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	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	6.0	1,225.07	7,350.42
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3.0	6,124.36	18,373.08
	Sub Total (Erection Portion) (i	n Rs.)			1,54,699.50
Civil Po	ortion				
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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	126	700.00	88,200.00
1.1.b	Earth work excavation of hard rock	Cum	54	1,720.00	92,880.00
1.2	Back filling with excavated soil outside and above the trench	Cum	180	202.00	36,360.00
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	0	2,643.67	-
	Civil works for Prefabricated RCC foundation with supply of				
2	all materials				
<b>2</b>		Nos.	3	23,145.30	69,435.90
	all materials	Nos.	3	23,145.30 3,600.00	69,435.90

#### Part-A

1. Construction of 3No's 33 kV RMU (3no - LLVV).

	struction of 3No's 33 kV RMU (3no - LLVV). ng of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectiv	ity of 33	kV feeders	with proposed RM	U.
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.	0	1,012.00	-
	Sub Total (Civil Portion) (in	Rs.)			4,14,440.70
Α	Sub Total (Supply Portion)				84,72,444.30
В	Stock, Storage & Insurance @ 3 % of A		2,54,173.33		
С	Sub Total (A+B)	87,26,617.63			
D	Contingency @ 3 % of C		2,61,798.53		
Е	Tools & Plants Charges @ 2% of C (considered for earthing items)				
F	Transportation @ 7.5% of C		6,54,496.32		
G	Erection Charges @ 10% of earthing items				379.33
Н	Total (C+D+E+F+G)				96,43,367.67
I	Sub Total (Erection Portion + Civil Portion)				5,69,140.20
J	Total Cost (H+I)				1,02,12,507.87
K	Other Overhead /(including Supervision Charges) @ 6 % of J				6,12,750.47
L	Total Estimated Capital Cost i.e. (J+K)		1,08,25,258.35		
М	GST @ 18% of L		19,48,546.50		
M1	CESS @ 1% of L		1,08,252.58		
N	Gross Total Material and Services (L+M+M1)				1,28,82,057.43

#### Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.

## **Supply Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	150		
b	Length of 33kV 1C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	450	970.92	4,36,914.00
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, aluminium UG Cable kits for 1Core	Set		8,517.56	-
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	15	8,517.56	1,27,763.40
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	15	6,488.92	97,333.80
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	0.00	357.60	-
<u> </u>	Completed 2212/ DAGII				
2 a	Supply of 33kV RMU 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)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	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: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	0.00	93.00	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,302.00	-
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-

	ANNEXURE-8.	.15			
Part-B					
Laying	of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity	of pro	osed RMU	with PTR.	
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC	Mtr.	0.0	77.99	-
4.2	Cables. Supply of Straight through connectors (Plastic coupler) and	C-+		6.766.00	
4.3	accessories for OFC connection. Supply of end Connector and accessories for OFC connection	Set	0	6,766.00	<u>-</u>
4.4	at RMU.	Set	0	7,535.00	-
	Supply of Standard FRTU 4Way with FRTU networking				
4.5	Equipment consisting of Fibre Optic switch (Mono mode	Nos.	0	2,19,420.00	-
	along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.			, ,	
	Sub Total (Supply Portion) (in	Rs.)			6,62,011.20
Erectio	n Portion				
SI. No.	Description of items	Unit	Quantity	Rate	Amount
	Erection, Commissioning & Testing of 33kV new line by		,	(in Rs.)	(in Rs.)
1	3X1Core, 400sqmm, XLPE UG cable without spare				
	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs,				
1.1	400sqmm, XLPE insulation (extruted type) UG cable in	Mtr.	450	94.50	42,525.00
	trefoil formation by open trench method.				
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, aluminium UG	Set	0	2,400.00	_
1.2	cable kits	Set			
	Erection of Outdoor termination kits Heat Shrinkable type				
1.3	suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	15	2,081.70	31,225.50
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	15	2,081.70	31,225.50
	, , , , , , , , , , , , , , , , , , , ,				
	Supply, Installation, Laying, Commissioning & Testing of				
	33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable				
1.5	as spare) including looping at cable terminations and	Mtr.	0	2,300.00	-
	straight through joints by <b>HDD method with</b> HDPE pipe			,	
	(110mm dia, PN8 PE80) for laying of individual run of UG				
	cable at main road and unaccessable place.				
1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open	Mtr.	0	300.00	_
2	trench.  Erection, Commissioning, Wiring and Testing of 33kV RMU				
	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT				
2.1	(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	-

#### **ANNEXURE-8.15** Part-B Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR. 2.6 0 8,000.00 Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL) Nos. FRTU and OFC for RMU SCADA Automation Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying 3.1 Mtr. 0.0 82.00 of OFC Cables.laid along 11kV UG cable. through open trench or HDD Erection of Straight through connectors (Plastic coupler) and 3.2 Set 0.0 612.54 accessories for OFC connection. Erection of end Connector and accessories for OFC 3.3 Set 0.0 1,225.07 connection at RMU, Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic 3.4 0.0 6,124.36 Nos. switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU. Sub Total (Erection Portion) (in Rs.) 1,04,976.00 **Civil Portion** Rate **Amount** SI. No. Description of items Unit Quantity (in Rs.) (in Rs.) Civil works with supply of all materials like cement, MS tor 1 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) 1.1.a Earth work excavation of soil Cum 126 700.00 88,200.00 Earth work excavation of hard rock 1.1.b Cum 54 1,720.00 92,880.00 1.2 Back filling with excavated soil outside and above the trench Cum 180 202.00 36,360.00 Damage of asphalt/tar road and other utilities and 1.3 reconstructing to bring to its original shape after laying of Mtr 0 2,643.67 cable in open trench (1mtr. width) Civil works for Prefabricated RCC foundation with supply of 2 all materials 2.1 Prefabricated RCC foundation of 33kV RMU Nos. 0 23,145.30 Supply of GI Fencing with Gate around each RMU sqmtr 0 3,600.00 Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth 4 Set 3,700.00 resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. Supply and erection of GI Pipe of dia. 150mm, Class-B 5 Mtr 120 1,463.40 1,75,608.00 Supply and Erection of Cable Route Marker along the cable 5 Nos. 1,012.00 5,060.00 route at an interval of 30mtrs with civil works

## <u>Part-B</u>

	Sub Total (Civil Portion) (in Rs.)		3,98,108.00		
Α	Sub Total (Supply Portion)				6,62,011.20
В	Stock, Storage & Insurance @ 3 % of A				19,860.34
С	Sub Total (A+B)				6,81,871.54
D	Contingency @ 3 % of C				20,456.15
Е	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				51,140.37
G	Erection Charges @ 10% of earthing items				-
Н	Total (C+D+E+F+G)				7,53,468.05
I	Sub Total (Erection Portion + Civil Portion)				5,03,084.00
J	Total Cost (H+I)				12,56,552.05
K	Other Overhead /(including Supervision Charges) @ 6 % of	ļ			75,393.12
L	Total Estimated Capital Cost i.e. (J+K)				13,31,945.17
М	GST @ 18% of L				2,39,750.13
M1	CESS @ 1% of L				13,319.45
N	Grand Total (L+M+M1)				15,85,014.75

ANNEXURE-8.16 (ABSTRACT)							
TP CENTRAL ODISHA DISTRIBUTION LIMITED							
Name	of the Division :-	PDP					
Name -	of the Sub-Division :	JED					
Name	of the Work :-	Proposal for Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS to mi issue.	tigate low voltage				
Scope	:-	<ol> <li>Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.</li> <li>Construction for 1no. 33kV Outdoor Bay at Raghunathpur PSS.</li> <li>Construction for 1no. 33kV Outdoor Bay at Chikinia PSS.</li> </ol>					
Nar	nes of Schemes: -	TPCODL CAPEX (FY 23-24)					
		ABSTRACT OF ESTIMATE					
SI. No.	Part	Description	Amount				
1	А	Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.	₹ 4,33,13,544.18				
2	В	Construction for 1 no. 33kV Outdoor Bay at Raghunathpur PSS.	₹ 36,30,897.07				
3	С	Construction for 1 no. 33kV Outdoor Bay at Chikinia PSS.	₹ 36,30,897.07				
		Total Amount	₹ 5,05,75,338.31				
		Total Amount (In Cr.)	₹ 5.06				

## Part-A

Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.

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

20

	MATERIALS FOR 33 KV DP Without Isolator					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	13 Mtr. Long H-Pole	No	56,735.71	40	22,69,428.57	
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	1242.8	94,452.80	
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	79.296	7,374.53	
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	1399.44	1,06,357.44	
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	1235.52	93,899.52	
6	Danger Plate, 2 no's.	No.	99.20	40	3,968.00	
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	12.036	1,119.35	
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	40	6,200.00	
9	H.T. Stay set (Complete )	Set	1,302.00	40	52,080.00	
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	80	4,960.00	
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	600	55,800.00	
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	20	26,040.00	
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	236	21,948.00	
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	120	11,904.00	
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	48.144	4,477.39	
16	33KV pin insulator polymer	No.	595.20	60	35,712.00	
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	120	74,400.00	
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	120	1,71,120.00	
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	120	1,71,120.00	
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	245.22	23,717.68	
21	Black Paint	Ltr	272.80	20	5,456.00	
22	Yellow Colour Paint for Background	Ltr	272.80	40	10,912.00	
Α			Total Cost of	of materials	32,52,447.28	
В	Stock, Storage & Insurance i.e 3% of A					
С	<del>-</del>				33,50,020.70	
D						
E						
F	Transportation @ 7.5% of C					
G	Erection Charges	@ 5% on	Trf/Breaker/W	/PB/ H-Pole	1,16,875.57	
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-	-Pole/HT	stay set/GI Pip	e/PSC pole)	86,307.69	

	ANNEXURE-8.1	<u> </u>			
Part-	<u>A</u> ruction of 33 kV new line from Chikinia PSS to Raghunathpur PS	S of lengt	th 11Ckm.		
I	Erection Charges @ 20% o	f PSC pol	e- Not to be us	ed for 33kv	-
J			Sui	m of (C to I)	39,71,956.54
	<u>Civil &amp; Services</u>	1 1		Total	
SI. No.	Description of Materials	Unit	Unit Rate	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	40	90,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	22	1,43,000.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125	Cu.mtr	6,500.00	4.5	29,250.00
4	Cumtr Construction Lartning chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth	No.	3,700.00	20	74,000.00
К	escistance including Installation of 38 Atr (1 Dine 40mm (1 Amm	<u> </u>	Total Civi	& Services	3,36,250.00
L				Total (J+K)	43,08,206.54
М	Other overheads (Including 6% supervision charges)	of L (for 3	3 KV DP Witho	out Isolator)	2,58,492.39
N			Sub	Total (L+M)	45,66,698.93
0			Total GST @	18% of (N)	8,22,005.81
Р			Total GST (	@ 1% of (N)	45,666.99
Q	Gross Total Material +Services (N+0	D+P) for 3	3 KV DP Witho	out Isolator	54,34,371.73
	No. of 33 KV DP required With Isolator (Ref. Drawing No TPCODL-HVD-0004)			2	
C.	<u>MATERIALS FOR 33 KV DP W</u>	<u>/ith Isolat</u>	<u>tor</u>	T-4-1	Takad
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	4	2,26,942.86
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	93.00	7.9296	737.45
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

#### **ANNEXURE-8.16** Part-A Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm. 50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 76.00 KG 177.372 13.480.27 4.927 mtr., 4 nos angle required = <math>(4\*4.5\*4.927)Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel KG 76.00 11.424 868.22 required = (1x7.14x0.8)Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle KG 76.00 3.492 265.39 length 0.388mtr., 1 nos angle required = (1\*4.5\*0.388) Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 10 KG 76.00 3.06 232.56 0.34mtr., 1 nos angle required = (1\*4.5\*0.340)Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., 11 | each channel length 0.5 mtr., 2 no's channel required =( KG 76.00 19.12 1,453.12 2x9.56x0.5) 99.20 12 Danger Plate, 2 no's. No. 4 396.80 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of KG 93.00 1.2036 13 111.93 0.510mtr length 2 no's = (2x0.59x0.510)H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, Pair 155.00 4 620.00 2 no's qty. required (1 Pair) 15 H.T. Stay set (Complete) Set 1,302.00 4 5,208.00 16 H.T. Stay Insulator Type-C (2 No's.) No. 62.00 8 496.00 17 7/8 SWG Stay Wire 15kg /stay 93.00 60 5,580.00 K.g. 1,302.00 4 5,208.00 18 | Gi Pipe Earthing 40mm. 3 Mtr. Long No. 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. 19 KG 93.00 113.28 10,535.04 For raising)= 24x2.36 99.20 12 20 GI barbed wire anticlimbing device 3 Kg. Per support Kg 1,190.40 Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. 21 KG 93.00 4.8144 447.74 Flat of 0.510mtr length 8 no's = (8x0.59x0.510)12,834.00 22 Lightning Arrester(30KV,10KA) (Station Class,class-2) EΑ 6 77,004.00 33 KV 1250 AMP Double break (Turn & twist center rotating) 23 2 Set 53,003.00 1,06,006.00 isolator without earth switch with PI(Polymer) 24 33KV pin insulator polymer No. 595.20 6 3,571.20 25 H W fitting(B&S) 90KN,4 Bolt 620.00 12 7,440.00 No. 26 Disc insulator (B&S) 90 KN polymer No. 1,426.00 12 17,112.00 PG Clamp for 232 sq.mm AAA conductor NO. 1,426.00 12 27 17,112.00 GI Nut, Bolt & Washer of different sizes (22.15 Kg each DP with 28 K.g. 96.72 44.3 4,284.70 Isolator) 29 Black Paint 272.80 2 Ltr 545.60 30 Yellow Colour Paint for Background Ltr 272.80 1,091.20 **Total Cost of materials** Α 5,53,104.25 Stock, Storage & Insurance i.e 3% of A В 16,593.13 C Sub Total (A+B) 5,69,697.38 D Contigency @ 3% of C 17,090.92 F Tools & Plants @ 2% of C 11,393.95 F Transportation @ 7.5% of C 42,727.30 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 11,687.56 Н Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole) 31,832.09 Erection Charges @ 20% of PSC pole- Not to be used for 33kv Τ

#### **ANNEXURE-8.16** Part-A Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm. Sum of (C to I) 6,84,429.19 Civil & Services SI. Total Total **Description of Materials** Unit **Unit Rate** Quantity No. <u>Amount</u> 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 No. 2,250.00 4 9,000.00 (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.) Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 2 Cu.mtr 6,500.00 2.2 14,300.00 0.55Cu.mtr Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu.mtr 3 6,500.00 0.45 2,925.00 Cu mtr Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth 4 No. 3,700.00 4 14,800.00 resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. **Total Civil & Services** Κ 41,025.00 Total (J+K) L 7,25,454.19 М Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator) 43,527.25 Ν Sub Total (L+M) 7,68,981.44 O Total GST @ 18% of (N) 1,38,416.66 Р Total GST @ 1% of (N) 7,689.81 Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator 9,15,087.92 Q No. of 33 KV Cut Point with 180 Degree Angle 14 (Ref. Drawing No.- TPCODL-HVD-0002) MATERIALS FOR 33 KV Cut Point with 180 Degree Angle SI. Total Total Unit **Unit Rate Description of Materials** No. Quantity Amount 1 13 Mtr. Long H-Pole No 56,735.71 14 7,94,300.00 Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each 2 K.g. 76.00 455.056 34,584.26 channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7) Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 3 K.g. 93.00 74.0096 6,882.89 no's required = (8x2.36x0.280)Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, 81.91008 each channel length 0.306 Mtr., 2 No's of Channel = (2x K.g. 76.00 6,225.17 9.56x0.306) Danger Plate, 1 no's. No. 99.20 14 1,388.80

KG

Kg

93.00

99.20

4.2126

42

391.77

4,166.40

Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of

GI barbed wire anticlimbing device 3 Kg. Per support

0.510mtr length 1 no's = (1x0.59x0.510)

	ANNEXURE-8.16						
Part-	<u>A</u>						
Const	truction of 33 kV new line from Chikinia PSS to Raghunathpur PS	SS of leng	th 11Ckm.				
	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr.		00.00	46.0504	4 5 5 7 00		
8	Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	16.8504	1,567.09		
9	33KV pin insulator polymer	No.	595.20	42	24,998.40		
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	84	52,080.00		
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	84	1,19,784.00		
12	Earthing of Support ( Coil Type )	EA	205.84	14	2,881.76		
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For	K.g.	93.00	3.668	341.12		
	connecting pole with Coil earthing						
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	84	1,19,784.00		
15	GI Nut, Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	68.306	6,606.56		
16	Black Paint	Ltr	272.80	14	3,819.20		
17	Yellow Colour Paint for Background	Ltr	272.80	28	7,638.40		
Α			Total Cost of	of materials	11,87,439.81		
В	Sto	ock, Stora	ge & Insurance	i.e 3% of A	35,623.19		
С			Sub	Total (A+B)	12,23,063.01		
D			Contigenc	y @ 3% of C	36,691.89		
Е			Tools & Plant	s @ 2% of C	24,461.26		
F		Т	ransportation (	@ 7.5% of C	91,729.73		
G	Erection Charges	@ 5% on	Trf/Breaker/V	/PB/ H-Pole	40,906.45		
Н	Erection Charges @ 10% of C (except Trf/Breaker/	WPB/ H-I	Pole/HT stay se	t/PSC pole)	40,493.40		
ı	Erection Charges @ 20% o	f PSC pol	e- Not to be us	ed for 33kv	-		
J			Su	m of (C to I)	14,57,345.74		
	<u>Civil &amp; Services</u>		Su	m of (C to I)	14,57,345.74		
SI.	Civil & Services  Description of Materials	Unit	Sul Unit Rate	m of (C to I)  Total  Quantity	14,57,345.74 Total Amount		
SI. No.	Description of Materials		Unit Rate	Total Quantity	Total Amount		
SI.	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	<b>Unit</b> Cu.mtr		Total	Total		
SI. No.	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) =		Unit Rate	Total Quantity	Total Amount		
SI. No.	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125	Cu.mtr	<i>Unit Rate</i> 6,500.00 6,500.00	Total Quantity	<b>Total Amount</b> 50,050.00		
SI. No. 1	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125	Cu.mtr	<i>Unit Rate</i> 6,500.00 6,500.00	Total Quantity 7.7 1.575	Total Amount 50,050.00 10,237.50 60,287.50		
\$1. No. 1 2	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125	Cu.mtr	<i>Unit Rate</i> 6,500.00 6,500.00  Total Civi	Total Quantity 7.7 1.575 I & Services Total (J+K) 180 Degree	Total Amount 50,050.00 10,237.50 60,287.50		
SI. No.  1  2  K	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	Unit Rate 6,500.00 6,500.00 Total Civi	Total Quantity 7.7 1.575 I & Services Total (J+K)	Total Amount 50,050.00 10,237.50 60,287.50 15,17,633.24		
SI. No.  1  2  K L	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	Unit Rate 6,500.00 6,500.00 Total Civi	Total Quantity 7.7 1.575  1 & Services Total (J+K) 180 Degree Angle) Total (L+M)	Total Amount 50,050.00 10,237.50 60,287.50 15,17,633.24 91,057.99		
SI. No.  1  2  K L  N	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	Unit Rate 6,500.00 6,500.00 Total Civi Cut Point with Sub Total GST @	Total Quantity 7.7 1.575  1 & Services Total (J+K) 180 Degree Angle) Total (L+M)	Total Amount 50,050.00 10,237.50 60,287.50 15,17,633.24 91,057.99 16,08,691.23		
SI. No.  1  2  K  L  N  O	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr Cu.mtr	Unit Rate 6,500.00 6,500.00 Total Civi Cut Point with Sub Total GST @ Total GST	Total Quantity 7.7 1.575 1 & Services Total (J+K) 180 Degree Angle) Total (L+M) 0 18% of (N) @ 1% of (N)	Total Amount  50,050.00  10,237.50  60,287.50  15,17,633.24  91,057.99  16,08,691.23  2,89,564.42		
SI. No.  1  2  K  L  M  O	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr  Other overheads (Including 6% supervision charges) of L (f	Cu.mtr Cu.mtr	Unit Rate 6,500.00 6,500.00 Total Civi Cut Point with Sub Total GST @ Total GST	Total Quantity 7.7 1.575 1 & Services Total (J+K) 180 Degree Angle) Total (L+M) 0 18% of (N) @ 1% of (N)	Total Amount  50,050.00  10,237.50  60,287.50  15,17,633.24  91,057.99  16,08,691.23  2,89,564.42  16,086.91		
SI. No.  1  2  K  L  M  O	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr  Other overheads (Including 6% supervision charges) of L (f	Cu.mtr Cu.mtr	Unit Rate 6,500.00 6,500.00 Total Civi Cut Point with Sub Total GST @ Total GST	Total Quantity 7.7 1.575 1 & Services Total (J+K) 180 Degree Angle) Total (L+M) 0 18% of (N) @ 1% of (N)	Total Amount  50,050.00  10,237.50  60,287.50  15,17,633.24  91,057.99  16,08,691.23  2,89,564.42  16,086.91		
SI. No.  1  2  K  L  M  O	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr  Other overheads (Including 6% supervision charges) of L (f	Cu.mtr Cu.mtr  Or 33 KV	Unit Rate 6,500.00 6,500.00 Total Civi Cut Point with Sub Total GST @ Total GST ont with 180 De	Total Quantity 7.7 1.575 1 & Services Total (J+K) 180 Degree Angle) Total (L+M) 0 18% of (N) @ 1% of (N) egree Angle	Total Amount  50,050.00  10,237.50  60,287.50  15,17,633.24  91,057.99  16,08,691.23  2,89,564.42  16,086.91		
SI. No.  1  2  K  L  M  O  P  Q	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr  Other overheads (Including 6% supervision charges) of L (f	Cu.mtr Cu.mtr  Or 33 KV	Unit Rate 6,500.00 6,500.00 Total Civi Cut Point with Sub Total GST @ Total GST ont with 180 De	Total Quantity 7.7 1.575 1 & Services Total (J+K) 180 Degree Angle) Total (L+M) 0 18% of (N) 0 1% of (N) egree Angle 8	Total Amount  50,050.00  10,237.50  60,287.50  15,17,633.24  91,057.99  16,08,691.23  2,89,564.42  16,086.91  19,14,342.56		
SI. No.  1  2  K  L  M  O	Description of Materials  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr  Other overheads (Including 6% supervision charges) of L (f	Cu.mtr Cu.mtr  Or 33 KV	Unit Rate 6,500.00 6,500.00 Total Civi Cut Point with Sub Total GST @ Total GST ont with 180 De	Total Quantity 7.7 1.575 1 & Services Total (J+K) 180 Degree Angle) Total (L+M) 0 18% of (N) @ 1% of (N) egree Angle	Total Amount  50,050.00  10,237.50  60,287.50  15,17,633.24  91,057.99  16,08,691.23  2,89,564.42  16,086.91		

	ANNEXURE-8.10	6			
Part-	A				
Const	_ truction of 33 kV new line from Chikinia PSS to Raghunathpur PS	S of leng	th 11Ckm.		
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	520.064	39,524.86
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	84.5824	7,866.16
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	93.61152	7,114.48
5	Danger Plate, 1 no's.	No.	99.20	8	793.60
6	Back Clamp for danger Plate 25X3 mm. flat, $0.59$ Kg/Mtr. Flat of $0.510$ mtr length 1 no's = $(1x0.59x0.510)$	KG	93.00	2.4072	223.87
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	9.6288	895.48
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	32	19,046.40
	H W fitting(B&S)90KN,4 Bolt	No.	620.00	48	29,760.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	48	68,448.00
12	Earthing of Support ( Coil Type )	No.	205.84	8	1,646.72
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	2.096	194.93
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	48	68,448.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	8	1,240.00
16	H.T. Stay set (Complete )	Set	1,302.00	8	10,416.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	8	496.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	90.48	8,751.23
20	Black Paint	Ltr	272.80	8	2,182.40
21	Yellow Colour Paint for Background	Ltr	272.80	16	4,364.80
Α				of materials	7,38,839.44
В	Sto	ock, Stora	ge & Insurance		22,165.18
С				Total (A+B)	7,61,004.62
D				y @ 3% of C	22,830.14
E			Tools & Plant		15,220.09
F		Т	ransportation	@ 7.5% of C	57,075.35
G	Erection Charges	@ 5% on	Trf/Breaker/V	VPB/ H-Pole	23,375.11
Н	Erection Charges @ 10% of C (except Trf/Breaker/	WPB/ H-I	Pole/HT stay se	t/PSC pole)	26,949.10
ı	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				
J			Su	m of (C to I)	9,06,454.41
	Civil & Services				
SI. 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

S00mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500x500x1500 mm.)    K		ANNEXURE-8.16					
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 (500mms500mms00mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500x500x1500 mm.)    K	Part-	<u>4</u>					
Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay   Wire. S)Stay clamps with Nuts & bolts, including excvation,   Supply of 0-Scum exement concrete foundation 1:2:4 size   S000mmxS00mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size   S000x500x1500 mm.)   Total Civil & Services   S2,450.01	Const	 truction of 33 kV new line from Chikinia PSS to Raghunathpur PS	S of leng	th 11Ckm.			
Total (J+K)   9,58,904.4	3	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	No.	2,250.00	8	18,000.00	
M	К		•	Total Civi	& Services	52,450.00	
N   Sub Total (L+M)   10,16,438.66     O   Total GST @ 18% of (N)   1,82,958.96     P   Total GST @ 18% of (N)   1,82,958.96     Q   Gross Total Material + Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle   12,09,552.01     33 KV Line Length In KM with 40 Mtr. Span (Ref. Drawing No TPCODL-HVD-0001)   11     Sub Total (Ref. Drawing No TPCODL-HVD-0001)   13     Sub Total (Ref. Drawing No TPCODL-HVD-0001)   13     Sub Total (Ref. Drawing No TPCODL-HVD-0001)   13     Sub Total (Ref. Drawing No TPCODL-HVD-0001)   14     Sub Total (Ref. Drawing No TPCODL-HVD-0001)   14     Sub Total (Ref. Drawing No TPCODL-HVD-0001)   14     Sub Total (Ref. Drawing No TPCDL-HVD-0001)   14	L				Total (J+K)	9,58,904.41	
Total GST @ 18% of (N)   1,82,958.96	М	Other overheads (Including 6% supervision charges) of L (	(for 33 K\	/ Cut Point with	90 Degree	57,534.26	
P   Total GST @ 1% of (N)   10,164.35	N			Sub	Total (L+M)	10,16,438.68	
State   Section   Sectio	0			Total GST @	18% of (N)	1,82,958.96	
33 KV Line Length In KM with 40 Mtr. Span (Ref. Drawing No TPCODL-HVD-0001)   11   15   15   15   15   15   15	Р			Total GST	@ 1% of (N)	10,164.39	
Ref. Drawing No TPCODL-HVD-0001   MATERIALS FOR 33 KV Pin Points	Q	Gross Total Material +Services (N+O+P) for 33	KV Cut P	oint with 90 De	gree Angle	12,09,562.02	
Ref. Drawing No TPCODL-HVD-0001   MATERIALS FOR 33 KV Pin Points							
Ref. Drawing No TPCODL-HVD-0001    St. No.   Description of Materials   Unit   Unit Rate   Quantity   Total Amount					11		
St. No.   Description of Materials   Unit   Unit Rate   Quantity   Amount			in Defeate				
No.         Description of Materials         Unit Unit Rate         Quantity         Amount           1         13 Mtr. Long H-Pole         No         56,735.71         231         1,31,05,950.00           2         33 KV V cross Arm (GI) 22Kg each         No.         1,959.20         231         4,52,575.20           3         Top bracket 100x50x6mm GI channel (300mm each)         No.         186.00         231         42,966.00           4         Danger Plate, 1 no's.         No.         99.20         231         22,915.20           5         Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)         KG         93.00         69.51         6,464.20           6         GI barbed wire anticlimbing device 3 Kg. Per support         Kg         99.20         693.00         68,745.60           7         Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)         KG         93.00         278.03         25,856.94           8         33KV pin insulator polymer         No.         595.20         693         4,12,473.60           9         Earthing of Support ( Coil Type )         No.         205.84         231         47,549.04           No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting po		MATERIALS FOR 33 KV PI	n Points	1	Total	Total	
1       13 Mtr. Long H-Pole       No       56,735.71       231       1,31,05,950.00         2       33 KV V cross Arm (GI) 22Kg each       No.       1,959.20       231       4,52,575.20         3       Top bracket 100x50x6mm GI channel (300mm each)       No.       186.00       231       42,966.00         4       Danger Plate, 1 no's.       No.       99.20       231       22,915.20         5       Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)       KG       93.00       69.51       6,464.2         6       GI barbed wire anticlimbing device 3 Kg. Per support       Kg       99.20       693.00       68,745.60         7       Flat of 0.510mtr length 4 no's = (4x0.59x0.510)       KG       93.00       278.03       25,856.94         8       33KV pin insulator polymer       No.       595.20       693       4,12,473.61         9       Earthing of Support ( Coil Type )       No.       205.84       231       47,549.04         10       No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing       K.g.       93.00       60.52       5,628.51         11       GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)       K.g.       96.72       334.95       32,396.3		Description of Materials	Unit	Unit Rate			
2 33 KV V cross Arm (GI) 22Kg each No. 1,959,20 231 4,52,575,21 3 Top bracket 100x50x6mm GI channel ( 300mm each) No. 186.00 231 42,966.00 4 Danger Plate, 1 no's. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510) 6 GI barbed wire anticlimbing device 3 Kg. Per support Kg 99.20 693.00 68,745.60 7 Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)  8 33KV prin insulator polymer No. 595.20 693 4,12,473.60 9 Earthing of Support ( Coil Type ) No. 205.84 231 47,549.00 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing 11 GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point) Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor Ltr 272.80 231.0 63,016.81 15 Yellow Colour Paint for Background Ltr 272.80 462.0 1,26,033.61 C Sub Total (A+B) Contigency @ 3% of C 6,49,167.92 E Contigency @ 3% of C 6,49,167.93 F Transportation @ 7.5% of C 16,22,919.86	NO.				_		
3   Top bracket 100x50x6mm GI channel (300mm each)   No.   186.00   231   42,966.00     4   Danger Plate, 1 no's.   No.   99.20   231   22,915.20     5   Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)   KG   93.00   69.51   6,464.2     6   GI barbed wire anticlimbing device 3 Kg. Per support   Kg   99.20   693.00   68,745.60     7   Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)   KG   93.00   278.03   25,856.94     8   33KV pin insulator polymer   No.   595.20   693   4,12,473.60     9   Earthing of Support (Coil Type )   No.   205.84   231   47,549.00     10   No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing   K.g.   93.00   60.52   5,628.51     11   GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)   K.g.   96.72   334.95   32,396.30     12   232 sq.mm AAA conductor   K.M.   1,94,060.00   33.99   65,96,099.40     13   Grimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   648.42   Conductor   Crimping type Midspan Compression Joint for 148 sq.mm AAA   EA   Conductor   Crimping type Mids						1,31,05,950.00	
4         Danger Plate, 1 no's.         No.         99.20         231         22,915.20           5         Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)         KG         93.00         69.51         6,464.20           6         Gi barbed wire anticlimbing device 3 Kg. Per support         Kg         99.20         693.00         68,745.60           7         Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)         KG         93.00         278.03         25,856.94           8         33KV pin insulator polymer         No.         595.20         693         4,12,473.61           9         Earthing of Support ( Coil Type )         No.         205.84         231         47,549.00           10         No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing         K.g.         93.00         60.52         5,628.51           11         GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)         K.g.         96.72         334.95         32,396.36           12         232 sq.mm AAA conductor         K.M.         1,94,060.00         33.99         65,96,099.40           13         Crimping type Midspan Compression Joint for 148 sq.mm AAA         EA         648.42         648.42 <td></td> <td></td> <td><u> </u></td> <td></td> <td></td> <td></td>			<u> </u>				
5         Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)         KG         93.00         69.51         6,464.22           6         GI barbed wire anticlimbing device 3 Kg. Per support         Kg         99.20         693.00         68,745.60           7         Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)         KG         93.00         278.03         25,856.94           8         33KV pin insulator polymer         No.         595.20         693         4,12,473.60           9         Earthing of Support ( Coil Type )         No.         205.84         231         47,549.00           10         No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing         K.g.         93.00         60.52         5,628.51           11         GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)         K.g.         96.72         334.95         32,396.36           12         232 sq.mm AAA conductor         K.M.         1,94,060.00         33.99         65,96,099.4t           13         Conductor         EA         648.42         648.42           14         Black Paint         Ltr         272.80         231.0         63,016.8t           15			ļ				
6 GI barbed wire anticlimbing device 3 Kg. Per support         Kg         99.20         693.00         68,745.60           7 Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)         KG         93.00         278.03         25,856.94           8 33KV pin insulator polymer         No.         595.20         693         4,12,473.60           9 Earthing of Support ( Coil Type )         No.         205.84         231         47,549.00           10 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing         K.g.         93.00         60.52         5,628.50           11 GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)         K.g.         96.72         334.95         32,396.36           12 232 sq.mm AAA conductor         K.M.         1,94,060.00         33.99         65,96,099.40           13 Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor         K.M.         1,94,060.00         33.99         65,96,099.40           14 Black Paint         Ltr         272.80         231.0         63,016.80           15 Yellow Colour Paint for Background         Ltr         272.80         462.0         1,26,033.60           A         Total Cost of materials         2,10,08,670.5         2,16,38,930.64           B <td></td> <td>Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of</td> <td></td> <td></td> <td></td> <td>6,464.23</td>		Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of				6,464.23	
7         Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)         KG         93.00         278.03         25,856.94           8         33KV pin insulator polymer         No.         595.20         693         4,12,473.60           9         Earthing of Support ( Coil Type )         No.         205.84         231         47,549.04           10         No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing         K.g.         93.00         60.52         5,628.50           11         GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)         K.g.         96.72         334.95         32,396.36           12         232 sq.mm AAA conductor         K.M.         1,94,060.00         33.99         65,96,099.40           13         Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor         EA         648.42         648.42           14         Black Paint         Ltr         272.80         231.0         63,016.80           15         Yellow Colour Paint for Background         Ltr         272.80         462.0         1,26,033.60           A         Total Cost of materials         2,10,08,670.52           B         Sub Total (A+B)         2,16,38,930.64	6		Kg	99.20	693.00	68,745.60	
9         Earthing of Support ( Coil Type )         No.         205.84         231         47,549.04           10         No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing         K.g.         93.00         60.52         5,628.55           11         GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)         K.g.         96.72         334.95         32,396.36           12         232 sq.mm AAA conductor         K.M.         1,94,060.00         33.99         65,96,099.40           13         Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor         EA         648.42         648.42         648.42         63,016.80           14         Black Paint         Ltr         272.80         231.0         63,016.80         63,016.80           15         Yellow Colour Paint for Background         Ltr         272.80         462.0         1,26,033.60	7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr.		93.00	278.03	25,856.94	
No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	8	33KV pin insulator polymer	No.	595.20	693	4,12,473.60	
10	9		No.	205.84	231	47,549.04	
12       232 sq.mm AAA conductor       K.M.       1,94,060.00       33.99       65,96,099.40         13       Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor       EA       648.42       648.42         14       Black Paint       Ltr       272.80       231.0       63,016.80         15       Yellow Colour Paint for Background       Ltr       272.80       462.0       1,26,033.60         A       Total Cost of materials       2,10,08,670.52         B       Stock, Storage & Insurance i.e 3% of A       6,30,260.12         C       Sub Total (A+B)       2,16,38,930.64         D       Contigency @ 3% of C       6,49,167.92         E       Tools & Plants @ 2% of C       4,32,778.62         F       Transportation @ 7.5% of C       16,22,919.80	10		K.g.	93.00	60.52	5,628.55	
13         Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor         EA         648.42         64	11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	334.95	32,396.36	
13         conductor         EA         648.42         648.42           14         Black Paint         Ltr         272.80         231.0         63,016.80           15         Yellow Colour Paint for Background         Ltr         272.80         462.0         1,26,033.60           A         Total Cost of materials         2,10,08,670.52           B         Stock, Storage & Insurance i.e 3% of A         6,30,260.12           C         Sub Total (A+B)         2,16,38,930.64           D         Contigency @ 3% of C         6,49,167.92           E         Tools & Plants @ 2% of C         4,32,778.63           F         Transportation @ 7.5% of C         16,22,919.80	12	232 sq.mm AAA conductor	K.M.	1,94,060.00	33.99	65,96,099.40	
15       Yellow Colour Paint for Background       Ltr       272.80       462.0       1,26,033.60         A       Total Cost of materials       2,10,08,670.52         B       Stock, Storage & Insurance i.e 3% of A       6,30,260.12         C       Sub Total (A+B)       2,16,38,930.64         D       Contigency @ 3% of C       6,49,167.92         E       Tools & Plants @ 2% of C       4,32,778.62         F       Transportation @ 7.5% of C       16,22,919.80	13	l	EA	648.42		-	
A         Total Cost of materials         2,10,08,670.52           B         Stock, Storage & Insurance i.e 3% of A         6,30,260.12           C         Sub Total (A+B)         2,16,38,930.64           D         Contigency @ 3% of C         6,49,167.92           E         Tools & Plants @ 2% of C         4,32,778.63           F         Transportation @ 7.5% of C         16,22,919.80	14	Black Paint	Ltr	272.80	231.0	63,016.80	
B Stock, Storage & Insurance i.e 3% of A 6,30,260.12  C Sub Total (A+B) 2,16,38,930.64  D Contigency @ 3% of C 6,49,167.92  E Tools & Plants @ 2% of C 4,32,778.62  F Transportation @ 7.5% of C 16,22,919.86	15	Yellow Colour Paint for Background	Ltr	272.80	462.0	1,26,033.60	
C         Sub Total (A+B)         2,16,38,930.64           D         Contigency @ 3% of C         6,49,167.92           E         Tools & Plants @ 2% of C         4,32,778.62           F         Transportation @ 7.5% of C         16,22,919.80	Α			Total Cost o	of materials	2,10,08,670.52	
D         Contigency @ 3% of C         6,49,167.92           E         Tools & Plants @ 2% of C         4,32,778.62           F         Transportation @ 7.5% of C         16,22,919.80	В	Sto	ock, Stora	ige & Insurance	i.e 3% of A	6,30,260.12	
D         Contigency @ 3% of C         6,49,167.92           E         Tools & Plants @ 2% of C         4,32,778.62           F         Transportation @ 7.5% of C         16,22,919.80	С			Sub <sup>-</sup>	Total (A+B)	2,16,38,930.64	
E         Tools & Plants @ 2% of C         4,32,778.63           F         Transportation @ 7.5% of C         16,22,919.80	D			Contigency	y @ 3% of C	6,49,167.92	
F Transportation @ 7.5% of C 16,22,919.80	E			Tools & Plant	s @ 2% of C	4,32,778.61	
	F		Т			16,22,919.80	
G   Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole   6,74,956.43	G	Erection Charges		•		6,74,956.43	

	ANNEXURE-8.16					
Part-	<u>Part-A</u>					
Const	ruction of 33 kV new line from Chikinia PSS to Raghunathpur PS					
Н	Erection Charges @ 10% of C (except Trf/Breaker/			' '	8,13,980.21	
<u> </u>	Erection Charges @ 20% o	f PSC pol			-	
J			Sui	m of (C to I)	2,58,32,733.61	
SI.	<u>Civil &amp; Services</u>			Total	Total	
No.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount	
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	127.05	8,25,825.00	
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	25.99	1,68,918.75	
К		•	Total Civi	& Services	9,94,743.75	
L				Total (J+K)	2,68,27,477.36	
М	Other overheads (Including 6% supervision	n charges)	of L (for 33 KV	Pin Points)	16,09,648.64	
N	Sub Total (L+M)					
0	Total GST @ 18% of (N)					
Р			Total GST	@ 1% of (N)	2,84,371.26	
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points					
	6% Supervision Charges S	Summary				
1	Other overheads (Including 6% supervision charges)	of L (for 3	3 KV DP Witho	out Isolator)	2,58,492.39	
2	Other overheads (Including 6% supervision charg				43,527.25	
3	Other overneads (including 6% supervision charges) of L (i			-	91,057.99	
4	Other overneads ( including 6% supervision charges) of L	(101 33 KV	Cut Point with	190 Degree Angle)	57,534.26	
5	Other overheads (Including 6% supervision	n charges)	of L (for 33 KV	Pin Points)	16,09,648.64	
		Tota	l (6% supervisi	on charges)	20,60,260.54	
	Gross Total Summa	ary				
1	Gross Total Material +Services (N+	O+P) for	33 KV DP With	out Isolator	54,34,371.73	
2	Gross Total Material +Services	(N+O+P)	for 33 KV DP W	/ith Isolator	9,15,087.92	
3	Gross Total Material +Services (N+O+P) for 33 I	KV Cut Po	int with 180 De	egree Angle	19,14,342.56	
4	Gross Total Material +Services (N+O+P) for 33	KV Cut P	oint with 90 De	egree Angle	12,09,562.02	
5	Gross Total Material +Se	ervices (N	+O+P) for 33 K	V Pin Points	3,38,40,179.94	
6	Gross Total	Material	and Services (1	L+2+3+4+5)	4,33,13,544.18	

## Part-B

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Raghunathpur PSS.

	No. of Bus isolator requirement			3	
	No. of VCB Requirement			1	
SI. 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	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.	1,302.00	8	10,416.00
12	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB, 10 metre mesh formation) = 20x2.36	KG	93.00	188.8	17,558.40
13	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,61,640.00	0.1	26,164.00
14	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	3	3,75,310.80
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	6,69,600.00	1	6,69,600.00
16	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	3	94,562.40
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	12	1,54,008.00
18	Control Cable 10Core x 2.5 mm <sup>2</sup>	Mtr	409.20	150	61,380.00
19	Control Cable 16Core x 2.5 mm <sup>2</sup>	Mtr	499.72	150	74,958.00
20	Control Cable 4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50	6,944.00
21	Control Cable 7Core x 2.5 mm <sup>2</sup>	Mtr	43.68	50	2,184.00
22	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	18	25,668.00

	ANNEXURE-8.16					
	<u>Part-B</u>					
	st of Construction for 1 no. of 33kv Outdoor Bay at Raghunathpur PSS		I	ı		
23	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	18	11,160.00	
24	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop	No.	1,339.20	18	24,105.60	
25	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	48	13,248.00	
26	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	96.72	54.872	5,307.22	
27	Black Paint	Ltr	272.80	4	1,091.20	
28	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40	
Α			Total Cost	of materials	19,32,795.69	
В	Sto	ck, Stora	age & Insurance	e i.e 3% of A	57,983.87	
С			Sub	Total (A+B)	19,90,779.56	
D			Contigenc	y @ 3% of C	59,723.39	
Е			Tools & Plant	s @ 2% of C	39,815.59	
F		T	ransportation	@ 7.5% of C	1,49,308.47	
G	Erection	Charges	@ 5% on Trf/B	reaker/Joist	34,484.40	
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole	e/HT stay	/ set/PSC pole/	GI Earthing)	1,29,036.31	
ı	Erection Charges @ 20% of	PSC po	le- Not to be us	sed for 33kv	-	
J			Su	m of (C to I)	24,03,147.72	
<u>Civil &amp; Services</u>						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
Α	VCB Foundation					
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	

	ANNEXURE-8.16					
Part- 1. Co	<u>B</u> st of Construction for 1 no. of 33kv Outdoor Bay at Raghunathpur PSS	5.				
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	
В	CT & PT Foundation			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	
С	Column as per Drawing Schedule-			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	
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	

#### **ANNEXURE-8.16** Part-B Cost of Construction for 1 no. of 33kv Outdoor Bay at Raghunathpur PSS. Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of Sam 301.00 89.64 26,981.64 columns, etc. for mass concrete. Steel reinforcement for R.C.C. work including straightening, cutting, 6 bending, placing in position and binding all complete: Thermo-109.00 734.58 80,069.22 Kg Mechanically Treated bars of grade Fe-500D or more. D Isolator Excavation (2.15x2.15x1.85mtr) & remove the debris using 1 necessary tools & machinery for excavation of cable trench & other Cum 482.00 14.18 6,832.35 civil works Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in 200.00 6.00 1,200.00 Cum depth, consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge. Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth 3 Cum 5130.00 0.85 4,363.07 level: 1:3:6 (1 Cement: 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size). 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 Cum 6500.00 8.55 55,575.00 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size). Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of 301.00 44.82 13,490.82 Sqm columns, etc. for mass concrete. Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Kg 109.00 367.29 40,034.61 Mechanically Treated bars of grade Fe-500D or more. Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth No. 3700.00 8 29,600.00 resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat **Total Civil & Services** Κ 4,75,318.33 Total (J+K) 28,78,466.04 L Other overheads (Including 6% supervision charges) of L М 1,72,707.96 Ν Sub Total (L+M) 30,51,174.01 Total GST @ 18% of (N) 0 5,49,211.32 Ρ Total Cess @ 1% of (N) 30,511.74 Gross Total Material +Services (N+O+P) 36,30,897.07 Q

# Part-C

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Chikinia PSS.

No. of Bus isolator requirement			3			
	No. of VCB Requirement	1				
SI. 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	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.	1,302.00	8	10,416.00	
12	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB, 10 metre mesh formation) = 20x2.36	KG	93.00	188.8	17,558.40	
13	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	КМ	2,61,640.00	0.1	26,164.00	
14	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	3	3,75,310.80	
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	6,69,600.00	1	6,69,600.00	
16	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	3	94,562.40	
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	12	1,54,008.00	
18	Control Cable 10Core x 2.5 mm <sup>2</sup>	Mtr	409.20	150	61,380.00	
19	Control Cable 16Core x 2.5 mm <sup>2</sup>	Mtr	499.72	150	74,958.00	
20	Control Cable 4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	50	6,944.00	
21	Control Cable 7Core x 2.5 mm <sup>2</sup>	Mtr	43.68	50	2,184.00	
22	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	18	25,668.00	

	ANNEXURE-8.16						
	Part-C						
	st of Construction for 1 no. of 33kv Outdoor Bay at Chikinia PSS.	l Na	620.00	10	11 100 00		
23	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	18	11,160.00		
24	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop	No.	1,339.20	18	24,105.60		
25	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	48	13,248.00		
26	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	96.72	54.872	5,307.22		
27	Black Paint	Ltr	272.80	4	1,091.20		
28	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40		
Α			Total Cost	of materials	19,32,795.69		
В	Stoc	k, Stora	ge & Insurance	e i.e 3% of A	57,983.87		
С			Sub	Total (A+B)	19,90,779.56		
D				y @ 3% of C	59,723.39		
E			Tools & Plant		39,815.59		
F			ransportation	_	1,49,308.47		
G	Erection C	harges	@ 5% on Trf/B	reaker/Joist	34,484.40		
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/	HT stay	set/PSC pole/	GI Earthing)	1,29,036.31		
1	Erection Charges @ 20% of	PSC pol			-		
J			Su	m of (C to I)	24,03,147.72		
SI.	<u>Civil &amp; Services</u>	1		Takal	Total		
No.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount		
A	VCB Foundation			Quantity	7		
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		

#### **ANNEXURE-8.16** Part-C Cost of Construction for 1 no. of 33kv Outdoor Bay at Chikinia PSS. Steel reinforcement for R.C.C. work including straightening, cutting, 7 bending, placing in position and binding all complete: Thermo-Kg 109.00 140.00 15,260.00 Mechanically Treated bars of grade Fe-500D or more. В CT & PT Foundation 0.00 BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable Cum 482.00 7.97 3,840.94 trench & other civil works Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in 2 Cum 200.00 4.50 900.00 depth, consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge. Supplying and filling in plinth with river sand under floors, including 3 Cum 900.00 0.36 326.70 watering, ramming, consolidating and dressing complete. Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth Cum 5130.00 0.36 1,862.19 level: 1:3:6 (1 Cement: 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size). 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 Cum 6500.00 2.36 15,356.25 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size). Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of Sqm 301.00 14.94 4,496.94 columns, etc. for mass concrete. Steel reinforcement for R.C.C. work including straightening, cutting, 7 bending, placing in position and binding all complete: Thermo-109.00 122.43 13,344.87 Kg Mechanically Treated bars of grade Fe-500D or more. С Column as per Drawing Schedule-0.00 Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary 1 Cum 482.00 51.31 24,731.30 tools & machinery for excavation of cable trench & other civil works Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in Cum 200.00 24.00 4.800.00 depth, consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge. Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth 3 Cum 5130.00 2.10 10,773.00 level: 1:3:6 (1 Cement: 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size).

	ANNEXURE-8.16						
Part-							
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	Isolator						
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	No.	3700.00	8	29,600.00		
К	Total Civil & Services						
L				Total (J+K)	28,78,466.04		
М	M Other overheads (Including 6% supervision charges) of L						
N	N Sub Total (L+M)						
0			Total GST @	18% of (N)	5,49,211.32		

	ANNEXURE-8.16						
	Part-C						
1. Cos	t of Construction for 1 no. of 33kv Outdoor Bay at Chikinia PSS.						
Р	Total Cess @ 1% of (N)	30,511.74					
Q	Gross Total Material +Services (N+O+P)	36,30,897.07					

		ANNEXURE-8.17 (ABSTRACT)				
		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name of th	e Division :-	CED				
Name of th	e Sub-Division : -	Niali				
Name of the Work :-		Proposal for Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS - 14.5km along with installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS and 1no. 5MVA, AVR Unit at Kulakapasi PSS to mitigate low voltage issue.				
Scope:-		<ol> <li>Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS.</li> <li>Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Kulakapasi PSS.</li> <li>Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.</li> </ol>				
Names of S	chemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
Sl. No.	Part	Description	Amount			
1	Α	Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS.	₹ 3,02,91,503.23			
2	В	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Kulakapasi PSS.	₹ 2,01,67,764.78			
3 C		Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.	₹ 3,45,75,571.62			
		Total Amount	₹ 8,50,34,839.62			
		Total Amount (In Cr.)	₹ 8.50			

	ANNEXURE-8.17						
<u>Part</u> Insta	<u>A</u> llation of 1No's 26.5/33KV 10MVA AVR Unit at Niali PSS.						
	No. of 33 KV AVR Unit			1			
	MATERIALS FOR 33 KV AV	R at Nic	ali PSS				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount		
1	26.5/33kV 10MVA Automatic Voltage Regulated Transformer (AVR).	EA	1,30,00,000.00	1	1,30,00,000.00		
2	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	970.92	800	7,76,736.00		
3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	8,517.56	12	1,02,210.72		
4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	6,488.92	4	25,955.68		
5	Pipe Earthing 40mm. GI Pipe	No.	1,302.00	4	5,208.00		
6	50x6mm GI Flat for earthing (2.4kg/mtr)	KG	93.00	48	4,464.00		
Α			Total Cost o		1,39,14,574.40		
В	S	tock, St	orage & Insurance				
C					1,43,32,011.63		
D E			Tools & Plant	y @ 3% of C	4,29,960.35 2,68,438.02		
F			Transportation (		10,74,900.87		
G	Frection Charge	s @ 5%	on Trf/Breaker/W		6,69,500.00		
H	Erection Charges @ 10% of C (except Trf/Breaker				459.79		
1	Erection Charges @ 20%				-		
J				m of (C to I)	1,67,75,270.67		
	<u>Civil &amp; Service</u>	<u>s</u>					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount		
1	Plinth for 10 MVA AVR	No.	8,32,187.22	1	8,32,187.22		
2	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.	Mtr.	94.50	800	75,600.00		
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	12	24,980.40		
4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	4	8,326.80		
5	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)						

5.1 Earth work excavation of soil

5.2 Earth work excavation of hard rock

5.3 Back filling with excavated soil outside and above the trench

700.00

202.00

1,720.00

Cum

Cum

Cum

84

36

120

58,800.00

61,920.00

24,240.00

	ANNEXURE-8.17						
<u>Part</u> Insta	- <u>A</u> Illation of 1No's 26.5/33KV 10MVA AVR Unit at Niali PSS.						
6	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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	4	14,800.00		
К			Total Civi	& Services	11,00,854.42		
L				Total (J+K)	1,78,76,125.09		
М	Other overheads (Including 6% supervision	on char	ges) of L (for 33 KV	VCB UNIT)	10,72,567.51		
N				Total (L+M)	1,89,48,692.60		
0			Total GST @		34,10,764.67		
Р				@ 1% of (N)	1,89,486.93		
Q	Gross Total Material +S		<u> </u>		2,25,48,944.19		
	Installation of 33kV Isolator- 5 no.s and 33l	KN ACR	- ZNO'S for HI AVK				
	No. of Bus isolator requirement  No. of VCB Requirement						
	No. of Bus isolator req	uireme	ont .				
SI.				Total	Total		
No.	Description of Materials	Unit	Unit Rate	Quantity	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	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	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	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	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	7	93,100.00		
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	1650	1,25,400.00		
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		

	ANNEXURE-8.17						
Part	Part-A						
Insta	allation of 1No's 26.5/33KV 10MVA AVR Unit at Niali PSS.						
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	570	43,320.00		
	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		
10	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	14	18,228.00		
11	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB, 10 metre mesh formation) = 20x2.36	KG	93.00	330.4	30,727.20		
12	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	КМ	2,61,640.00	0.3	78,492.00		
13	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	5	6,25,518.00		
14	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR-600-300-150/1-1 A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for Transformer protection	EA	7,31,600.00	2	14,63,200.00		
15	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	6	1,89,124.80		
16	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	21	2,69,514.00		
17	Control Cable 10Core x 2.5 mm <sup>2</sup>	Mtr	409.20	250	1,02,300.00		
18	Control Cable 16Core x 2.5 mm <sup>2</sup>	Mtr	499.72	250	1,24,930.00		
19	Control Cable 4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	100	13,888.00		
20	Control Cable 7Core x 2.5 mm <sup>2</sup>	Mtr	43.68	100	4,368.00		
21	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	30	42,780.00		
22	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	30	18,600.00		
23	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop	No.	1,339.20	30	40,176.00		
24	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	168	46,368.00		
25	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	96.72	96.026	9,287.63		
26	Black Paint	Ltr	272.80	7	1,909.60		
27	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20		
A1	Annihabla	T		of materials	36,70,585.78		
A2 A	Applicable		o make it Landed  Total landed Cost (		6,60,705.44 43,31,291.22		
B	S		torage & Insurance		1,29,938.74		
c				Total (A+B)	44,61,229.96		
D			Contigenc	y @ 3% of C	1,33,836.90		
E			Tools & Plant	s @ 2% of C	89,224.60		
F			Transportation (		3,34,592.25 73,160.00		
G							
<u> </u>	<u> </u>						
<u> </u>	Erection Charges @ 20% of PSC pole- Not to be used for 33kv  Sum of (C to I)						
<u> </u>	 Civil & Service	<u> </u>	Sui	ili oi (C to i)	53,17,526.95		
SI.		<u>=</u> 		Total	Total		
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount		
1	VCB as per Drawing Schedule- OPTCL/CIVIL/9.				-		
2	Excavation with back filling (2.15x1.4x1.2mtr)	Cum	214.00	7.22	1,545.08		
3	PCC (1:3:6)	Cum	4708.00	0.45	2,125.66		
4	RCC(1:1.5:3)	Cum	9095.00	3.70	33,651.50		
	100(1.1.3.3)	Cuiii	3033.00	J./0	33,031.30		

#### **ANNEXURE-8.17** Part-A Installation of 1No's 26.5/33KV 10MVA AVR Unit at Niali PSS. Column as per Drawing Schedule-0.00 6 Excavation with back filling (2.15x2.15x1.85mtr) Cum 214.00 153.93 32,940.86 PCC (1:3:6) Cum 4708.00 6.30 29,660.40 RCC(1:1.5:3) Cum 9095.00 42.30 3,84,718.50 Isolator 10 Excavation with back filling Cum 214.00 23.63 5,055.75 4708.00 1.42 6,673.59 11 PCC (1:3:6) Cum 12 RCC(1:1.5:3) Cum 9095.00 14.25 1,29,603.75 13 СТ 214.00 4.30 920.20 14 Excavation with back filling Cum 15 PCC (1:3:6) Cum 4708.00 0.22 1,016.93 1.72 16 RCC(1:1.5:3) Cum 9095.00 15,661.59 Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth 17 3,700.00 14 51,800.00 No. resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. **Total Civil & Services** K1 6,95,373.81 Applicable Taxes to make it Landed Cost @18% Κ2 1,25,167.29 Total landed Cost (K=K1+ K2) Κ 8,20,541.10 L Total (J+K) 61,38,068.05 Other overheads (Including 6% supervision charges) of L Μ 3,68,284.08 Sub Total (L+M) 65,06,352.13 Ν Total GST @ 18% of (N) 0 11,71,143.38 Ρ Total Cess @ 1% of (N) 65,063.52 Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT Q 77,42,559.04 **Gross Total Summary** Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT 1 2,25,48,944.19 2 Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT 77,42,559.04 3 Gross Total Material, Services and Inspection Fees (1+2+3) 3,02,91,503.23

Installation of 1No's 26.5/33KV 5MVA AVR Unit at Kulakapasi PSS.		ANNEYURE 0.47						
No. of 37 KV VE Unit   No. of 37 KV Automatic Voltage Regulated Transformer (AVR).   EA   65,00,000.00   1   65		ANNEXURE-8.17						
St.   Description of Materials   Unit   Unit Rate   Quantity   Amount		<del>-</del>						
St.   Description of Materials		No. of 33 KV VCB Unit			1			
Signature   Sign		<u>-</u>	akapas	si PSS				
Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG   2						Amount		
2 cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA- 20kA)  3 supply of Outdoor termination kits Heat Shrinkable type suitable for Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core  4 Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core  5 Pipe Earthing 40mm. GI Pipe  No. 1,302.00 4 5,208.00  6 S0x6mm GI Flat for earthing (2.4kg/mtr) KG 93.00 48 4,464.00  8 Stock, Storage & Insurance i.e 3% of A 2,22,437.23  C C SUBSTAN STORE SUBSTAN STORE SUBSTAN STORE SUBSTAN STORE SUBSTAN STORE SUBSTAN STORE SUBSTAN S	1	26.5/33kV 5MVA Automatic Voltage Regulated Transformer (AVR).	EA	65,00,000.00	1	65,00,000.00		
3 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core   Set   8,517.56   12   1,02,210.72	2	Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-	Mtr.	970.92	800	7,76,736.00		
Set   S,488.92   4   25,955.88	3		Set	8,517.56	12	1,02,210.72		
South   South   South   Stock   Storage & Insurance   12 % of A   2,24,48/mtr)	4	***	Set	6,488.92	4	25,955.68		
A Stock, Storage & Insurance i.e 3% of A 2,22,437.23  C Sub Total (A+B) 76,37,011.63  D Contigency @ 3% of C Sub Tools & Plants @ 2% of C 1,34,538.05  E C Tools & Plants @ 2% of C 2,29,110.35  E C Tools & Plants @ 2% of C 1,34,538.05  G Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 459,79  H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 459,79  J Erection Charges @ 20% of PSC pole- Not to be used for 33kv  Sum of (C to I) 89,08,645.67  Sul Tools & Pole Not to be used for 33kv  Sum of (C to I) 89,08,645.67  Sul Tools & Services  SI. Mo Description of Materials Unit Unit Rate Quantity 12, 12, 13, 13, 13, 13, 13, 13, 13, 13, 13, 13	5	Pipe Earthing 40mm. GI Pipe	No.	1,302.00	4	5,208.00		
B Stock, Storage & Insurance i.e 3% of A 2,22,437.23 C Sub Total (Ar-B) 76,37,011.63 C Contigency @ 3% of C 2,29,110.35 E COntigency @ 3% of C 1,345,538.02 F Tools & Plants @ 2% of C 1,345,538.02 F P Transportation @ 7.5% of C 5,72,775.87 G P P P P P P P P P P P P P P P P P P P	6	50x6mm GI Flat for earthing (2.4kg/mtr)	KG			4,464.00		
C Sub Total (A+B) 76,37,011.63  D Contigency @ 3% of C 2,29,110.35  Tools & Plants @ 2% of C 5,72,775.87  G FERCTION Charges @ 10% of C (except Trif/Breaker/WPB/ H-Pole 3,34,750.00  H Frection Charges @ 10% of C (except Trif/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 459.79  I Frection Charges @ 20% of PSC pole- Not to be used for 33kv 5.  Sum of (C to I) 89,08,645.67  Sum of (C to I) 89,08,645.67  Sum of (C to I) 89,08,645.67  Civil & Services  SI. Description of Materials  I Unit Rate Quantity  Laying, Commissioning & Testing of 33kv, 1Core, 4Runs, 400sqmm, XLPE insulation (extructed type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  B Frection of Outdoor termination kits Heat Shrinkable type suitable for 33kv, 1Core, 400sqmm, HT UG cable kits  E Frection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  E Farth work excavation of soil (1mtr. width X 1.2mtr. depth)  E Farth work excavation of soil (1mtr. width X 1.2mtr. depth)  Construction Earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance, including Installation of anthresistance, including Installation of anthresistance, including Installation of 3Mtr Gl Pipe 40mm/50mm including welding of if lat around pipe. BA has to supply of charcoal etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of Gl Pipe 40mm dia 3Mtr long is nscope of TPCODL. The installation will be done as per	Α					74,14,574.40		
D Contigency @ 3% of C 2,29,110.35 E Tools & Plants @ 2% of C 1,34,538.05 F Tools & Plants @ 2% of C 5,72,775.87 G Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole 7,755.87 G Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 459,79 I Erection Charges @ 20% of PSC pole-Not to be used for 33kv J Received Services  Sum of (C to I) 89,08,645.67  Sum of (C to I) 94,050 Bescription of Materials Unit Unit Rate Quantity Amount Quantity (Angum, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Set 2,081.70 12 24,980.40  Ferction of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits Set 2,081.70 4 8,326.80  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Set 2,081.70 4 8,326.80  Cum 700.00 84 58,800.00  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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx450mmx450mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	В	Stoc	k, Stor					
E   Tools & Plants @ 2% of C   1,34,538.02   F   Transportation @ 7.5% of C   5,72,775.87   G   Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole   3,34,750.00   H   Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)   459.79   I   Erection Charges @ 20% of PSC pole- Not to be used for 33kv	С							
F   Transportation @ 7.5% of C   5,72,775.87 G   Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole   3,34,750.00   459.75   1   Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)   459.75   1   Erection Charges @ 20% of PSC pole-Not to be used for 33k/								
Erection Charges @ 5% on Trf/Breaker/WPB/H-Pole   3,34,750.00					_			
H Erection Charges @ 10% of C (except Trf/Breaker/WPB/H-Pole/HT stay set/PSC pole) 459.79  I Erection Charges @ 20% of PSC pole- Not to be used for 33kv - Sum of (C to 1) 89,08,645.67    Sum of (C to 1)								
I Erection Charges @ 20% of PSC pole- Not to be used for 33kv June 1 Sum of (C to I) 89,08,645.67    Sum of (C to I) 89,08,645.67   Civil & Services								
Sum of (C to 1) 89,08,645.67  Civil & Services  SI. Description of Materials  Plinth for 5MVA AVR  1 Plinth for 5MVA AVR  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  3 Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  5.1 Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  5.2 Earth work excavation of soil  Cum 700.00 84 58,800.00  5.3 Back filling with excavated soil outside and above the trench  Cum 202.00 120 24,240.00  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 . Ba has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx450mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per								
SI. No Description of Materials Unit Unit Rate Quantity Amount  1 Plinth for SMVA AVR No. 6,73,016.72 1 6,73,016.72  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  3 Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  4 Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  5 Et 2,081.70 4 8,326.80  5 Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  5.1 Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  5.2 Earth work excavation of hard rock  Cum 700.00 84 58,800.00  5.3 Back filling with excavated soil outside and above the trench  Cum 202.00 120 24,240.00  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 3Mtr GI Pipe 40mm/50mm including welding of GI flat around 3Mtr GI Pipe 40mm/50mm including welding of GI flat around 3Mtr GI Pipe 40mm/50mm including welding of GI flat around 3Mtr GI Pipe 40mm/50mm including welding of GI flat around 3Mtr GI Pipe 40mm/50mm including welding of GI flat around 3Mtr GI Pipe 40mm/50mm including welding of GI flat around 3Mtr GI Pipe 40mm/50mm including welding of GI Flat around 3Mtr GI Pipe 40mm/50mm including welding of GI Flat around 3Mtr GI Pipe 40mm/50mm including welding of GI Flat around 3Mtr GI Pipe 40mm/50mm including welding of GI Flat around 3Mtr GI Pipe 40mm/50mm including welding of GI Flat around 3Mtr GI Pipe 40mm/50mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per								
SI. No Description of Materials Unit Unit Rate Quantity Amount  Plinth for 5MVA AVR Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Set 2,081.70 12 24,980.40  Frection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Set 2,081.70 4 8,326.80  Earth work excavation of soil (2mtr. width X 1.2mtr. depth)  S.1 Earth work excavation of hard rock Cum 1,720.00 36 61,920.00  S.2 Earth work excavation of hard rock Cum 202.00 120 24,240.00  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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	J	Civil & Sarvicas		Sui	11 01 (C to 1)	89,08,645.67		
No. Description of Materials  Plinth for 5MVA AVR  Plinth for 5MVA AVR  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil (2mt. width X 1.2mtr. depth)  Earth work excavation of hard rock  Cum 700.00 84 58,800.00  Earth work excavation of hard rock  Cum 1,720.00 36 61,920.00  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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	CI	<u>Civil &amp; Services</u>			Total			
Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Ereth work excavation of soil (1mtr. width X 1.2mtr. depth)  5.1 Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  5.2 Earth work excavation of hard rock  Cum 700.00 84 58,800.00  5.3 Back filling with excavated soil outside and above the trench  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 earth with bentonide powder, calculation of earth including welding of GI flat around pipe. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	No				Quantity			
XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  5.1 Earth work excavation of soil  5.2 Earth work excavation of hard rock  Cum 700.00 84 58,800.00  5.3 Back filling with excavated soil outside and above the trench  Construction 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. 8A has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	1		No.	6,/3,016./2	1	6,/3,016./2		
for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  5.1 Earth work excavation of soil  Earth work excavation of hard rock  Cum 700.00 84 58,800.00  5.2 Earth work excavation of hard rock  Cum 1,720.00 36 61,920.00  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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	2	XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench	Mtr.	94.50	800	75,600.00		
4 33kV, 1Core, 400sqmm, HT UG cable kits  5 Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  5.1 Earth work excavation of soil  5.2 Earth work excavation of hard rock  5.3 Back filling with excavated soil outside and above the trench  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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	3		Set	2,081.70	12	24,980.40		
5.1 Earth work excavation of soil  5.2 Earth work excavation of hard rock  5.3 Back filling with excavated soil outside and above the trench  Cum  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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	4		Set	2,081.70	4	8,326.80		
5.2 Earth work excavation of hard rock  5.3 Back filling with excavated soil outside and above the trench  Cum  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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	5	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)						
5.3 Back filling with excavated soil outside and above the trench  Cum  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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per			Cum		84	58,800.00		
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	5.2	Earth work excavation of hard rock	Cum	1,720.00	36	61,920.00		
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	5.3	Back filling with excavated soil outside and above the trench	Cum	202.00	120	24,240.00		
	6	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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	No.	3,700.00	4	14,800.00		

	ANNEXURE-8.17							
<u>Part</u>	<del></del>							
	Installation of 1No's 26.5/33KV 5MVA AVR Unit at Kulakapasi PSS.  K Total Civil & Services 9,41,683.92							
K			I otal Civi		9,41,683.92			
L	Other overheads ( Including 6% supervision	chargo	s) of L (for 22 K)	Total (J+K)	98,50,329.59			
M N	Other overneads (including 6% supervision	ciiaige		Total (L+M)	5,91,019.78 <b>1,04,41,349.37</b>			
0			Total GST @		18,79,442.89			
P				@ 1% of (N)	1,04,413.49			
Q	Gross Total Material +Serv	rices (N			1,24,25,205.74			
_	Installation of 33kV Isolator- 5 no.s and 33kv V		•					
	No. of Bus isolator requirement	- 		5				
	No. of VCB Requirement			2				
	No. of Bus isolator requires	nent						
SI.			_	Total	Total			
No	Description of Materials	Unit	Unit Rate	Quantity	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	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	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	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	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	7	93,100.00			
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	1650	1,25,400.00			
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			
	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			
10	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	14	18,228.00			
11	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation )= 20x2.36	KG	93.00	330.4	30,727.20			
12	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,61,640.00	0.3	78,492.00			
13	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	5	6,25,518.00			
14	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR-600-300-150/1-1 A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for Transformer protection	EA	7,31,600.00	2	14,63,200.00			

	ANNEXURE-8.17						
Part	<u>-B</u>						
Inst	allation of 1No's 26.5/33KV 5MVA AVR Unit at Kulakapasi PSS.		<u> </u>				
15	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	6	1,89,124.80		
16	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	21	2,69,514.00		
17	Control Cable 10Core x 2.5 mm <sup>2</sup>	Mtr	409.20	250	1,02,300.00		
18	Control Cable 16Core x 2.5 mm <sup>2</sup>	Mtr	499.72	250	1,24,930.00		
19	Control Cable 4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	100	13,888.00		
20	Control Cable 7Core x 2.5 mm <sup>2</sup>	Mtr	43.68	100	4,368.00		
21	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	30	42,780.00		
22	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	30	18,600.00		
23	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop	No.	1,339.20	30	40,176.00		
24	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	168	46,368.00		
25	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	96.72	96.026	9,287.63		
26	Black Paint	Ltr	272.80	7	1,909.60		
27	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20		
A1			Total Cost o		36,70,585.78		
A2	Applicable Tax		make it Landed (		6,60,705.44 43,31,291.22		
A B	Stor		age & Insurance		1,29,938.74		
С		,		Total (A+B)	44,61,229.96		
D				/ @ 3% of C	1,33,836.90		
E F			Tools & Plants Transportation (	_	89,224.60		
G	Erection C		6 @ 5% on Trf/Br		3,34,592.25 73,160.00		
Н	Erection Charges @ 10% of C (except Trf/Breaker/V				2,25,483.25		
ı	Erection Charges @ 20% of	PSC po			-		
J	Civil & Services		Sur	n of (C to I)	53,17,526.95		
SI.				Total	Total		
No	Description of Materials	Unit	Unit Rate	Quantity	Amount		
1	VCB as per Drawing Schedule- OPTCL/CIVIL/9.				-		
2	Excavation with back filling (2.15x1.4x1.2mtr)	Cum	214.00	7.22	1,545.08		
3	PCC (1:3:6)	Cum	4708.00	0.45	2,125.66		
4	RCC(1:1.5:3)	Cum	9095.00	3.70	33,651.50		
5	Column as per Drawing Schedule-			0.00	-		
6	Excavation with back filling (2.15x2.15x1.85mtr)	Cum	214.00	153.93	32,940.86		
7	PCC (1:3:6)	Cum	4708.00	6.30	29,660.40		
8	RCC(1:1.5:3)	Cum	9095.00	42.30	3,84,718.50		
9	Isolator						
10	Excavation with back filling	Cum	214.00	23.63	5,055.75		
11	PCC (1:3:6)	Cum	4708.00	1.42	6,673.59		
12	RCC(1:1.5:3)	Cum	9095.00	14.25	1,29,603.75		
12 13	RCC(1:1.5:3)	Cum	9095.00	14.25	1,29,603.75		
	RCC(1:1.5:3)	Cum	9095.00	4.30	1,29,603.75 920.20		

	ANNEXURE-8.17							
	Part-B							
	nstallation of 1No's 26.5/33KV 5MVA AVR Unit at Kulakapasi PSS.							
15	PCC (1:3:6)	PCC (1:3:6) Cum 4708.00 0.22						
16	RCC(1:1.5:3)	Cum	9095.00	1.72	15,661.59			
17	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	14	51,800.00			
K1	K1 Total Civil & Services							
К2	Applicable Taxes to make it Landed Cost @18%							
К		To	tal landed Cost	(K=K1+ K2)	8,20,541.10			
L				Total (J+K)	61,38,068.05			
М	Other overheads ( Incl	uding 6			3,68,284.08			
N				Total (L+M)	65,06,352.13			
0			Total GST @		11,71,143.38			
Р				@ 1% of (N)	,			
Q Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT					77,42,559.04			
	<u>Gross Total Summary</u>							
1	Gross Total Material +Ser		•		1,24,25,205.74			
2	Gross Total Material +Ser		•		77,42,559.04 2,01,67,764.78			
3	3 Gross Total Material, Services and Inspection Fees (1+2+3)							

#### **ANNEXURE-8.17** Part-B Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5kM. No. of 33 KV DP required Without Isolator 12 (Ref. Drawing No.- TPCODL-HVD-0004) **MATERIALS FOR 33 KV DP Without Isolator** SI. Total Total **Description of Materials** Unit **Unit Rate** Quantity No. Amount 1 WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) No 31,200.00 24 7,48,800.00 Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's 2 KG 76.00 745.68 56,671.68 channel required =( 2x9.56x3.25) Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = 93.00 47.5776 3 KG 4,424.72 Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length KG 839.664 76.00 63,814.46 4 1.96 Mtr., 5 no's channel required =( 5x7.14x1.96) 50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos 5 KG 76.00 741.312 56,339.71 angle required = (4\*4.5\*3.432)99.20 24 6 Danger Plate, 2 no's. 2,380.80 No. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 7 KG 93.00 7.2216 671.61 2 no's = (2x0.59x0.510)H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. 8 Pair 155.00 24 3.720.00 required (1 Pair) 9 H.T. Stay set (Complete) Set 1,302.00 24 31,248.00 62.00 48 2,976.00 10 H.T. Stay Insulator Type-C (2 No's.) No. 11 7/8 SWG Stay Wire 15kg /stay 93.00 360 33,480.00 K.g. 1,302.00 12 Gi Pipe Earthing 40mm. 3 Mtr. Long No. 12 15,624.00 50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 141.6 13 KG 93.00 13.168.80 mtr. For raising)= 5x2.36 14 GI barbed wire anticlimbing device 3 Kg. Per support Kg 99.20 72 7,142.40 Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr 15 KG 93.00 28.8864 2,686.44 length 8 no's = (8x0.59x0.510)595.20 16 33KV pin insulator polymer No. 36 21,427.20 17 H W fitting(B&S) 90KN,4 Bolt 620.00 44,640.00 No. 72 1,426.00 72 1,02,672.00 18 Disc insulator (B&S) 90 KN polymer No. 19 PG Clamp for 232 sq.mm AAA conductor NO. 1,426.00 72 1,02,672.00 20 147.132 14,230.61 GI Nut, Bolt & Washer of different sizes (12.261 Kg each DP without Isolator) K.g. 96.72 272.80 12 21 Black Paint Ltr 3,273.60 Yellow Colour Paint for Background 272.80 24 6,547.20 22 Ltr Α **Total Cost of materials** 13,38,611.22 Stock, Storage & Insurance i.e 3% of A В 40,158.34 C Sub Total (A+B) 13,78,769.56 D Contigency @ 3% of C 41.363.09 Tools & Plants @ 2% of C Ε 27,575.39 F Transportation @ 7.5% of C 1,03,407.72 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 38,563.20 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole) Н 51,784.61 ı Erection Charges @ 20% of PSC pole- Not to be used for 33kv J Sum of (C to I) 16,41,463.57 Civil & Services SI. Total Total

Unit

**Unit Rate** 

Quantity

Amount

**Description of Materials** 

No.

#### **ANNEXURE-8.17** Part-B Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5kM. 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 No. 2,250.00 24 54,000.00 1 (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.) 2 Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 13.2 85,800.00 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr Cu.mtr 6,500.00 2.7 17,550.00 Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, 3,700.00 4 No. 12 44,400.00 calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. **Total Civil & Services** K 2,01,750.00 L Total (J+K) 18,43,213.57 Μ Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) 1,10,592.81 Ν Sub Total (L+M) 19,53,806.38 Total GST @ 18% of (N) 0 3,51,685.15 Р Total CESS @ 1% of (N) 19,538.06 Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator Q 23,25,029.59 No. of 33 KV DP required With Isolator(Ref. Drawing No.- TPCODL-HVD-0004) 3 MATERIALS FOR 33 KV DP With Isolator SI. Total Total **Unit Rate** Unit **Description of Materials** No. Quantity Amount 31,200.00 1 WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) No 6 1,87,200.00 Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's 2 KG 76.00 246.648 18,745.25 channel required =( 2x9.56x4.3) Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = 93.00 3 KG 11.8944 1.106.18 (6x2.36x0.280) Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4 KG 76.00 92.106 7,000.06 4.3 Mtr., 1 no's channel required =( 1x7.14x4.3) Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 5 KG 76.00 184.212 14,000.11 Mtr., 2 no's channel required =( 2x7.14x4.3) Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length KG 76.00 368.424 6 28,000.22 4.3 Mtr., 4 no's channel required =( 4x7.14x4.3) 50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos 7 KG 76.00 266.058 20,220.41 angle required = (4\*4.5\*4.927)Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., 8 KG 76.00 17.136 1,302.34 each channel length 0.8 Mtr., 1 no's channel required =( 1x7.14x0.8) Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 9 KG 76.00 5.238 398.09 nos angle required = (1\*4.5\*0.388)Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos 10 76.00 KG 4.59 348.84 angle required = (1\*4.5\*0.340)Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length KG 76.00 28.68 11 2,179.68 0.5 mtr., 2 no's channel required =( 2x9.56x0.5) 99.20 595.20 12 Danger Plate, 2 no's. No. 6 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 13 KG 93.00 1.8054 167.90 2 no's = (2x0.59x0.510)H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. 14 Pair 155.00 6 930.00 required (1 Pair) 15 H.T. Stay set (Complete) Set 1,302.00 6 7,812.00 744.00 16 H.T. Stay Insulator Type-C (2 No's.) 12 No. 62.00 17 7/8 SWG Stay Wire 15kg /stay 93.00 90 8,370.00 K.g.

	ANNEXURE-8.17						
Part-L		4446					
_	nentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqr				7.042.00		
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	6	7,812.00		
1 19 1	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	93.00	169.92	15,802.56		
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	18	1,785.60		
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	7.2216	671.61		
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	9	1,15,506.00		
1 /3 1	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	3	1,59,009.00		
-	33KV pin insulator polymer	No.	595.20	9	5,356.80		
25	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	18	11,160.00		
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	18	25,668.00		
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	18	25,668.00		
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	66.45	6,427.04		
-	Black Paint	Ltr	272.80	3	818.40		
30	Yellow Colour Paint for Background	Ltr	272.80	6	1,636.80		
Α			Total Cost o	of materials	6,76,442.09		
В	Sto	ock, Stora	ge & Insurance	i.e 3% of A	20,293.26		
С			Sub <sup>-</sup>	Total (A+B)	6,96,735.35		
D			Contigency	y @ 3% of C	20,902.06		
Е			Tools & Plants	s @ 2% of C	13,934.71		
F		Ti	ransportation (	@ 7.5% of C	52,255.15		
G	Erection Charges	@ 5% on	Trf/Breaker/W	/PB/ H-Pole	9,640.80		
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H	-Pole/HT	stay set/GI Pol	e/PSC pole)	47,748.13		
- 1	Erection Charges @ 20% o	f PSC pol	e- Not to be us	sed for 33kv	-		
J	Civil 8 Samilage		Sui	m of (C to I)	8,41,216.20		
61	<u>Civil &amp; Services</u>			7.4.4	7-4-1		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
	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	6	13,500.00		
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	3.3	21,450.00		
4	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr  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.	Cu.mtr No.	6,500.00 3,700.00	0.675 6	4,387.50 22,200.00		
К							
L	L Total (J+K)						
М	M Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)						
N	N Sub Total (L+M)						
0	_ , ,						
Р	· · ·						
Q	Q Gross Total Material +Services (N+O) for 33 KV DP With Isolator 11,38,733.51						
No	No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD- 0002)  MATERIALS FOR 33 KV Cut Point with 180 Degree Angle						

<u>Part-B</u> Auamentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5kM.

Augn	Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5kM.							
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount			
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	15	4,68,000.00			
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	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.	93.00	79.296	7,374.53			
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.	99.20	15	1,488.00			
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	4.5135	419.76			
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	45	4,464.00			
8	Back Clamp for anticlimbing device 25X3 mm. flat, $0.59$ Kg/Mtr. Flat of $0.510$ mtr length 4 no's = $(4x0.59x0.510)$	KG	93.00	18.054	1,679.02			
9	33KV pin insulator polymer	No.	595.20	45	26,784.00			
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	90	55,800.00			
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	90	1,28,340.00			
12	Earthing of Support ( Coil Type )	EA	205.84	15	3,087.60			
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.93	365.49			
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	90	1,28,340.00			
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	73.185	7,078.45			
16	Black Paint	Ltr	272.80	15	4,092.00			
17	Yellow Colour Paint for Background	Ltr	272.80	30	8,184.00			
Α			Total Cost of	of materials	8,89,221.23			
В	Sto	ock, Stora	ge & Insurance	i.e 3% of A	26,676.64			
С			Sub '	Total (A+B)	9,15,897.87			
D			Contigency	y @ 3% of C	27,476.94			
E			Tools & Plant		18,317.96			
F		Т	ransportation (		68,692.34			
	Fraction Charges							
G	Erection Charges				24,102.00			
Н	Erection Charges @ 10% of C (except Trf/Breaker/				43,385.79			
I	Erection Charges @ 20% o	f PSC pol			-			
J			Sui	m of (C to I)	10,97,872.89			
	<u>Civil &amp; Services</u>		Γ					
SI.	Description of Materials	Unit	Unit Rate	Total	Total			
No.	,			Quantity	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	6,500.00	1.6875	10,968.75			
К .			i otai Civi	I & Services	<b>64,593.75</b> 11,62,466.64			
L								
M								
N 0								
P								
Q	GIOSS TOTAL MATERIAL TOELVILES (NTO) 101 55 K	Cut Po	IIIC MAICH TOO DE	PICE WIRE	14,66,335.42			
	No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No TPCODL-HVD-0003)							
	MATERIALS FOR 33 KV Cut Point with 90 De	gree Ang	<u>le</u>					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount			

	ANNEXURE-8.17					
Part-	<u>B</u>					
Augn	nentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqn	nm AAAC				
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	15	4,68,000.00	
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	975.12	74,109.12	
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	158.592	14,749.06	
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	175.5216	13,339.64	
5	Danger Plate, 1 no's.	No.	99.20	15	1,488.00	
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	4.5135	419.76	
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	45	4,464.00	
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	18.054	1,679.02	
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	60	35,712.00	
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	90	55,800.00	
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	90	1,28,340.00	
12	Earthing of Support ( Coil Type )	No.	205.84	15	3,087.60	
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.93	365.49	
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	90	1,28,340.00	
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	15	2,325.00	
16	H.T. Stay set (Complete )	Set	1,302.00	15	19,530.00	
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	15	930.00	
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	225	20,925.00	
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	169.65	16,408.55	
20	Black Paint	Ltr	272.80	15	4,092.00	
21	Yellow Colour Paint for Background	Ltr	272.80	30	8,184.00	
Α			Total Cost of	of materials	10,02,288.23	
В	Sto	ck, Stora	ge & Insurance	i.e 3% of A	30,068.65	
С			Sub <sup>-</sup>	Total (A+B)	10,32,356.88	
D			Contigency	/ @ 3% of C	30,970.71	
E			Tools & Plants	s @ 2% of C	20,647.14	
F		Т	ransportation (		77,426.77	
G	Erection Charges				24,102.00	
Н	Erection Charges @ 10% of C (except Trf/Breaker/				50,529.56	
<del></del>	Erection Charges @ 20% o				30,323.30	
j	Erection charges & 20% o	1 1 3C poi		m of (C to I)	12,36,033.05	
	Civil & Services		341	11 01 (0 10 1)	12,30,033.03	
SI.				Total	Total	
No.	Description of Materials	Unit	Unit Rate	Quantity	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	6,500.00	1.69	10,968.75	
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 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	15	33,750.00	
			Total Chil	9. Comica-	98,343.75	
<u>K</u>						
L M						
N	Care Commence ( mondaing on supervision endiges) of E (101 33			Total (L+M)	80,062.61 <b>14,14,439.41</b>	
0			Total GST @		2,54,599.09	
<u> </u>	10tal G31 & 10% 61 (14)					

	ANNEXURE-8.17							
Part-	Part-B							
Augn	nentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqn	nm AAAC	: - 14.5kM.					
Р				@ 1% of (N)	14,144.39			
Q	Gross Total Material +Services (N+O+P) for 33	KV Cut P	oint with 90 De	egree Angle	16,83,182.89			
33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No TPCODL-HVD-0001)								
	MATERIALS FOR 33 KV Pin Points							
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount			
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	210	65,52,000.00			
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	210				
3	Top bracket 100x50x6mm GI channel ( 2kg each)	<u> </u>	·	210	4,11,432.00			
		No.	186.00		39,060.00			
4	Danger Plate, 1 no's.	No.	99.20	210	20,832.00			
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	63.19	5,876.58			
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	630.00	62,496.00			
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	252.76	23,506.31			
8	33KV pin insulator polymer	No.	595.20	630	3,74,976.00			
	Earthing of Support ( Coil Type )	No.	205.84	210	43,226.40			
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	55.02	5,116.86			
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	V a	96.72	304.50	29,451.24			
		K.g.						
	232 sq.mm AAA conductor  Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	K.M. EA	1,94,060.00	46.35	89,94,681.00			
				210.0				
14 15	Black Paint Yollow Colour Paint for Packground	Ltr	272.80 272.80	210.0 420.0	57,288.00			
	Yellow Colour Paint for Background	Ltr			1,14,576.00			
Α			Total Cost o		1,67,34,518.39			
В	Sto	ock, Stora	ge & Insurance	i.e 3% of A	5,02,035.55			
С				Total (A+B)	1,72,36,553.94			
D			Contigence	y @ 3% of C	5,17,096.62			
Е			Tools & Plant	s @ 2% of C	3,44,731.08			
F		Т	ransportation (	@ 7.5% of C	12,92,741.55			
G	Erection Charges				3,37,428.00			
Н	Erection Charges @ 10% of C (except Trf/Breaker/				10,48,799.39			
					10,40,733.33			
<u> </u>	Erection Charges @ 20% o	1 PSC poi			-			
J			Sui	m of (C to I)	2,07,77,350.57			
	<u>Civil &amp; Services</u>							
SI.	Description of Materials	Unit	Unit Rate	Total	Total			
No.				Quantity	Amount			
_1_	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	115.50	7,50,750.00			
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			
3	Dismantalling of 148/232sqmm Conductor	km	10,800.00	45.00	4,86,000.00			
4	Dismantalling of 100/80sqmm Conductor	km	9,000.00		-			
К			Total Civi	l & Services	13,90,312.50			
L								
М								
N								
0								
P								
Q	Gross Total Material +Se	rvices (N-			2,34,977.23 <b>2,79,62,290.20</b>			
			, : :::		, -,,			
	6% Supervision Charges Summary	<u> </u>						

ANNEXURE-8.17						
Part-	<u>B</u>					
Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5kM.						
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)	1,10,592.81				
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)	54,165.22				
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	69,748.00				
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	80,062.61				
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)	13,30,059.78				
	Total (6% supervision charges)	16,44,628.43				
	Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	23,25,029.59				
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator	11,38,733.51				
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle	14,66,335.42				
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle	16,83,182.89				
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points	2,79,62,290.20				
6	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	3,45,75,571.62				

		ANNEXURE-8.18 (ABSTRACT)				
		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name c	of the Division :-	BAED				
Name o	of the Sub- n : -	Tangi				
Name o	Proposal for Augmentation of 33kv Bhusandpur fdr. 5.5 ckm line between Bharai Name of the Work :- Jankia PSS and Construction of 2No's 33 kV RMU with UG cable at Jankia PSS to roughly voltage issue and improve reliability.					
Scope:-		<ol> <li>Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.</li> <li>Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.</li> <li>Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.</li> </ol>				
Name	es of Schemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1	А	Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.	₹ 96,41,075.51			
2	В	<ol> <li>Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL).</li> <li>Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.</li> </ol>	₹ 79,49,699.30			
3	С	Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80			
		Total Amount	₹ 1,88,58,786.61			
		Total Amount (In Cr.)	₹ 1.89			
Total e	stimated cost is R	Rs. 1.89 Crore. (Under TPCODL Capex Scheme)				

	ANNEXURE-8.18					
Part- Cons	<u>A</u> truction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bha	rat Electi	ricals and Jank	ia PSS.		
	No. of 33 KV DP required Without Isolator			5		
	(Ref. Drawing No TPCODL-HVD-0004)					
	MATERIALS FOR 33 KV DP Without Isolator	ı	T			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	10	3,12,000.00	
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	93.00	19.824	1,843.63	
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.	99.20	10	992.00	
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	3.009	279.84	
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	10	1,550.00	
9	H.T. Stay set (Complete )	Set	1,302.00	10	13,020.00	
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	20	1,240.00	
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	150	13,950.00	
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	5	6,510.00	
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	59	5,487.00	
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	30	2,976.00	
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	12.036	1,119.35	
16	33KV pin insulator polymer	No.	595.20	15	8,928.00	
	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	30	18,600.00	
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	30	42,780.00	
19	PG Clamp for 148 sg.mm AAA conductor	NO.	768.80	30	23,064.00	
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	61.305	5,929.42	
21	Black Paint	Ltr	272.80	5	1,364.00	
22	Yellow Colour Paint for Background	Ltr	272.80	10	2,728.00	
Α			Total Cost of	of materials	5,38,038.68	
В	Sto	ck, Stora	ge & Insurance	e i.e 3% of A	16,141.16	
С		-		Total (A+B)	5,54,179.84	
D				y @ 3% of C	16,625.40	
E			Tools & Plant		11,083.60	
 F		т	ransportation (		-	
	Erection Charges				41,563.49	
G					16,068.00 19,546.17	
H .	H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)					
<u> </u>	Erection Charges @ 20% of	PSC pol			-	
J			Su	m of (C to I)	6,59,066.49	
SI.	<u>Civil &amp; Services</u> Description of Materials	Unit	Unit Rate	Total	Total	
No.	Fixing of 23/V/line Complete stay and includes 4) Trum By 11, According to 10, Co.			Quantity	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	No.	2,250.00	10	22,500.00	
	size 500X500X1500 mm.)					

Cu.mtr

Cu.mtr

6,500.00

6,500.00

5.5

1.125

35,750.00

7,312.50

Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr

Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr

	ANNEXURE-8.18					
Part-	4					
Const	ruction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bha	rat Electr	icals and Jank	ia PSS.		
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	5	18,500.00	
К			Total Civi	& Services	84,062.50	
L				Total (J+K)	7,43,128.99	
М	Other overheads (Including 6% supervision charges) of	of L (for 3	3 KV DP Witho	ut Isolator)	44,587.74	
N			Sub	Total (L+M)	7,87,716.73	
0			Total GST @	18% of (N)	1,41,789.01	
Р			Total CESS (	- · · ·	7,877.17	
Q	Gross Total Material +Services (N+C	)+P) for 3	3 KV DP Witho	out Isolator	9,37,382.91	
	No. of 22 VIV Cut Point with 100 Power Annie					
	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 A	Angle				
SI.				Total	Total	
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount	
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	5	1,56,000.00	
,	Straight Cross Arm Channel $100 \times 50 \times 6$ mm, $9.56 \times 6$ /mtr, each channel length $1.7 \times 1.7$ Mtr., $2 \times 1.7$ No's of Channel = $(2 \times 9.56 \times 1.7)$	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.	93.00	26.432	2,458.18	
4	Straight Cross Arm Top Channel $100 \times 50 \times 6$ mm, $9.56 \times 6$ /mtr, each channel length $0.306 \times 10^{-2}$ Mtr., $2 \times 10^{-2}$ No's of Channel = $(2 \times 9.56 \times 0.306)$	K.g.	76.00	29.2536	2,223.27	
5	Danger Plate, 1 no's.	No.	99.20	5	496.00	
6	Back Clamp for danger Plate 25X3 mm. flat, $0.59$ Kg/Mtr. Flat of $0.510$ mtr length 1 no's = $(1x0.59x0.510)$	KG	93.00	1.5045	139.92	
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	15	1,488.00	
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	6.018	559.67	
	33KV pin insulator polymer	No.	595.20	15	8,928.00	
	H W fitting(B&S)90KN,4 Bolt	No.	620.00	30	18,600.00	
	Disc insulator (B&S)90 KN polymer Earthing of Support ( Coil Type )	No. EA	1,426.00 205.84	30 5	42,780.00 1,029.20	
	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.31	121.83	
14	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	30	23,064.00	
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	24.395	2,359.48	
16	Black Paint	Ltr	272.80	5	1,364.00	
17	Yellow Colour Paint for Background	Ltr	272.80	10	2,728.00	
Α			Total Cost o		2,76,691.08	
В	Sto	ck, Stora	ge & Insurance		8,300.73	
С				Total (A+B)	<b>2,84,991.81</b> 8,549.75	
D	Contigency @ 3% of C					
Е	Tools & Plants @ 2% of C					
F	' -					
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole					
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)					
ı	Erection Charges @ 20% of PSC pole- Not to be used for 33kv					
J Sum of (C to I)						
	<u>Civil &amp; Services</u>					
SI. 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	2.75	17,875.00	
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.5625	3,656.25	
K			Total Civil	& Services	21,531.25	
L				Total (J+K)	3,62,612.22	

	ANNEXURE-8.18					
Part-	=					
$\vdash$	ruction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bhai				21,756.73	
M						
N				Total (L+M)	3,84,368.95	
0			Total GST @		69,186.41	
Р				@ 1% of (N)	3,843.69	
Q	Gross Total Material +Services (N+O+P) for 33 KV	/ Cut Poi	nt with 180 De	gree Angle	4,57,399.05	
	No. of 33 KV Cut Point with 90 Degree Angle					
	(Ref. Drawing No TPCODL-HVD-0003)			5		
	MATERIALS FOR 33 KV Cut Point with 90 Degree A	ngle				
SI.	Description of Materials	Unit	Unit Rate	Total	Total	
No.	Description of Materials	Onit	Onit Rate	Quantity	Amount	
	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	5	1,56,000.00	
1 7 1	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr.,	K.g.	76.00	325.040	24,703.04	
	4 No's of Channel = (4x 9.56x1.7) Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required =	_				
1 3 1	(16x2.36x0.280)	K.g.	93.00	52.864	4,916.35	
	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306	14	70.00	50.507	4 *** 5 ==	
4	Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	58.507	4,446.55	
	Danger Plate, 1 no's.	No.	99.20	5	496.00	
l h l	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's =	KG	93.00	1.505	139.92	
	(1x0.59x0.510)	V.a.	00.20	15	1 400 00	
	GI barbed wire anticlimbing device 3 Kg. Per support  Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4	Kg	99.20	15	1,488.00	
1 X I	no's = (4x0.59x0.510)	KG	93.00	6.018	559.67	
	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	20	11,904.00	
-	H W fitting(B&S)90KN,4 Bolt	No.	620.00	30	18,600.00	
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	30	42,780.00	
12	Earthing of Support ( Coil Type )	No.	205.84	5	1,029.20	
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.31	121.83	
14	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	30	23,064.00	
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1	Pair	155.00	5	775.00	
	Pair)					
	H.T. Stay set (Complete )	Set	1,302.00	5	6,510.00	
-	H.T. Stay Insulator Type-C (2 No's.) 7/8 SWG Stay Wire 15kg /stay	No. K.g.	62.00 93.00	5 75	6,975.00	
	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	56.55	5,469.52	
	Black Paint	Ltr	272.80	5	1,364.00	
	Yellow Colour Paint for Background	Ltr	272.80	10	2,728.00	
A			Total Cost o	of materials	3,14,380.08	
В	Sto	ck, Stora	ge & Insurance	i.e 3% of A	9,431.40	
С	Sub Total (A+B)					
D						
E						
F						
G					8,034.00	
H .	Erection Charges @ 10% of C (except Trf/Breaker/\			· · · · · · · · · · · · · · · · · · ·	14,812.44	
	Erection Charges @ 20% of PSC pole- Not to be used for 33kv					
J	Sum of (C to I) <u>Civil &amp; Services</u>				3,87,134.35	
SI.				Total	Total	
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount	
	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.75	17,875.00	
2	Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.56	3,656.25	

	ANNEXURE-8.18					
Part-	<u>A</u>					
Const	 truction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bha	rat Electr	icals and Jank	ia PSS.		
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, 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	5	11,250.00	
К		•	Total Civi	& Services	32,781.25	
L				Total (J+K)	4,19,915.60	
М	Other overheads (Including 6% supervision charges) of L (for 33 H	(V Cut Po	int with 90 Deg	gree Angle)	25,194.94	
N			Sub	Total (L+M)	4,45,110.54	
0			Total GST @	18% of (N)	80,119.90	
Р			Total CESS	@ 1% of (N)	4,451.11	
Q	Gross Total Material +Services (N+O) for 33 l	KV Cut Po	int with 90 De	gree Angle	5,29,681.54	
	33 Kv Line Length In KM with 40 Mtr. Span (Ref. Drawing No TPCODL-HVD-0001)			5.5		
	MATERIALS FOR 33 KV Pin Points					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	77	24,02,400.00	
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	77	1,50,858.40	
3	Top bracket 100x50x6mm GI channel ( 2kg each)	No.	186.00	77	14,322.00	
4	Danger Plate, 1 no's.	No.	99.20	77	7,638.40	
5	Back Clamp for danger Plate 25X3 mm. flat, $0.59$ Kg/Mtr. Flat of $0.510$ mtr length 1 no's = $(1x0.59x0.510)$	KG	93.00	23.17	2,154.74	
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	231.00	22,915.20	
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	92.68	8,618.98	
8	33KV pin insulator polymer	No.	595.20	231	1,37,491.20	
9	Earthing of Support ( Coil Type )	No.	205.84	77	15,849.68	
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	20.17	1,876.18	
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	111.65	10,798.79	
12	148 sq.mm AAA conductor	K.M.	1,01,680.00	17.00	17,28,051.60	
13	Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor  Black Paint	EA Ltr	405.27 272.80	77.0	21,005.60	
15	Yellow Colour Paint for Background	Ltr	272.80	154.0	42,011.20	
A	Tellow Colour valleto. Daoigramm		Total Cost of		45,65,991.97	
В	Sto	ck, Stora	ge & Insurance		1,36,979.76	
С				Total (A+B)	47,02,971.73	
D				y @ 3% of C	1,41,089.15	
E			Tools & Plant		94,059.43	
F	Transportation @ 7.5% of C					
G	Erection Charges				3,52,722.88 1,23,723.60	
Н	Erection Charges @ 10% of C (except Trf/Breaker/				2,22,849.97	
ı	Erection Charges @ 20% of	F PSC pol	e- Not to be us	ed for 33kv	=	
J			Sui	m of (C to I)	56,37,416.77	
	<u>Civil &amp; Services</u>					
SI.	Description of Materials	Unit	Unit Rate	Total	Total	
No.	, ,			Quantity	Amount	
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	42.35	2,75,275.00	
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	8.66	56,306.25	
3 <b>K</b>	Dismantalling of 80/100 sqmm Conductor	KM	9,000.00	16.50	1,48,500.00	
L			TOTAL CIVI	Total (J+K)	4,80,081.25 61,17,498.02	
M	Other overheads (Including 6% supervision	charges)	of L (for 33 KV		3,67,049.88	
	1	01	,	7	-,- ,50	

ANNEXURE-8.18						
Part-A						
Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.						
N	Sub Total (L+M)	64,84,547.91				
0	Total GST @ 18% of (N)	11,67,218.62				
Р	Total CESS @ 1% of (N)	64,845.48				
Q	Gross Total Material +Services (N+O) for 33 KV Pin Points	77,16,612.01				
	6% Supervision Charges Summary					
1 Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)						
2 Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)						
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	21,756.73				
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	25,194.94				
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)	3,67,049.88				
	Total (6% supervision charges)	4,58,589.29				
	Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	9,37,382.91				
2	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator	-				
3	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle	4,57,399.05				
4	Gross Total Material +Services (N+O) for 33 KV Cut Point with 90 Degree Angle	5,29,681.54				
5	Gross Total Material +Services (N+O) for 33 KV Pin Points	77,16,612.01				
6						

### Part-B

- 1. Construction of 2No's 33 kV RMU (1no LLVV, 1no LLLL).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.

# **Supply Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	90		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	270	1,337.13	3,61,025.10
1.3	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	6	5,245.00	31,470.00
1.4	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	4,894.00	58,728.00
_					
2	Supply of 33kV RMU		1		
d f	No. of 33kV 4Way RMU (LLVV) No. of 33kV 4Way RMU (LLLL)	nos.	1		
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	1	19,59,421.00	19,59,421.00
3	Earthing				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	26.40	93.00	2,455.20
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	4	1,302.00	5,208.00
4	FRTU and OFC for RMU SCADA Automation				
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	4	7,535.00	30,140.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2	2,19,420.00	4,38,840.00
	Sub Total (Supply Portion) (in I	Rs.)			52,22,551.30

# **Erection Portion**

SI. No.	Description of items Unit		Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	270	94.50	25,515.00
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

### Part-B

- 1. Construction of 2No's 33 kV RMU (1no LLVV, 1no LLLL).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.

Z. Lay	2. Laying of 33kV 3k 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed kivio.							
1.4	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40			
2	Erection, Commissioning, Wiring and Testing of 33kV RMU							
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00			
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	1	8,000.00	8,000.00			
3	FRTU and OFC for RMU SCADA Automation							
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	4.0	1,225.07	4,900.28			
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2.0	6,124.36	12,248.72			
	Sub Total (Erection Portion) (in	Rs.)			96,134.60			
	ortion			D-1-				
SI. 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)							
1.1.a	Earth work excavation of <b>soil</b>	Cum	75.6	700.00	52,920.00			
1.1.b	Earth work excavation of hard rock	Cum	32.4	1,720.00	55,728.00			
1.2	Back filling with excavated soil outside and above the trench	Cum	108	202.00	21,816.00			
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			
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	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.	0	1,012.00	-			
	Sub Total (Civil Portion) (in R	s.)			2,61,797.80			
Α	Sub Total (Supply Portion)				52,22,551.30			
В	Stock, Storage & Insurance @ 3 % of A				1,56,676.54			
С	C Sub Total (A+B)							

### Part-B

- 1. Construction of 2No's 33 kV RMU (1no LLVV, 1no LLLL).
- 2. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.

Contingency @ 3 % of C	1,61,376.84
Tools & Plants Charges @ 2% of C (considered for earthing items)	50.58
Transportation @ 7.5% of C	4,03,442.09
Erection Charges @ 10% of earthing items	252.89
Total (C+D+E+F+G)	59,44,350.22
Sub Total (Erection Portion + Civil Portion)	3,57,932.40
Total Cost (H+I)	63,02,282.62
Other Overhead /(including Supervision Charges) @ 6 % of J	3,78,136.96
Total Estimated Capital Cost i.e. (J+K)	66,80,419.58
GST @ 18% of L	12,02,475.52
CESS @ 1% of L	66,804.20
Gross Total Material and Services (L+M+M1)	79,49,699.30
	Tools & Plants Charges @ 2% of C (considered for earthing items)  Transportation @ 7.5% of C  Erection Charges @ 10% of earthing items  Total (C+D+E+F+G)  Sub Total (Erection Portion + Civil Portion)  Total Cost (H+I)  Other Overhead /(including Supervision Charges) @ 6 % of J  Total Estimated Capital Cost i.e. (J+K)  GST @ 18% of L  CESS @ 1% of L

#### Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.

# Supply Portion

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)		
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories						
а	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	120				
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	360	970.92	3,49,531.20		
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	8,517.56	1,02,210.72		
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	6,488.92	77,867.04		
	Sub Total (Supply Portion) (in Rs.)						

### **Erection Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)	
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare					
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruted type) UG cable in trefoil formation by open trench method.	Mtr.	360	94.50	34,020.00	
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40	
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40	
	Sub Total (Erection Portion) (in Rs.)					
					_	

# **Civil Portion**

SI. 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)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	100.8	700.00	70,560.00
1.1.b	Earth work excavation of hard rock	Cum	43.2	1,720.00	74,304.00
1.2	Back filling with excavated soil outside and above the trench	Cum	144	202.00	29,088.00
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.	4	1,012.00	4,048.00
	Sub Total (Civil Portion) (in Rs.)				
Α	Sub Total (Supply Portion)				5,29,608.96
В	Stock, Storage & Insurance @ 3 % of A				15,888.27
С	Sub Total (A+B)				5,45,497.23

#### **ANNEXURE-8.18** Part-B Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR. Contingency @ 3 % of C 16,364.92 Ε Tools & Plants Charges @ 2% of C (considered for earthing items) F Transportation @ 7.5% of C 40,912.29 G Erection Charges @ 10% of earthing items Total (C+D+E+F+G) 6,02,774.44 Sub Total (Erection Portion + Civil Portion) 4,02,467.20 J Total Cost (H+I) 10,05,241.64 Κ Other Overhead /(including Supervision Charges) @ 6 % of J 60,314.50 L Total Estimated Capital Cost i.e. (J+K) 10,65,556.14 Μ GST @ 18% of L 1,91,800.10 Μ1 CESS @ 1% of L 10,655.56 Ν Grand Total (L+M+M1) 12,68,011.80

ANNEXURE-8.19 (ABSTRACT)								
TP CENTRAL ODISHA DISTRIBUTION LIMITED								
Name of the	e Division :-	NYED						
Name of the Sub-Division : - Itamati								
Name of the	e Work :-	Proposal for Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS and 5MVA AVR Unit at Hatabasta PSS to mitigate low voltage issue.						
Scope:-		1. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS. 2. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta PSS.						
Names of Schemes: - TPCODL CAPEX (FY 23-24)								
	ABSTRACT OF ESTIMATE							
CL No.	Dowl	Description	Amarint					

Sl. No.	Part	Description	Amount
1	А	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS.	₹ 2,01,67,764.78
2	В	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta PSS.	₹ 2,01,67,764.78
		Total Amount	₹ 4,03,35,529.56
		Total Amount (In Cr.)	₹ 4.03

Total estimated cost is Rs. 4.03 Crore. (Under TPCODL Capex Scheme)

	ANNEXURE-8.19								
Part-B									
Construction of 1No's 26.5/33KV 5MVA AVR Unit at Bolagarh PSS.									
	No. of 33 KV AVR Unit			1					
MATERIALS FOR 33 KV AVR at Bolagarh PSS									
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount				
1	26.5/33kV 5MVA Automatic Voltage Regulated Transformer (AVR).	EA	65,00,000.00	1	65,00,000.00				
, , ,	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	970.92	800	7,76,736.00				
3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	8,517.56	12	1,02,210.72				
_ / _	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	6,488.92	4	25,955.68				
-	Pipe Earthing 40mm. GI Pipe	No.	1,302.00	4	5,208.00				
	50x6mm GI Flat for earthing (2.4kg/mtr)	KG	93.00	48	4,464.00				
Α		1 6:	Total Cost o		74,14,574.40				
В	Sto	ck, Stor	age & Insurance		2,22,437.23				
С					76,37,011.63				
D			Tools & Plants	/ @ 3% of C	2,29,110.35				
E F		-	Transportation (		1,34,538.02 5,72,775.87				
G	Erection Charges (				3,34,750.00				
Н	Erection Charges @ 10% of C (except Trf/Breaker/V				459.79				
-''	Erection Charges @ 20% of Execution Charges @ 20% of				459.79				
<u> </u>	Election changes & 20% of	1 30 pc		m of (C to I)	89,08,645.67				
	<u>Civil &amp; Services</u>								
	Description of Materials   Unit   Unit Rate   Total								
SI.	Description of Materials	Unit	Unit Rate		Amount				
No.	Description of Materials  Plinth for 5MVA AVR	<b>Unit</b>		Total Quantity					
<b>No.</b> 1 2			<b>Unit Rate</b> 6,73,016.72 94.50	Quantity	Amount 6,73,016.72 75,600.00				
1 2	Plinth for 5MVA AVR  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm,	No.	6,73,016.72	Quantity 1	6,73,016.72				
2 3 4	Plinth for 5MVA AVR  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	No.	6,73,016.72 94.50	Quantity 1 800	6,73,016.72 75,600.00				
No.  1  2  3  4  5	Plinth for 5MVA AVR  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)	No. Mtr.	94.50 2,081.70 2,081.70	<b>Quantity</b> 1 800 12	6,73,016.72 75,600.00 24,980.40 8,326.80				
3 4 5 5.1	Plinth for 5MVA AVR  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil	No. Mtr.	94.50 2,081.70 700.00	Quantity       1       800       12       4       84	6,73,016.72 75,600.00 24,980.40 8,326.80 58,800.00				
3 4 5 5.1 5.2	Plinth for 5MVA AVR  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil  Earth work excavation of hard rock	No. Mtr. Set	94.50 2,081.70 2,081.70	Quantity       1       800       12       4	6,73,016.72 75,600.00 24,980.40 8,326.80 58,800.00 61,920.00				
3 4 5 5.1 5.2	Plinth for 5MVA AVR  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil	No. Mtr. Set Set	94.50 2,081.70 700.00	Quantity       1       800       12       4       84	6,73,016.72 75,600.00 24,980.40 8,326.80 58,800.00				
3 4 5 5.1 5.2 5.3	Plinth for 5MVA AVR  Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.  Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits  Earth work excavation of soil (1mtr. width X 1.2mtr. depth)  Earth work excavation of soil  Earth work excavation of hard rock	No.  Mtr.  Set  Set  Cum  Cum	94.50 2,081.70 2,081.70 700.00 1,720.00	900 12 4 84 36	6,73,016.72 75,600.00 24,980.40 8,326.80 58,800.00 61,920.00				

	ANNEXURE-8.19							
Part-								
	truction of 1No's 26.5/33KV 5MVA AVR Unit at Bolagarh PSS.			Total (I+K)	00 50 220 50			
L M	Total (J+K) 98,50,329.59 Other overheads (Including 6% supervision charges) of L (for 33 KV VCB UNIT) 5,91,019.78							
N								
0	SubTotal (L+M)         1,04,41,349.3           Total GST @ 18% of (N)         18,79,442.8							
P				@ 1% of (N)	1,04,413.49			
Q	Gross Total Material +Sen	vices (N			1,24,25,205.74			
	Installation of 33kV Isolator- 5 no.s and 33kv VCB-				, , _, _,			
No. of Bus isolator requirement 5								
	No. of VCB Requirement			2				
	No. of Bus isolator requireme	nt_						
SI.	Description of Materials	Unit	Unit Rate	Total	Total			
No.	T. 1. C.I. Columny / 7. 25 material and appropriation of 2. No. of 150V7CVC 5 man			Quantity	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	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	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	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	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	7	93,100.00			
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	1650	1,25,400.00			
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			
	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			
10	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	14	18,228.00			
11	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB, 10 metre mesh formation) = 20x2.36	KG	93.00	330.4	30,727.20			
12	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,61,640.00	0.3	78,492.00			
13	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	5	6,25,518.00			
14	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR-600-300-150/1-1 A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for Transformer protection	EA	7,31,600.00	2	14,63,200.00			
15	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	6	1,89,124.80			
16	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	21	2,69,514.00			
17	Control Cable 10Core x 2.5 mm <sup>2</sup>	Mtr	409.20	250	1,02,300.00			
18	Control Cable 16Core x 2.5 mm <sup>2</sup>	Mtr	499.72	250	1,24,930.00			
	!							

	ANNEXURE-8.19				
Part-	В				
	truction of 1No's 26.5/33KV 5MVA AVR Unit at Bolagarh PSS.				
19	Control Cable 4Core x 2.5 mm <sup>2</sup>	Mtr	138.88	100	13,888.00
20	Control Cable 7Core x 2.5 mm <sup>2</sup>	Mtr	43.68	100	4,368.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	30	42,780.00
22	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	30	18,600.00
23	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop	No.	1,339.20	30	40,176.00
24	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	168	46,368.00
25	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	96.72	96.026	9,287.63
26	Black Paint	Ltr	272.80	7	1,909.60
27	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20
A1			Total Cost o		36,70,585.78
A2	Applicable Ta		make it Landed		6,60,705.44
Α			al landed Cost (		43,31,291.22
В	Sto	ck, Stor	age & Insurance		1,29,938.74
С				Total (A+B) y @ 3% of C	44,61,229.96
D E			Tools & Plant		1,33,836.90 89,224.60
F			Transportation (	_	3,34,592.25
G	Erection (		6 @ 5% on Trf/B		73,160.00
Н	Erection Charges @ 10% of C (except Trf/Breaker/V				2,25,483.25
ı	Erection Charges @ 20% of	PSC po	ole- Not to be us	sed for 33kv	-
J			Su	m of (C to I)	53,17,526.95
	<u>Civil &amp; Services</u>				
SI.	Description of Materials	Unit	Unit Rate	Total	Total
No.				Quantity	Amount
1	VCB as per Drawing Schedule- OPTCL/CIVIL/9.				-
2	Excavation with back filling (2.15x1.4x1.2mtr)	Cum	214.00	7.22	1,545.08
3	PCC (1:3:6)	Cum	4708.00	0.45	2,125.66
4	RCC(1:1.5:3)	Cum	9095.00	3.70	33,651.50
5	Column as per Drawing Schedule-			0.00	_
6	Excavation with back filling (2.15x2.15x1.85mtr)	Cum	214.00		32,940.86
7	PCC (1:3:6)	Cum	4708.00		29,660.40
8	RCC(1:1.5:3)	Cum	9095.00	42.30	3,84,718.50
9	Isolator				
10	Excavation with back filling	Cum	214.00	23.63	5,055.75
11	PCC (1:3:6)	Cum	4708.00	1.42	6,673.59
12	RCC(1:1.5:3)	Cum	9095.00	14.25	1,29,603.75
13	ст				
14	Excavation with back filling	Cum	214.00	4.30	920.20
15	PCC (1:3:6)	Cum	4708.00	0.22	1,016.93
16	RCC(1:1.5:3)	Cum	9095.00	1.72	15,661.59
17	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	14	51,800.00
K1				I & Services	6,95,373.81
K2	Applicable Ta		make it Landed		1,25,167.29
K		To	tal landed Cost	(K=K1+ K2)	8,20,541.10

	ANNEXURE-8.19								
Part-	<u>B</u>								
Construction of 1No's 26.5/33KV 5MVA AVR Unit at Bolagarh PSS.									
L	Total (J+K)	61,38,068.05							
М	Other overheads (Including 6% supervision charges) of L	3,68,284.08							
N	Sub Total (L+M)	65,06,352.13							
0	Total GST @ 18% of (N)	11,71,143.38							
Р	Total Cess @ 1% of (N)	65,063.52							
q	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT	77,42,559.04							
	Gross Total Summary								
1	Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT	1,24,25,205.74							
2	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT	77,42,559.04							
3	Gross Total Material, Services and Inspection Fees (1+2+3)	2,01,67,764.78							

#### **ANNEXURE-8.19** Part-C Construction of 1No's 26.5/33KV 5MVA AVR Unit at Hatabasta PSS. No. of 33 KV AVR Unit **MATERIALS FOR 33 KV AVR at Hatabasta PSS** SI.N Total Unit **Unit Rate Description of Materials** Amount Quantity o. 26.5/33kV 5MVA Automatic Voltage Regulated Transformer (AVR). EΑ 65,00,000.00 1 65,00,000.00 1 Supply of 33kV, 1Core, 400sgmm Aluminium, XLPE insulation UG Cable 2 800 Mtr. 970.92 7,76,736.00 (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA) Supply of Outdoor termination kits Heat Shrinkable type suitable for 3 12 Set 8,517.56 1,02,210.72 33kV, 1Core, 400sgmm, HT UG Cable kits for 1Core Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, Set 6,488.92 4 25,955.68 1Core, 400sqmm, HT UG Cable kits for 1Core Pipe Earthing 40mm. GI Pipe No. 1,302.00 4 5,208.00 50x6mm GI Flat for earthing (2.4kg/mtr) KG 93.00 48 4,464.00 6 **Total Cost of materials** 74,14,574.40 Α Stock, Storage & Insurance i.e 3% of A 2,22,437.23 В C Sub Total (A+B) 76,37,011.63 Contigency @ 3% of C D 2,29,110.35 Ε Tools & Plants @ 2% of C 1,34,538.02 F Transportation @ 7.5% of C 5,72,775.87 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 3,34,750.00 Н Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 459.79 Erection Charges @ 20% of PSC pole- Not to be used for 33kv Т J Sum of (C to I) 89,08,645.67 Civil & Services Total SI.N **Description of Materials** Unit **Unit Rate** Amount o. Quantity Plinth for 5MVA AVR 6,73,016.72 No. 6,73,016.72 Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE linsulation (extruted type) UG cable (with one single 1core, 400sqmm, Mtr. 94.50 800 75,600.00 XLPE cable as spare) in trefoil formation by open trench method. Erection of Outdoor termination kits Heat Shrinkable type suitable for 3 2,081.70 12 24,980.40 Set 33kV, 1Core, 400sgmm, HT UG cable kits Erection of Indoor termination kits Heat Shrinkable type suitable for 4 Set 2,081.70 4 8,326.80 33kV, 1Core, 400sqmm, HT UG cable kits Earth work excavation of soil (1mtr. width X 1.2mtr. depth) 5.1 Earth work excavation of soil Cum 700.00 84 58,800.00 5.2 Earth work excavation of hard rock Cum 1,720.00 61,920.00 36 5.3 Back filling with excavated soil outside and above the trench Cum 202.00 120 24,240.00

#### **ANNEXURE-8.19** Part-C Construction of 1No's 26.5/33KV 5MVA AVR Unit at Hatabasta PSS. **Total Civil & Services** 9,41,683.92 Total (J+K) 98.50.329.59 L Other overheads (Including 6% supervision charges) of L (for 33 KV VCB UNIT) 5,91,019.78 Μ SubTotal (L+M) 1,04,41,349.37 Ν 0 Total GST @ 18% of (N) 18,79,442.89 Р Total GST @ 1% of (N) 1,04,413.49 Q Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT 1,24,25,205.74 Installation of 33kV Isolator- 5 no.s and 33kv VCB- 2No's for HT AVR Unit No. of Bus isolator requirement 5 No. of VCB Requirement 2 No. of Bus isolator requirement SI. Total Total Unit | Unit Rate **Description of Materials** No. Quantity Amount T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm 1 Nos. 26,600.00 2 53,200.00 channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) Nos. 31,920.00 31,920.00 2 1 for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT T-1A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos of 3 Nos. 23,560.00 4 94,240.00 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT T-2A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 4 Nos. 28,120.00 2 56,240.00 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV 5 incoming line - (2 nos. Beam- one for Surge Arrester and other for Nos. 15,200.00 2 30,400.00 Isolator, Nominal Unit Wt - 0.2 MT) G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel Nos. 13,300.00 7 93,100.00 jointed by plates) for 33kV Bus Stringing, Nominal Unit Wt - 0.175 MT) Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment 7 KG 76.00 1650 1,25,400.00 Structures per set - 0.33 MT) Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of 8 KG 76.00 400 30,400.00 Equipment Structures per set - 0.2 MT) GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 9 KG 76.00 570 43,320.00 GI Spikes with cone and GI (2 nos) base plate 10mm (50x3000 mm GI 3,641.92 Nos. 8 29,135.35 pipe) (Unit Wt=0.035 MT) GI Pipe Earthing 40mm. 3 Mtr. Long 1,302.00 14 10 No. 18,228.00 50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB, 10 11 KG 93.00 330.4 30,727.20 metre mesh formation )= 20x2.36 12 400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc. KM 2,61,640.00 0.3 78,492.00 33 kV 1250 AMP Double break (Turn & twist center rotating) isolator 13 5 Set 1,25,103.60 6,25,518.00 with earth switch with PI(Polymer) 33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR-600-300-150/1-1 A, 15VA, STC 25KA/3sec, class: 0.5, EΑ 7,31,600.00 2 14,63,200.00 5P10) for Transformer protection 33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled ) CLASS 0.5 / 3P, EΑ 31,520.80 6 1,89,124.80 with O/P burden of 100VA

#### **ANNEXURE-8.19** Part-C Construction of 1No's 26.5/33KV 5MVA AVR Unit at Hatabasta PSS. Lightning Arrester(30KV,10KA) (Station Class,class-2) EΑ 12,834.00 21 2,69,514.00 Mtr 409.20 250 1,02,300.00 17 Control Cable 10Core x 2.5 mm<sup>2</sup> Mtr 250 18 Control Cable 16Core x 2.5 mm<sup>2</sup> 499.72 1,24,930.00 19 Control Cable 4Core x 2.5 mm<sup>2</sup> Mtr 138.88 100 13,888.00 20 Control Cable 7Core x 2.5 mm<sup>2</sup> Mtr 43.68 100 4,368.00 Disc insulator (B&S) 90 KN polymer 1,426.00 30 42,780.00 21 No. 22 H W fitting(B&S) 90KN,4 Bolt No. 620.00 30 18,600.00 8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop 1,339.20 30 40,176.00 23 No. 24 PG Clamp for 232 sq.mm AAA conductor NO. 276.00 168 46,368.00 96.026 25 GI Nut, Bolt & Washer of different sizes (13.718 Kg each Strutures) K.g. 96.72 9,287.63 26 272.80 7 1,909.60 Black Paint Ltr 27 Yellow Colour Paint for Background Ltr 272.80 14 3,819.20 **Total Cost of materials** Α1 36,70,585.78 Applicable Taxes to make it Landed Cost @18% **A2** 6,60,705.44 Total landed Cost (A=A1 + A2) 43,31,291.22 Α Stock, Storage & Insurance i.e 3% of A В 1,29,938.74 C Sub Total (A+B) 44,61,229.96 D Contigency @ 3% of C 1,33,836.90 Tools & Plants @ 2% of C Ε 89,224.60 F Transportation @ 7.5% of C 3,34,592.25 Erection Charges @ 5% on Trf/Breaker/Joist 73,160.00 G Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) Н 2,25,483.25 Erection Charges @ 20% of PSC pole- Not to be used for 33kv Ι Sum of (C to I) 53,17,526.95 J Civil & Services SI. Total Total **Description of Materials Unit Rate** No. Quantity Amount VCB as per Drawing Schedule- OPTCL/CIVIL/9. 1 2 Excavation with back filling (2.15x1.4x1.2mtr) Cum 214.00 7.22 1,545.08 3 PCC (1:3:6) Cum 4708.00 0.45 2,125.66 4 RCC(1:1.5:3) Cum 9095.00 3.70 33,651.50 Column as per Drawing Schedule-0.00 Excavation with back filling (2.15x2.15x1.85mtr) Cum 214.00 153.93 32,940.86 7 PCC (1:3:6) Cum 4708.00 6.30 29,660.40 8 RCC(1:1.5:3) Cum 9095.00 42.30 3,84,718.50 9 Isolator 10 Excavation with back filling Cum 214.00 23.63 5,055.75 PCC (1:3:6) Cum 4708.00 1.42 11 6,673.59 12 RCC(1:1.5:3) Cum 9095.00 14.25 1,29,603.75 13 CT 14 Excavation with back filling 214.00 4.30 920.20 Cum 0.22 15 PCC (1:3:6) Cum 4708.00 1,016.93 16 RCC(1:1.5:3) 1.72 Cum 9095.00 15,661.59

	ANNEXURE-8.19						
Part-							
Cons	truction of 1No's 26.5/33KV 5MVA AVR Unit at Hatabasta PSS.	ı	I				
17	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.	Making earthing chamber including excavation , soil treatment with point powder , calculation of earth resistance, including Installation No. 3,700.00					
K1	6,95,373.81						
К2	K2 Applicable Taxes to make it Landed Cost @18%						
K	Κ Total landed Cost (K=K1+ K2)						
L				Total (J+K)	61,38,068.05		
М	Other overheads ( Inclu	uding 6	5% supervision c	harges) of L	3,68,284.08		
N			Sub	Total (L+M)	65,06,352.13		
0			Total GST @	18% of (N)	11,71,143.38		
Р			Total Cess	@ 1% of (N)	65,063.52		
Q	Gross Total Material +Serv	ices (N	+O+P) for 33 K	VCB UNIT	77,42,559.04		
	Gross Total Summary		·				
1	Gross Total Material +Services (N+O+P) for 33 KV AVR UNI						
2	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT						
3	Gross Total Material, Serv	vices a	nd Inspection F	ees (1+2+3)	2,01,67,764.78		

#### Annexure-9 11kV Network Infrastructure 11kV Low Voltage & Overload Mitigation SI. No. Mitigation Type Unit Quantity Amount (in Rs.) 11kV Feeder Low Voltage 22.00 6,20,13,355.11 1 km 2 11kV Feeder Overloading 105.33 15,72,11,249.50 km **Total Cost** 21,92,24,605 Total Cost in Cr. 22

#### 11kV Feeder Overloading Total cost Proposed Proposed Proposed Total cost Proposed Length in Ckm 11 KV Feeder New Fdr Total cost otal cost (UG)-(C Nos of Line DP with **GRAND Total -**Circle Division PSS Name Proposals (New fdr OH/ UG/Cond.Augm. FROM (Augm.) (B) (in Length in ) (in Rs.) ABS) ( D) (in Length in (OH)(A) Line DP A+B+C+D (in Rs.) Name (Augmentation Ckm (U/G) Rs.) Ckm (OH) in 100 mm2) with ABS Rs.) New 11KV UG feeder from Delta PSS till Baramunda Kalimandir -2km Sushree Villa-200 mtr and 1 line DP at SBI and sushree Villa. dedicated fdr meet from Delta PSS -2km Barmunda Kali BBSR-1 BCDD-I Delta Fire Station Delta PSS 4.64.483.26 2.35 1.73.02.318.14 1.77.66.801.40 Cable augmentation from 185sqmm to 400sqmm of length 3x50 mtr (For three Mandir fdr-inside PSS) Note-Total Cost OH -A is for 2nos of DP Shatabdi A) Conductor augmentation 34/55/80 to 100sqmm from Delta PSS till P.Gopal Krishna 2 BBSR-1 BCDD-I Delta PSS 33,44,479.44 33.44.479.44 Delta OTR Nagar P.Gopalkrishna DT -3km 11KV feeder-4 from Delta PSS will charge & 500Mtr interlinking along with 2No's near Steward 8,42,036.67 BBSR-1 BCDD-I Delta Siripur DP is proposed for diverting Siripur feeder load to new FDR -4 with 2nos of DP Delta PSS School to 0.5 8.42.036.67 with ABS charge Fdr-4 Aug. of existing UG cable from 3Cx185sqmm to 3cx400sqmm of length 100mtr nside CS-PUR-2 RRSR-1 RCDD-II CSPLIR-2 HR-3 CS-PLIR-2 PSS 0.1 7,36,268.86 7,36,268.86 with spare (From Cspur-2 PSS VCB to 11 kV DP inside PSS) PSS Jayadev Vihar Aug. of existing UG cable from 3Cx95sqmm to 3cx400sqmm of length 110 mtr nside Nayapally PSS RRSR-1 BCDD-II Navapalli 0.11 8.09.895.74 8,09,895.74 (NP) with spare (From VCB to 11 kV DP inside PSS) Navapally PSS BBSR-1 BED NaharKanta Atala Conductor augmentation from 35sqmm/55sqmm to 100sqmm of length 1.3km 1.3 14,49,274.42 14,49,274.42 New Feeder to be propose from Same pss to Near Kanplate Ab switch. With BBSR-1 BED NaharKanta Balianta 1.2 20,20,888.00 20,20,888.00 100sqmm.-1.2km and 2nos of DP. Kapileswar BBSR-1 BED Mulapadia Kapileshwar 3Cx400SQM to Kapileswar Canal upto 300mtr with spare for load bifurcation Mulapadia PSS 0.3 22,08,806.57 22,08,806.57 New UG line using 3Cx400sqmm from Phulnakhara pss to AB Switch near Phulnakhara AB Switch near BBSR-1 BED Phulnakhara 0.7 51,53,882.00 51,53,882.00 Govindpur Nakhara gada for 700mtr Nakhara gada 1. Location:- Pss to Malamach. Conductor Upgrdation 34/55 to 80:- 7 CKM, 11 M WPB Pole:- 15. 2. Location:- Samia AB Switch to Panchumatha AB Switch. Conductor 10 BBSR-1 NED Kakatpur-1&2 Kakatpur PSS Malamach 2,34,11,356.08 2,34,11,356.08 Kakatpur 21 Upgradation 34/55 to 80:- 8 ckm, 11 M WPB Pole:- 25 3. Malamach to Lataharan Conductor upgradation 34 to 80:- 6 ckm, 11 M WPB Pole :- 10 1. Location:- Odapadi cut point to Barakana & Mahadey basta, Upgradation from 34/55 to 80 sqmm:- 10 CKM, 11 M WPB POLE:- 20. Barakana 2.Nilkanthapur to Fakirsahi Patna. Upgradation from 34/55 to 80 sqmm:- 8 ckm, Odanadi 2.50.50.151.01 2,50,50,151.01 11 BBSR-1 NED Kakatpur Nilakanthapui &Mahadev 22 11 M WPB Pole :- 30 Basta 3. Location:- Odapadi cutpoint to Patharpaka upgradation from 34 to 80 :- 5 ckm, 11 m WPB Pole:- 25 Construction of new line using 100sgmm of length 1km from Bhartipur PSS to 12 BBSR-1 NFD Pipili Pipili Bazar Shartipur PSS Pipli Feeder 1 16,84,073.33 16,84,073.33 Pipli feeder 1- Approx. 3km D/C from Gandhi Chhak to LIC required to separate the Ruran & 13 BBSR-2 BAED Balugaon Balugaon andhi Chhak 3 50,52,219.99 50,52,219.99 Augmentation from Putana to Sorana approx. 7Ckm to be upgraded from 14 BBSR-2 BAED Tangi Kalupada Putana orana 7.0 78,03,785.36 78,03,785.36 34sqmm to 100sqmm 1- Ankulapadar PSS to 4-pole appx. 5Ckm to be upgraded from 55sqmm to Ankulapadar 15 BBSR-2 BAED Ankulapadar Town-1 4Pole 5.0 55,74,132.40 55,74,132.40 100sqmm PSS - Hatasahi school 100kVA to Maninagaswar RWSS 63kVA appx. 1.5Ckm to be Hata sahi Maninagaswar 16 BBSR-2 BAED Ranapur Ranpur 1.5 16,72,239.72 16,72,239.72 upgraded from 34sqmm to 100sqmm. school 100kVA RWSS 63kVA From Golapada 11kV feeder with 800mtr line extension around 7 nos of DTs will Golapada 17 BBSR-2 KHD Kudiary 16,84,073.33 16,84,073.33 Harirajpur Kudiary be shifted from kudiary to Golapada feeder. feeder. Proposed New feeder upto Gini AB Switch Keranga with 100sqmm upto 4km for GINI AB switch From 18 BBSR-2 KHD Gurujanga Haladia 4 67,36,293.32 67,36,293.32 load bifurcation. Gurujanga PSS Keranga Block office 19 BBSR-2 PURI Bramhagiri Alarnath Conductor Augmentation from 35sqmmto 100sqmm of length 2.1 km Brahmigiri pSS 2.1 23,41,135.61 23,41,135.61 DTR 20 BBSR-2 PURI Sakhigopal Conductor Augmentation from 80 qmm to 100sqmm of length 4 km Sakhigopal PSS Sarugudha ABS 4.0 44,59,305.92 44,59,305.92 Moonlight AB Choudhury Conductor Augumentation 148sqmm from Kalinga PSS to Moonlight AB Switch 21 CUTTACK CDD-I Kalinga PSS 38,79,613.25 38,79,613.25 Kalinga Switch via KRK 2.5 via KBK switch 2.5 km Bazar-II witch

Annexure-9

	Annexure-9															
SI. No.	Circle	Division	PSS Name	11 KV Feeder Name	Proposals (New fdr OH/ UG/Cond.Augm.	FROM	Overloading TO	Proposed New Fdr Length in Ckm (OH)	Total cost (OH)(A)	Proposed Length in Ckm (Augmentation in 100 mm2)	Total cost (Augm.) (B) (in Rs.)	Proposed Length in Ckm (U/G)	Total cost (UG)-(C ) (in Rs.)	Proposed Nos of Line DP with ABS	Total cost (Line DP with ABS) ( D) (in Rs.)	GRAND Total - A+B+C+D (in Rs.)
22	CUTTACK	CDD-I	Kalinga	l High Court	Augumentation From Kalinga PSS to Saitani Bagicha Line AB Switch with 1.2ckm 148sqmm	Kalinga PSS	Saitani Bagicha Line AB Switch		,	1.2	18,62,214.36		-		-	18,62,214.36
23	CUTTACK	CDD-II	Jagatpur	Old Industry	Bifurcation of existing 11 kV Old Industry Feeder emanating from 33/11 kV Jagatpur PSS by constructing 1 No. of new feeder from 33/11 kV Jagatpur PSS to Gayana Chhak AB Switch with UG 1.5km				-		-	1.5	1,10,44,032.86		-	1,10,44,032.86
24	CUTTACK	CED	Tangi	Manguli	Refurbishment Tangi PSS to Manguli Chowk 8km100sqmm	Tangi PSS	Manguli Chowk		-	8.0	89,18,611.84		-		-	89,18,611.84
25	Dhenkanal	ANED	Hemsarpada		Augmentation of existing conductor 55 sqmm to 100sqmm from Hemasarpada PSS to near Jarasingha Sant Mandir AB switch of length -0.5 km	Hemsarpada	Near Jarasingha Sant Mandir AB switch		-	0.5	5,57,413.24		-		-	5,57,413.24
26	Dhenkanal	DED	Mathakargola	Hiral	Augmentation of existing conductor 55 sqmm to 100sqmm from Mathakargola PSS to Sasapasi L.I DTR 63kVA of length -2 km	Mathakargola	Sasapasi L.I 63 kVA DTR		-	2.0	22,29,652.96		-		-	22,29,652.96
27	Paradeep	KED-II	Korua/ Kudanagari	Marondranur	Augmentation of Conductor from 55sqmm to 100sqmm of length from Kudanagari PSS to Narendrapur line AB switch	Kudanagri PSS	Naredrapur IIne AB switch		-	2.0	22,29,652.96		-		-	22,29,652.96
28	Paradeep	KED-II	Mahakalpada	l Chanali	Augmentation of Conductor from 55sqmm to 100sqmm of length from Mahakalpada PSS to Khiastan line AB switch	Mahakalapada PSS	Khiastan AB S		-	6.0	66,88,958.88		-		-	66,88,958.88
	TOTAL					10.70	1,84,84,067.89	89.57	10,14,71,977.45	5.06	3,72,55,204.16	-	-	15,72,11,249.50		

#### Annexure-9

#### 11kV Feeder Low Voltage

Sr No.	Circle	Division	PSS Name	11 KV Feeder Name	Proposals (New fdr OH/ UG/Cond.Augm.	Proposals in Details	Proposed Length in Ckm for 100mm2 (OH)- Augmentation	Per Unit Cost	Total cost (Aug)(A)	Proposed Length in Ckm for 148mm2 (OH) Augmentation	(Aug)(P)	Proposed Length in Ckm (For New Line in 100mm2)	(OH new)	-cg	(UG)- ( C)			GRAND Total - A+B+C+D
1	Cuttack	AED	Athagarh	Karikole	Augmentation	Augmentation of conductor from 34 /55 mm2 to 100mm2 of length 11 KM from Back Side Medical(Near PSS) to Madhusudan Medical .	11.00	11,14,826.48	1,22,63,091.29		-		-		-		-	1,22,63,091.29
2	Cuttack	AED	Athagarh	Kandarpur	Augmentation	Augmentation of conductor from 34 mm2 to 100mm2 of length 5 KM from Medical back Side to Kandar Pur .	5.00	11,14,826.48	55,74,132.40		-		•		-		-	55,74,132.40
3	BBSR-II	KHD	Khordha I.E (10 Pole)	ITown-II		1. Proposed 2 no. of new feeder from Ten Pole PSS to Nabina Bag Near gandhi Padia in Ug cable of length (3+3)Km.(One Feeder is for Nabina bag & 1 Is for Gada Khordha)		11,14,826.48	-		-		-		-	6	4,41,76,131.42	4,41,76,131.42
					TOTAL		16.00		1,78,37,223.69	-	-	-		-	-	6.00	4,41,76,131.42	6,20,13,355.11

	Annexure-10 Auto Reclosure, LTDB, RMU						
SI. No.	Description	Quantity (in nos.)	Amount (in cr.)				
1	11kV line DP with Auto Reclosure	21	2.58				
2	LT Distribution Box with MCCB, for 100kVA trf.	80	0.90				
3	LT Distribution Box with MCCB, for 250kVA trf.	54	1.70				
4	LT Distribution Box with MCCB, for 500kVA trf.	40	1.69				
5	3W 11kV RMU (LLV) along with 3C, 400sqmm UG Cable, jointing kits and LA.	10	1.53				
6	4W 11kV RMU (LLVV) along with 3C, 400sqmm UG Cable, jointing kits and LA.	8	1.41				
7	3W 33kV RMU (LLV) along with 1C, 630sqmm UG Cable, jointing kits and LA.	0	0.00				
8	4W 33kV RMU (LLVV) along with 1C, 630sqmm UG Cable, jointing kits and LA.	7	3.19				
	Total						

## 11kV line DP with Auto Reclosure

# No. of DP required Without AB switch (Ref. Drawing No.- TPCODL-MVD-0012) and Auto reclosure

1

Sum of (C to I)

9,59,053.81

	0012) and Auto reclosure			1			
	MATERIALS OF DP Without Is	olator					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	WPB 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No	26,516.95	2	53,033.90		
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	43.976	3,342.18		
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	76.00	3.9648	301.32		
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	47.4096	3,603.13		
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 2.671 mtr., 4 nos angle required = (4.5x2.671x4)	KG	76.00	48.078	3,653.93		
6	Danger Plate, 2 no's.	No.	99.20	2	198.40		
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97		
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.551 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	2	310.00		
9	H.T. Stay set (Complete )	Set	1,302.00	2	2,604.00		
10	H.T. Stay Insulator Type-C	No.	62.00	2	124.00		
11	7/10 SWG Stay Wire 15kg /stay	K.g.	93.00	30	2,790.00		
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00		
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	11.8	1,097.40		
14	GI barbed wire anticlimbing device 3 Kg. Per support, 2 no's qty. required =(2x3kg)	Kg	99.20	6	595.20		
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87		
16	11 KV pin insulator polymer	No.	248.00	3	744.00		
17	H W fitting(B&S) 70KN, 3Bolt	No.	434.00	6	2,604.00		
18	Disc insulator (B&S) 70 KN polymer	No.	1,426.00	6	8,556.00		
19	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without AB Switch)	K.g.	96.72	12.261	1,185.88		
20	Black Paint	Ltr	272.80	1	272.80		
21	Yellow Colour Paint for Background	Ltr	272.80	2	545.60		
22	Auto Reclosure - 11kV Outdoor	EA	6,75,701.24	1	6,75,701.24		
Α			Total Cost o		7,62,844.82		
В	Sto	ck, Stora	ge & Insurance	i.e 3% of A	22,885.34		
С			Sub 1	Total (A+B)	7,85,730.16		
D	Contigency @ 3% of						
E	E Tools & Plants @ 2% of C						
F	Transportation @ 7.5% of C						
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole						
Н	Erection Charges @ 10% of C (except Trf/Breaker/\	NPB/ H-F	Pole/HT stay se	t/PSC pole)	72,376.13		
ı	Erection Charges @ 20% of	PSC pol	e- Not to be us	ed for 33kv	-		
	I and the second		_	(10. 1)	0 -0 0-0 04		

# Civil & Services

SI. 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	2	4,500.00		
2	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	0.90	5,850.00		
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.23	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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	1	3,700.00		
К			Total Civil	& Services	15,512.50		
L				Total (J+K)	9,74,566.31		
М	Other overheads ( Including 6% supervision cha	rges) of L	(for DP Witho	ut Isolator)	58,473.98		
N	Sub Total (L+M)						
0	Total GST @ 18% of (N						
P			Total CESS (		10,330.40		
Q	Gross Total Material +Service	s (N+O+F	) for DP Witho	out Isolator	12,29,317.95		

LTDB for 100kVA DTR							
	No. of DP Mounted DSS (Ref. Drawing No TPCODL)			1			
	MATERIALS FOR DP Mount	ted DSS					
SI.	Description of Materials	Unit	Unit Rate	Total	Total		
No.	SUPPLY OF FOLLOWING EQUIPMENT 8			Quantity	Amount		
1	PSC POLE 9 METER LONG 300 KG	EA	3,720.00	1	3,720.00		
	LT Distribution Box with MCCB, Aluminium Busbar of single Bay						
2	with kit kat fuse for 100 KVA S/S	Nos.	42,950.00	1	42,950.00		
3	4 Cx 150 mm2 LT XLPE Cable(Armoured) - FOR 100 KVA Trf. to LTDB	Mtr.	732.12	15	10,981.80		
4	4 Cx 70 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	376.78	10	3,767.80		
5	4 Cx 35 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	213.38	10	2,133.80		
6	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	1	1,302.00		
7	50x6mm GI Flat for earthing, 2.36kg/mtr., 2 mtr for LTDB) KG 100.00 4.72						
Α	Total Cost of materia						
В	Stoc	k, Storag	e & Insurance	e i.e 3% of A	1,959.82		
С			Sub	Total (A+B)	67,287.22		
D			Contigeno	y @ 3% of C	2,018.62		
Е	Tools & Plants @ 2% of C						
F		Tra	ansportation	@ 7.5% of C	5,046.54		
G	Erection Charges @	҈ 5% on <sup>-</sup>	Γrf/Breaker/V	VPB/ H-Pole	-		
Н	Erection Charges @ 10% of C (except Trf/Breaker/V	VPB/ H-P	ole/HT stay se	et/PSC Pole)	6,211.46		
I	Erection Charges @ 20% of	PSC pole	- Not to be us	sed for 33kv	766.32		
J			Su	m of (C to I)	82,675.90		
	Civil and Services Works		T				
1	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375 Cu.mtr	Cu.mtr	6,500.00	0.375	2,437.50		
2	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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	1	3,700.00		
3	Dismantling				-		
i	Dismantling of LTDB	EA	550.00	1	550.00		
K			Total Civi	I & Services	6,687.50 89,363.40		
L							
M N							
0							
P	Total CESS @ 1%of (N)						
Q	Gross	Total Ma	terial +Servi	ces (N+O+P)	1,12,722.99		

	LTDB for 250kVA DTR							
	No. of DP Mounted DSS (Ref. Drawing No TPCODL)			1				
	MATERIALS FOR DP Mod	unted DS	<u> </u>					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount			
	SUPPLY OF FOLLOWING EQUIPMEN	T & MAT	ERIALS					
1	PSC POLE 9 METER LONG 300 KG	EA	3,720.00	1	3,720.00			
2	LT Distribution Box with MCCB, Aluminium Busbar for 3 Bay with kit kat fuse for 250 KVA S/S	Nos.	1,30,000.00	1	1,30,000.00			
3	1 Cx 400 mm2 LT XLPE Cable(Un-Armoured) - Trf. to LTDB	Mtr.	359.66	120	43,159.20			
4	4 Cx 70 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	376.78	30	11,303.40			
5	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	1	1,302.00			
6	50x6mm GI Flat for earthing, 2.36kg/mtr., 2 mtr for LTDB)	KG	100.00	4.72	472.00			
Α			Total Cost	of materials	1,89,956.60			
В	St	ock, Stor	age & Insuranc	e i.e 3% of A	5,698.70			
С			Sub	Total (A+B)	1,95,655.30			
D			Contigen	cy @ 3% of C	5,869.66			
Е	Tools & Plants @ 2% of							
F	Transportation @ 7.5% of C							
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole							
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole							
ı	Erection Charges @ 20% of	of PSC pc	le- Not to be u	sed for 33kv	19,048.26 766.32			
J		· ·		ım of (C to I)	2,39,926.79			
	Civil and Services Wor	·ks		· · · · · · · · · · · · · · · · · · ·	,,-			
1	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375 Cu.mtr	Cu.mtr	6,500.00	0.375	2,437.50			
2	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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	1	3,700.00			
3	LTDB Plinth	NO	3,000.00	1	3,000.00			
4	Dismantling							
i	Dismantling of LTDB	EA	550.00	1	550.00			
K			i otai Civ	il & Services	9,687.50			
L	Other everheads / In	cluding 6	% supervision	Total (J+K)	<b>2,49,614.29</b> 14,976.86			
M								
l M								
N O			Total GST (	ର 18% of (N)।	47 626 <b>4</b> 1			
<b>Ν</b> Ο Ρ				@ 18% of (N) 5 @ 1%of (N)	47,626.41 2,645.91			

	LTDB for 500kVA DTI	R						
	No. of DP Mounted DSS (Ref. Drawing No TPCODL)			1				
	MATERIALS FOR DP Mo	unted DS	<u>s</u>					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount			
	SUPPLY OF FOLLOWING EQUIPMEN	T & MAT	ERIALS					
1	PSC POLE 9 METER LONG 300 KG	EA	3,720.00	1	3,720.00			
2	LT Distribution Box with MCCB, Aluminium Busbar for 3 Bay with kit kat fuse for 500 KVA S/S	Nos.	1,70,000.00	1	1,70,000.00			
3	1 Cx 400 mm2 LT XLPE Cable(Un-Armoured) - Trf. to LTDB	Mtr.	359.66	180	64,738.80			
4	4 Cx 95 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	479.61	9,592.20				
5	4 Cx 70 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	376.78	20	7,535.60			
6	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	1	1,302.00			
7	50x6mm GI Flat for earthing, 2.36kg/mtr., 2 mtr for LTDB)	KG	100.00	4.72	472.00			
Α			Total Cost	of materials	2,57,360.60			
В	St	ock, Stora	age & Insurance	e i.e 3% of A	7,720.82			
С			Sub	Total (A+B)	2,65,081.42			
D	Contigency @ 3% of							
E	Tools & Plants @ 2% of							
F	Transportation @ 7.5% of							
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole							
Н	Erection Charges @ 10% of C (except Trf/Breaker,				25,990.88			
<u> </u>	Erection Charges @ 20% o				766.32			
<u> </u>		•		m of (C to I)	3,24,973.79			
	Civil and Services Wor	·ks		, ,				
1	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375 Cu.mtr	Cu.mtr	6,500.00	0.375	2,437.50			
2	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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	1	3,700.00			
3	LTDB Plinth	NO	3,000.00	1	3,000.00			
4	Dismantling				-			
i	Dismantling of LTDB	EA	550.00	1	550.00 <b>9,687.50</b>			
K								
L	· · · · · · · · · · · · · · · · · · ·							
M								
<b>N</b>				18% of (N)	<b>3,54,740.97</b> 63,853.37			
P				@ 1%of (N)	3,547.41			
Q	Gros	ss Total N	1aterial +Servi		4,22,141.75			

#### Standard BoQ and Estimate for 11kV 3C, 400sqmm UG Cable along with 11kV RMU **Supply Portion** Rate Amount SI. No. Description of items Unit Quantity (in Rs.) (in Rs.) Supply of materials for 11kV, 3Core, 400sqmm, XLPE insulation 1 armoured UG cable with accessories Length of 11kV 3C, 400sqmm cable (open trench) 45 Mtr. а b Length of 11kV 3C, 400sqmm cable (HDD) Mtr. Supply of 11kV, 3Core, 400sqmm, XLPE insulation armoured UG cable 1.1 Mtr. 45.00 83,700.00 1,860.00 (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA- 15kA) Supply of Straight through jointing kits Heat Shrinkable type suitable 1.2 Set 31,393.08 for 11kV, 3Core, 400 sgmm, Aluminium UG cable for 3Core (Set) Supply of Indoor termination kits Heat Shrinkable type suitable for 1.3 Set 11,881.68 11kV, 3Core, 400 sqmm, HT UG cable for 3Core (Set) Supply of Outdoor termination kits Heat Shrinkable type suitable for 1.4 Set 3 17,240.96 51,722.88 11kV, 3Core, 400 sqmm, HT UG cable for 3Core (Set) Supply of **HDPE** PE 80-PN8 pipe of **160mm** diameter (for 400sqmm 1.5 Mtr. 45.00 775.40 34,893.00 HT cable laying) Supply of 11kV RMU 2 No. of 11kV 3Way RMU (LLV) nos. 1 No. of 11kV 4Way RMU (LLVV) nos. No. of 11kV 3Way RMU (LLV+M) nos. C No. of 11kV 4Way RMU (LLVV+M) d nos. 2.1 Supply of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV) Nos. 1 3,99,034.00 3,99,034.00 2.2 Supply of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV) Nos. 0 5,57,710.00 Supply of RMU 3W 11kV 630A with metering unit (LLV+M) 0 5,76,739.00 2.3 Nos. 2.4 Supply of RMU 4W 11kV 630A with metering unit (LLVV+M) Nos. 0 8,13,749.00 3 Earthing Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, 3.1 13.20 93.00 kg 1,227.60 structure etc.) Pipe Earthing 40mm. GI Pipe 1,302.00 2,604.00 3.2 Nos. 2 4 **FRTU and OFC for RMU SCADA Automation** Supply of 12 core fibre optic cable single mode, duct type, fibre 22.00 4.1 Mtr. armoured laid along UG cable. 4.2 Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables. Mtr. 0.0 77.99 Supply of Straight through connectors (Plastic coupler) and 4.3 0 Set 6,766.00 accessories for OFC connection. 4.4 Supply of end Connector and accessories for OFC connection at RMU, Set 2 7,535.00 15,070.00 Supply of Standard FRTU 4Way with FRTU networking Equipment 4.5 consisting of Fibre Optic switch (Mono mode along wilh associate LIU Nos. 1 2,19,420.00 2,19,420.00 unit for connection of FO Cable. for 3 Way & 4 way RMU. Sub Total (Supply Portion) (in Rs.) 8,07,671.48 **Erection Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
SI. 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 <b>open trench method</b> .	Mtr.	45.00	94.50	4,252.50
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	0	2,400.00	-
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	0	1,900.80	-
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	3	1,900.80	5,702.40
1.5	Supply, Installation, Laying, Commissioning, Testing of 11kV, 3core, 1Run, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable in <b>HDD method with HDPE pipe</b> (160mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessable place.	Mtr.	0	2,800.00	-
1.6	Laying of <b>160mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	45.00	300.00	13,500.00
2	Erection, Commissioning, Wiring and Testing of 11kV RMU				
2.1	Erection of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	1	9,639.00	9,639.00
2.2	Erection of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	0	9,639.00	
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	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Nos.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
	Sub Total (Erection Portion) (in Rs.)				41,668.40
Civil Po	rtion				
SI. 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 1mtr. depth)				

SI. No. Description of items Unit Q	uantity	Rate (in Rs.)	Amount (in Rs.)					
1.1.a Earth work excavation of <b>soil</b> Cum	31.5	700.00	22,050.00					
1.1.b Earth work excavation of hard rock Cum	13.5	1,720.00	23,220.00					
1.2 Back filling with excavated soil outside and above the trench Cum	45	202.00	9,090.00					
Damage of asphalt/tar road and other utilities and reconstructing to								
1.3 bring to its original shape after laying of cable in open trench (1mtr. Mtr width)	22.5	2,643.67	59,482.59					
Civil works for Prefabricated RCC foundation with supply of all materials								
2.1 Prefabricated RCC foundation of 11kV 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					
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.	2	3,700.00	7,400.00					
5 Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.) Mtr	24	1,463.40	35,121.60					
6 Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	2	1,012.00	2,024.00					
Sub Total (Civil Portion) (in Rs.)	•		2,53,533.49					
A Sub Total (Supply Portion)			8,07,671.48					
B Stock, Storage & Insurance @ 3 % of A			24,230.14					
C Sub Total (A+B)			8,31,901.62					
D Contingency @ 3 % of C			24,957.05					
E Tools & Plants Charges @ 2% of C (considered for earthing items)			25.29					
F Transportation @ 7.5% of C			62,392.62					
G Erection Charges @ 10% of earthing items			126.44					
H Total (C+D+E+F+G)			9,19,403.03					
I Sub Total (Erection Portion + Civil Portion)			2,95,201.89					
	12,14,604.92							
J Total Cost (H+I)		Other Overhead /(including Supervision Charges) @ 6 % of J						
			72,876.29					
			72,876.29 12,87,481.21					
K Other Overhead /(including Supervision Charges) @ 6 % of J			•					
K Other Overhead /(including Supervision Charges) @ 6 % of J  L Total Estimated Capital Cost i.e. (J+K)			12,87,481.21					

	Standard BoQ and Estimate for 11kV 3C, 400sqmm UG 0	Cable al	ong with 11	kV RMU	
Supply	Portion				
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 11kV, 3Core, 400sqmm, XLPE insulation armoured UG cable with accessories				
а	Length of 11kV 3C, 400sqmm cable (open trench)	Mtr.	45		
b	Length of 11kV 3C, 400sqmm cable (HDD)	Mtr.			
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.	45.00	1,860.00	83,700.00
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		31,393.08	-
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		11,881.68	-
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	3	17,240.96	51,722.88
1.5	Supply of <b>HDPE</b> PE 80-PN8 pipe of <b>160mm</b> diameter (for 400sqmm HT cable laying)	Mtr.	45.00	775.40	34,893.00
2	Supply of 11kV RMU				
-	No. of 11kV 3Way RMU (LLV)	nos			
a b	No. of 11kV 4Way RMU (LLVV)	nos.	1		
		nos.	1		
c d	No. of 11kV 3Way RMU (LLV+M)	nos.			
	No. of 11kV 4Way RMU (LLVV+M)	nos.		2.00.024.00	
2.1	Supply of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	0	3,99,034.00	
2.2	Supply of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.		5,57,710.00	5,57,710.00
2.3	Supply of RMU 3W 11kV 630A with metering unit (LLV+M)	Nos.	0	5,76,739.00	
	Supply of RMU 4W 11kV 630A with metering unit (LLVV+M)	Nos.	0	8,13,749.00	
3	Earthing				
3.1	Earthing Conductor: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	13.20	93.00	1,227.60
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,302.00	2,604.00
4	FRTU and OFC for RMU SCADA Automation			,	•
	Supply of 12 core fibre optic cable single mode, duct type, fibre			22.25	
4.1	armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	2	7,535.00	15,070.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment 4.5 consisting of Fibre Optic switch (Mono mode along wilh associate LIU Nos. 1 2,19,420 unit for connection of FO Cable. for 3 Way & 4 way RMU.		2,19,420.00	2,19,420.00	
	Sub Total (Supply Portion) (in Rs.)				9,66,347.48
Erection	n Portion				
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)

SI. 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.		45.00	94.50	4,252.50
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	0	2,400.00	-
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	0	1,900.80	-
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	3	1,900.80	5,702.40
1.5	Supply, Installation, Laying, Commissioning, Testing of 11kV, 3core, 1Run, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable in <b>HDD method with HDPE pipe</b> (160mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessable place.		0	2,800.00	-
1.6	Laying of <b>160mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	45.00	300.00	13,500.00
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.	1	9,639.00	9,639.00
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	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Nos.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	1
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
	Sub Total (Erection Portion) (in Rs.)				41,668.40
Civil Po	rtion				
SI. 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 1mtr. depth)				
1.1.a	Earth work excavation of <b>soil</b>	Cum	31.5	700.00	22,050.00
1.1.b	Earth work excavation of hard rock	Cum	13.5	1,720.00	23,220.00
1.2	Back filling with excavated soil outside and above the trench	Cum	45	202.00	9,090.00
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	22.5	2,643.67	59,482.59

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)		
2	Civil works for Prefabricated RCC foundation with supply of all materials						
2.1	Prefabricated RCC foundation of 11kV 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						
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.		7,400.00				
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	24	1,463.40	35,121.60		
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	2	1,012.00	2,024.00		
	Sub Total (Civil Portion) (in Rs.)						
Α	Sub Total (Supply Portion)						
В	Stock, Storage & Insurance @ 3 % of A						
С	Sub Total (A+B)						
D	Contingency @ 3 % of C				29,860.14		
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				25.29		
F	Transportation @ 7.5% of C				74,650.34		
G	Erection Charges @ 10% of earthing items				126.44		
н	Total (C+D+E+F+G)				11,00,000.12		
I	Sub Total (Erection Portion + Civil Portion)				2,95,201.89		
J	Total Cost (H+I)				13,95,202.00		
K	Other Overhead /(including Supervision Charges) @ 6 % of J						
L	Total Estimated Capital Cost i.e. (J+K)						
М	GST @ 18% of L						
M1	CESS @ 1% of L						
N	Grand Total (L+M+M1)						

# Standard BoQ and Estimate for 33kV, 1C 630sqmm UG Cable along with 33kV RMU

# **Supply Portion**

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)			
	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE			(111 113.)	(111 113.)			
1	insulation UG Cable with accessories							
а	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	45					
ь	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.						
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA-59.4kA and SC rating of Armour in kA-20kA)	Mtr.	135	1,337.13	1,80,512.55			
1.2	Supply of <b>Straight through jointing kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG Cable kits for 1Core	Set		9,600.00	-			
1.3	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	6	5,245.00	31,470.00			
1.4	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 33kV, 1Core, 630sgmm, HT UG Cable kits for 1Core	Set		4,894.00	-			
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	135.00	357.60	48,276.00			
2	Supply of 33kV RMU							
a	No. of 33kV 3Way RMU (LLV+M)	nos.						
b	No. of 33kV 4Way RMU (LLVV+M)	nos.						
С	No. of 33kV 3Way RMU (LLV)	nos.	1					
d	No. of 33kV 4Way RMU (LLVV)	nos.						
е	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)	Nos.	0	22,93,723.00	-			
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	31,74,874.00	-			
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	1	17,87,101.00	17,87,101.00			
	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: <b>50X6 mm</b> (2.4kg./mtr.) <b>GI Flat</b> for equipment, structure etc.)	kg	13.20	93.00	1,227.60			
3.2	Pipe Earthing 40mm. Gl Pipe	Nos.	2	1,302.00	2,604.00			
4	FRTU and OFC for RMU SCADA Automation							
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-			
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-			
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-			
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	2	7,535.00	15,070.00			
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	2,19,420.00	2,19,420.00					
	Sub Total (Supply Portion) (in Rs.)							

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
Erecti	on Portion				
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core,				
	<b>630sqmm, XLPE UG cable with one spare</b> Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm,				
1.1	XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by <b>open trench method</b> .	Mtr.	135	94.50	12,757.50
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	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	Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) including looping at cable terminations and straight through joints by <b>HDD method with</b> HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessable place.	0	2,300.00	-	
1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	135.00	300.00	40,500.00
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
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.	1	8,000.00	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 <b>3</b>	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)  FRTU and OFC for RMU SCADA Automation	Nos.	0	8,000.00	<u>-</u>
	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
	Sub Total (Erection Portion) (in Rs.)				82,322.20
<b>6</b> : :: =					
	ortion		1 1	Data .	A
SI. 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)				
	Earth work excavation of <b>soil</b>	Cum	37.8	700.00	26,460.00
1.1.b	Earth work excavation of hard rock	Cum	16.2	1,720.00	27,864.00

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)			
1.2	Back filling with excavated soil outside and above the trench	Cum	54	202.00	10,908.00			
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	22.5	2,643.67	59,482.59			
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 <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 Set 2 3,700.00 resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe.							
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  2 1,012.00							
	Sub Total (Civil Portion) (in Rs.)							
Α	Sub Total (Supply Portion)				22,85,681.15			
В	Stock, Storage & Insurance @ 3 % of A				68,570.43			
С	Sub Total (A+B)				23,54,251.58			
D	Contingency @ 3 % of C				70,627.55			
Е	Tools & Plants Charges @ 2% of C (considered for earthing items)				25.29			
F	Transportation @ 7.5% of C				1,76,568.87			
G	Erection Charges @ 10% of earthing items				126.44			
Н	Total (C+D+E+F+G)				26,01,599.73			
I	Sub Total (Erection Portion + Civil Portion)				3,81,849.29			
J	Total Cost (H+I)							
K	Other Overhead /(including Supervision Charges) @ 6 % of J							
L	Total Estimated Capital Cost i.e. (J+K)							
М	GST @ 18% of L							
M1	CESS @ 1% of L				31,624.56			
N	Grand Total (L+M+M1)				37,63,322.60			

#### Standard BoQ and Estimate for 33kV, 1C 630sqmm UG Cable along with 33kV RMU **Supply Portion** SI. Rate Amount Description of items Unit Quantity (in Rs.) No. (in Rs.) Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE 1 insulation UG Cable with accessories Length of 33kV 1C, 630sqmm cable (open trench) 45 Mtr. Length of 33kV 1C, 630sqmm cable (HDD) Mtr. Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in Mtr. 135 1,337.13 1,80,512.55 kA-20kA) Supply of Straight through jointing kits Heat Shrinkable type 1.2 suitable for 33kV, 1Core, 630sqmm, aluminium UG Cable kits for Set 9,600.00 1Core Supply of Outdoor termination kits Heat Shrinkable type suitable 1.3 6 Set 5,245.00 31,470.00 for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core Supply of Indoor termination kits Heat Shrinkable type suitable for 1.4 4,894.00 Set 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core Supply of materials for High Density Polyethelene (HDPE) pipe 1.5 Mtr. 135.00 357.60 48,276.00 110mm diameter, PE 80- PN8 for laying of 33kV UG cable 2 Supply of 33kV RMU No. of 33kV 3Way RMU (LLV+M) nos. b No. of 33kV 4Way RMU (LLVV+M) nos. С No. of 33kV 3Way RMU (LLV) nos. No. of 33kV 4Way RMU (LLVV) 1 nos. No. of 33kV 3Way RMU (LLL) nos. No. of 33kV 4Way RMU (LLLL) nos. 0 2.1 Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M) Nos. 22,93,723.00 2.2 Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M) 0 31,74,874.00 Nos. 2.3 Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV) Nos. 0 17,87,101.00 23,35,264.00 Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV) Nos. 1 23,35,264.00 2.5 Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL) Nos. 0 14,46,210.00 Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL) Nos. 0 19,59,421.00 3 Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, 3.1 13.20 kg 93.00 1,227.60 structure etc.) 2 3.2 Pipe Earthing 40mm. GI Pipe Nos. 1,302.00 2,604.00 FRTU and OFC for RMU SCADA Automation Supply of 12 core fibre optic cable single mode, duct type, fibre 4.1 Mtr. 22.00 armoured laid along UG cable. 4.2 0.0 Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables. Mtr. 77.99 Supply of Straight through connectors (Plastic coupler) and Set 0 6,766.00 accessories for OFC connection. Supply of end Connector and accessories for OFC connection at 4.4 2 Set 7,535.00 15,070.00 RMU,

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1	2,19,420.00	2,19,420.00
	Sub Total (Supply Portion) (in Rs.	)			28,33,844.15
Erecti	on Portion				
SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method.	Mtr.	135	94.50	12,757.50
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	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	Supply, Installation, Laying, Commissioning & Testing of 33kV,  1Core, 4Runs, 630sqmm, XLPE insulation (extruted type) UG cable (with one single 1core, 630sqmm, XLPE cable as space) including		0	2,300.00	-
1.6	Laying of <b>110mm dia</b> PE 80-PN8, <b>HDPE pipe</b> inside open trench.	Mtr.	135.00	300.00	40,500.00
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
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	-
2.6 <b>3</b>	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)  FRTU and OFC for RMU SCADA Automation	Nos.	0	8,000.00	-
3.1	ERTU and OFC for RMU SCADA Automation  Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD		0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
	Sub Total (Erection Portion) (in Rs	.)			82,322.20

SI. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)		
Civil P SI. 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			(III NS.)	(III NS.)		
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)						
1.1.a	Earth work excavation of <b>soil</b>	Cum	37.8	700.00	26,460.00		
1.1.b	Earth work excavation of hard rock	Cum	16.2	1,720.00	27,864.00		
1.2	Back filling with excavated soil outside and above the trench	Cum	54	202.00	10,908.00		
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	22.5	2,643.67	59,482.59		
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 <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	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.	2	1,012.00	2,024.00		
	Sub Total (Civil Portion) (in Rs.)				2,99,527.09		
Α	Sub Total (Supply Portion)				28,33,844.15		
В	Stock, Storage & Insurance @ 3 % of A				85,015.32		
С	Sub Total (A+B)				29,18,859.47		
D	Contingency @ 3 % of C				87,565.78		
Е	Tools & Plants Charges @ 2% of C (considered for earthing items)				25.29		
F	Transportation @ 7.5% of C				2,18,914.46		
G	Erection Charges @ 10% of earthing items				126.44		
н	Total (C+D+E+F+G)				32,25,491.45		
ı	Sub Total (Erection Portion + Civil Portion)				3,81,849.29		
J							
К							
L							
М	GST @ 18% of L				6,88,280.61		
M1	CESS @ 1% of L				38,237.81		
N	Grand Total (L+M+M1)				45,50,299.61		

# ANNEXURE-11 Summary of proposal details for 33kV Feeder Refurbishment:

SI. No.	Circle	Division	Name of 33kV Feeder	Proposal Details	Costing in Cr	Annexure Nos.
1	Cuttack	CED	Athagarh	Strengthening of existing 33kV Athagarh feeder emanating from 132/33kV Choudwar GSS by augmentation of 148 sqmm conductor with 232sqmm conductor for a length of 4.5Ckm from Choudwar GSS to 33/11kV Chatisha PSS.	₹1.0	Annexure- 11.1
2	Cuttack	AED	Khuntuni	Strengthening of existing 33kV Narangbasta feeder emanating from 132/33kV Khuntuni GSS by augmentation of conductor of 148 sqmm conductor with 232sqmm conductor for a length of 6Ckm from Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda.	₹1.4	Annexure- 11.2
3	Cuttack	AED	Kanpur	Strengthening of existing 33kV Kanpur feeder emanating from 132/33kV Narsinghpur GSS by augmentation of 100/55 sqmm conductor with 232sqmm conductor for a length of 10Ckm from Narsinghpur Grid to Kandhabareni PSS.	₹ 2.0	Annexure- 11.3
4	Dhenkanal	ANED	Angul-2	Strengthening of existing 33kV Angul-2 feeder emanating from 132/33kV Angul GSS by augmentation of Conductor of 80/55 sqmm conductor with 232sqmm conductor for a length of 7Ckm from 33/11kV Badakera PSS to Shree Metallik Pvt Ltd. tapping.	₹1.6	Annexure- 11.4
5	Dhenkanal	ANED	Angul-2	Strengthening of existing 33kV Angul-2 feeder emanating from 132/33kV Angul GSS by augmentation of Conductor of 80/55 sqmm conductor with 232sqmm conductor for a length of 4.5Ckm from Bhata ABS to Tarini Nursery.	₹ 1.00	Annexure- 11.5
			тот	AL	₹ 7.0	

#### 1.0 33kV Athagarh Feeder Refurbishment (Choudwar Grid to Chatisha PSS)

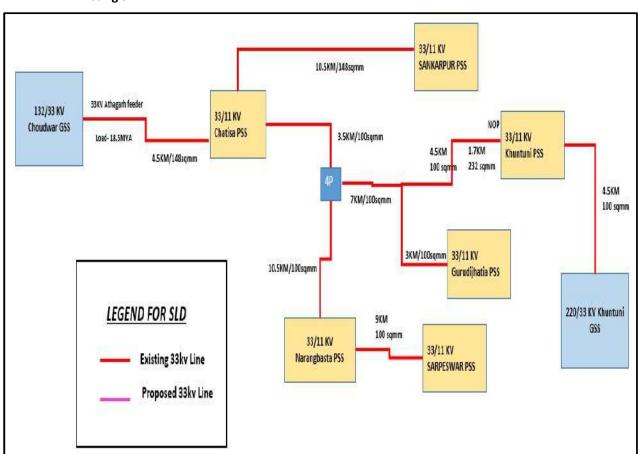
**Proposal:** Strengthening of existing 33kV Athagarh feeder emanating from 132/33kV Choudwar GSS by augmentation of 148 sqmm conductor with 232sqmm conductor for a length of 4.5Ckm from Choudwar GSS to 33/11kV Chatisha PSS.

**Objective:** To maintain reliability of power supply, reduction if frequent interruptions in the feeder, reduction of conductor snapping and strengthening the existing network by augmenting weak section and lower conductor size.

#### **Existing Scenario:**

- At present, 33kV Athagarh feeder is emanating from 132/33kV Choudwar GSS. 5 no. of 33/11kV PSS i.e, Chatisa PSS, Sankarpur PSS, Narangbasta PSS, Sarpeswar PSS, Gurudijhatia PSS and other 33kV consumers are connectred from this feeder. The existing feeder is lengthy with 45.2Ckm and the peak load is 18.5MVA.
- Existing Athagarh feeder from Choudwar GSS to Chatisha PSS with existing line is in unsafe
  condition. Conductor has become weak due to past fault feeding. In addition, conductor
  snapping is experienced along with tiled poles along the feeder and span length is high.
  Minimum ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 4.5Ckm.

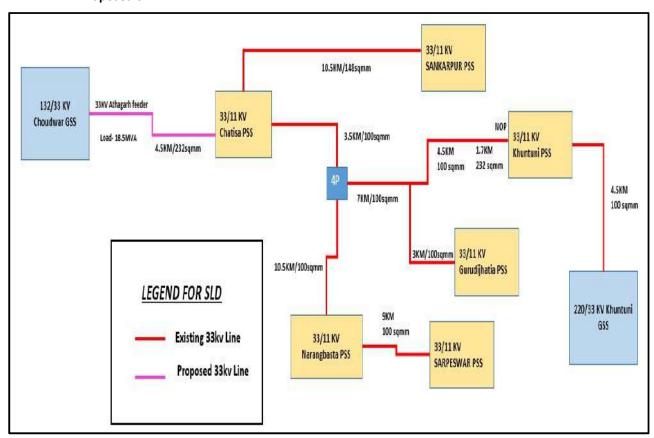
#### **Existing SLD:**



#### **Proposed Scenario:**

- Peak load for FY' 27-28 will be 23.4 MVA on 33kV Athagarh feeder considering load growth of 6% per annum.
- Augmentation & refurbishment is proposed for 4.5Ckm from 148 sq.mm to 232 sq.mm from Choudwar GSS to Chatisa PSS.

#### **Proposed SLD:**



#### **Detailed Scope of Work:**

Augmentation & refurbishment of line for 4.5Ckm from 148 sq.mm to 232 sq.mm along with installation of 79nos. of interposing pole on existing line.

## BOQ:

	TP CENTI	RAL ODISHA DISTRIBUTION LIMITED					
	Name of the Division :-	CED					
	Name of the Sub-Division : -	- Choudwar					
	Name of the Work :-	33kV Feeder Refurbishment	33kV Feeder Refurbishment				
	Scope of work:-	Part-A: - 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm					
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)					
		ABSTRACT OF ESTIMATE					
SI. No.	Part	Description	Amount				
1	А	Part-A: - 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm	1,00,03,568.47				
		Total Amount	1,00,03,568.47				
		Total Amount (In Cr)	1.00				
Total	estimated cost is Rs. 1 Crore.	(On TPCODL Capex Scheme)					

Cost Estimate: ₹ 1.00cr. (For detailed BoQ refer Annexure-11.1).

## Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

# 2.0 <u>33kV Narangbasta Feeder Refurbishment (Khuntuni Police Station to</u> Radhakishorepur UG and from Panima chhak to Oranda)

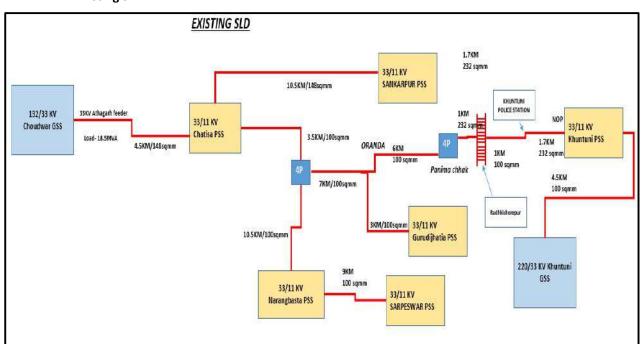
**Proposal:** Strengthening of existing 33kV Narangbasta feeder emanating from 132/33kV Khuntuni GSS by augmentation of conductor of 148 sqmm conductor with 232sqmm conductor for a length of 6Ckm from Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda.

**Objective:** To maintain reliability of power supply, mitigating N-1 and strengthening the existing network by augmenting lower conductor size.

#### **Existing Scenario:**

- At present, 33kV Narangbasta feeder is emanating from 132/33kV Choudwar GSS. 1 no. of 33/11kV PSS i.e, Khuntuni and other 33kV consumers are connectred from this feeder. Total length of this feeder is 4.5km and the peak load is 11.5MVA.
- Existing Narangbasta feeder from Khuntuni Police Station to Radhakishorepur UG and from
  Panima chhak to Oranda is in unsafe condition. Conductor has become weak due to past
  fault feeding. Conductor has become weak due to past fault feeding. In addition, conductor
  snapping is experienced along with tiled poles along the feeder and span length is high.
  Minimum ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 6Ckm.
- It is also not possible to backfeed 4 no.s of PSS which are connected from Choudwar GSS which hampers the N-1 contingency condition.

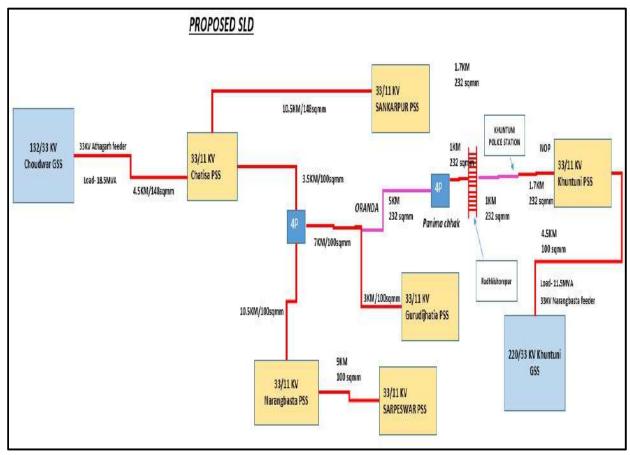
#### **Existing SLD:**



#### **Proposed Scenario:**

- Peak load for FY' 27-28 will be 12.58 MVA on 33kV Narangbasta feeder considering load growth of 2% per annum.
- Augmentation & refurbishment is proposed for 6Ckm from 100 sq.mm to 232 sq.mm from Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda.

#### **Proposed SLD:**



#### **Detailed Scope of Work:**

Augmentation & refurbishment of line for 6Ckm from 100 sq.mm to 232 sq.mm. In along with installation of 108nos. of interposing pole on existing line.

## BOQ:

	TP CENTRAL ODISHA DISTRIBUTION LIMITED						
	Name of the Division :-	AED ATHAGARH					
	Name of the Sub-Division : -	ATHAGARH					
	Name of the Work :-	33kV Feeder Refubishment	33kV Feeder Refubishment				
	Scope of work:-	Part-A: - 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm					
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)					
		ABSTRACT OF ESTIMATE					
SI. No.	Part	Description	Amount				
1	А	Part-A: - 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm	1,35,66,368.84				
		Total Amount	1,35,66,368.84				
		Total Amount (In Cr)	1.36				
Total	Total estimated cost is Rs. 1.36 Crore. (On TPCODL Capex Scheme)						

Cost Estimate: ₹ 1.36cr. (For detailed BoQ refer Annexure-11.2).

## Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

## 3.0 33kV Kanpur Feeder Refurbishment (Narsinghpur Grid to Kandhabareni PSS)

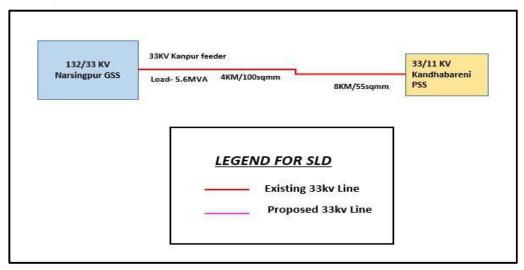
**Proposal:** Strengthening of existing 33kV Kanpur feeder emanating from 132/33kV Narsinghpur GSS by augmentation of 100/55 sqmm conductor with 232sqmm conductor for a length of 12Ckm from Narsinghpur Grid to Kandhabareni PSS.

**Objective:** To maintain reliability of power supply, reduction if frequent interruptions in the feeder, reduction of conductor snapping and strengthening the existing network by augmenting weak section and lower conductor size.

#### **Existing Scenario:**

- At present, 33kV Kanpur feeder is emanating from 132/33kV Narsingpur GSS. 1 no. of 33/11kV PSS i.e, Kandhabareni and other 33kV consumers are connectred from this feeder. The existing feeder total length is 12km and the peak load is 5.6MVA.
- Existing Kanpur feeder from Narsingpur GSS to Kandhabareni PSS with existing line is in unsafe condition. Conductor has become weak due to past fault feeding. In addition, conductor snapping is experienced along with tiled poles along the feeder and span length is high. Minimum ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 12Ckm.

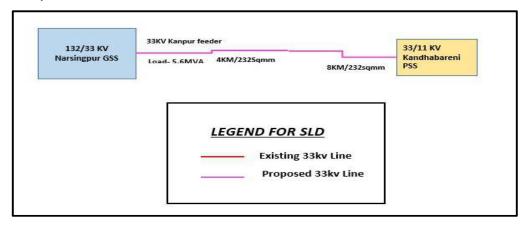
#### **Existing SLD:**



#### **Proposed Scenario:**

- Peak load for FY' 27-28 will be 6.55 MVA on 33kV Narangbasta feeder considering load growth of 4% per annum.
- Augmentation & refurbishment is proposed for 10km from 100/55 sq.mm to 232 sq.mm from Narsinghpur Grid to Kandhabareni PSS.

## **Proposed SLD:**



## **Detailed Scope of Work:**

Augmentation & refurbishment of line for 10Ckm from 100 and 55sq.mm to 232 sq.mm along with installation of 108nos. of interposing pole on existing line.

## BOQ:

	TP CENT	RAL ODISHA DISTRIBUTION LIMITED				
	Name of the Division :-	AED ATHAGARH				
	Name of the Sub-Division : -	NARSINGHPUR				
	Name of the Work :-	33kV Feeder Refurbishment				
	Scope of work:-	Part-A: - 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm				
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1	А	Part-A:- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 12Ckm	2,09,21,847.12			
		Total Amount	2,09,21,847.12			
		Total Amount (In Cr)	2.09			
Total	estimated cost is Rs. 2.09 Cro	re. (On TPCODL Capex Scheme)	1			

Cost Estimate: ₹ 2.09cr. (For detailed BoQ refer Annexure-11.3).

## Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

CAPEX FY: 23-24 (33kV Feeder Refurbishment)

## 4.0 33kV Angul-2 Feeder Refurbishment (Badakera PSS to Shree Metallik tapping)

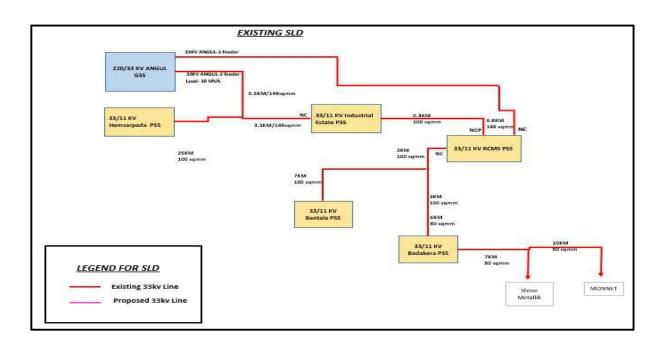
**Proposal:** Strengthening of existing 33kV Angul-2 feeder emanating from 132/33kV Angul GSS by augmentation of Conductor of 80/55 sqmm conductor with 232sqmm conductor for a length of 7Ckm from 33/11kV Badakera PSS to Shree Metallik Pvt Ltd. tapping.

**Objective:** To maintain reliability of power supply, improvement of low voltage issue, improvement of N-1 contingency condition, reduction if frequent interruptions in the feeder, reduction of conductor snapping and strengthening the existing network by augmenting weak section and lower conductor size.

## **Existing Scenario:**

- At present, 33kV Angul-2 feeder is emanating from 132/33kV Angul GSS. 3 no. of 33/11kV PSS i.e, Industrial Estate, Bantala, Badakera and few 33kV consumers including Shree Metallik Pvt Ltd. which are connectred from this feeder. The existing total length of the feeder is 40.2Ckm and the peak load is 18.8MVA.
- Existing Angul-2 feeder from Badakera PSS to 33kV consumer Shree Metallik with existing
  line is on 8/9 mtr PSC pole. In addition, conductor snapping is experienced along with tiled
  poles along the feeder and span length is high. Also V-cross arm are damaged and minimun
  ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 7Ckm. Due to low size of conductor
  and lengthy line from Angul Grid, the 33kV consumers connected to the tail end of feeder,
  i.e., Shree Metallik and MONNET are experiencing low voltage.

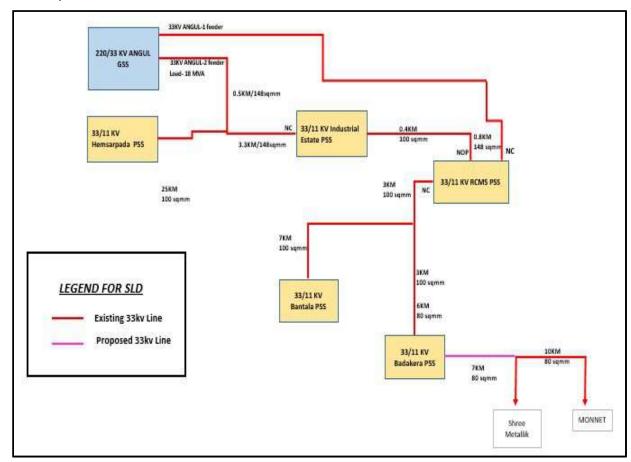
## **Existing SLD:**



## **Proposed Scenario:**

- Peak load for FY' 27-28 will be 25.6 MVA on Angul-2 feeder considering load growth of 8% per annum.
- Augmentation & refurbishment is proposed for 7Ckm from 80 sq.mm to 232 sq.mm from Badakera to Shree Metallik tapping.

## **Proposed SLD:**



## **Detailed Scope of Work:**

Augmentation & refurbishment of line for 7Ckm from 80 sq.mm to 232 sq.mm along with installation of 126nos. of interposing pole on existing line.

## BOQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED					
Name of the Division :-	ANGUL				
Name of the Sub-Division : -	ANGUL				
Name of the Work :-	33kV Feeder Refurbishment				
Scope of work:-	Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length-7Ckm.				
Names of Schemes: -	TPCODL CAPEX(FY 23-24)				

		ABSTRACT OF ESTIMATE					
SI. No.	Part Description A						
1	А	Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.	1,58,27,430.31				
	Total Amount						
	Total Amount (In Cr) 1.						
Total	estimated cost is Rs. 1.58 Cro	ore. (On TPCODL Capex Scheme)					

Cost Estimate: ₹ 1.58cr. (For detailed BoQ refer Annexure-11.4).

## Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

## 5.0 33kV Angul-2 Feeder Refurbishment (Bhata ABS to Tarini Nursery)

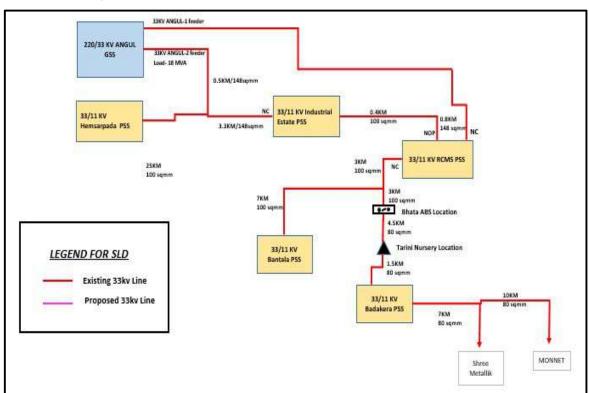
**Proposal:** Strengthening of existing 33kV Angul-2 feeder emanating from 132/33kV Angul GSS by augmentation of Conductor of 80/55 sqmm conductor with 232sqmm conductor for a length of 4.5Ckm from Bhata ABS to Tarini Nursery.

**Objective:** To maintain reliability of power supply, improvement of low voltage issue, improvement of N-1 contingency condition, reduction if frequent interruptions in the feeder, reduction of conductor snapping and strengthening the existing network by augmenting weak section and lower conductor size.

## **Existing Scenario:**

- At present, 33kV Angul-2 feeder is emanating from 132/33kV Angul GSS. 3 no. of 33/11kV PSS i.e, Industrial Estate, Bantala, Badakera and few 33kV consumers including Shree Metallik Pvt Ltd. which are connectred from this feeder. The existing total length of the feeder is 40.2Ckm and the peak load is 18.8MVA.
- Existing Angul-2 feeder from Badakera PSS to 33kV consumer Shree Metallik with existing
  line is on 8/9 mtr PSC pole. In addition, conductor snapping is experienced along with tiled
  poles along the feeder and span length is high. Also V-cross arm are damaged and minimun
  ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 4.5Ckm. Due to low size of conductor and lengthy line from Angul Grid, the 33kV consumers connected to the tail end of feeder, i.e., Shree Metallik and MONNET are also experiencing low voltage.

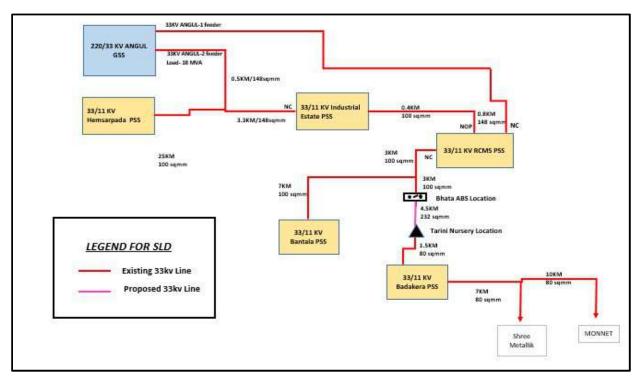
**Existing SLD:** 



## **Proposed Scenario:**

- Peak load for FY' 27-28 will be 25.6 MVA on Angul-2 feeder considering load growth of 8% per annum.
- Augmentation & refurbishment is proposed for 4.5km from 80 sq.mm to 232 sq.mm from Bhata ABS to Tarini Nursery.

## **Proposed SLD:**



## **Detailed Scope of Work:**

Augmentation & refurbishment of line for 4.5Ckm from 80 sq.mm to 232 sq.mm along with installation of 79nos. of interposing pole on existing line.

## BOQ:

	TP CENTRAL ODISHA DISTRIBUTION LIMITED						
	Name of the Division :-	vision :- ANGUL					
	Name of the Sub-Division : -	n:- ANGUL					
	Name of the Work :-	:- 33kV Feeder Refurbishment  Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm					
	Scope of work:-						
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)					
	<u>ABSTRACT OF ESTIMATE</u>						
SI. No.	Part	Description Amount					

1	А	Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm	99,72,916.45		
	Total Amount Total Amount (In Cr)		99,72,916.45		
			1.00		
Total estimated cost is Rs. 1.00 Crore. (On TPCODL Capex Scheme)					

Cost Estimate: ₹ 1.00cr. (For detailed BoQ refer Annexure-11.5).

## Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

# **ANNEXURE-11.1 (ABSTRACT)**

	TP C	ENTRAL ODISHA DISTRIBUTION LIMITED					
	Name of the Division :-	CED					
	Name of the Sub-Division : - CHOUDWAR						
	Name of the Work :-	33kV Feeder Refurbishment					
	Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Scope of work:- Augmentation (from existing 148 sqmm to 232sqmm) from Choudwal Grid to Chatisha PSS- Total Length 4.5Ckm						
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)					
		ABSTRACT OF ESTIMATE					
SI. No.	Part	Description	Amount				
1	Part-A :- 33kV Athagarh Feeder Refurbishment w Conductor Augmentation (from existing 148 sqmr to 232sqmm) from Choudwar Grid to Chatisha PS Total Length 4.5Ckm		1,00,03,568.47				
		Total Amount	1,00,03,568.47				
		Total Amount (In Cr)	1.00				
Total	Total estimated cost is Rs. 1.00 Crore. (On TPCODL Capex Scheme)						

Part-A: - 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm

2 Top Channel 100XS0/Morm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required = (2.92.565a.25)  3 Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)  4 Double Pole Belting, Channel 75x40X 4.8mm, 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's 4 Cannel Required = (5x2.14.14.26)  5 Danger Plate, 2 no's. 5 Back Clarm for Ganger Plate 2.5X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (1x4.55x3.34)  6 Danger Plate, 2 no's. 8 H.T. Stay clarm, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  9 H.T. Stay saut (Complete)  1 H.T. Stay sautomp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  9 H.T. Stay sautomp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  9 H.T. Stay sautomp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  9 H.T. Stay sautomp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  9 H.T. Stay sautomp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  9 H.T. Stay sautomp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  9 H.T. Stay sautomp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  9 H.T. Stay sautomp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  10 H.T. Stay sautomp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty, required (1 Pair)  11 J. 785 WG Stay Wire 15kg/Stay  12 Gil File Earthing, 2.36kg/mtr., 12.5 mtr. For mesh formation and 2.5 mtr. For Reg. 1 no's qty, required (1 Pair)  13 Josonom Gil Fila for earthing, 2.36kg/mtr., 12.5 mtr. For mesh formation and 2.5 mtr. For Reg. 1 no's qty, required (1 Pair)  14 Gil Pair Earthing 40mm. 3 Mtr. Long  15 Gil Pair Earthing 40mm. 3 Mtr. Long  16 Josonom Gil Fila for earthing, 2.36kg/mtr., 12.5 mtr. For mesh formation and 2.5 mtr. For Reg. 1 no's qty, required (1 Pair)  17 H. Whitting 68.539 Oxth, March 1 no's qt		Total Length 4.5Ckm		,		
		• •			4	
Total   Company   Compan		· · · · · · · · · · · · · · · · ·				
No.   No.   Controlled   Multiple   Multi	SI	WATERIALS FOR 33 KV DF WILHOUT ISSULTED			Total	Total
2         To Channel 100XSOKomm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel         KG         7.60         248.56         18,895           3         Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)         KG         9.300         15.8592         1,474           4         Double Polse Belting, Channel 75x40X4.8 mm, 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required = (5x2.34x1.458)         KG         7.600         279.888         21,277           5         9505x56mm Gl Bracing Angle, 4.5%g,/mtr., each angle length 3.432 mtr., 4 nos angle required = (4x2.43x4.458)         KG         7.600         247.104         18,775           6         Danger Plate, 2 no's.         No.         99.20         8         792           7         Back Clamp for danger Plate 25X3 mm. flat, 0.55Kg/Mtr. Flat of 0.510mtr length 2 no's = (5x2.53x0.53x0.50)         KG         93.00         2.4072         222           8         H.T. Stay sett (Complete)         Set         1,302.00         8         1,244           9         H.T. Stay sett (Complete)         No.         6,00         16         393           11         775 SWG Stay Whre 13kg Jstay         No.         1,302.00         4         5,20           12         175 SWG Stay Whre 13kg Jstay         No.         1,302.00		Description of Materials	Unit	Unit Rate		
Fish Plate 50x6 mm	1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	8	2,49,600.00
Double Pole Belting Channel 7SX40X 4.8mm, 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's kG 76.00 279.888 21.273	2		KG	76.00	248.56	18,890.56
Sociation   Strating Angle, 4,5Kg/mtr., each angle length 3,432 mtr., 4 nos angle required   KG   76.00   279,888   21,271   5   5050506mn   618 acing Angle, 4,5Kg/mtr., each angle length 3,432 mtr., 4 nos angle required   KG   76.00   247,104   18,775   6   Danger Plate, 2 no's.	3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	15.8592	1,474.91
6   Agric Pate 2 or S.   No.   1920   8   793	4	channel required =( 5x7.14x1.96)	KG	76.00	279.888	21,271.49
2	5		KG	76.00	247.104	18,779.90
Mathematical Complete   Math	6		No.	99.20	8	793.60
H.T. Stay set (Complete   Set	7		KG	93.00	2.4072	223.87
10   H.T. Stay Insulator Type-C (2 No's)   No.   62.00   16   99:     17   7/8 SWG Stay Wire 15kg /stay   K.g.   93.00   120   11,166     18   17   18   18   18   18   18   18	8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	8	1,240.00
11   7/8 SWG Stay Wire 15kg /stay	_			-		10,416.00
12 Gi Pipe Earthing 40mm. 3 Mtr. Long   No.   1,302.00   4   5,208	_					992.00
13   Sokemm Gl Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36						
14   Gl barbed wire anticlimbing device 3 Kg. Per support		50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For				4,389.60
Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's =   KG   93.00   9.6288   895	14		Kg	99.20	24	2,380.80
17		Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's =				895.48
18   Disc insulator (B&S) 90 KN polymer	16	,	No.	595.20	12	7,142.40
19   PG Clamp for 232 sq.mm AAA conductor   NO.   1,426.00   24   34,224   20   GI Nut, Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)   K.g.   96.72   49.044   4,744   1,093   1   1   1   1   1   1   1   1   1	17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	24	14,880.00
20   GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)   K.g.   96.72   49.044   4,743     21   Black Paint			No.			34,224.00
21   Black Paint   Ltr   272.80   4   1,092	_					34,224.00
22   Yellow Colour Paint for Background						4,743.54
A A Grant Cost of materials A,46,203 B Stock, Storage & Insurance i.e 3% of A 13,386 C Sub Total (A+B) 4,59,583 D Contigency @ 3% of C 13,787 E Tools & Plants @ 2% of C 7,59,583 G Frection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G Frection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole) 17,261 I Frection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole) 17,261 I Frection Charges @ 20% of PSC pole- Not to be used for 33kv J Sum of (C to I) 5,47,154  Sum of (C to I) 5,47,154  Sum of (C to I) 5,47,154  Civil & Services  Si. Description of Materials  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 0.5 Cum 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.)  2 Concreting ratio 1:1.5:3 (500mmX500mmX2020mm) = 0.55Cu.mtr Cu.mtr 6,500.00 4.4 28,600 3 Couping ratio 1:1.5:3 with dimension (500X500X450) = 0.1125 Cu mtr Cu.mtr 6,500.00 0.9 5,850  Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance, No. 3,700.00 4 14,800						2,182.40
B Stock, Storage & Insurance i.e 3% of A 13,386 C Sub Total (A+B) 4,59,588 D Contigency @ 3% of C 13,787 E CONTIGENCY @ 3% of C 9,191 F Tools & Plants @ 2% of C 9,191 F Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole HT stay set/GI Pipe/PSC pole) 12,854 H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole) 17,261 I Erection Charges @ 20% of PSC pole- Not to be used for 33kv J Sum of (C to I) 5,47,154  SI. No. Description of Materials    Unit   Unit Rate   Total Quantity   Amount		Tellow colour Fullition background				4,46,203.74
Contigency @ 3% of C 13,787  E Contigency @ 3% of C 13,787  E Contigency @ 3% of C 13,787  E Contigency @ 3% of C 13,787  F Contigency @ 3% of C 9,191  Fransportation @ 7.5% of C 34,465  G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 12,854  H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole) 17,261  I Erection Charges @ 20% of PSC pole- Not to be used for 33kv  J Sum of (C to I) 5,47,154  Civil & Services   Si. No. Description of Materials  Description of Materials  Description of Materials  Vinit Vinit Rate Vinit Vinit Amount  Total Amount  Total Amount  Total Construction of Materials No. 2,250.00 8 18,000  Concreting ratio 1:1.5:3 (S00mmX500mmX200mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)  Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder , calculation of earth resistance, No. 3,700.00 4 14,800.00  Sub Total Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder , calculation of earth resistance, No. 3,700.00 4 14,800.00  Sub Total Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, No. 3,700.00 4 14,800.00  Sub Total Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, No. 3,700.00 4 14,800.00  Sub Total Construction Earthing chamber including earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, No. 3,700.00 4 14,800.00		Stor	ck. Stora	ge & Insurance	e i.e 3% of A	13,386.11
D Contigency @ 3% of C 13,787  E Tools & Plants @ 2% of C 9,191  F Transportation @ 7.5% of C 34,466  G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 12,854  H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole) 17,261  I Erection Charges @ 20% of PSC pole- Not to be used for 33kv  J Sum of (C to I) 5,47,154  Linit Unit Rate Quantity Total Quantity Amount  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.)  2 Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 4.4 28,600  3 Couping ratio 1:1.5:3 with dimension (500X500X450) = 0.1125 Cu mtr Cu.mtr 6,500.00 0.9 5,850  Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance, No. 3,700.00 4 14,800.00 14,	_		, , , , , ,	_		4,59,589.85
E   Tools & Plants @ 2% of C   9,191  F   Transportation @ 7.5% of C   34,466  G   Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole   12,854  H   Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)   17,261  I   Erection Charges @ 20% of PSC pole- Not to be used for 33kv  J   Sum of (C to I)   5,47,154    Civil & Services	_				, ,	13,787.70
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 metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)  Practice Including excavation, soil treatment with bentonide powder, calculation of earth resistance, and including excavation, soil treatment with bentonide powder, calculation of earth resistance, No. 3,700.00 4 14,800 12,850 12,850 17,850 12,850 17,						9,191.80
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 metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)  Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance,  Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole) 17,261  17,261  17,261  17,261  17,261  17,261  17,261  18,261  18,261  18,261  19,261  10,261  10,261  11,261  11,261  12,261  12,261  10,261  11,261  12,261  12,261  13,261  14,261  14,261  14,261  16,261  17,			Tr			34,469.24
H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/Gl Pipe/PSC pole)  I Erection Charges @ 20% of PSC pole- Not to be used for 33kv  J Sum of (C to I)  Sum of (C to I)  5,47,154  Civil & Services   Civil & Services  Unit Unit Rate Quantity  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.)  Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance,  No. 3,700.00  4 14,800.00		Frection Charges (				12,854.40
Erection Charges @ 20% of PSC pole- Not to be used for 33kv     Sum of (C to I)   5,47,154     Sum of (C to I)   5,47,154		-				17,261.54
SI. No. Description of Materials  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 excation, 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.)  2 Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance,  No. 3,700.00 4 14,800.						-
SI. No. Description of Materials    Unit   Unit Rate   Total Quantity   Total Quantity   Total Quantity		Election charges & 2070 of	1 30 pon			5 47 154 52
No. Description of Materials  Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate  Signature of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate  Signature of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate  Signature of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate  No. 2,250.00  8 18,000  Conscruction gratio 1:1.5:3 (500mmX500mmX200mm) = 0.55Cu.mtr  Coupring ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  Coupring ratio 1:1.5:3 with dimension (500X500X450) = 0.1125 Cu mtr  Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance,  No. 3,700.00  4 14,800	,	<u>Civil &amp; Services</u>			0. (0 to 1)	3,47,134.32
1 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.)  2 Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr  3 Couping ratio 1:1.5:3 with dimension (500X500X450) = 0.1125 Cu mtr  4 Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance,  No. 2,250.00 8 18,000 2,250.00 2,250		Description of Materials	Unit	Unit Rate		
3 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr  Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance,  No. 3,700.00 4 14,800	1	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	No.	2,250.00	8	18,000.00
Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance, No. 3,700.00 4 14,800	2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
4 including excavation, soil treatment with bentonide powder, calculation of earth resistance, No. 3,700.00 4 14,800	3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
including installation of sixth of tipe 40 min/softmin including welding of of hat around pipe.	4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber			4	14,800.00

### **ANNEXURE-11.1** Part-A: - 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm **Total Civil & Services** 67,250.00 Total (J+K) 6,14,404.52 Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) Μ 36,864.27 Ν Sub Total (L+M) 6,51,268.79 Total GST @ 18% of (N) 0 1,17,228.38 Total CESS @ 1% of (N) Р 6,512.69 Q Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator 7,75,009.86 No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002) 4 MATERIALS FOR 33 KV Cut Point with 180 Degree Angle Total Total **Unit Rate Description of Materials** Unit No. Quantity **Amount** 1 WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) No 31,200.00 4 1,24,800.00 Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's K.g. 76.00 130.016 9,881.22 of Channel = (2x 9.56x1.7)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280) 93.00 21.1456 1,966.54 K.g. Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., K.g. 76.00 23.40288 1,778.62 2 No's of Channel = (2x 9.56x0.306) No. 99.20 4 396.80 Danger Plate, 1 no's. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = KG 93.00 1.2036 111.93 (1x0.59x0.510) GI barbed wire anticlimbing device 3 Kg. Per support 99.20 12 1,190.40 Kg Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = KG 93.00 4.8144 447.74 8 (4x0.59x0.510) 33KV pin insulator polymer No. 595.20 12 7,142.40 H W fitting(B&S)90KN,4 Bolt No. 620.00 24 14.880.00 1.426.00 34.224.00 11 Disc insulator (B&S)90 KN polymer No. 24 205.84 823.36 12 | Earthing of Support (Coil Type) EΑ 4 13 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing 93.00 1.048 97.46 K.g. 14 PG Clamp for 232 sq.mm AAA conductor NO. 1,426.00 24 34,224.00 1,887.59 15 GI Nut, Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point) K.g. 96.72 19.516 272.80 1,091.20 16 Black Paint 4 Ltr Yellow Colour Paint for Background 272.80 2,182.40 Ltr 17 **Total Cost of materials** 2,37,125.66 Α В Stock, Storage & Insurance i.e 3% of A 7,113.77 С Sub Total (A+B) 2,44,239.43 D Contigency @ 3% of C 7,327.18 Ε Tools & Plants @ 2% of C 4,884.79 Transportation @ 7.5% of C F 18,317.96 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 6,427.20 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 11,569.54 Н Erection Charges @ 20% of PSC pole- Not to be used for 33kv ı J Sum of (C to I) 2,92,766.10 Civil & Services Total SI. Total **Description of Materials** Unit **Unit Rate** No. **Ouantity** Amount Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr 6,500.00 2.2 14,300.00 1 Cu.mtr 2 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr Cu.mtr 6.500.00 0.45 2,925.00 Κ **Total Civil & Services** 17,225.00 Total (J+K) L 3,09,991.10 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle) 18,599.47 Μ Ν Sub Total (L+M) 3,28,590.57

0

Total GST @ 18% of (N)

59,146.30

### **ANNEXURE-11.1** Part-A: - 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm Total CESS @ 1% of (N) 3,285.91 Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle 3,91,022.78 Q No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003) MATERIALS FOR 33 KV Cut Point with 90 Degree Angle SI. Total Total **Unit Rate Description of Materials** Unit No. Quantity Amount 31,200.00 WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) 4 1,24,800.00 No Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's 2 K.g. 76.00 260.032 19,762.43 of Channel = (4x 9.56x1.7)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280) 93.00 42.2912 K.g. 3.933.08 Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 46.80576 76.00 3,557.24 K.g. 4 No's of Channel = (4x 9.56x0.306) 99.20 396.80 No. 4 Danger Plate, 1 no's Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = KG 1.2036 93.00 111.93 (1x0.59x0.510) GI barbed wire anticlimbing device 3 Kg. Per support 99.20 12 1,190.40 Kg Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = KG 93.00 4.8144 447.74 33KV pin insulator polymer (4 No's each 90 Deg. Cut point) 595.20 9.523.20 No. 16 10 H W fitting(B&S)90KN,4 Bolt 620.00 14,880.00 No. 1,426.00 24 34,224.00 11 Disc insulator (B&S)90 KN polymer No. Earthing of Support (Coil Type) No. 205.84 823.36 13 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing 1.048 97.46 K.g. 93.00 14 PG Clamp for 232 sq.mm AAA conductor NO. 1,426.00 24 34,224.00 15 H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair) 155.00 620.00 Pair 4 16 H.T. Stay set (Complete ) Set 1,302.00 4 5,208.00 17 H.T. Stay Insulator Type-C (2 No's.) No. 62.00 248.00 18 7/8 SWG Stay Wire 15kg /stay K.g. 93.00 5,580.00 19 GI Nut, Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point) K.g. 96.72 45.24 4,375.61 20 Black Paint Ltr 272.80 1,091.20 Yellow Colour Paint for Background 21 Ltr 272.80 2,182.40 **Total Cost of materials** 2,67,276.86 Α Stock, Storage & Insurance i.e 3% of A 8,018.31 В C Sub Total (A+B) 2,75,295.17 D Contigency @ 3% of C 8,258.86 Tools & Plants @ 2% of C 5,505.90 Ε Transportation @ 7.5% of C 20,647.14 F Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 6,427.20 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) н 13,474.55 Erection Charges @ 20% of PSC pole- Not to be used for 33kv т J Sum of (C to I) 3,29,608.81 Civil & Services SI. Total Total Description of Materials Unit **Unit Rate** No. Quantity 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 6,500.00 0.45 2,925.00 Cu.mtr 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 No. 2,250.00 4 9,000.00 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.) **Total Civil & Services** 26,225.00 L Total (J+K) 3,55,833.81

### **ANNEXURE-11.1** Part-A: - 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle) 21,350.03 Sub Total (L+M) 3,77,183.84 Ν 0 Total GST @ 18% of (N) 67,893.09 Total CESS @ 1% of (N) Р 3,771.84 Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle Q 4,48,848.77 4.5 33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001) **MATERIALS FOR 33 KV Pin Points** Total Total **Description of Materials** Unit **Unit Rate** No. Quantity Amount 1 WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) No 31,200.00 63 19,65,600.00 33 KV V cross Arm (GI) 22Kg each No. 1,959.20 1,23,429.60 63 Top bracket 100x50x6mm GI channel ( 2kg each) 186.00 11,718.00 63 No. Danger Plate, 1 no's 99.20 63 6,249.60 No. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = 5 KG 93.00 18.96 1,762.97 (1x0.59x0.510) 99.20 189.00 18,748.80 GI barbed wire anticlimbing device 3 Kg. Per support Kg Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = KG 93.00 75.83 7.051.89 (4x0.59x0.510) 33KV pin insulator polymer No. 595.20 189 1,12,492.80 205.84 Earthing of Support (Coil Type) No. 63 12,967.92 10 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing 93.00 16.51 1,535.06 K.g. GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point) 96.72 91.35 8,835.37 11 K.g. 232 sq.mm AAA conductor K.M. 1,94,060.00 13.91 26,98,404.30 12 13 Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor EΑ 648.42 272.80 17,186.40 Ltr 63.0 14 Black Paint 15 Yellow Colour Paint for Background Ltr 272.80 126.0 34,372.80 **Total Cost of materials** 50,20,355.52 Α Stock, Storage & Insurance i.e 3% of A 1,50,610.67 В C Sub Total (A+B) 51,70,966.18 D Contigency @ 3% of C 1,55,128.99 Tools & Plants @ 2% of C Ε 1,03,419.32 Transportation @ 7.5% of C F 3,87,822.46 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 1,01,228.40 Н Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 3,14,639.82 Erection Charges @ 20% of PSC pole- Not to be used for 33kv ı Sum of (C to I) 62,33,205.17 J Civil & Services Total Total SI. **Unit Rate Description of Materials** Unit No. Quantity Amount 1 Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 34.65 2,25,225.00 6,500.00 2 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr 7.09 46,068.75 Cu.mtr 10,800.00 3 Dismantalling of 148/232sqmm Conductor 13.50 1,45,800.00 km Κ **Total Civil & Services** 4,17,093.75 Total (J+K) 66,50,298.92 L Μ Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points) 3,99,017.94 Sub Total (L+M) Ν 70,49,316.86 Total GST @ 18% of (N) 12,68,877.03 0 Total CESS @ 1% of (N) 70,493.17 Gross Total Material +Services (N+O+P) for 33 KV Pin Points Q 83,88,687.06 **6% Supervision Charges Summary** 1 Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) 36,864.27

### **ANNEXURE-11.1** Part-A:- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator) 3 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle) 18,599.47 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle) 4 21,350.03 5 Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points) 3,99,017.94 Total (6% supervision charges) 4,75,831.70 **Gross Total Summary** Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator 7,75,009.86 Gross Total Material +Services (N+O) for 33 KV DP With Isolator 3 Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle 3,91,022.78 Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle 4,48,848.77 4 Gross Total Material +Services (N+O+P) for 33 KV Pin Points 5 83,88,687.06 Q Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km. Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km R S Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each Т Final decision by electrical Inspector U Gross Total Material, Services and Inspection Fees (P+Q+R+S+T) 1,00,03,568.47

		ANNEXURE-11.2 (ABSTRACT)					
		TP CENTRAL ODISHA DISTRIBUTION LIMITED					
	Name of the Division :- AED ATHAGARH						
	Name of the Sub-Division : -	ATHAGARH					
	Name of the Work :-	33kV Feeder Refubishment					
	Scope of work:-	Part-A: - 33kV Narangbasta Feeder Refurbishment with Co existing 100 sqmm to 232sqmm) Khuntuni Police Station to from Panima chhak to Oranda- Total Length 6Ckm					
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)					
		ABSTRACT OF ESTIMATE					
SI. No.	Part	Description	Amount				
1	А	Part-A: - 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm	1,35,66,368.84				
		Total Amount	1,35,66,368.84				
		Total Amount (In Cr)	1.3				

**ANNEXURE-11.2** Part-A: - 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm No. of 33 KV DP required Without Isolator 6 (Ref. Drawing No.- TPCODL-HVD-0004) MATERIALS FOR 33 KV DP Without Isolator Total Total Description of Materials Unit **Unit Rate** No. Quantity Amount WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) No 31,200.00 12 3,74,400.00 Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel 2 KG 76.00 372.84 28,335.84 required = (2x9.56x3.25)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280) KG 93.00 23.7888 2,212.36 Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., KG 76.00 419.832 31,907.23 5 no's channel required =( 5x7.14x1.96) 50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle 5 KG 76.00 370.656 28,169.86 required = (4\*4.5\*3.432)99.20 12 1.190.40 Danger Plate, 2 no's. No. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = 7 KG 93.00 3.6108 335.80 (2x0.59x0.510) H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 8 Pair 155.00 12 1,860.00 Pair) 1,302.00 15,624.00 12 H.T. Stay set (Complete) Set 10 H.T. Stay Insulator Type-C (2 No's.) No. 62.00 24 1,488.00 11 7/8 SWG Stay Wire 15kg /stay 93.00 180 16,740.00 K.g. 1,302.00 6 7,812.00 12 Gi Pipe Earthing 40mm. 3 Mtr. Long No. 50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For 13 KG 93.00 70.8 6,584.40 raising)= 5x2.3699.20 36 3,571.20 14 GI barbed wire anticlimbing device 3 Kg. Per support Kg Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 14.4432 15 KG 93.00 1,343.22 no's = (8x0.59x0.510)10,713.60 16 33KV pin insulator polymer No. 595.20 18 22,320.00 H W fitting(B&S) 90KN,4 Bolt No. 620.00 36 17 18 Disc insulator (B&S) 90 KN polymer No. 1,426.00 36 51,336.00 NO. 36 51,336.00 19 PG Clamp for 232 sq.mm AAA conductor 1,426.00 73.566 7,115.30 20 GI Nut, Bolt & Washer of different sizes (12.261 Kg each DP without Isolator) 96.72 K.g. 1,636.80 272.80 21 Black Paint Ltr 6 272.80 Yellow Colour Paint for Background Ltr 12 3,273.60 22 **Total Cost of materials** 6,69,305.61 Α 20,079.17 В Stock, Storage & Insurance i.e 3% of A C Sub Total (A+B) 6,89,384.78 20,681.54 D Contigency @ 3% of C Tools & Plants @ 2% of C 13,787.70 Ε Transportation @ 7.5% of C 51,703.86 F Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 19,281.60 G Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole 25,892.31 Н Erection Charges @ 20% of PSC pole- Not to be used for 33kv ı Sum of (C to I) 8,20,731.78 J Civil & Services Total SI. Total Unit **Unit Rate Description of Materials** No. Quantity Amount 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 No. 2,250.00 12 27,000.00 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.) Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr 6,500.00 42,900.00 Cu.mtr 6.6 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr Cu.mtr 6,500.00 1.35 8,775.00 Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth No. 3,700.00 6 22.200.00 resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe Κ **Total Civil & Services** 1,00,875.00 Total (J+K) L 9,21,606.78 Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)

55,296.41

9,76,903.19

1,75,842.57

Sub Total (L+M)

Total GST @ 18% of (N)

Μ

N

0

	ANNEXURE-11.2					
1	Part-A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to					
P	akishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm		Total CESS	@ 1% of (N)	9,769.03	
Q	Gross Total Material +Services (N	+O+P) fo	r 33 KV DP With	out Isolator	11,62,514.80	
				_		
<u> </u>	No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No TPCODL-HVD-0002)			6		
SI.	MATERIALS FOR 33 KV Cut Point with 180 Degre	<u>e Angle</u>		Total	Total	
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount	
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	6	1,87,200.00	
2	Straight Cross Arm Channel $100 \times 50 \times 6$ mm, $9.56$ KG/mtr, each channel length $1.7$ Mtr., $2$ No's of Channel = $(2x 9.56x1.7)$	K.g.	76.00	195.024	14,821.82	
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	31.7184	2,949.81	
4	Straight Cross Arm Top Channel $100 \times 50 \times 6$ mm, $9.56 \times 6$ /mtr, each channel length $0.306$ Mtr., $2 \times 9.56 \times 0.306$	K.g.	76.00	35.10432	2,667.93	
5	Danger Plate, 1 no's.	No.	99.20	6	595.20	
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.8054	167.90	
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	18	1,785.60	
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	7.2216	671.61	
9	33KV pin insulator polymer	No.	595.20	18	10,713.60	
-	H W fitting(B&S)90KN,4 Bolt	No.	620.00	36	22,320.00	
11 12	Disc insulator (B&S)90 KN polymer Earthing of Support ( Coil Type )	No. EA	1,426.00 205.84	36 6	51,336.00 1,235.04	
	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.572	146.20	
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	36	51,336.00	
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	29.274	2,831.38	
16	Black Paint	Ltr	272.80	6	1,636.80	
17	Yellow Colour Paint for Background	Ltr	272.80	12	3,273.60	
A B		Stock Sto	rage & Insurance	of materials	<b>3,55,688.49</b> 10,670.65	
C		otock, ste		Total (A+B)	3,66,359.15	
D				y @ 3% of C	10,990.77	
Е			Tools & Plant		7,327.18	
F			Transportation		,	
G			on Trf/Breaker/V			
H	Erection Charges @ 10% of C (except Trf/Breake Erection Charges @ 20%				17,354.31	
<del>                                     </del>	Election charges & 2010	701 130		m of (C to I)	4,39,149.15	
	<u>Civil &amp; Services</u>				, ,	
SI. 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	3.3	21,450.00	
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.675	4,387.50	
K			l otal Civi	I & Services Total (J+K)	25,837.50	
L M	Other overheads (Including 6% supervision charges) of L (for 33	KV Cut F	oint with 180 De	• •	4,64,986.65 27,899.20	
N	Other overheads (medding 0% super vision endiges) of 2 (101 33	niv cari		Total (L+M)	4,92,885.85	
0						
Р	Total CESS @ 1% of (N)					
Q	Q Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle					
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No TPCODL-HVD-0003)  6						
<u> </u>	MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
SI.	Description of Materials	Unit	Unit Rate	Total	Total	
No.	WDR 160v152 (12Mtr. Long. 20 MAVC/Mtr.)	Nic	21 200 00	<b>Quantity</b> 6	1 97 200 00	
2	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) 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 = $(4x 9.56x1.7)$	No K.g.	31,200.00 76.00	390.048	1,87,200.00 29,643.65	
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	63.4368	5,899.62	
	11				l	

	ANNEXURE-11.2					
Part-	A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing	g 100 sqm	m to 232sqmm)	Khuntuni Po	lice Station to	
Radh	akishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm					
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	70.20864	5,335.86	
5	Danger Plate, 1 no's.	No.	99.20	6	595.20	
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.8054	167.90	
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	18	1,785.60	
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	7.2216	671.61	
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	24	14,284.80	
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	36	22,320.00	
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	36	51,336.00	
12	Earthing of Support ( Coil Type )	No.	205.84	6	1,235.04	
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.572	146.20	
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	36	51,336.00	
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	6	930.00	
16	H.T. Stay set (Complete )	Set	1,302.00	6	7,812.00	
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	6	372.00	
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	90	8,370.00	
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	67.86	6,563.42	
	Black Paint	Ltr	272.80	6	1,636.80	
21	Yellow Colour Paint for Background	Ltr	272.80	12	3,273.60	
Α				of materials	4,00,915.29	
В	S	tock, Sto	rage & Insurance		12,027.46	
С				Total (A+B)	4,12,942.75	
D				y @ 3% of C	12,388.28	
E			Tools & Plant		8,258.86	
F	Footbas Ohan	0.50/	Transportation	_	30,970.71	
<u>G</u>	Erection Charges @ 10% of C (except Trf/Break		on Trf/Breaker/V		9,640.80	
H	Erection Charges @ 10% of C (except 111/Break)  Erection Charges @ 20%				20,211.82	
<u>                                     </u>	Election Charges @ 207	0 UI P3C		m of (C to I)	4,94,413.22	
<b>–</b>	Civil & Services		Ju	111 01 (C to 1)	4,34,413.22	
SI.	CIVIL CL SCIVICES			Total	Total	
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount	
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	3.30	21,450.00	
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.68	4,387.50	
	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	6	13,500.00	
К			Total Civi	l & Services	39,337.50	
L				Total (J+K)	5,33,750.72	
М	Other overheads (Including 6% supervision charges) of L (for	33 KV Cut		0 0 1	32,025.04	
N				Total (L+M)	5,65,775.76	
0			Total GST @		1,01,839.64 5,657.76	
P						
Q	Gross Total Material +Services (N+O+P) for 3	33 KV Cut	Point with 90 De	egree Angle	6,73,273.16	
	33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No TPCODL-HVD-0001)					
	MATERIALS FOR 33 KV Pin Points					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	84	26,20,800.00	
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	84	1,64,572.80	
	T	l No	186.00	84	15,624.00	
3	Top bracket 100x50x6mm GI channel ( 2kg each)	No.	100.00			
3	Danger Plate, 1 no's.	No.	99.20	84	8,332.80	
		+		<b>.</b>		

ANNEXURE-11.2							
Part-A: - 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police							
I	Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm						
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	101.10	9,402.52		
8	33KV pin insulator polymer	No.	595.20	252	1,49,990.40		
9	Earthing of Support ( Coil Type )	No.	205.84	84	17,290.56		
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	22.01	2,046.74		
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	121.80	11,780.50		
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	18.54	35,97,872.40		
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-		
14	Black Paint	Ltr	272.80	84.0	22,915.20		
15	Yellow Colour Paint for Background	Ltr	272.80	168.0	45,830.40		
Α				of materials	66,93,807.35		
В		Stock, Sto	rage & Insurance	e i.e 3% of A	2,00,814.22		
С				Total (A+B)	68,94,621.57		
D				y @ 3% of C	2,06,838.65		
E			Tools & Plant	_	1,37,892.43		
F	5 11 01	0.50/	Transportation	_	5,17,096.62		
G			on Trf/Breaker/V		1,34,971.20		
H	Erection Charges @ 10% of C (except Trf/Breaks				4,19,519.76		
<u> </u>	Erection Charges @ 20%	ot PSC p					
J	<u>Civil &amp; Services</u>		Su	m of (C to I)	83,10,940.23		
SI.	Description of Materials	Unit	Unit Rate	Total	Total		
No.	Description of Waterials	O'III	Omt Nate	Quantity	Amount		
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	46.20	3,00,300.00		
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	9.45	61,425.00		
3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	18.00	1,62,000.00		
К			Total Civi	I & Services	5,23,725.00		
L				Total (J+K)	88,34,665.23		
М	Other overheads (Including 6% supervis	ion charge	· ·		5,30,079.91		
N				Total (L+M)	93,64,745.14		
0			Total GST @		16,85,654.13		
P				@ 1% of (N)	93,647.45		
Q	Gross Total Material +	Services (	N+O+P) for 33 K	V Pin Points	1,11,44,046.72		
	69/ Supervision Charges Summary						
<u> </u>	6% Supervision Charges Summary	s) of L (fo	~ 22 KV/ DD \\/:+b	out Isolator\	FF 205 44		
1	Other overheads (Including 6% supervision charge				55,296.41		
2	Other overheads (Including 6% supervision cha		-				
3	Other overheads (Including 6% supervision charges) of L (for 3 Other overheads ( Including 6% supervision charges) of L (for 3			0 0 /	27,899.20		
5					32,025.04 5,30,079.91		
	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)  Total (6% supervision charges)						
	Total (6% supervision charges) 6,45,3  Gross Total Summary						
1	1 Gross Total Material +Services (N+O+P) 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) for 33 KV Cut Point with 180 Degree Angle						
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle						
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points						
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.				1,11,44,046.72		
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km						
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each						
Т		Final de	cision by electric	al Inspector			
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)						

		ANNEXURE-11.3 (ABSTRACT)						
		TP CENTRAL ODISHA DISTRIBUTION LIMITED						
	Name of the Division :- AED							
	Name of the Sub-Division : -	NARSINGHPUR						
	Name of the Work :-	33kV Feeder Refurbishment						
	Part-A: - 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from Scope of work:-  existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm							
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	I					
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1	А	Part-A: - 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm	2,09,21,847.12					
		Total Amount	2,09,21,847.12					
		Total Amount (In Cr)	2.09					

Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm

	Grid to Kandhabareni PSS- Total Length 10Ckm						
	No. of 33 KV DP required Without Isolator			12			
(Ref. Drawing No TPCODL-HVD-0004)							
	MATERIALS FOR 33 KV DP Without Isolato	<u>or</u>		1			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	24	7,48,800.00		
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	93.00	47.5776	4,424.72		
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.	99.20	24	2,380.80		
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	7.2216	671.61		
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	24	3,720.00		
	H.T. Stay set (Complete )	Set	1,302.00	24	31,248.00		
	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	48	2,976.00		
	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	360	33,480.00		
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	12	15,624.00		
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	141.6	13,168.80		
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	72	7,142.40		
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	28.8864	2,686.44		
	33KV pin insulator polymer	No.	595.20	36	21,427.20		
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	72	44,640.00		
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	72	1,02,672.00		
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	72	1,02,672.00		
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)  Black Paint	K.g.	96.72	147.132	14,230.61		
21	Yellow Colour Paint for Background	Ltr Ltr	272.80 272.80	12 24	3,273.60 6,547.20		
	Tellow Colour Failt for Background	LU	Total Cost of		13,38,611.22		
<b>А</b> В	Sto	ck Stora	ge & Insurance		40,158.34		
	3.00	ck, Stora		Total (A+B)			
<b>C</b>				у @ 3% of C	<b>13,78,769.56</b> 41,363.09		
E			Tools & Plant		27,575.39		
F	For the Change		ransportation (		1,03,407.72		
G :	Erection Charges (			-	38,563.20		
H .	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-			· · · ·	51,784.61		
-	Erection Charges @ 20% of	PSC poi			-		
J			Sui	m of (C to I)	16,41,463.57		
	<u>Civil &amp; Services</u>			1			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
	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		2 252 55		F.4.000.00		
1	excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size	No.	2,250.00	24	54,000.00		
	(500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)						
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		
_	. 5		3,220.00		,- 30.03		

### **ANNEXURE-11.3** Part-A: - 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of No. 3,700.00 12 44,400.00 earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. **Total Civil & Services** 2,01,750.00 Total (J+K) 18,43,213.57 L Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) Μ 1,10,592.81 Sub Total (L+M) Ν 19,53,806.38 Total GST @ 18% of (N) 0 3,51,685.15 Ρ Total CESS @ 1% of (N) 19,538.06 Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator Q 23,25,029.59 No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002) 12 MATERIALS FOR 33 KV Cut Point with 180 Degree Angle Total **Total** Unit **Unit Rate** Description of Materials No. Quantity Amount WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) 31,200.00 1 No 12 3,74,400.00 Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 2 K.g. 76.00 390.048 29,643.65 Mtr., 2 No's of Channel = (2x 9.56x1.7)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = 3 K.g. 93.00 63.4368 5,899.62 (8x2.36x0.280) Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 70.20864 K.g. 76.00 5,335.86 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306) No. 99.20 12 1,190.40 Danger Plate, 1 no's. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's 6 KG 93.00 3.6108 335.80 =(1x0.59x0.510)7 GI barbed wire anticlimbing device 3 Kg. Per support 99.20 36 3,571.20 Kg Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length KG 93.00 14.4432 1,343.22 4 no's = (4x0.59x0.510)595.20 21,427.20 33KV pin insulator polymer No. 36 10 H W fitting(B&S)90KN,4 Bolt 620.00 72 44,640.00 No. 72 11 Disc insulator (B&S)90 KN polymer No. 1,426.00 1,02,672.00 Earthing of Support (Coil Type) EΑ 205.84 12 2,470.08 12 13 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing K.g. 93.00 3.144 292.39 1,426.00 1,02,672.00 14 PG Clamp for 232 sq.mm AAA conductor NO. 72 96.72 58.548 5,662.76 15 GI Nut, Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point) K.g. Black Paint Ltr 272.80 3,273.60 16 12 Yellow Colour Paint for Background 17 Ltr 272.80 6,547.20 **Total Cost of materials** 7,11,376.98 Α Stock, Storage & Insurance i.e 3% of A В 21,341.31 C Sub Total (A+B) 7,32,718.29 Contigency @ 3% of C D 21,981.55 Tools & Plants @ 2% of C Ε 14.654.37 F Transportation @ 7.5% of C 54,953.87 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 19,281.60 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) 34,708.63 Н Erection Charges @ 20% of PSC pole- Not to be used for 33kv J Sum of (C to I) 8,78,298.31 Civil & Services Total SI. Total **Description of Materials** Unit **Unit Rate** No. Quantity <u>Amount</u> Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 6.6 42,900.00

	ANNEXURE-11.3				
	A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 1 to Kandhabareni PSS- Total Length 10Ckm	LOO and	55 sqmm to 23	32sqmm) fro	m Narsinghpur
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.35	8,775.00
К			Total Civi	l & Services	51,675.00
L				Total (J+K)	9,29,973.31
М	Other overheads (Including 6% supervision charges) of L (for 33 KV	Cut Poi	nt with 180 De	gree Angle)	55,798.40
N			Sub	Total (L+M)	9,85,771.71
0			Total GST @	9 18% of (N)	1,77,438.91
Р			Total CESS	@ 1% of (N)	9,857.72
Q	Gross Total Material +Services (N+O) for 33 KV	/ Cut Poi	nt with 180 D	egree Angle	11,73,068.33
	No. of 33 KV Cut Point with 90 Degree Angle			12	
	(Ref. Drawing No TPCODL-HVD-0003)  MATERIALS FOR 33 KV Cut Point with 90 Degree	Anale			
SI.	MATERIALS FOR 33 RV CULT OINE WITH 30 Degree	Angre		Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	12	3,74,400.00
	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7	140	31,200.00		
2	Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	780.096	59,287.30
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	126.8736	11,799.24
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	140.4173	10,671.71
5	Danger Plate, 1 no's.	No.	99.20	12	1,190.40
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.6108	335.80
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	36	3,571.20
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	14.4432	1,343.22
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	48	28,569.60
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	72	44,640.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	72	1,02,672.00
12	Earthing of Support ( Coil Type )	No.	205.84	12	2,470.08
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.144	292.39
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	72	1,02,672.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	12	1,860.00
16	H.T. Stay set (Complete )	Set	1,302.00	12	15,624.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	12	744.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	180	16,740.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	135.72	13,126.84
20	Black Paint	Ltr	272.80	12	3,273.60
21	Yellow Colour Paint for Background	Ltr	272.80	24	6,547.20
Α				of materials	8,01,830.59
В	5100	k, Stora	ge & Insurance		24,054.92
С				Total (A+B)	8,25,885.50
D				y @ 3% of C	24,776.57
E			Tools & Plant		16,517.71
F			ransportation		61,941.41
G	Erection Charges (	@ 5% on	Trf/Breaker/V	VPB/ H-Pole	19,281.60
Н	Erection Charges @ 10% of C (except Trf/Breaker/V	VPB/ H-F	Pole/HT stay se	et/PSC pole)	40,423.65
ı	Erection Charges @ 20% of	PSC pol	e- Not to be us	sed for 33kv	-
J			Su	m of (C to I)	9,88,826.44
SI.	<u>Civil &amp; Services</u> Description of Materials	Unit	Unit Rate	Total	Total
<b>No.</b>	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	<b>Quantity</b> 6.60	<b>Amount</b> 42,900.00
	- 0.33Cu.iiu	Cuilli	0,500.00	3.00	42,300.00

### **ANNEXURE-11.3** Part-A: - 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm Couping ratio 1:1.5:3 with dimension ( 500X500X450)= 0.1125 Cu mtr Cu.mtr 6,500.00 1.35 8,775.00 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 12 No. 2,250.00 27.000.00 (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.) **Total Civil & Services** 78,675.00 Κ Total (J+K) 10,67,501.44 L Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle) Μ 64,050.09 Ν Sub Total (L+M) 11,31,551.52 Total GST @ 18% of (N) 0 2,03,679.27 Ρ Total CESS @ 1% of (N) 11,315.52 Q Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle 13,46,546.31 33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001) 10 **MATERIALS FOR 33 KV Pin Points** SI. Total Total **Description of Materials** Unit **Unit Rate** No. Quantity Amount 31,200.00 1 WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) No 100 31,20,000.00 1,959.20 100 1,95,920.00 33 KV V cross Arm (GI) 22Kg each No. Top bracket 100x50x6mm GI channel ( 2kg each) 186.00 100 18,600.00 3 No. 4 99.20 100 9,920.00 Danger Plate, 1 no's. No. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's KG 93.00 30.09 2,798.37 =(1x0.59x0.510)99.20 300.00 29,760.00 GI barbed wire anticlimbing device 3 Kg. Per support Kg Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 7 KG 93.00 120.36 11,193.48 4 no's = (4x0.59x0.510)33KV pin insulator polymer No. 595.20 300 1,78,560.00 9 205.84 100 20,584.00 Earthing of Support (Coil Type) No. 93.00 26.20 2,436.60 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing K.g. GI Nut, Bolt & Washer of different sizes (1.45 Kg/ Pin Point) K.g. 145.00 14,024.40 11 96.72 59,96,454.00 12 232 sq.mm AAA conductor K.M. 1,94,060.00 30.90 Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor 648.42 13 EΑ Black Paint 272.80 100.0 27,280.00 14 Ltr 15 Yellow Colour Paint for Background 272.80 200.0 54,560.00 Ltr **Total Cost of materials** 96,82,090.85 Α В Stock, Storage & Insurance i.e 3% of A 2,90,462.73 C Sub Total (A+B) 99,72,553.58 Contigency @ 3% of C D 2,99,176.61 Ε Tools & Plants @ 2% of C 1,99,451.07 F Transportation @ 7.5% of C 7,47,941.52 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 1,60,680.00 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) Н 6,75,895.36 ı Erection Charges @ 20% of PSC pole- Not to be used for 33kv J Sum of (C to I) 1,20,55,698.13 Civil & Services SI. Total **Total Description of Materials** Unit **Unit Rate** No. Quantity **Amount** Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 55.00 3,57,500.00 1 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr 6,500.00 Cu.mtr 11.25 73,125.00

### **ANNEXURE-11.3** Part-A: - 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm Dismantalling of 100/80sqmm Conductor 9,000.00 12.00 1,08,000.00 km Dismantalling of 55sqmm Conductor km 6,300.00 24.00 1,51,200.00 6,89,825.00 Κ **Total Civil & Services** Total (J+K) 1,27,45,523.13 L Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points) 7,64,731.39 M Sub Total (L+M) Ν 1,35,10,254.52 0 Total GST @ 18% of (N) 24,31,845.81 Ρ Total CESS @ 1% of (N) 1,35,102.55 Q Gross Total Material +Services (N+O+P) for 33 KV Pin Points 1,60,77,202.88 **6% Supervision Charges Summary** Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) 1,10,592.81 1 Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator) 2 3 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle) 55,798.40 4 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle) 64,050.09 5 Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points) 7,64,731.39 Total (6% supervision charges) 9,95,172.69 **Gross Total Summary** Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator 1 23,25,029.59 Gross Total Material +Services (N+O) for 33 KV DP With Isolator 2 Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle 3 11,73,068.33 Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle 4 13,46,546.31 Gross Total Material +Services (N+O+P) for 33 KV Pin Points 1,60,77,202.88 5 Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km Q R Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each S Τ Final decision by electrical Inspector U Gross Total Material, Services and Inspection Fees (P+Q+R+S+T) 2,09,21,847.12

		ANNEXURE-11.4 (ABSTRACT)	
		TP CENTRAL ODISHA DISTRIBUTION LIMITED	
	Name of the Division :-	ANGUL	
	Name of the Sub-Division : -	ANGUL	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmexisting 80sqmm to 232sqmm) from Badakera PSS to Shree Metalli Total Length-7Ckm.	•
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	I
		ABSTRACT OF ESTIMATE	
SI. No.	Part	Description	Amount
1	А	Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length-7Ckm.	1,58,27,430.31
		Total Amount	1,58,27,430.31
		Total Amount (In Cr)	1.58

Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length-7Ckm.

Meta	Netallik tapping point. Total Length- 7Ckm.						
	33kV Line Length with 40 Mtr. Span using 232 SQ.MMAAA Conductor						
No. of 33 KV DP required Without Isolator							
	(Ref. Drawing No TPCODL-HVD-0004)			,			
	MATERIALS FOR 33 KV DP Without Isolate	<u>or</u>					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	14	4,36,800.00		
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	434.98	33,058.48		
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	27.7536	2,581.08		
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	489.804	37,225.10		
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	432.432	32,864.83		
6	Danger Plate, 2 no's.	No.	99.20	14	1,388.80		
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	4.2126	391.77		
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	14	2,170.00		
	H.T. Stay set (Complete )	Set	1,302.00	14	18,228.00		
	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	28	1,736.00		
	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	210	19,530.00		
12	Gi Pipe Earthing 40mm. 3 Mtr. Long 50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr.	No. KG	1,302.00 93.00	7 82.6	9,114.00 7,681.80		
14	For raising)= 5x2.36 GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	42	4,166.40		
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	16.8504	1,567.09		
	33KV pin insulator polymer	No.	595.20	21	12,499.20		
	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	42	26,040.00		
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	42	59,892.00		
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	42	59,892.00		
	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	85.827	8,301.19		
21	Black Paint	Ltr	272.80	7	1,909.60		
22	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20		
Α			Total Cost o		7,80,856.55		
В	Sto	ck, Stora	ge & Insurance		23,425.70		
С			Sub 1	Total (A+B)	8,04,282.24		
D			Contigency	y @ 3% of C	24,128.47		
Е			Tools & Plants	s @ 2% of C	16,085.64		
F		Tr	ansportation (	@ 7.5% of C	60,321.17		
G	Erection Charges	@ 5% on	Trf/Breaker/W	/PB/ H-Pole	22,495.20		
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				30,207.69		
1	Erection Charges @ 20% of				-		
J			Sui	m of (C to I)	9,57,520.41		
	<u>Civil &amp; Services</u>						
SI. 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	14	31,500.00		
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	7.7	50,050.00		
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.575	10,237.50		

### **ANNEXURE-11.4** Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm. Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of No. 3,700.00 7 25,900.00 earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . Κ **Total Civil & Services** 1,17,687.50 L Total (J+K) 10,75,207.91 Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) Μ 64,512.47 Ν Sub Total (L+M) 11,39,720.39 Total GST @ 18% of (N) 0 2,05,149.67 Total CESS @ 1% of (N) Р 11,397.20 Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator Q 13,56,267.26 7 No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002) MATERIALS FOR 33 KV Cut Point with 180 Degree Angle SI. Total Total **Description of Materials** Unit **Unit Rate** No. Quantity **Amount** WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) No 31,200.00 7 2,18,400.00 1 Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 2 K.g. 227.528 76.00 17,292.13 Mtr., 2 No's of Channel = (2x 9.56x1.7)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = 3 93.00 37.0048 K.g. 3,441.45 (8x2.36x0.280) Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length Δ 76.00 40.95504 3,112.58 K.g. 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306) 5 No. 99.20 7 694.40 Danger Plate, 1 no's. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's KG 2.1063 195.89 6 93.00 = (1x0.59x0.510)7 GI barbed wire anticlimbing device 3 Kg. Per support 99.20 21 2,083.20 Kg Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 KG 93.00 8.4252 783.54 4 no's = (4x0.59x0.510)595.20 12,499.20 9 33KV pin insulator polymer No. 21 10 H W fitting(B&S)90KN,4 Bolt 620.00 26,040.00 No. 42 1,426.00 42 59,892.00 11 Disc insulator (B&S)90 KN polymer No. 7 EΑ 205.84 1,440.88 12 Earthing of Support (Coil Type) No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing K.g. 93.00 1.834 170.56 14 PG Clamp for 232 sq.mm AAA conductor NO. 1,426.00 42 59,892.00 34.153 15 GI Nut, Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point) 96.72 3,303.28 K.g. 16 Black Paint 272.80 1,909.60 Ltr 7 17 Yellow Colour Paint for Background Ltr 272.80 14 3,819.20 **Total Cost of materials** Α 4,14,969.91 В Stock, Storage & Insurance i.e 3% of A 12,449.10 C Sub Total (A+B) 4,27,419.00 Contigency @ 3% of C D 12,822.57 Ε Tools & Plants @ 2% of C 8,548.38 F Transportation @ 7.5% of C 32,056.43 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 11,247.60 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) Н 20,246.70 1 Erection Charges @ 20% of PSC pole- Not to be used for 33kv Sum of (C to I) J 5,12,340.68 Civil & Services SI. Total Total Unit **Unit Rate** Description of Materials No. Quantity **Amount** 1 Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 3.85 25,025.00 Cu.mtr 2 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr 6,500.00 0.7875 5,118.75 **Total Civil & Services** 30,143.75 Κ Total (J+K) 5,42,484.43 L

### **ANNEXURE-11.4** Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm. Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle) 32,549.07 Sub Total (L+M) 5,75,033.50 Ν 0 Total GST @ 18% of (N) 1,03,506.03 Р Total CESS @ 1% of (N) 5,750.33 Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle Q 6,84,289.86 No. of 33 KV Cut Point with 90 Degree Angle 7 (Ref. Drawing No.- TPCODL-HVD-0003) MATERIALS FOR 33 KV Cut Point with 90 Degree Angle SI. Total Total **Description of Materials** Unit **Unit Rate** No. Quantity **Amount** 1 WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) No 31,200.00 7 2,18,400.00 Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 2 455.056 34,584.26 K.g. 76.00 Mtr., 4 No's of Channel = (4x 9.56x1.7)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = 3 93.00 74.0096 6,882.89 K.g. (16x2.36x0.280) Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 4 76.00 81.91008 6,225.17 K.g. $0.306 \, Mtr., 4 \, No's \, of \, Channel = (4x \, 9.56x \, 0.306)$ 5 No. 99.20 694.40 Danger Plate, 1 no's. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's 6 KG 93.00 2.1063 195.89 = (1x0.59x0.510)99.20 2,083.20 GI barbed wire anticlimbing device 3 Kg. Per support Kg 21 Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8.4252 8 KG 93.00 783.54 4 no's = (4x0.59x0.510)33KV pin insulator polymer (4 No's each 90 Deg. Cut point) No. 595.20 28 16.665.60 620.00 26,040.00 10 H W fitting(B&S)90KN,4 Bolt No. 42 42 11 Disc insulator (B&S)90 KN polymer No. 1,426.00 59,892.00 12 | Earthing of Support (Coil Type) No. 205.84 7 1,440.88 1.834 13 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing K.g. 93.00 170.56 14 PG Clamp for 232 sq.mm AAA conductor NO. 1,426.00 42 59,892.00 H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 15 Pair 155.00 7 1,085.00 Pair) Set 1,302.00 7 9,114.00 16 H.T. Stay set (Complete) 17 H.T. Stay Insulator Type-C (2 No's.) No. 62.00 7 434.00 105 9,765.00 18 7/8 SWG Stay Wire 15kg /stay K.g. 93.00 19 GI Nut, Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point) 96.72 79.17 7,657.32 20 Black Paint 272.80 1,909.60 Ltr 21 Yellow Colour Paint for Background 272.80 3,819.20 Ltr **Total Cost of materials** Α 4,67,734.51 В Stock, Storage & Insurance i.e 3% of A 14,032.04 C Sub Total (A+B) 4,81,766.54 D Contigency @ 3% of C 14,453.00 Tools & Plants @ 2% of C Ε 9,635.33 F Transportation @ 7.5% of C 36,132.49 G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 11,247.60 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) Н 23,580.46 Erection Charges @ 20% of PSC pole- Not to be used for 33kv ı Sum of (C to I) J 5,76,815.42 Civil & Services SI. Total Total **Description of Materials** Unit **Unit Rate** No. Quantity **Amount**

6,500.00

6,500.00

Cu.mtr

Cu.mtr

3.85

0.79

25,025.00

5,118.75

Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr

Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr

1

### **ANNEXURE-11.4** Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm. 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 2,250.00 7 15,750.00 No. (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.) **Total Civil & Services** Κ 45,893.75 Total (J+K) L 6,22,709.17 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle) 37,362.55 Μ Ν Sub Total (L+M) 6,60,071.72 Total GST @ 18% of (N) 0 1,18,812.91 Ρ Total CESS @ 1% of (N) 6,600.72 Q Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle 7,85,485.35 33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001) 7 **MATERIALS FOR 33 KV Pin Points** SI. Total Total **Description of Materials** Unit **Unit Rate** No. Quantity **Amount** WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) No 31,200.00 30,57,600.00 1 98 2 33 KV V cross Arm (GI) 22Kg each No. 1,959.20 98 1,92,001.60 Top bracket 100x50x6mm GI channel (2kg each) 186.00 98 18,228.00 No. 4 Danger Plate, 1 no's. No. 99.20 98 9,721.60 Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's 5 KG 93.00 29.49 2,742.40 = (1x0.59x0.510)GI barbed wire anticlimbing device 3 Kg. Per support 99.20 294.00 29,164.80 6 Kg Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 7 KG 93.00 117.95 10.969.61 4 no's = (4x0.59x0.510)8 33KV pin insulator polymer 595.20 294 1,74,988.80 No. 20,172.32 Earthing of Support (Coil Type) No. 205.84 98 10 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing 25.68 K.g. 93.00 2,387.87 K.g. 96.72 13,743.91 11 GI Nut, Bolt & Washer of different sizes (1.45 Kg/ Pin Point) 142.10 1,94,060.00 21.63 41,97,517.80 232 sq.mm AAA conductor K.M. 13 Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor EΑ 648.42 26,734.40 14 Black Paint Ltr 272.80 98.0 Yellow Colour Paint for Background 53,468.80 15 Ltr 272.80 196.0 Α **Total Cost of materials** 78,09,441.91 В Stock, Storage & Insurance i.e 3% of A 2,34,283.26 C Sub Total (A+B) 80,43,725.17 D Contigency @ 3% of C 2,41,311.76 Ε Tools & Plants @ 2% of C 1,60,874.50 F Transportation @ 7.5% of C 6,03,279.39 G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 1,57,466.40 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) Н 4,89,439.72 ı Erection Charges @ 20% of PSC pole- Not to be used for 33kv J Sum of (C to I) 96.96.096.93 Civil & Services SI. Total Total **Description of Materials** Unit **Unit Rate** No. Quantity **Amount** Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr Cu.mtr 6,500.00 53.90 3,50,350.00 1 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr 2 Cu.mtr 6,500.00 11.03 71,662.50 3 Dismantalling of 100/80sqmm Conductor 1,89,000.00 km 9,000.00 21.00 Κ **Total Civil & Services** 6,11,012.50 Total (J+K) L 1,03,07,109.43 Μ Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points) 6,18,426.57 Sub Total (L+M) Ν 1,09,25,536.00

	ANNEXURE-11.4			
	3kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badake apping point. Total Length- 7Ckm.	ra PSS to Shree		
0	Total GST @ 18% of (N)	19,66,596.48		
Р	Total CESS @ 1% of (N)	1,09,255.36		
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points	1,30,01,387.84		
	6% Supervision Charges Summary			
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)	64,512.47		
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)	-		
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	32,549.07		
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	37,362.55		
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)			
	Total (6% supervision charges)			
•	Gross Total Summary			
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	13,56,267.26		
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator	-		
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle	6,84,289.86		
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle	7,85,485.35		
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points	1,30,01,387.84		
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.			
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km			
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each			
Т	Final decision by electrical Inspector			
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	1,58,27,430.31		

		ANNEXURE-11.5 (ABSTRACT)						
		TP CENTRAL ODISHA DISTRIBUTION LIMITED						
	Name of the Division :- ANGUL							
	Name of the Sub-Division : -	ANGUL						
	Name of the Work :-	33kV Feeder Refurbishment						
	Scope of work:-	ctor Augmentation Farini Nursery- Total						
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)						
		ABSTRACT OF ESTIMATE						
SI.	Part	Description	Amount					
1	А	Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm	99,72,916.45					
		Total Amount	99,72,916.45					
		Total Amount (In Cr)	1.0					

Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm

	A : 33kV Angul-2 Feeder Returbishment with Conductor Augmentation (from existing 80s ery- Total Length 4.5Ckm	sqiiiii to	2323qiiiii) ii o	ili bilata Ab.	3 to ranni
	No. of 33 KV DP required Without Isolator (Ref. Drawing No TPCODL-HVD-0004)			4	
	MATERIALS FOR 33 KV DP Without Isolator				
SI.				Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	8	2,49,600.00
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	248.56	18,890.56
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	15.8592	1,474.91
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	279.888	21,271.49
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	247.104	18,779.90
6	Danger Plate, 2 no's.	No.	99.20	8	793.60
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	2.4072	223.87
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	8	1,240.00
9	H.T. Stay set (Complete )	Set	1,302.00	8	10,416.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	16	992.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	47.2	4,389.60
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	9.6288	895.48
16	33KV pin insulator polymer	No.	595.20	12	7,142.40
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	24	14,880.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	24	34,224.00
_	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	49.044	4,743.54
	Black Paint	Ltr	272.80	4	1,091.20
22	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
Α	Cho	al Ctara	Total Cost of		4,46,203.74
В <b>С</b>	510	ck, Stora	-	Total (A+B)	13,386.11
D				y @ 3% of C	<b>4,59,589.85</b> 13,787.70
E			Tools & Plant	_	9,191.80
F		Tr	ansportation (	_	34,469.24
G	Erection Charges				12,854.40
Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-				17,261.54
I	Erection Charges @ 20% of				-
J	Civil & Services		Su	m of (C to I)	5,47,154.52
SI.		11	IIn!t Dete	Total	Total
No.	Description of Materials	Unit	Unit Rate	Quantity	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	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	4	14,800.00
К	or nat around pipe.	1	Total Civi	l & Services	67,250.00
ı,			TOTAL CIVI	i & Jei Vices	07,230.00

#### **ANNEXURE-11.5** Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery-Total Length 4.5Ckm L Total (J+K) 6.14.404.52 Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator) Μ 36,864.27 Ν Sub Total (L+M) 6,51,268.79 0 Total GST @ 18% of (N) 1,17,228.38 Р Total CESS @ 1% of (N) 6,512.69 Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator Q 7,75,009.86 4 No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002) MATERIALS FOR 33 KV Cut Point with 180 Degree Angle SI. Total Total **Unit Rate Description of Materials** Unit No. Quantity Amount WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.) 31,200.00 4 1,24,800.00 1 No Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., K.g. 76.00 130.016 9,881.22 2 No's of Channel = (2x 9.56x1.7)Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = K.g. 93.00 21.1456 1,966.54 (8x2.36x0.280) Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 76.00 23.40288 1,778.62 K.g. $0.306 \, \text{Mtr.}, \, 2 \, \text{No's of Channel} = (2x \, 9.56x \, 0.306)$ 99.20 4 396.80 5 Danger Plate, 1 no's. No. Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = 6 KG 93.00 1.2036 111.93 (1x0.59x0.510) GI barbed wire anticlimbing device 3 Kg. Per support 99.20 12 1,190.40 Kg Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 8 KG 93.00 4.8144 447.74 no's = (4x0.59x0.510)595.20 9 33KV pin insulator polymer No. 12 7,142.40 H W fitting(B&S)90KN,4 Bolt 620.00 14,880.00 No. 24 Disc insulator (B&S)90 KN polymer 1,426.00 24 34,224.00 No. 12 Earthing of Support (Coil Type) EΑ 205.84 4 823.36 K.g. 1.048 No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing 93.00 97.46 1,426.00 24 34,224.00 NO. PG Clamp for 232 sq.mm AAA conductor GI Nut, Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point) 19.516 15 K.g. 96.72 1,887.59 272.80 1,091.20 16 Black Paint Ltr 4 17 Yellow Colour Paint for Background 272.80 8 2,182.40 Ltr **Total Cost of materials** 2,37,125.66 Α Stock, Storage & Insurance i.e 3% of A В 7,113.77 C Sub Total (A+B) 2,44,239.43 D Contigency @ 3% of C 7,327.18 Tools & Plants @ 2% of C Ε 4,884.79 F Transportation @ 7.5% of C 18,317.96 G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 6,427.20 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole) Н 11,569.54 Erection Charges @ 20% of PSC pole- Not to be used for 33kv ı J Sum of (C to I) 2,92,766.10 Civil & Services SI. Total Total Unit **Description of Materials Unit Rate** No. Quantity Amount Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr 6,500.00 14,300.00 1 Cu.mtr 2.2 2 Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr 6.500.00 0.45 2,925.00 Cu.mtr Κ **Total Civil & Services** 17,225.00 L Total (J+K) 3,09,991.10 Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle) Μ 18,599.47 Ν Sub Total (L+M) 3,28,590.57 0 Total GST @ 18% of (N) 59,146.30 Ρ Total CESS @ 1% of (N) 3,285.91

Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to	Tarini
Nursery- Total Length 4.5Ckm	

I	A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80s ery-Total Length 4.5Ckm	qmm to	232sqmm) fro	m Bhata AB	S to Tarini		
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle						
	No. of 33 KV Cut Point with 90 Degree Angle						
	(Ref. Drawing No TPCODL-HVD-0003)			4			
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle							
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00		
2	Straight Cross Arm Channel $100 \times 50 \times 6$ mm, $9.56$ KG/mtr, each channel length $1.7$ Mtr., $4$ No's of Channel = $(4 \times 9.56 \times 1.7)$	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.	93.00	42.2912	3,933.08		
	Straight Cross Arm Top Channel $100 \times 50 \times 6$ mm, $9.56 \times 6$ KG/mtr, each channel length $0.306 \times 10^{-5}$ Mtr., $4 \times 10^{-5}$ No's of Channel = $(4 \times 9.56 \times 0.306)$	K.g.	76.00	46.80576	3,557.24		
5	Danger Plate, 1 no's.	No.	99.20	4	396.80		
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93		
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40		
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74		
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	16	9,523.20		
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00		
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00		
12	Earthing of Support ( Coil Type )	No.	205.84	4	823.36		
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46		
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00		
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required ( 1 Pair)	Pair	155.00	4	620.00		
16	H.T. Stay set (Complete )	Set	1,302.00	4	5,208.00		
	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00		
	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00		
_	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	45.24	4,375.61		
20	Black Paint	Ltr	272.80	4	1,091.20		
21	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40		
Α			Total Cost o	of materials	2,67,276.86		
В	Stoc	k, Storag	ge & Insurance	i.e 3% of A	8,018.31		
C			Sub	Total (A+B)	2,75,295.17		
D			Contigenc	y @ 3% of C	8,258.86		
E			Tools & Plant		5,505.90		
F		т.	ransportation		20,647.14		
	Exaction Charges						
G	Erection Charges @ 10% of Clayeant Trf/Progles/				6,427.20		
Н	Erection Charges @ 10% of C (except Trf/Breaker/\			· · · · · · · · · · · · · · · · · · ·	13,474.55		
ı	Erection Charges @ 20% of	PSC pol					
J	<u>Civil &amp; Services</u>		Su	m of (C to I)	3,29,608.81		
SI. 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, 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		
			Total Civil	l & Services	26 225 00		
K			TOTAL CIVI	i a services	26,225.00		

	ANNEXURE-11.5					
l	A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sery-Total Length 4.5Ckm	sqmm to	232sqmm) fro	m Bhata AB	S to Tarini	
L	Total (J+K					
м	Other overheads (Including 6% supervision charges) of L (for 33 I	(V Cut Po	int with 90 De	gree Angle)	21,350.03	
N				Total (L+M)	3,77,183.84	
0				18% of (N)		
				, ,	67,893.09	
P				@ 1% of (N)	3,771.84	
Q	Gross Total Material +Services (N+O+P) for 33 I	(V Cut Po	oint with 90 De	egree Angle	4,48,848.77	
	33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No TPCODL-HVD-0001)			4.5		
	MATERIALS FOR 33 KV Pin Points					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	63	19,65,600.00	
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	63	1,23,429.60	
3	Top bracket 100x50x6mm GI channel ( 2kg each)	No.	186.00	63	11,718.00	
4	Danger Plate, 1 no's.	No.	99.20	63	6,249.60	
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	18.96	1,762.97	
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	189.00	18,748.80	
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	75.83	7,051.89	
8	33KV pin insulator polymer	No.	595.20	189	1,12,492.80	
9	Earthing of Support ( Coil Type )	No.	205.84	63	12,967.92	
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	16.51	1,535.06	
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	91.35	8,835.37	
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	13.91	26,98,404.30	
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-	
14	Black Paint	Ltr	272.80	63.0	17,186.40	
15	Yellow Colour Paint for Background	Ltr	272.80	126.0	34,372.80	
Α_				of materials	50,20,355.52	
В	Sto	ck, Stora	ge & Insurance		1,50,610.67	
С			Sub	Total (A+B)	51,70,966.18	
D			Contigenc	y @ 3% of C	1,55,128.99	
Е			Tools & Plant	s @ 2% of C	1,03,419.32	
F		Tı	ransportation (	@ 7.5% of C	3,87,822.46	
G	Erection Charges	@ 5% on	 Trf/Breaker/W	/PR/ H-Pole	1,01,228.40	
Н	Erection Charges @ 10% of C (except Trf/Breaker/\				3,14,639.82	
⊢.					3,14,039.82	
<u> </u>	Erection Charges @ 20% of	PSC poi			-	
J			Su	m of (C to I)	62,33,205.17	
	<u>Civil &amp; Services</u>	ı				
SI.	Description of Materials	Unit	Unit Rate	Total	Total	
<b>No.</b>	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	<b>Quantity</b> 34.65	Amount 2,25,225.00	
2	Couping ratio 1:1.5:3 (300HHM3300HHM2200HHM) = 0.33Cu.Htt	Cu.mtr	6,500.00	7.09	46,068.75	
3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	13.50	1,21,500.00	
К			,	& Services	3,92,793.75	
L				Total (J+K)	66,25,998.92	
<u>-</u> м	Other overheads (Including 6% supervision	charges)	of L (for 33 KV		3,97,559.94	
N					70,23,558.86	
0	Total GST @ 18% of (N)  Total CESS @ 1% of (N)				12,64,240.59	
P					70,235.59	
Q	Gross Total Material +Ser	vices (N+	יט+צ) tor 33 K\	/ PIN Points	83,58,035.04	

### **ANNEXURE-11.5**

Part-A: 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini

	6% Supervision Charges Summary				
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)	36,864.27			
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)	-			
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	18,599.47			
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	21,350.03			
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)	3,97,559.94			
	Total (6% supervision charges)	4,74,373.70			
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	7,75,009.86			
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator	-			
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle	3,91,022.78			
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle	4,48,848.77			
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points	83,58,035.04			
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.				
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km				
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each				
Т	Final decision by electrical Inspector				
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	99,72,916.45			

	Annexure-12 Earthing									
SI. No.	DESCRIPTION OF WORK	Quantity (in nos.)	Amount (in cr.)							
1	Earthing	990	1.00							

B Stock, Storage & Insurance i.e 3% of A 105.42 C Sub Total (A+B) 3,619.42 D Contigency @ 3% of C 108.58 E Tools & Plants @ 2% of C 72.31 F Transportation @ 7.5% of C 271.46 G Erection Charges @ 5% on Trf/Breaker/WPB/H-Pole - Frection Charges @ 5% on Trf/Breaker/WPB/H-Pole - Frection Charges @ 10% of C (except Trf/Breaker/WPB/H-Pole/HT stay set/PSC Pole) 227.84 I Erection Charges @ 20% of PSC pole- Not to be used for 33kv - Sum of (C to I) 4,299.61  Civil and Services Works (As per Technical Specification)  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 . BA has to supply of charcoal-etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing  K Total Civil & Services 3,700.00  K Other overheads (Including 6% supervision charges) of the pit 479.98 M Other overheads (Including 6% supervision charges) of the 77.99 N Sub Total (I+M) 8,479.66 O Total GST @ 18% of (N) 1,526.34 P Hother overheads (Including 6% supervision of for (N) 1,526.34 Total CESS @ 1% of (N) 84.88	Standard Estimate & BoQ for Earthing										
1		Description of Materials   Unit									
1											
A Stock, Storage & Insurance i.e 3% of A 105.42  C Sub Total (A+B) 3,619.42  D Contigency @ 3% of C 108.55  E Tools & Plants @ 2% of C 72.31  F Transportation @ 7.5% of C 271.46  G Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole) 227.84  I Erection Charges @ 20% of PSC pole- Not to be used for 33kv 5  J Sum of (C to 1) 4,299.61  Civil and Services Works (As per Technical Specification)  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 Gl Pipe 40mm/50mm including welding of Gl flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of Gl Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing  K Total Civil & Services 3,700.00  K Other overheads (Including 6% supervision charges) of L 79.99.61  N Other overheads (Including 6% supervision charges) of L 79.99.61  N Other overheads (Including 6% supervision charges) of L 79.99.61  Total CESS @ 1% of (N) 1,526.34  P Other Storage & Insurance i.e. 23 of A 105.42  Total CESS @ 1% of (N) 1,526.34	1	I No 1 1302 001 1 1									
B Stock, Storage & Insurance i.e 3% of A 105.42 C Sub Total (A+B) 3,619.42 D Contigency @ 3% of C 108.58 E Tools & Plants @ 2% of C 72.31 F Transportation @ 7.5% of C 271.46 G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole	2	50x6mm GI Flat for earthing KG 100.00 22.12									
Contigency @ 3% of C 108.58  E	Α			<b>Total Cost</b>	of materials	3,514.00					
D Contigency @ 3% of C 108.58 E Tools & Plants @ 2% of C 72.31 F Tools & Plants @ 2% of C 72.31 F Transportation @ 7.5% of C 271.46 G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole) 227.84 I Erection Charges @ 20% of PSC pole- Not to be used for 33kv - Sum of (C to I) 4,299.61  Civil and Services Works (As per Technical Specification)  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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing  K Total Civil & Services 3,700.00  K Other overheads (Including 6% supervision charges) of L 479.98 N Other overheads (Including 6% supervision charges) of L 479.98 Sub Total (L+M) 8,479.64 O Total GST @ 18% of (N) 1,526.34 Total CESS @ 1% of (N) 84.88	В	Sto	ck, Storage	& Insurance	e i.e 3% of A	105.42					
Tools & Plants @ 2% of C 72.31  F	С			Sub	Total (A+B)	3,619.42					
F   Transportation @ 7.5% of C   271.4¢   G   Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole	D			Contigend	y @ 3% of C	108.58					
Frection Charges @ 5% on Trf/Breaker/WPB/ H-Pole  H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)  Erection Charges @ 20% of PSC pole- Not to be used for 33kv  Civil and Services Works (As per Technical Specification)  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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing  K Total Civil & Services 3,700.00  L Total (J+K) 7,999.61  M Other overheads (Including 6% supervision charges) of L 479.98  N Other overheads (Including 6% supervision charges) of L 479.98  Sub Total (L+M) 8,479.66  Total GST @ 18% of (N) 1,526.34  P Total CESS @ 1% of (N) 84.88	E		Т	ools & Plant	ts @ 2% of C	72.39					
H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole) 227.84  I Erection Charges @ 20% of PSC pole- Not to be used for 33kv  J Sum of (C to I) 4,299.66  Civil and Services Works (As per Technical Specification)  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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing  K Total Civil & Services 3,700.00  L Total (J+K) 7,999.61  M Other overheads (Including 6% supervision charges) of L 479.98  N Sub Total (L+M) 8,479.66  O Total GST @ 18% of (N) 1,526.34  P Total CESS @ 1% of (N) 84.88	F		Trar	nsportation	@ 7.5% of C	271.46					
Civil and Services Works (As per Technical Specification)  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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing  K  Total Civil & Services 3,700.00  Total (J+K) 7,999.61  N  Other overheads (Including 6% supervision charges) of L 479.98  N  Total GST @ 18% of (N) 1,526.34  P  Total CESS @ 1% of (N) 84.88	G	Erection Charges	@ 5% on Tr	f/Breaker/\	WPB/ H-Pole	-					
Civil and Services Works (As per Technical Specification)  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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing  K  Total Civil & Services 3,700.00  Total (J+K) 7,999.61  N  Other overheads (Including 6% supervision charges) of L 779.98  N  Total GST @ 18% of (N) 1,526.34  P  Total CESS @ 1% of (N) 84.88	Н	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)									
Civil and Services Works (As per Technical Specification)  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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing  K  Total Civil & Services 3,700.00  Total GI+K) 7,999.61  N  Other overheads (Including 6% supervision charges) of L 479.92  N  Sub Total (L+M) 8,479.61  O  Total GST @ 18% of (N) 1,526.34  P  Total CESS @ 1% of (N) 84.88	I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv									
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing  K  Total Civil & Services 3,700.00  Total (J+K) 7,999.60  N  Other overheads (Including 6% supervision charges) of L 779.90  N  Sub Total (L+M) 8,479.60  Total GST @ 18% of (N) 1,526.32  P  Total CESS @ 1% of (N) 84.88	J			Su	ım of (C to I)	4,299.68					
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing  K  Total Civil & Services 3,700.00  Total (J+K) 7,999.60  N  Other overheads (Including 6% supervision charges) of L 479.90  N  Sub Total (L+M) 8,479.60  Total GST @ 18% of (N) 1,526.34  P  Total CESS @ 1% of (N) 84.80											
L         Total (J+K)         7,999.68           M         Other overheads (Including 6% supervision charges) of L         479.98           N         Sub Total (L+M)         8,479.66           O         Total GST @ 18% of (N)         1,526.34           P         Total CESS @ 1% of (N)         84.88	1	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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per	No.	3,700.00	1	3,700.00					
M         Other overheads ( Including 6% supervision charges) of L         479.98           N         Sub Total (L+M)         8,479.66           O         Total GST @ 18% of (N)         1,526.34           P         Total CESS @ 1% of (N)         84.86	K			Total Civ	il & Services	3,700.00					
N         Sub Total (L+M)         8,479.66           O         Total GST @ 18% of (N)         1,526.34           P         Total CESS @ 1% of (N)         84.86						7,999.68					
O Total GST @ 18% of (N) 1,526.34 P Total CESS @ 1% of (N) 84.8		Other overheads ( Inc	luding 6% s			479.98					
P Total CESS @ 1% of (N) 84.8						8,479.66					
		Grac	s Total Mat		- ' '	10,090.80					

## **ANNEXURE-13**

# **PTR Augmentation**

Overloading of PTR is an alarming issue and need immediate attention for implementing mitigation proposals. PTR overloading issue can be mitigated by replacement of existing PTR with higher rating of PTR.

Since the priority of PTR overloading is very high we have prioritized & considered wherein PTR loading is greater than 75% in 2years timeline.

Approx. costing is given below:

# **Summary of Proposal Details for PTR Augmentation:**

SI. No.	Name of Circle	Name of Division	Name of 33/11kV PSS	PTR No.	Proposal Details	Amount (in cr.)	Annexure
1	BBSR-1	BCDD-2	INFOCITY	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.	2.73	Annexure- 13.1
2	BBSR-1	BED	NAHARKANTA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.	2.73	Annexure- 13.3
3	BBSR-1	BCDD-2	SAINIK SCHOOL	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.	2.73	Annexure- 13.3
4	BBSR-1	BED	MULAPADIA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.	2.73	Annexure- 13.4
5	BBSR-1	BCDD-2	KALINGA NAGAR	PTR-3	Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.	2.73	Annexure- 13.5
6	BBSR-2	PED	KACHERI	PTR-1 & PTR-2	Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.	5.47	Annexure- 13.6
7	BBSR-2	PED	BALIAPANDA	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.	2.73	Annexure- 13.7

SI. No.	Name of Circle	Name of Division	Name of 33/11kV PSS	PTR No.	Proposal Details	Amount (in cr.)	Annexure
8	CUTTACK	CDD-2	MAHANADI VIHAR	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.	2.73	Annexure- 13.8
9	CUTTACK	CDD-1	SECTOR-6 (CDA)	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.	2.73	Annexure- 13.9
10	DHENKANAL	ANED	HEMSURPADA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.	2.73	Annexure- 13.10
			TOTAL	•		30.06	

### 1.0 Augmentation of Power Transformer at INFOCITY Substation

### Proposal:

Augmentation of existing 1no. 33/11kV, 7.5MVA Power Transformer (PTR-2) to 16MVA at Infocity 33/11kV Substation in BCDD-2 division of BBSR-1 circle to mitigate overloading condition.

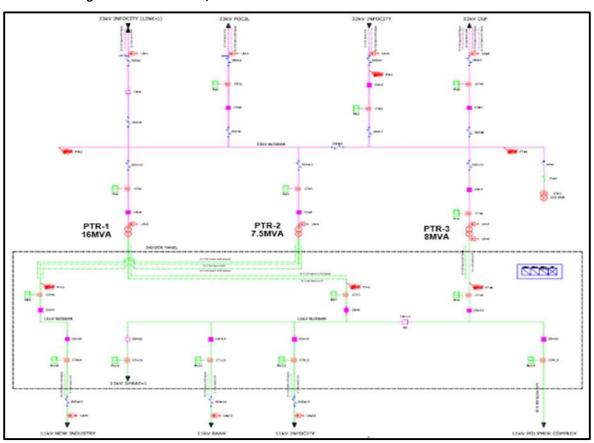
### **Existing Scenario:**

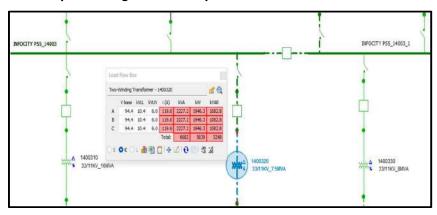
- Loading of 33/11kV Infocity PTR-1, 2 and 3 are 2.74MVA, 5.33MVA and 3.21MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years), the projected loading of Summer'24 for PTR-1, 2 and 3 would be 3.22MVA, 6.44MVA and 3.89MVA respectively.
- PTR-2 will be loaded up to 86%, w.r.t, the existing transformer capacity of 7.5MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

Existing Summer'22 Loading and projected load at Infocity PTRs:

	Name of		PTR Pating	AS IS			Projec	yrs. Load	
SI. No.	33/11kV PSS	PTR No.	Rating AS IS (in MVA)	Peak Load (in MVA)	% Loading (As-Is)	%Loading Range	Peak Load (in MVA)	% Loading (As-Is)	%Loading Range
1	INFOCITY	PTR-1	16	2.74	17%	0-50%	3.32	21%	0-50%
2	INFOCITY	PTR-2	7.5	5.33	71%	50%-75%	6.44	86%	75%-90%
3	INFOCITY	PTR-3	8	3.21	40%	0-50%	3.89	49%	0-50%

Existing SLD of INFOCITY 33/11kV PSS:



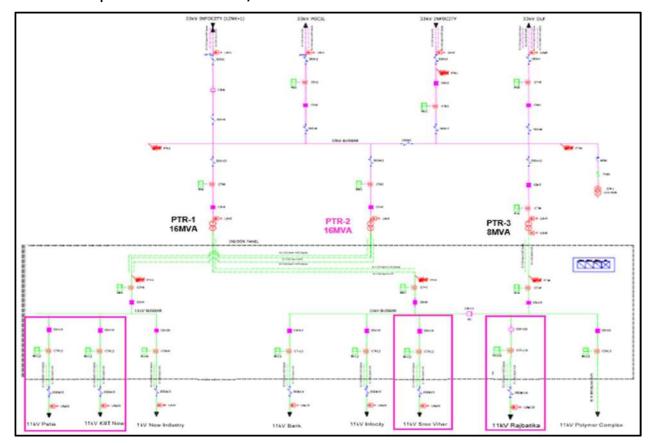


## **Proposed Scenario:**

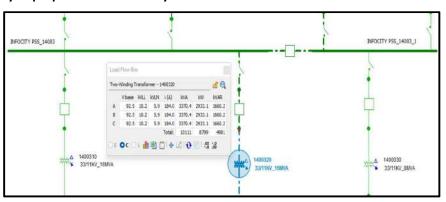
- Augmentation of PTR-2 from 7.5 MVA to 16MVA at Infocity PSS is proposed to meet the full load
  of Infocity PSS along with PTR-1 and 3 at peak load condition after 2 years load growth.
- Further, new 11kV feeders proposed under Supplementary CAPEX namely KIIT New (2.8MVA) for diversion from KIIT feeder, Patia New (2.7MVA) for load diversion from Patia feeder and Shree Vihar New (2.7MVA) for load diversion from Shree Vihar feeder to Infocity PSS, PTR-1 (16MVA) proposed to be executed by Summer'23.
- Subsequently, Shree Vihar New feeder to be shifted from PTR-1 to PTR-2 after augmentation of PTR-2 from 7.5MVA to 16MVA in order to mitigate the overloading of PTR-1 at Summer'24.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	INFOCITY	PTR-1	16	9.97	62%	50%-75%
2	INFOCITY	PTR-2	16	9.71	61%	50%-75%
3	INFOCITY	PTR-3	8	3.89	49%	0-50%

## Proposed SLD of INFOCITY 33/11kV PSS:



## Load Flow Study of proposed scenario in Cyme Software:



## **BoQ for PTR Augmentation (PTR-2):**

Name of the Division :-	BCDD-2				
Name of the Sub-Division : -	Periphery				
Name of the Work :-	Mitigation of 33/11kV PTR Overloading				
Scope:-	Augmentation of 1no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.				
Names of Schemes: -	TPCODL CAPEX (FY 23-24)				
ABSTRACT OF ESTIMATE					

Sl. No.	Part	Description	Amount
1	А	Augmentation of 01no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.1).

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

### 2.0 Augmentation of Power Transformer at NAHARKANTA Substation

### Proposal:

Augmentation of existing 1no. 33/11kV 8MVA Power Transformer (PTR-1) to 16MVA at Naharkanta 33/11kV Substation in BED division of BBSR-1 circle to mitigate overloading condition.

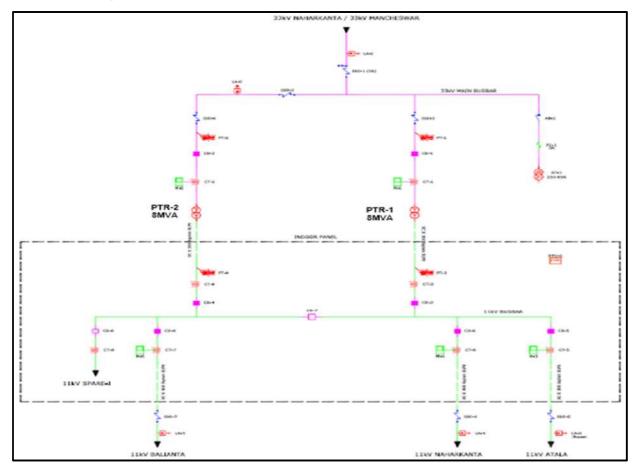
### **Existing Scenario:**

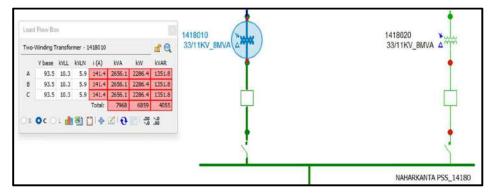
- Loading of 33/11kV Naharkanta PTR-1 and 2 are 6.57MVA and 3.94MVA respectively at peak load
  condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years),
  the projected loading of Summer'24 for PTR-1 and 2 would be 7.95MVA and 4.77MVA respectively.
- PTR-1 will be loaded up to 99%, w.r.t, the existing transformer capacity of 8MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

**Existing Summer'22 Loading and projected load at Naharkanta PTRs:** 

			PTR		AS IS		Projec	rs. Load	
SI. No.	Name of 33/11kV PSS	PTR No.	Rating AS IS (in MVA)	Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	NAHARKANTA	PTR-1	8	6.57	82%	75%-90%	7.95	99%	90%-100%
2	NAHARKANTA	PTR-2	8	3.94	49%	0-50%	4.77	60%	50%-75%

Existing SLD of NAHARKANTA 33/11kV PSS:



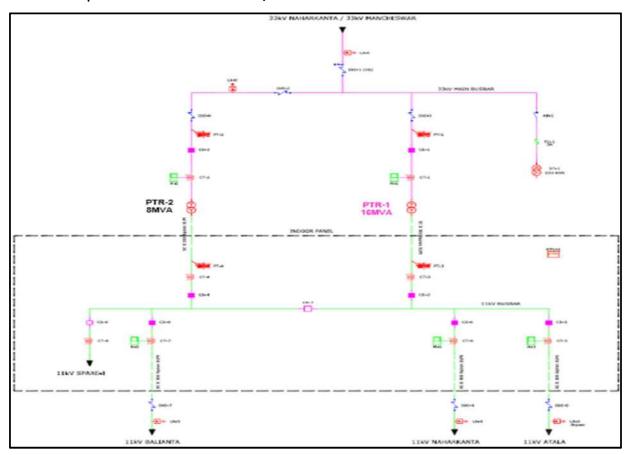


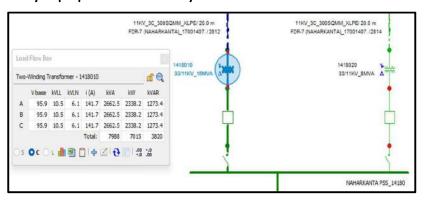
## **Proposed Scenario:**

Augmentation of PTR-1 from 8 MVA to 16MVA at Naharkanta PSS is proposed to meet the full load
of Naharkanta PSS along with PTR-2 at peak load condition after 2 years load growth.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	NAHARKANTA	PTR-1	16	7.95	50%	0-50%
2	NAHARKANTA	PTR-2	8	4.77	60%	50%-75%

## Proposed SLD of NAHARKANTA 33/11kV PSS:





## **BoQ for PTR Augmentation (PTR-1):**

Name of the D	ivision :-	BED						
Name of the Si	ub-Division	Rasulgarh						
Name of the W	Vork :-	Mitigation of 33/11kV PTR Overloading						
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8 Naharkanta 33/11kV PSS with other civil works.	MVA to 16MVA at					
Names of Sche	emes: -	TPCODL CAPEX (FY 23-24)						
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1	А	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.	₹ 2,73,30,980.29					
	Total Amount 2,73,30,980.29							
	Total Amount (In Cr) 2.73							
Total estimate	d cost is Rs.	2.73 Crore. (On TPCODL Capex Scheme)	1					

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.2).

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

### 3.0 Augmentation of Power Transformer at SAINIK SCHOOL Substation

### Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-1) to 16MVA at Sainik School 33/11kV Substation in BCDD-2 division of BBSR-1 circle to mitigate overloading condition.

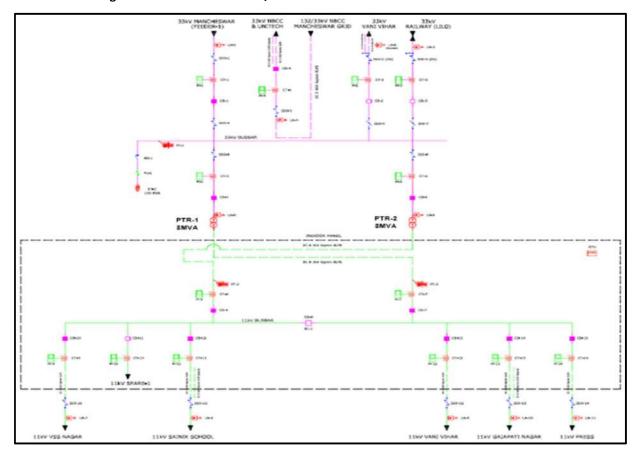
### **Existing Scenario:**

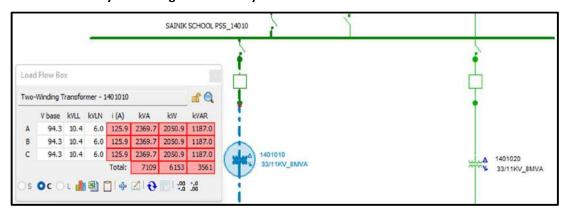
- Loading of 33/11kV Sainik School PTR-1 and 2 are 5.87MVA and 4.29MVA respectively at peak load
  condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years),
  the projected loading of Summer'24 for PTR-1 and 2 would be 7.11MVA and 5.19MVA.
- PTR-1 will be loaded up to 89%, w.r.t, the existing transformer capacity of 8MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

**Existing Summer'22 Loading and projected load at Naharkanta PTRs:** 

SI.	Name of		PTR Rating		AS IS		Project	Projected Load (2yrs. Load Growth)			
No	33/11kV PSS	PTR No.	AS IS (in MVA)	Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG		
1	Sainik School	PTR-1	8	5.87	73%	50%-75%	7.11	89%	75%-90%		
2	Sainik School	PTR-2	8	4.29	54%	50%-75%	5.19	65%	50%-75%		

Existing SLD of SAINIK SCHOOL 33/11kV PSS:



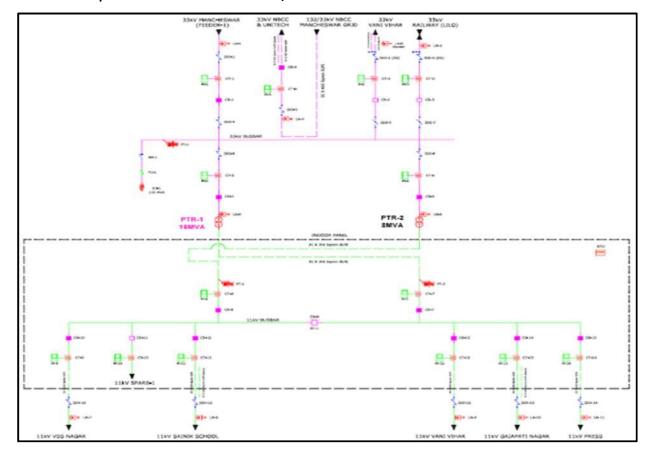


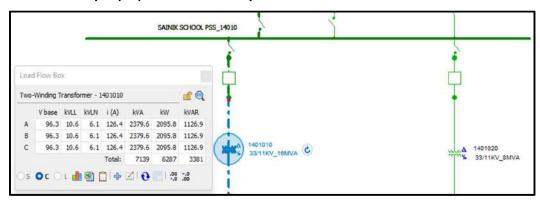
## **Proposed Scenario:**

 Augmentation of PTR-1 from 8 MVA to 16MVA at Sainik School PSS is proposed to meet the full load of Sainik School PSS along with PTR-2 at peak load condition after 2 years load growth.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	Sainik School	PTR-1	16	7.11	44%	0-50%
2	Sainik School	PTR-2	8	5.19	65%	50%-75%

## Proposed SLD of SAINIK SCHOOL 33/11kV PSS:





## **BoQ for PTR Augmentation (PTR-1):**

Name of the D	Division :-	BCDD-2					
Name of the S :-	ub-Division	Nayapalli					
Name of the V	Vork :-	Mitigation of 33/11kV PTR Overloading					
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.					
Names of Schemes: - TPCODL CAPEX (FY 23-24)							
ABSTRACT OF ESTIMATE							
SI. No.	Part	Description	Amount				
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.	₹ 2,73,30,980.29				
		Total Amount	₹ 2,73,30,980.29				
	Total Amount (In Cr) 2.73						
Total estimate	ed cost is Rs.	2.73 Crore. (On TPCODL Capex Scheme)					

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.3).

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

### 4.0 Augmentation of Power Transformer at MULAPADIA Substation

### Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-1) to 16MVA at Mulapadia 33/11kV Substation in BED division of BBSR-1 circle to mitigate overloading condition.

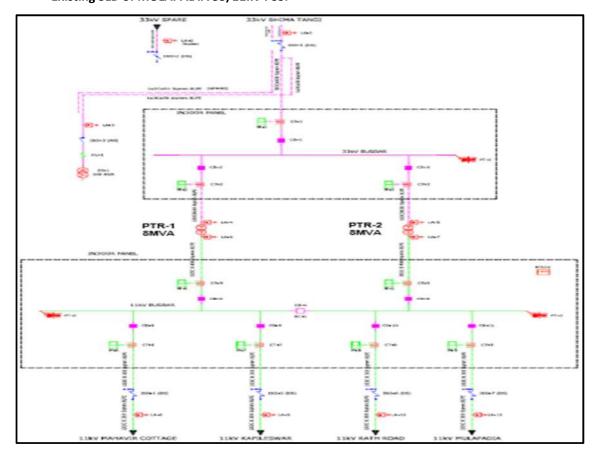
### **Existing Scenario:**

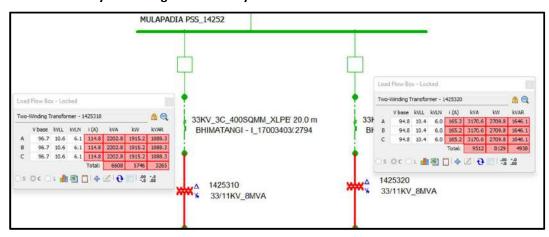
- Loading of 33/11kV Mulapadia PTR-1 and 2 are 5.49MVA and 7.89MVA respectively at peak load
  condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years),
  the projected loading of Summer'24 for PTR-1 and 2 would be 6.64MVA and 9.54MVA respectively.
- PTR-1 and PTR-2 will be loaded up to 83% and 119% respectively, w.r.t, the existing transformer capacity of 8MVA each in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

Existing Summer'22 Loading and projected load at Mulapadia PTRs:

Name of		PTR		AS IS		Projec	ted Load (2y Growth)	rs. Load	
SI. No.	33/11kV PTR	Rating AS IS (in MVA)	Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG	
1	MULAPADIA	PTR-1	8	5.49	69%	50%-75%	6.64	83%	75%-90%
2	MULAPADIA	PTR-2	8	7.89	99%	90%- 100%	9.54	119%	>100%

### Existing SLD of MULAPADIA 33/11kV PSS:



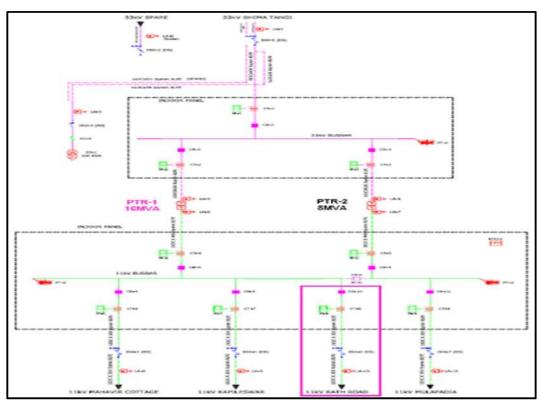


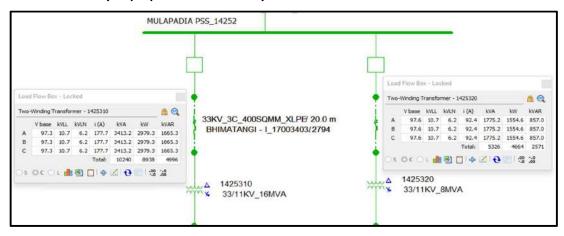
### **Proposed Scenario:**

- Augmentation of PTR-1 from 8 MVA to 16MVA at Mulapadia PSS is proposed to meet the full load of Mulapadia PSS along with PTR-2 at peak load condition after 2years load growth.
- Subsequently, 11kV feeder shifting of Mulapadia feeder (3.5MVA) from PTR-2 to PTR-1 is proposed in order to mitigate the overloading of PTR-1 and PTR-2 at Summer'24.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	MULAPADIA	PTR-1	16	10.87	68%	50%-75%
2	MULAPADIA	PTR-2	8	5.31	66%	50%-75%

## Proposed SLD of MULAPADIA 33/11kV PSS:





### **BoQ for PTR Augmentation (PTR-1):**

Name of the D	ivision :-	BED						
Name of the S :-	ub-Division	Temple						
Name of the V	Vork :-	Mitigation of 33/11kV PTR Overloading						
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.						
Names of Sche	emes: -	TPCODL CAPEX (FY 23-24)						
	ABSTRACT OF ESTIMATE							
SI. No.	Part	Description	Amount					
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.	₹ 2,73,30,980.29					
		Total Amount	₹ 2,73,30,980.29					
	Total Amount (In Cr)							

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.4).

Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

### 5.0 Augmentation of Power Transformer at KALINGA NAGAR Substation

### Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-3) to 16MVA at Kalinga Nagar 33/11kV Substation in BCDD-2 division of BBSR-1 circle to mitigate overloading condition.

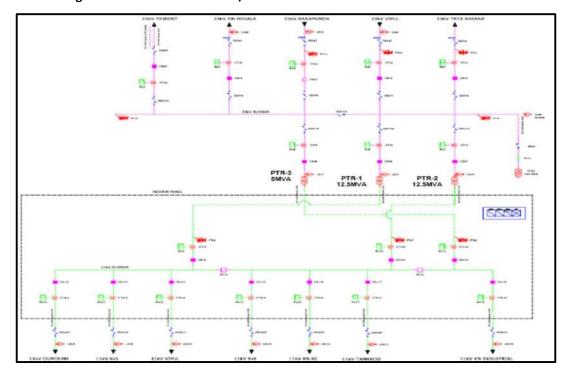
### **Existing Scenario:**

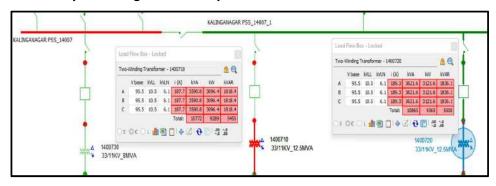
- Loading of 33/11kV Kalinga Nagar PTR-1, 2 and 3 are 8.96MVA, 9.03MVA and 4.25MVA respectively
  at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per
  year for 2years), the projected loading of Summer'24 for PTR-1, 2 and 3 would be 10.84MVA,
  10.92MVA and 5.14MVA.
- PTR-1 and PTR-2 will be loaded up to 87% each, w.r.t, the existing transformer capacity of 12.5MVA
  each in Summer'24 which is greater than the permissible limit of 75% loading resulting in
  overloading of the PTR.

Existing Summer'22 Loading and projected load at Kalinga Nagar PTRs:

			PTR		AS IS		Projecte	d Load (2yrs. Lo	oad Growth)
SI. No.	Name of 33/11kV PSS	PTR No.	Rating AS IS (in MVA)	Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	KALINGA NAGAR	PTR-1	12.5	8.96	72%	50%-75%	10.84	87%	75%-90%
2	KALINGA NAGAR	PTR-2	12.5	9.03	72%	50%-75%	10.92	87%	75%-90%
3	KALINGA NAGAR	PTR-3	8	4.25	53%	50%-75%	5.14	64%	50%-75%

Existing SLD of KALINGA NAGAR 33/11kV PSS:



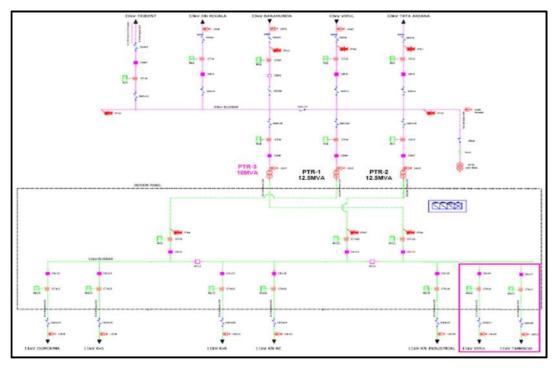


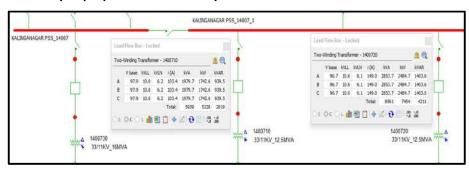
### **Proposed Scenario:**

- Augmentation of PTR-3 from 8 MVA to 16MVA at Kalinga Nagar PSS is proposed to meet the full load of Kalinga Nagar PSS along with Ptr-1 and 2 at peak load condition after 2 years load growth.
- Further, 11kV feeder load diversion proposed under Supplementary CAPEX namely K-5 11kV feeder for load diversion of 2.54MVA to CET PSS to be executed by Summer'23.
- Subsequently, shifting of 11kV Vipul feeder (1.48MVA load) from PTR-1, 12.5MVA to PTR-3 and shifting of 11kV Tomanda feeder (1.98MVA load) from PTR-2, 12.5MVA to PTR-3 in order to mitigate the overloading of PTR-1 and PTR-2 at Summer'24.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	KALINGA NAGAR	PTR-1	12.5	5.98	48%	0-50%
2	KALINGA NAGAR	PTR-2	12.5	8.53	68%	50%-75%
3	KALINGA NAGAR	PTR-3	16	9.33	58%	50%-75%

### Proposed SLD of KALINGA NAGAR 33/11kV PSS:





## **BoQ for PTR Augmentation (PTR-3):**

Name of the [	Division :-	BCDD-2				
Name of the S	Sub-Division	Khandagiri				
Name of the Work :- Mitigation of 33/11kV PTR Overloading						
Scope:- Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MV/Kalinga Nagar 33/11kV PSS with other civil works.						
Names of Sch	emes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1	А	Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.	₹ 2,73,30,980.29			
		Total Amount	₹ 272 20 090 20			

**Total Amount (In Cr)** 

Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.5).

### **Benefits:**

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

2,73,30,980.29

2.73

### 6.0 Augmentation of Power Transformer at KACHERI Substation

### Proposal:

Augmentation of existing 2nos. 33/11kV, 8MVA Power Transformers (PTR-1 and PTR-2) to 16MVA at Kacheri 33/11kV Substation in PED division of BBSR-2 circle to mitigate overloading condition.

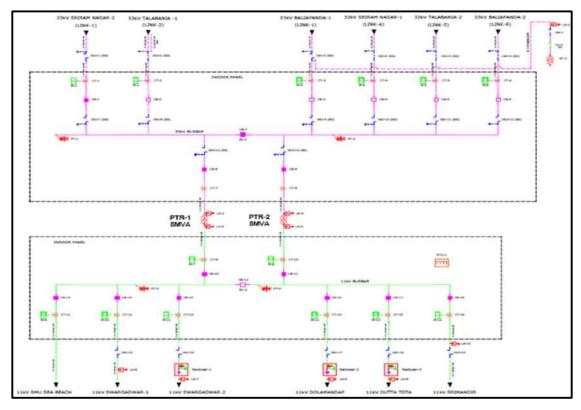
### **Existing Scenario:**

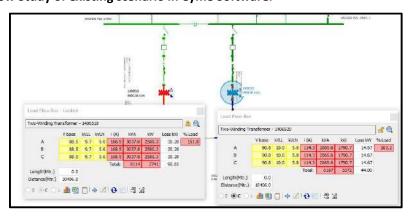
- Loading of 33/11kV Kacheri PTR-1 and 2 are 7.49MVA and 4.97MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 9.06MVA and 6.02MVA respectively.
- PTR-1 and PTR-2 will be loaded up to 113% and 75.2% respectively, w.r.t, the existing transformer capacity of 8MVA each in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.
- Taking into consideration the significance of reliable power supply during Ratha Yatra, N-1 contingency condition is also not met in the existing scenario.

## Existing Summer'22 Loading and projected load at Kacheri PTRs:

Name	Name of		PTR Rating		AS IS		Projec	cted Load (2y Growth)	rs. Load
SI. No.	33/11kV PSS	PTR No.	AS IS (in MVA)	Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	KACHERI	PTR-1	8	7.49	94%	90%- 100%	9.06	113%	>100%
2	KACHERI	PTR-2	8	4.97	62%	50%-75%	6.02	75.2%	75%-90%

## Existing SLD of KACHERI 33/11kV PSS:



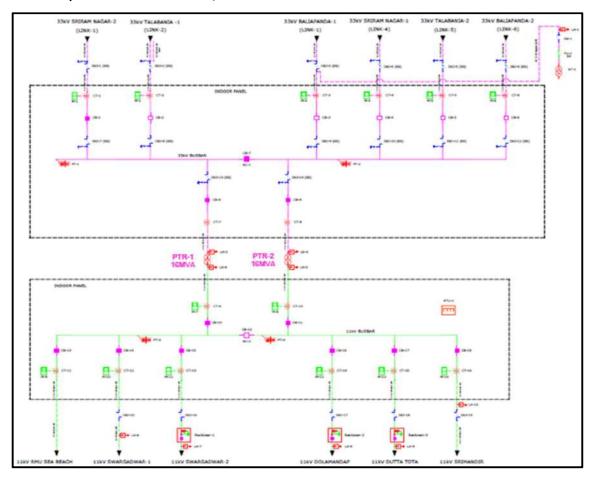


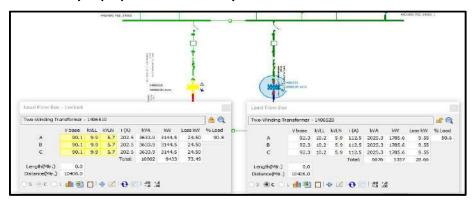
## **Proposed Scenario:**

Augmentation of PTR-1 and PTR-2 from 8 MVA to 16MVA at Kacheri PSS is proposed to meet the
full load of Kacheri PSS at peak load condition along with N-1 contingency issue after 2years load
growth due to criticality of the area during Rath Yatra.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	KACHERI	PTR-1	16	10.87	68%	50%-75%
2	KACHERI	PTR-2	16	6.02	37.6%	0-50%

## Proposed SLD of KACHERI 33/11kV PSS:





## **BoQ for PTR Augmentation (PTR-1 & PTR-2):**

Name of the D	ivision :-	PED						
Name of the S :-	ub-Division	Puri-1						
Name of the V	Vork :-	Mitigation of 33/11kV PTR Overloading						
Scope:-		Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.						
Names of Sche	emes: -	TPCODL CAPEX (FY 23-24)						
ABSTRACT OF ESTIMATE								
SI. No.	Part	Description	Amount					
1	А	Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.	₹ 5,46,61,960.59					
		Total Amount	₹ 5,46,61,960.59					
Total Amount (In Cr) 5.47								
Total estimate	ed cost is Rs.	5.47 Crore. (On TPCODL Capex Scheme)						

Cost Estimate: ₹ 5.47cr. (For detailed BoQ refer Annexure-13.6).

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To mitigate N-1 contingency issue.
- To ensure reliable power supply to the consumers.

### 7.0 Augmentation of Power Transformer at BALIAPANDA Substation

### Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-2) to 16MVA at Baliapanda 33/11kV Substation in PED division of BBSR-2 circle to mitigate overloading condition.

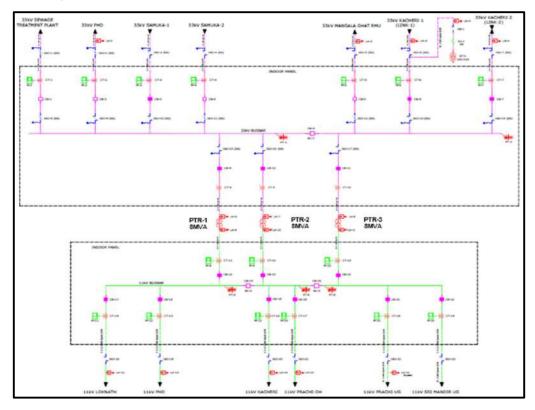
### **Existing Scenario:**

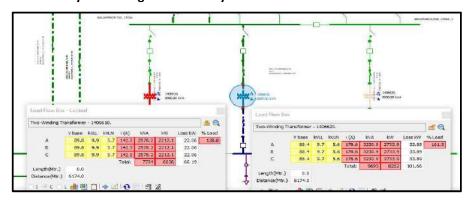
- Loading of 33/11kV Baliapanda PTR-1, 2 and 3 are 6.23MVA, 7.83MVA and 4.37MVA respectively
  at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per
  year for 2years), the projected loading of Summer'24 for PTR-1, 2 and 3 would be 7.54MVA,
  9.47MVA and 5.29MVA respectively.
- PTR-1 and PTR-2 will be loaded up to 94% and 118% respectively, w.r.t, the existing transformer capacity of 8MVA each in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

**Existing Summer'22 Loading and projected load at Baliapanda PTRs:** 

			PTR Rating AS IS (in MVA)		AS IS		Projected Load (2yrs. Load Growth)		
SI. No.	Name of 33/11kV PSS	PTR No.		Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	BALIAPANDA	PTR-1	8	6.23	78%	75%- 90%	7.54	94%	90%-100%
2	BALIAPANDA	PTR-2	8	7.83	98%	90%- 100%	9.47	118%	>100%
3	BALIAPANDA	PTR-3	8	4.37	55%	50%- 75%	5.29	66%	50%-75%

Existing SLD of BALIAPANDA 33/11kV PSS:



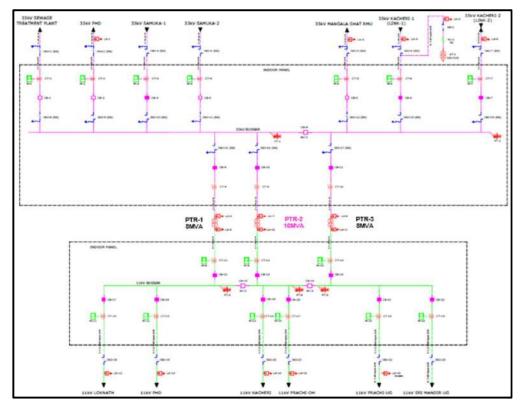


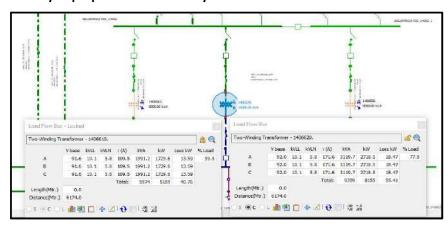
## **Proposed Scenario:**

- Augmentation of PTR-2 from 8 MVA to 16MVA at Baliapanda PSS is proposed to meet the full load of Baliapanda PSS along with PTR-1 and PTR-3 at peak load condition after 2years load growth.
- Subsequently, 11kV feeder load diversion of 11kV Baliapanda feeder (1.5MVA), PTR-1 to 11kV
   Swargadwar feeder, PTR-1 of Kacheri PSS is proposed in order to mitigate the overloading of PTR-1 at Summer'24.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	BALIAPANDA	PTR-1	8	5.72	72%	50%-75%
2	BALIAPANDA	PTR-2	16	9.47	59%	50%-75%
3	BALIAPANDA	PTR-3	8	5.29	66%	50%-75%

# Proposed SLD of BALIAPANDA 33/11kV PSS:





# **BoQ for PTR Augmentation (PTR-2):**

Name of the Division :-		PED						
Name of the S :-	ub-Division	Puri-1						
Name of the V	Vork :-	Mitigation of 33/11kV PTR Overloading						
Scope:-		Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.						
Names of Sche	emes: -	TPCODL CAPEX (FY 23-24)						
ABSTRACT OF ESTIMATE								
Sl. No.	Part	Description Amo						
1	А	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.	₹ 2,73,30,980.29					
		Total Amount	₹ 2,73,30,980.29					
		Total Amount (In Cr)	2.73					

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.7).

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

### 8.0 Augmentation of Power Transformer at MAHANADI VIHAR Substation

### Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-1) to 16MVA at Mahanadi Vihar 33/11kV Substation in CDD-2 division of CUTTACK circle to mitigate overloading condition.

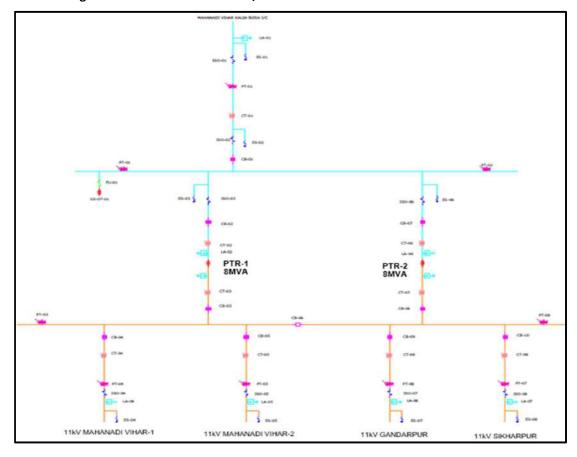
### **Existing Scenario:**

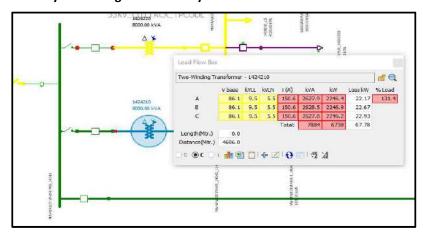
- Loading of 33/11kV Mahanadi Vihar PTR-1 and 2 are 6.67MVA and 3.81MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (9% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 7.92MVA and 4.53MVA respectively.
- PTR-1 will be loaded up to 99%, w.r.t, the existing transformer capacity of 8MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

Existing Summer'22 Loading and projected load at Mahanadi Vihar PTRs:

	Name of 33/11kV PSS		PTR Rating AS IS (in MVA)		AS IS		Projected Load (2yrs. Load Growth)		
SI. No.		PTR No.		Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	MAHANADI VIHAR	PTR-1	8	6.67	83%	75%-90%	7.92	99%	90%-100%
2	MAHANADI VIHAR	PTR-2	8	3.81	48%	0-50%	4.53	57%	50%-75%

Existing SLD of MAHANADI VIHAR 33/11kV PSS:



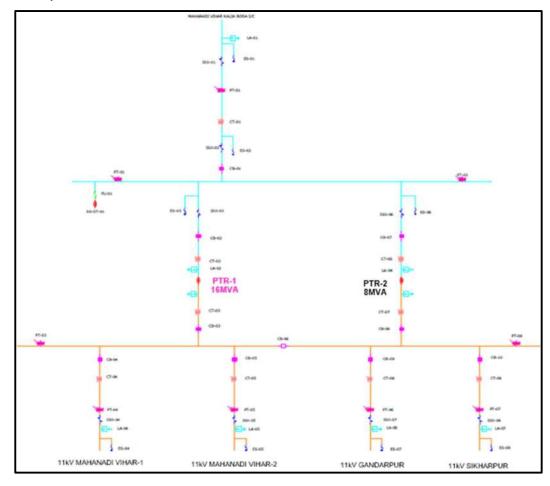


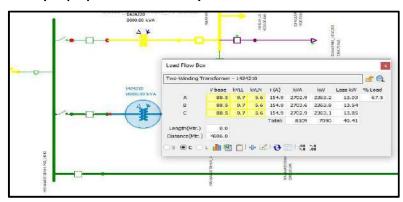
## **Proposed Scenario:**

 Augmentation of PTR-1 from 8 MVA to 16MVA at Mahanadi Vihar PSS is proposed to meet the full load of Mahanadi Vihar PSS along with PTR-2 at peak load condition after 2years load growth.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	MAHANADI VIHAR	PTR-1	16	7.92	50%	0-50%
2	MAHANADI VIHAR	PTR-2	8	4.53	57%	50%-75%

## Proposed SLD of MAHANADI VIHAR 33/11kV PSS:





## **BoQ for PTR Augmentation (PTR-1):**

Name of the D	ivision :-	CDD-2						
Name of the S :-	ub-Division	Mahanadi Vihar						
Name of the V	Vork :-	Mitigation of 33/11kV PTR Overloading						
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.						
Names of Sch	emes: -	TPCODL CAPEX (FY 23-24)						
	ABSTRACT OF ESTIMATE							
SI. No.	Part	<b>Description</b> Amount						
1	А	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.	₹ 2,73,30,980.29					
		Total Amount	₹ 2,73,30,980.29					
		Total Amount (In Cr) 2.73						
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)								

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.8).

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

### 9.0 Augmentation of Power Transformer at SECTOR-6 (CDA) Substation

### Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-2) to 16MVA at Sector-6 (CDA) 33/11kV Substation in CDD-1 division of CUTTACK circle to mitigate overloading condition.

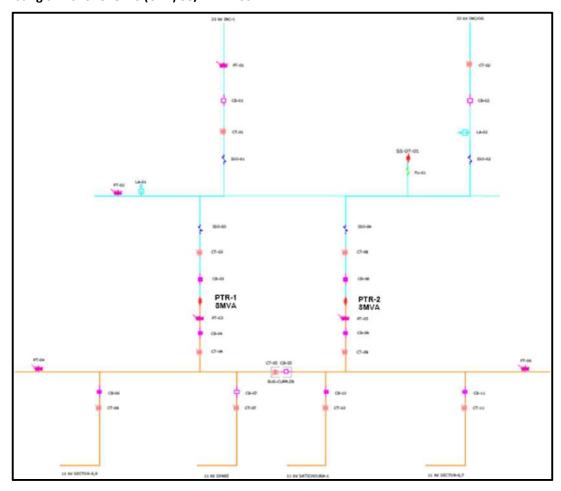
### **Existing Scenario:**

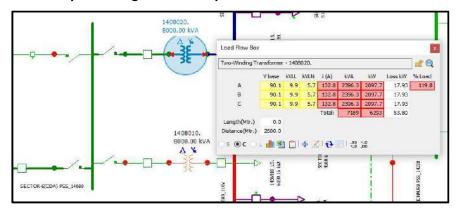
- Loading of 33/11kV Sector-6 (CDA) PTR-1 and 2 are 4.61MVA and 6.27MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (7% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 5.28MVA and 7.17MVA.
- PTR-2 will be loaded up to 90%, w.r.t, the existing transformer capacity of 8MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

### Existing Summer'22 Loading and projected load at Sector-6 (CDA) PTRs:

			PTR		AS IS		Projected Load (2yrs. Load Growth)			
SI. No.	Name of 33/11kV PSS	PTR No.	Rating AS IS (in MVA)	Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG	
1	SECTOR-6 (CDA)	PTR-1	8	4.61	58%	50%-75%	5.28	66%	50%-75%	
2	SECTOR-6 (CDA)	PTR-2	8	6.27	78%	75%-90%	7.17	90%	75%-90%	

Existing SLD of SECTOR-6 (CDA) 33/11kV PSS:



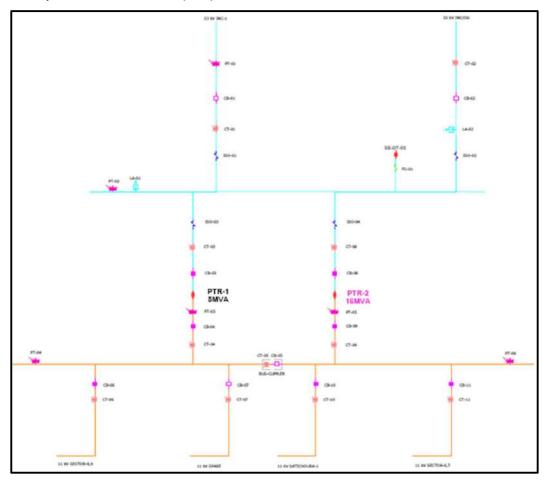


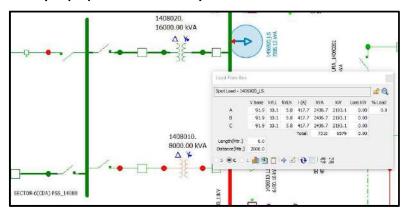
## **Proposed Scenario:**

 Augmentation of PTR-2 from 8 MVA to 16MVA at Sector-6 (CDA) PSS is proposed to meet the full load of Sector-6 (CDA) PSS along with PTR-1 at peak load condition after 2years load growth.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	SECTOR-6 (CDA)	PTR-1	8	5.28	66%	50%-75%
2	SECTOR-6 (CDA)	PTR-2	16	7.17	44.8%	0-50%

# Proposed SLD of SECTOR-6 (CDA) 33/11kV PSS:





## **BoQ for PTR Augmentation (PTR-2):**

Name of the D	ivision :-	CDD-1						
Name of the S :-	ub-Division	Sector-6 SDO						
Name of the V	Vork :-	Mitigation of 33/11kV PTR Overloading						
Scope:-		Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.						
Names of Sche	emes: -	TPCODL CAPEX (FY 23-24)						
	ABSTRACT OF ESTIMATE							
SI. No.	Part	<b>Description</b> Amoun						
1	A	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.	₹ 2,73,30,980.29					
		Total Amount	₹ 2,73,30,980.29					
		Total Amount (In Cr) 2.73						
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)								

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.9).

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

### 10.0 Augmentation of Power Transformer at HEMSURPADA Substation

### Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-1) to 16MVA at Hemsurpada 33/11kV Substation in ANED division of DHENKANAL circle to mitigate overloading condition.

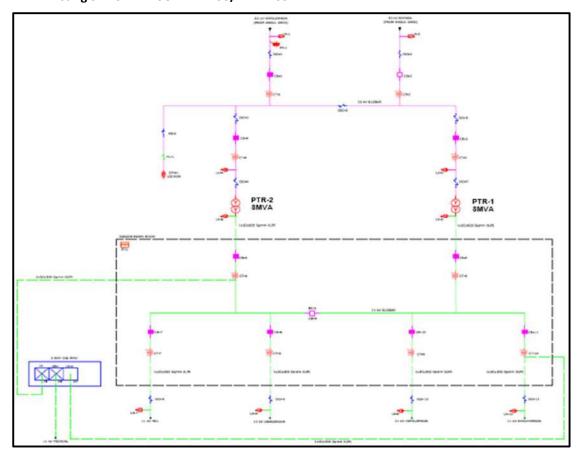
### **Existing Scenario:**

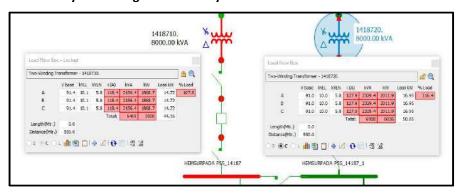
- Loading of 33/11kV Hemsurpada PTR-1 and 2 are 5.30MVA and 5.70MVA respectively at peak load
  condition of Summer'22. Considering load growth for 2years (8% load growth per year for 2years),
  the projected loading of Summer'24 for PTR-1 and 2 would be 6.18MVA and 6.65MVA respectively.
- PTR-1 and PTR-2 will be loaded 77% and 83% respectively, w.r.t, the existing transformer capacity
  of 8MVA each in Summer'24 which is greater than the permissible limit of 75% loading resulting in
  overloading of the PTR.

Existing Summer'22 Loading and projected load at Hemsurpada PTRs:

	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
SI. No.				Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	HEMSURPADA	PTR-1	8	5.30	66%	50%-75%	6.18	77%	75%-90%
2	HEMSURPADA	PTR-2	8	5.70	71%	50%-75%	6.65	83%	75%-90%

### Existing SLD of HEMSURPADA 33/11kV PSS:



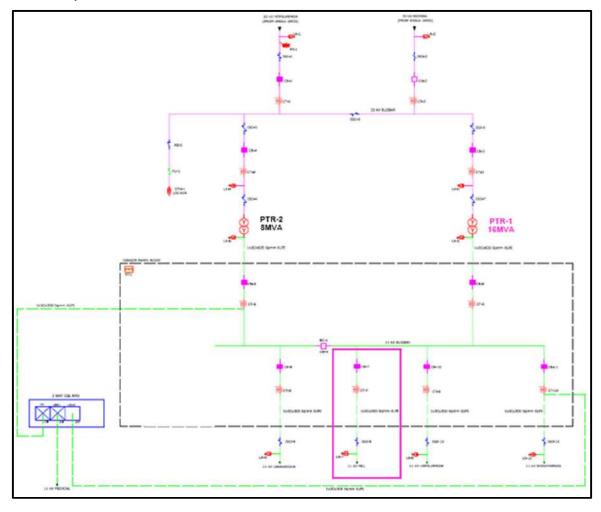


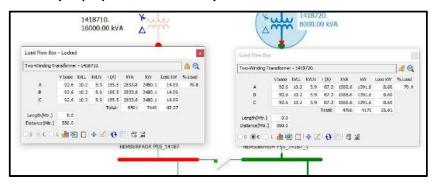
### **Proposed Scenario:**

- Augmentation of PTR-1 from 8 MVA to 16MVA at Hemsurpada PSS is proposed to meet the full load of Hemsurpada PSS alongwith PTR-2 at peak load condition after 2years load growth.
- Subsequently, 11kV feeder shifting of MCL feeder (1.75MVA) from PTR-2 to PTR-1 is proposed in order to mitigate the overloading of PTR-2 at Summer'24.

SI. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	HEMSURPADA	PTR-1	16	8.22	51%	50%-75%
2	HEMSURPADA	PTR-2	8	4.61	58%	50%-75%

## Proposed SLD of HEMSURPADA 33/11kV PSS:





## **BoQ for PTR Augmentation (PTR-1):**

Name of the D	ivision :-	ANED						
Name of the Su	ub-Division	Angul						
Name of the W	/ork :-	Mitigation of 33/11kV PTR Overloading						
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.						
Names of Sche	mes: -	TPCODL CAPEX (FY 23-24)						
ABSTRACT OF ESTIMATE								
SI. No.	Part	<b>Description</b> Amount						
1	А	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.	₹ 2,73,30,980.29					
		Total Amount	₹ 2,73,30,980.29					
	2.73							
Total estimate	Total Amount (In Cr) 2.73  Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)							

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.10).

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

PTRs are proposed with lo	wer capacity PTRs wherever overloading is observed in TPCODL jurisdiction. S
the priority of PTR overloa	ading is very high we have prioritized & considered wherein PTR loading is gre
than 75% in 2years timelin	e. This proposal facilitates the utilization of assets to maximum extent without
extra cost addition in CAPE	EX.

	Annexure-13 PTR Augmentation								
SI. No.	Name of Circle	Name of Division	Name of 33/11kV PSS	PTR No.	Proposal Details	Amount (in cr.)	Annexure		
1	BBSR-1	BCDD-2	INFOCITY	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.	2.73	Annexure-13.1		
2	BBSR-1	BED	NAHARKANTA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.	2.73	Annexure-13.3		
3	BBSR-1	BCDD-2	SAINIK SCHOOL	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.	2.73	Annexure-13.3		
4	BBSR-1	BED	MULAPADIA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.	2.73	Annexure-13.4		
5	BBSR-1	BCDD-2	KALINGA NAGAR	PTR-3	Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.	2.73	Annexure-13.5		
6	BBSR-2	PED	KACHERI	PTR-1 & PTR-2	Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.	5.47	Annexure-13.6		
7	BBSR-2	PED	BALIAPANDA	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.	2.73	Annexure-13.7		
8	CUTTACK	CDD-2	MAHANADI VIHAR	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.	2.73	Annexure-13.8		
9	CUTTACK	CDD-1	SECTOR-6 (CDA)	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.	2.73	Annexure-13.9		
10	DHENKANAL	ANED	HEMSURPADA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.	2.73	Annexure- 13.10		
				TO	OTAL	30.06			

		ANNEXURE-13.1					
		TP CENTRAL ODISHA DISTRIBUTION LIMITED					
Name of	Name of the Division :- BCDD-2						
Name of	f the Sub-Division : -	Periphery					
Name of the Work :- Mitigation of 33/11kV PTR Overloading							
Scope:-		Augmentation of 1no. Power Transformer (PTR-2) from 7.5MV. 33/11kV PSS with other civil works.	A to 16MVA at Infocity				
Names o	of Schemes: -	TPCODL CAPEX (FY 23-24)					
		ABSTRACT OF ESTIMATE					
SI. No.	Part	Description	Amount				
1	А	Augmentation of 01no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.	₹ 2,73,30,980.29				
		Total Amount	₹ 2,73,30,980.29				
		Total Amount (In Cr)	2.73				

# ANNEXURE-13.1 Augmentation of 1no. 7.5 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Infocity PSS) Description of Materials Unit Unit Rate Quantity SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)

Total

Amount

(in Rs.)

3,32,196.64

12,93,892.82

8,53,241.49

Sum of (C to I) 2,02,53,122.13

4,329.71

Tools & Plants @ 2% of C

Transportation @ 7.5% of C

Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole

### 12.5/16 MVA, 33/11 KV Power Transformer with OLTC 1,65,67,796.00 1,65,67,796.00 1 Nos. 1 150.00 2 50x6mm GI Flat for earthing, 2.36kg/mtr. KG 93.00 13,950.00 1,289.60 5 6,448.00 3 40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long No 50.00 4,836.00 GI Nuts & Bolts of Assorted size Kg 96.72 5 Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable km 10,22,940.00 0.072 73,651.68 Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, 6 EΑ 5,014.00 6 30,084.00 Supply of **Outdoor termination kits** Heat Shrinkable type suitable for 11kV, 1 Core, 630 EΑ 7 4,901.00 6 29,406.00 sqmm, HT UG cable Channel 100X50X6mm, 9.56 KG/Mtr. KG 93.00 250 23,250.00 9 SWITCH GEAR PANEL BOARD 11kV I/D VCB No. Total Cost of materials 1,67,49,421.68 Α Stock, Storage & Insurance i.e 3% of A В 5,02,482.65 c Sub Total (A+B) 1,72,51,904.33 Contigency @ 3% of C D 5,17,557.13

# H Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole) I Erection Charges @ 20% of PSC pole- Not to be used for 33kV J Sum of (C to I) Civil and Services Works

SI.

No.

Ε

F

G

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by <b>open trench method</b> .	km	94,500.00	0.072	6,804.00
2	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
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. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane, charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				
8	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	20	9,640.00

(As per Technical Specification)

	Augmentation of 1no. 7.5 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Infocity PSS)					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)	
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00	
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00	
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00	
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00	
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00	
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00	
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00	
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm, 75x40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00	
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00	
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22	
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	l 1	6,747.00	12	80,964.00	
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools, Machinery & Manpower for the activity.	l	751.50	20	15,030.00	
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00	
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	l	1,000.00	17	17,000.00	

Augmentation of 1no. 7.5 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Infocity PSS)						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)	
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass, small tree, plant etc.		2,235.00	47	1,05,045.00	
24	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	12	5,784.00	
25	Excavating trenches of required width and depth for pipe, cables etc including Excavation for sockets including geting out the excavated materials, returning (refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00	
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00	
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00	
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00	
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00	
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)		109.00	1503	1,63,827.00	
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00	
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61	
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the	Cum	7,316.00	19	1,39,004.00	
34	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	l 1	1,000.00	2	2,000.00	
К				& Services	14,14,057.43	
Total (J+K)						
M Other overheads (Including 6% supervision charges) of L					13,00,030.77	
N			Total GST @	otal (L+M)	<b>2,29,67,210.33</b>	
P				SS 1% of N	41,34,097.86 2,29,672.10	
Q	Gri	oss Total	Material +Service		2,73,30,980.29	
R			tal Material +Serv		2.73	
				, - 7		

		ANNEXURE-13.2						
		TP CENTRAL ODISHA DISTRIBUTION LIMITED						
Name of th	Name of the Division :- BED							
Name of th	ne Sub-Division : -	Rasulgarh						
Name of the Work :- Mitigation of 33/11kV PTR Overloading								
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.						
Names of S								
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1 A		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.	₹ 2,73,30,980.29					
		Total Amount	₹ 2,73,30,980.29					
		Total Amount (In Cr)	2.73					
Total estim	nated cost is Rs. 2.7	3 Crore. (On TPCODL Capex Scheme)						

### ANNEXURE-13.2 Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Naharkanta PSS) Total SI. Total **Description of Materials** Unit **Unit Rate** Amount No. Quantity (in Rs.) SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification) 12.5/16 MVA, 33/11 KV Power Transformer with OLTC Nos. 1,65,67,796.00 1 1,65,67,796.00 50x6mm GI Flat for earthing, 2.36kg/mtr. KG 93.00 150.00 13,950.00 40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long No 1,289.60 5 6,448.00 3 4 GI Nuts & Bolts of Assorted size 50.00 Κg 96.72 4,836.00 Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable 10,22,940.00 0.072 73,651.68 km Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, FΑ 6 5,014.00 6 30,084.00 Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 7 EΑ 4.901.00 6 29.406.00 sqmm, HT UG cable Channel 100X50X6mm, 9.56 KG/Mtr. KG 93.00 250 23,250.00 SWITCH GEAR PANEL BOARD 11kV I/D VCB No. 9 Α Total Cost of materials 1,67,49,421.68 Stock, Storage & Insurance i.e 3% of A В 5,02,482.65 Sub Total (A+B) C 1,72,51,904.33 Contigency @ 3% of C 5,17,557.13 D Tools & Plants @ 2% of C Ε 3,32,196.64 Transportation @ 7.5% of C F 12,93,892.82 Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole G 8,53,241.49 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole) Н 4,329.71 Erection Charges @ 20% of PSC pole- Not to be used for 33kV Sum of (C to I) 2,02,53,122.13 J **Civil and Services Works** (As per Technical Specification) SI. Total Total Unit **Unit Rate Description of Materials** No. Quantity Amount Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation 1 km 94,500.00 0.072 6,804.00 armoured (extruded type) UG cable by open trench method Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 1,900.80 6 11,404.80 Set sgmm, aluminium UG cable kits for 3core (set) Erection of **Outdoor termination kits** Heat Shrinkable type suitable for 11kV, 1 Core, 630 Set 1,900.80 6 11,404.80 sqmm, aluminium UG cable kits for 3core (set) 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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with 3.700.00 5 18.500.00 Nο cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing **Demolition Work for Existing PTR** BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower 751.50 20 15,030.00 Cum for the activity Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading FΑ 75,900.00 75,900.00 1 of same PTR if Required. Insurance during transportation shall be in TPCODL scope. Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include 4,217.00 loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, EΑ 1 4,217.00 Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane, charges for crane will be paid separately. Civil Work for New PTR BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary Cum 482.00 20 9,640.00 tools & machinery for excavation of cable trench & other civil works.

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Naharkanta PSS)					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)	
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	40	52,200.00	
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00	
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00	
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00	
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00	
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00	
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00	
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00	
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00	
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		6,039.61	2	12,079.22	
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	1	6,747.00	12	80,964.00	
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	l .	751.50	20	15,030.00	
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	1	7,316.00	25	1,82,900.00	
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	1	1,000.00	17	17,000.00	

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Naharkanta PSS)							
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)			
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass, small tree, plant etc.	Cum	2,235.00	47	1,05,045.00			
24	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	12	5,784.00			
25	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.							
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Cum 200.00 15							
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00			
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00			
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00			
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)		109.00	1503	1,63,827.00			
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00			
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		6,039.61	1	6,039.61			
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work	Cum	7,316.00	19	1,39,004.00			
34	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.		1,000.00	2	2,000.00			
К								
L								
M					13,00,030.77			
N				Total (L+M)	2,29,67,210.33			
O P			Total GST @	ESS 1% of N	41,34,097.86 2,29,672.10			
Q	C:	oss Tota	Il Material +Servic		2,73,30,980.29			
R			tal Material +Service		2.73			
•••				(	2.,,3			

		ANNEXURE-13.3					
		TP CENTRAL ODISHA DISTRIBUTION LIMITED					
Name of	Name of the Division :- BCDD-2						
Name of the Sub-Division : - Nayapalli							
Name of the Work :- Mitigation of 33/11kV PTR Overloading							
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8M School 33/11kV PSS with other civil works.	VA to 16MVA at Sainik				
Names o	of Schemes: -	TPCODL CAPEX (FY 23-24)					
		ABSTRACT OF ESTIMATE					
SI. No.	Part	Description	Amount				
1	А	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.	₹ 2,73,30,980.29				
		Total Amount	₹ 2,73,30,980.29				
		Total Amount (In Cr)	2.73				

## Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Sainik School PSS)

	PTR-1 (Sainik School PSS)					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)	
	SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00	
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00	
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00	
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00	
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68	
6	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00	
7	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00	
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00	
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-	
Α			Total Cost o	of materials	1,67,49,421.68	
В		Stock, S	orage & Insurance	e i.e 3% of A	5,02,482.65	
С				Total (A+B)	1,72,51,904.33	
D	<u> </u>					
E	-					
F	1 2					
G H	· · · · · · · · · · · · · · · · · · ·					
<u> </u>	Liection charges @ 20/	0 01 1 30	·	m of (C to I)	2,02,53,122.13	
<u> </u>	Civil and Sarvicas Warks			5. (5.55.1)	2,02,33,122.13	

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by <b>open trench method</b> .	km	94,500.00	0.072	6,804.00
2	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.		751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane, charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	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	20	9,640.00

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Sv PTR-1 (Sainik School PSS)	witchgea	r Panel		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	1	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	l .	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	1	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	1	1,000.00	17	17,000.00

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Sainik School PSS)							
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)			
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass, small tree, plant etc.	Cum	2,235.00	47	1,05,045.00			
24	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	12	5,784.00			
25	Excavating trenches of required width and depth for pipe, cables etc including Excavation for sockets including geting out the excavated materials, returning (refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00			
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00			
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00			
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00			
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00			
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)		109.00	1503	1,63,827.00			
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00			
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		6,039.61	1	6,039.61			
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work	Cum	7,316.00	19	1,39,004.00			
34	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.		1,000.00	2	2,000.00			
К			Total Civi	& Services	14,14,057.43 2,16,67,179.56			
L								
M								
N								
O P				ESS 1% of N	41,34,097.86 2,29,672.10			
Q	G	ross Tota	Il Material +Servic		2,73,30,980.29			
R					2.73			
••	R Gross Total Material +Services (in cr.)							

	ANNEXURE-13.4							
	TP CENTRAL ODISHA DISTRIBUTION LIMITED							
Name o	of the Division :-	BED						
Name o	of the Sub-Division : -	Temple						
Name o	of the Work :-	Mitigation of 33/11kV PTR Overloading						
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.						
Names	of Schemes: -	TPCODL CAPEX (FY 23-24)						
		ABSTRACT OF ESTIMATE						
SI. No.	Part	Description	Amount					
1	Augmentation of 01no. Power Transformer (PTR-1) find A 8MVA to 16MVA at Mulapadia 33/11kV PSS with oth works.		₹ 2,73,30,980.29					
		Total Amount	₹ 2,73,30,980.29					
		Total Amount (In Cr)	2.73					
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)								

### **ANNEXURE-13.4** Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mulapadia PSS) Total SI. Total **Description of Materials** Unit **Unit Rate** Amount Quantity No. (in Rs.) **SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS** (As per Technical Specification) 12.5/16 MVA, 33/11 KV Power Transformer with OLTC 1,65,67,796.00 1,65,67,796.00 Nos. 1 2 50x6mm GI Flat for earthing, 2.36kg/mtr. KG 93.00 150.00 13.950.00 40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long 1.289.60 5 6.448.00 GI Nuts & Bolts of Assorted size Kg 96.72 50.00 4.836.00 Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable 10,22,940.00 0.072 73,651.68 Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, EΑ 5,014.00 6 30,084.00 Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 7 4,901.00 6 29,406.00 sgmm, HT UG cable Channel 100X50X6mm, 9.56 KG/Mtr. KG 93.00 250 23,250.00 SWITCH GEAR PANEL BOARD 11kV I/D VCB Α **Total Cost of materials** 1,67,49,421.68 В Stock, Storage & Insurance i.e 3% of A 5,02,482.65 Sub Total (A+B) C 1,72,51,904.33 Contigency @ 3% of C D 5,17,557.13 Tools & Plants @ 2% of C Ε 3,32,196.64 F Transportation @ 7.5% of C 12,93,892.82 G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 8,53,241.49 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole) 4,329.71 Н Erection Charges @ 20% of PSC pole- Not to be used for 33kV J Sum of (C to I) 2,02,53,122.13 Civil and Services Works (As per Technical Specification) SI. Total Total Unit **Unit Rate Description of Materials** No. Quantity Amount Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation 94,500.00 0.072 1 km 6,804.00 armoured (extruded type) UG cable by open trench method. Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 2 Set 1,900.80 6 11,404.80 sqmm, aluminium UG cable kits for 3core (set) Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 Set 1,900.80 6 11,404.80 sqmm, aluminium UG cable kits for 3core (set) 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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with 3,700.00 18,500.00 cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing Demolition Work for Existing PTR BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower Cum 751.50 20 15,030.00 for the activity Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading 75,900.00 1 75,900.00

4.217.00

482.00

1

4.217.00

9,640.00

EΑ

of same PTR if Required. Insurance during transportation shall be in TPCODL scope.

crane, charges for crane will be paid separately.

tools & machinery for excavation of cable trench & other civil works.

Civil Work for New PTR

Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel,

Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with

BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Sv PTR-1 (Mulapadia PSS)	witchgea	r Panel		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material		6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.		1,000.00	17	17,000.00

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mulapadia PSS)						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)		
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass, small tree, plant etc.	Cum	2,235.00	47	1,05,045.00		
24	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	12	5,784.00		
25	Excavating trenches of required width and depth for pipe, cables etc including Excavation for sockets including geting out the excavated materials, returning (refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00		
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00		
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00		
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00		
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00		
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00		
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00		
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61		
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work	Cum	7,316.00	19	1,39,004.00		
34	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00		
К		-	Total Civil	& Services	14,14,057.43 2,16,67,179.56		
L							
М							
N							
0			Total GST @	18% of (N)	41,34,097.86		
Р			CI	ESS 1% of N	2,29,672.10		
Q	Gr	oss Tota	l Material +Servic	es (N+O+P)	2,73,30,980.29		
R		Gross To	tal Material +Serv	rices (in cr.)	2.73		

		ANNEXURE-13.5				
		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name c	of the Division :-	BCDD-2				
Name c	of the Sub-Division : -	Khandagiri				
Name c	of the Work :-	Mitigation of 33/11kV PTR Overloading				
Scope:-		Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.				
Names	of Schemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1	А	Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.	₹ 2,73,30,980.29			
		Total Amount	₹ 2,73,30,980.29			
		Total Amount (In Cr)	2.73			

# Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-3 (Kalinga Nagar PSS)

	PTR-3 (Kalinga Nagar PSS)							
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)			
	SUPPLY OF FOLLOWING EQUIPMENT & MATEF (As per Technical Specification)	RIALS						
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC Nos. 1,65,67,796.00 1							
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00			
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00			
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00			
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68			
6	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00			
7	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00			
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00			
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-			
Α			Total Cost o	f materials	1,67,49,421.68			
В		Stock, St	orage & Insurance	i.e 3% of A	5,02,482.65			
С				Total (A+B)	1,72,51,904.33			
D	ÿ , -							
Е								
F	The state Colorest							
G	\$ · · · · ·							
<u>H</u>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)  Erection Charges @ 20% of PSC pole- Not to be used for 33kV							
<u> </u>	Erection Charges @ 20%	% UT PSC	•		2,02,53,122.13			
	Sum of (C to I)							

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by <b>open trench method</b> .	km	94,500.00	0.072	6,804.00
2	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane, charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR		_		
8	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	20	9,640.00

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without St PTR-3 (Kalinga Nagar PSS)	witchgea	ır Panel		
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	1	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	1	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	1	1,000.00	17	17,000.00

Uniterstices of coases aggregate, wastering and compacting to the required density. Scope of work also includes of jumples such as grass, small tree, plant etc.		Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-3 (Kalinga Nagar PSS)						
may make stone aggregate to W8M specifications in uniform thickness, hand picking to proper grade and camber, applying and toroning requisite type of screening his hinding materials of the manufactory of the property of the service of the serv		Description of Materials	Unit	Unit Rate		Amount		
Lun 48.2.00 12 5,98.0.0  Excavating trenches of required with and depth for pipe cables et including Excavation for sockets including geting out the excavated materials, returning/refillig) the soil as required in sockets including geting out the excavated materials, returning/refillig) the soil as required in sockets including geting out the excavated materials, returning/refillig) the soil as required in unservicable materials as direct by ELF or laying of different size of cable/pipes laying. Scope of sow for excludes Single of HUMP/PCV (Pipes as per TECOL) drawing in Rocky soil.  84 Avail Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.  85 Avail provide hard Barricading with zero strip one use for cable excavation site for safety of the employees & pedestrains.  86 Providing and laying Plain Cerent Concrete (PCC) of proportion (13:6) in foundations, Trench and plinists using approved quality of cement, 20mm size hard crusher broken grants store metal and screened, washed sharp sand for mortar of approved quality and from etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, case, of all materials & cost of all abours, sunfiels, 18/2 and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  85 Providing and shuttering including strutting, propping etc. and removal of form for Sequin additions, footings, bases of columns etc. for mass concrete  86 Referencement Flaster of mix - 1-41 is cerement; 4 lines and (50 % fine : 50% coarse) as per as Sequin 282.00 53 14,946.00  87 Providing and laying Plain Cement Concrete (PCC) of proportion (12:4) in foundations and olinidate using approved quality of cement, 20mm is hard crusher broken granties stone metal and screened, washed sharps and for mortar of approved quality of cement, 20mm is hard crusher broken granties stone metal and screened, washed sharps and for	23	mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of	Cum	2,235.00	47	1,05,045.00		
sockets including geting out the excavated materials/returning/ferfiligh the soil as required in Jayers not exceeding 250 mm depth, including consolidating each deposited layers by armsing, watering etc. stacking servicable materials as direct on deliven from measurements and disposal of unservicible materials as direct by ELf for lyping of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rockys soil.  26	24		Cum	482.00	12	5,784.00		
Ba will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (13:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quality of cement, 20mm size hard crusher broken granite etc. complete to required levels in layers not exceeding 15tm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundies, T&P and all other machinaries required for the work etc., as directed by inspired to required levels in layers not exceeding 15tm thick in each layer including straightening, cutting, bending, placing in position and binding all completes, cold wished bars/TMT as per TPCODL specification (Scope also include supply of material)  12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all materials and screened, washed sharp sand for most or approved quality and from approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for most or approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for most or approved quality and from approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for most and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for most and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for most and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for most and plinths in the plant siz	25	sockets including geting out the excavated materials, returning (refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00		
27 8 will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (13:6) in foundations, Trench and plinths using approved quality of cement, 20mm site 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 cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials.  28 etc. complete to required levies in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials and cost of all babours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  29 Centring and shuttering including strutting, propping etc. and removal of form for productions, footings, bases of columns etc. for mass concrete Reinforcement for R.C. work including strightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  12 mm Cement Plaster of mix -1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (12:4) in foudations and plints using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quarry, including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials.  Providing and laying Reinforced Cement Concrete (RCC) of proportion (12:4) in foudations and plints using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved guarry, including cost, conveyance, loading, unloading, royalties and taxes, cess,	26	. , ,	Cum	200.00	15	3,000.00		
Trench and plinths using approved quality of cement, 20mm size hard crusher broken granites stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including holsting, lowering, laying concrete, ramming, watering and curring cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all abours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  29 Centring and shuttering including struttling, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete  80 Richforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all compilete, cold twisted basry/TMT as per TPCODL specification (Scope also per TPCODL specification, Scope includes supply of all material.  10 12 mm Cement Plaster of mix-1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  11 2 mm Cement Plaster of mix-1:4 (1 Cement; 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  12 mm Cement Plaster of mix-1:4 (1 Cement; 2 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  13 2 mix of the second plant of the second plant structure of	27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety	Mtr	180.00	24	4,320.00		
Foundations, footings, bases of columns etc. for mass concrete  Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all compilete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size 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, reamming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10 mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work supplying and spreading, filing other works with fine sand under floors, ground etc as per EIC  Is instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total (J+M) 2,16,67,179.56  Other overheads (Including 6% supervision charges) of L 13,00,030.77	28	Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by	Cum	5,130.00	2	10,260.00		
and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total (Jeff) 2,16,67,179.56  M Other overheads (Including 6% supervision charges) of 1, 13,00,030.77  N Other overheads (Including 6% supervision charges) of 1, 22,967,210.33  Total GST @ 18% of (N) 2,29,672.10.33	29		Sqm	301.00	89	26,789.00		
per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total Civil & Services  A Total Civil & Services  14,14,057.43  Chem Chem overheads (Including 6% supervision charges) off. 13,00,030.77  N Other overheads (Including 6% supervision charges) off. 2,29,672.10.33  Total GST @ 18% of (N) 4,134,090.78.00  CESS 1% of N 2,29,672.10.33  Total GST @ 18% of (N) 4,134,090.78.00	30	and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also		109.00	1503	1,63,827.00		
plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total (J+K) 2,16,67,179.56  M Other overheads (Including 6% supervision charges) of L 13,000,007.00  Total GST @ 18% of (N) 41,34,097.86  P CESS 1% of N 2,29,67,210.33  Other overheads (Including 14 Services (N+O+P) 2,73,30,980.25	31		Sqm	282.00	53	14,946.00		
mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  K  Total Civil & Services 14,14,057.43  Total (J+K) 2,16,67,179.56  M  Other overheads (Including 6% supervision charges) of L 13,00,030.77  N  CESS 1% of N) 2,29,67,21.03  O Gross Total Material +Services (N+O+P) 2,73,30,980.29	32	plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries,	Cum	6,039.61	1	6,039.61		
34       instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.       Cum       1,000.00       2       2,000.00       2         K       Total Civil & Services       14,14,057.43         L       Total (J+K)       2,16,67,179.56         M       Other overheads (Including 6% supervision charges) of L       13,00,030.77         N       Sub Total (L+M)       2,29,67,210.33         O       Total GST @ 18% of (N)       41,34,097.86         P       CESS 1% of N       2,29,672.10         Q       Gross Total Material +Services (N+O+P)       2,73,30,980.29	33	mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all	Cum	7,316.00	19	1,39,004.00		
L         Total (J+K)         2,16,67,179.56           M         Other overheads (Including 6% supervision charges) of L         13,00,030.77           N         Sub Total (L+M)         2,29,67,210.33           O         Total GST @ 18% of (N)         41,34,097.86           P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29	34	instruction. Scope of work also includes watering, ramming, consolidating and dressing	1	1,000.00	2	2,000.00		
M         Other overheads (Including 6% supervision charges) of L         13,00,030.77           N         Sub Total (L+M)         2,29,67,210.33           O         Total GST @ 18% of (N)         41,34,097.86           P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29				Total Civil		14,14,057.43		
N         Sub Total (L+M)         2,29,67,210.33           O         Total GST @ 18% of (N)         41,34,097.86           P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29								
O         Total GST @ 18% of (N)         41,34,097.86           P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29								
P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29								
Q Gross Total Material +Services (N+O+P) 2,73,30,980.29								
		Gi	ross Tota			2,73,30,980.29		
	R		Gross To	tal Material +Serv	ices (in cr.)	2.73		

		ANNEXURE-13.6		
		TP CENTRAL ODISHA DISTRIBUTION LIMITED		
Name of	the Division :-	PED		
Name of	the Sub-Division : -	Puri-1		
Name of	the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-		Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.		
Names o	f Schemes: -	TPCODL CAPEX (FY 23-24)		
		ABSTRACT OF ESTIMATE		
SI. No.	Part	Description	Amount	
1	А	Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.	₹ 5,46,61,960.59	
		Total Amount	₹ 5,46,61,960.59	
		Total Amount (In Cr)	5.47	

# Augmentation of 2nos. 8 MVA PTR with 16 MVA each Without Switchgear Panel PTR-1 and PTR-2 (Kacheri PSS)

PTR-1 and PTR-2 (Kacheri PSS)							
SI. No.	Description of Materials	Unit	Unit Rate	Total Amount (in Rs.)			
	SUPPLY OF FOLLOWING EQUIPMENT & MATER (As per Technical Specification)	RIALS					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	2	3,31,35,592.00		
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	300.00	27,900.00		
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	10	12,896.00		
4	GI Nuts & Bolts of Assorted size	Kg	96.72	100.00	9,672.00		
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.144	1,47,303.36		
6	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	12	60,168.00		
7	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	12	58,812.00		
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	500	46,500.00		
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-		
Α			Total Cost o	f materials	3,34,98,843.36		
В		Stock, St	orage & Insurance	i.e 3% of A	10,04,965.30		
С				Total (A+B)	3,45,03,808.66		
D	Contigency @ 3% of C						
Е	Tools & Plants @ 2% of C						
F	Transportation @ 7.5% of C						
G	<u> </u>						
Н							
I	Erection Charges @ 209	6 of PSC	•		4,05,06,244.25		
J	J Sum of (C to I)						

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by <b>open trench method</b> .	km	94,500.00	0.144	13,608.00
2	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	12	22,809.60
3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	12	22,809.60
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	10	37,000.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	40	30,060.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	2	1,51,800.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	2	8,434.00
	Civil Work for New PTR				-

	Augmentation of 2nos. 8 MVA PTR with 16 MVA each Without Switchgear Panel PTR-1 and PTR-2 (Kacheri PSS)						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)		
8	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	40	19,280.00		
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	80	1,04,400.00		
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	20	4,000.00		
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	80	14,400.00		
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		5,130.00	8	41,040.00		
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	106	31,906.00		
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)		109.00	3500	3,81,500.00		
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	1600	2,01,600.00		
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	800	21,600.00		
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	66	18,612.00		
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	4	24,158.44		
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	l	6,747.00	24	1,61,928.00		
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	40	30,060.00		
21	mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work	Cum	7,316.00	50	3,65,800.00		
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	ı	1,000.00	34	34,000.00		

Si.   Description of Materials   Unit   Unit Rate   Total Quantit	Total Amount (in Rs.)  2,10,090.00  11,568.00  1,25,280.00  6,000.00  8,640.00				
mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of iungle such as grass.small tree.plant etc.  24	2,10,090.00 11,568.00 1,25,280.00 6,000.00 8,640.00				
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.  Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.  BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.  BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	1,25,280.00 6,000.00 8,640.00				
Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc., stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.  26 BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.  27 BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	6,000.00				
Machinery & Manpower for the activity.  27 BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	8,640.00				
of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	,				
Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	20,520.00				
Centring and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	53,578.00				
Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position 3006 includes and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	3,27,654.00				
31 2 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	29,892.00				
Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	12,079.22				
Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work	2,78,008.00				
Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	4,000.00				
K Total Civil & Services					
L Total (J+K)					
M Other overheads (Including 6% supervision charges) of L					
N         Sub Total (L+N)           O         Total GST @ 18% of (	1 1 1 1 1 1 1				
O Total GST @ 18% of ( P CESS 1% of	<del>' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' </del>				
Q Gross Total Material +Services (N+O+					
R Gross Total Material +Services (in c					

		ANNEXURE-13.7				
		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name of	the Division :-	PED				
Name of	the Sub-Division : -	Puri-1				
Name of	the Work :-	Mitigation of 33/11kV PTR Overloading				
Scope:-		Augmentation of 01no. Power Transformer (PTR-2) from 8 Baliapanda 33/11kV PSS with other civil works.	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.			
Names o	of Schemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1	А	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.	₹ 2,73,30,980.29			
		Total Amount	₹ 2,73,30,980.29			
		Total Amount (In Cr)	2.73			

# Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Baliapanda PSS)

	PTR-2 (Baliapanda PSS)					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)	
	SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00	
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00	
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00	
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00	
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68	
6	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00	
7	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00	
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00	
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-	
Α			Total Cost o	f materials	1,67,49,421.68	
В		Stock, St	orage & Insurance	i.e 3% of A	5,02,482.65	
С				Total (A+B)	1,72,51,904.33	
D				/ @ 3% of C	5,17,557.13	
Е						
F						
G			on Trf/Breaker/W	-	8,53,241.49 4,329.71	
H						
-	Erection Charges @ 20%	6 of PSC	•		-	
J	of the does the world.		Sur	n of (C to I)	2,02,53,122.13	

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by <b>open trench method</b> .	km	94,500.00	0.072	6,804.00
2	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.		751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane, charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR		_		-
8	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	20	9,640.00

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Baliapanda PSS)						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)		
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	40	52,200.00		
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00		
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00		
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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		5,130.00	4	20,520.00		
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00		
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00		
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00		
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00		
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00		
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		6,039.61	2	12,079.22		
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	1	6,747.00	12	80,964.00		
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	1	751.50	20	15,030.00		
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00		
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	1	1,000.00	17	17,000.00		

Discretification of Coaster aggregate, watering and compacting to the required density. Scope of work also includes of jurgies such as grass, small recipiant etc.    All will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary could be a provided and provided to include of jurgies such as grass, and treeplant works.		Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Baliapanda PSS)						
and make stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and combering, requisite year beer discrement, briding materials oil.  24 Intention of the property of the p		Description of Materials	Unit	Unit Rate		Amount		
Lum 48.2.00 12 5,78.0.0  Excavating trenches of required width and depth for pipe cables etc including baseavation for sockets including gating out the excavated materials, returning/refillig) the soil as required in your sockets including gating out the excavated materials for measurements and disposal of unservirable materials as direct by ELF for laying of different size of table/pipes laying. Scope of work excludes sixing of HUMP/PMC Pipes as part PECOLO drawing in Rocky soil.  8 Awill Back fill the cable excavation size with same earth. Ba will provide necessary Tools, Machinery & Manpower for the activity.  9 Awill provide hard Barricading with zebra strip one use for cable excavation size for safety of the employees & pedestrains.  9 Providing and laying Plain Cement Concrete (PCC) of proportion (13:86) in foundations, Trench and plains the size of providing cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all induces, unloading, unloading, royalties and taxes, cess, of all materials & cost of all induces in the providence of the providing and shuttering including strutting, proping etc.  9 Providing and shuttering including strutting, proping etc. and removal of form for Refundations, footings, bases of columns etc. for mass concrete  10 Reinforcement Plaster of mix - 1-41 Cement : 4 lines and (50 % fine : 50% coarse) as per as per TPCOOL specification (Scope also include supply of material)  10 Providing and laying Plain Cement Concrete (PCC) of proportion (12:24) in foundations and plinten using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed shary sand for mortar of approved quary, including strutting, proping etc. and removal of form for Sqrm 301.00 89 26,789.0  10 Providing and laying Plain Cement Concrete (PCC) of proportion (12:24) in foundations and plinten using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed shary sand for mortar of approved quality o	23	mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of		2,235.00	47	1,05,045.00		
sockets including geting out the excavated materials/returning/refilligh the soil as required in Jayers not exceeding 250 mm depth, including consolidating each deposited layers by amaning, watering etc, stacking servicable materials for measurements and disposal of unservicible materials as directly by Ecf or bying officered size of cable/pipes laying, Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rockysoil.  28	24		Cum	482.00	12	5,784.00		
Ba will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (13:6) in foundations, Tench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from gentles to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundies, T&P and all other machinaries required for the work etc., as directed by entroper forms of per PTCDOL specification. Scope includes supply of materials and screened washed sharp sand for most per per PTCDOL specification. Scope includes supply of materials and screened washed sharp sand for most per	25	sockets including geting out the excavated materials, returning (refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	48	62,640.00				
27 A will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (13:6) in foundations, Tench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quality and firm and plinths using approved quality and form approved quality and form approved quality of experiments. So, of all materials & cost of all babours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  29 Centring and shuttering including strutting, propping etc. and removal of form for programment for R.C. work including strutting, propping etc. and removal of form for productions, footings, bases of columns etc. for machinaries required for the work etc., as directed by Engineer-in-Charge.  29 Centring and shuttering including strutting, propping etc. and removal of form for productions, footings, bases of columns etc. for machinaries required for the work etc., as directed by Engineer-in-Charge.  29 Reinforcement for R.C. work including striptiening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material).  20 Includes supply of material and screened for mix -1:4 (1 Cement: 4 Fine sand (50 % fine: 50% coarse) as per as per TPCODL specification. Scope includes supply of all materials.  21 Providing and laying Plain Cement Concrete (PCC) of proportion (12:24) in foundations, and plints using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quary, uncluding cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all habours, sundries, 18 part of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mor	26	. , ,	Cum	200.00	15	3,000.00		
Trench and plinths using approved quality of cement, 20mm size 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 cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all abours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  29 Centring and shuttering including struttling, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete  30 Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all compilete, cold twisted bary/TMT as per FCOOL specification (Scope also per TPCODL specification, Scope includes supply of material)  31 12 mm Cement Plaster of mix -1.4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  32 Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quality of cement, 20mm & 10 mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from	27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety	Mtr	180.00	24	4,320.00		
Foundations, footings, bases of columns etc. for mass concrete  Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all compilete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royaltes and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  K  Subplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total (I-M) 2,16,67,179-51 3,00,00.07 15,00 15,00 15,00 15,00 15,00 15,00 15,00 15,00 15,00 15,00 1	28	Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by	Cum	5,130.00	2	10,260.00		
and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  12 mm Cmemt Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total (I+K) 2,16,67,179.5f  M Other overheads ( Including 6% supervision charges) of L 13,00,030.77  Sub Total (I+K) 2,29,67,210.3i  7	29		Sqm	301.00	89	26,789.00		
per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total (JHK) 2,16,67,179.50  M Other overheads (Including 6% supervision charges) of L 13,00,030.77  N Other overheads (Including 6% supervision charges) of L 13,00,030.77  Q Gross Total Material +Services (N+O+P) 2,279,672.10.33	30	and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also	Kg	109.00	1503	1,63,827.00		
plinths using approved quality of cement, 20mm size 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 or required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  K  Total Civil & Services  14,14,057.43  Total (I+K)  2,16,67,179.54  Other overheads (Including 6% supervision charges) of L  300  Total GST @ 18% of (N)  4,229,67,210.33  Total GST @ 18% of (N)  2,29,67,210.33  CESS 1% of N  2,29,67,210.33	31		Sqm	282.00	53	14,946.00		
mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  K  Total Civil & Services 14,14,057.43  Total (J+K) 2,16,67,179.56  N  Other overheads (Including 6% supervision charges) of L 3,00,030.77  Sub Total (L+M) 2,29,67,21.03  O Total GST @ 18% of (N) 41,34,097.86  CESS 1% of N 2,29,672.10  Q  Gross Total Material + Services (N+O+P) 2,73,30,980.29	32	plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries,		6,039.61	1	6,039.61		
34       instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.       Cum       1,000.00       2       2,000.00         K       Total Civil & Services       14,14,057.45         L       Total (J+K)       2,16,67,179.56         M       Other overheads (Including 6% supervision charges) of L       13,00,030.77         N       Sub Total (L+M)       2,29,67,210.33         O       Total GST @ 18% of (N)       41,34,097.86         P       CESS 1% of N       2,29,672.10         Q       Gross Total Material +Services (N+O+P)       2,73,30,980.29	33	mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all		7,316.00	19	1,39,004.00		
L         Total (J+K)         2,16,67,179.50           M         Other overheads (Including 6% supervision charges) of L         13,00,030.77           N         Sub Total (L+M)         2,29,67,210.33           O         Total GST @ 18% of (N)         41,34,097.86           P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29	34	instruction. Scope of work also includes watering, ramming, consolidating and dressing		1,000.00	2	2,000.00		
M         Other overheads (Including 6% supervision charges) of L         13,00,030.77           N         Sub Total (L+M)         2,29,67,210.33           O         Total GST @ 18% of (N)         41,34,097.86           P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29								
N         Sub Total (L+M)         2,29,67,210.33           O         Total GST @ 18% of (N)         41,34,097.86           P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29		Other	Includio	7 6% suponvision -1				
O         Total GST @ 18% of (N)         41,34,097.86           P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29								
P         CESS 1% of N         2,29,672.10           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.29								
Q Gross Total Material +Services (N+O+P) 2,73,30,980.29						2,29,672.10		
		Gi	oss Tota			2,73,30,980.29		
,	R		Gross To	tal Material +Serv	ices (in cr.)	2.73		

		ANNEXURE-13.8			
		TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name o	f the Division :-	CDD-2			
Name of the Sub-Division : - Mahanadi Vihar					
Name of the Work :- Mitigation of 33/11kV PTR Overloading					
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8N Mahanadi Vihar 33/11kV PSS with other civil works.	IVA to 16MVA at		
Names of Schemes: - TPCODL CAPEX (FY 23-24)					
		ABSTRACT OF ESTIMATE			
SI. No.	Part	Description	Amount		
1 A		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.	₹2,73,30,980.29		
		Total Amount	₹ 2,73,30,980.29		
		Total Amount (In Cr)	2.73		

### **ANNEXURE-13.8** Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mahanadi Vihar PSS) Total SI. Total **Description of Materials** Unit **Unit Rate** Amount No. Quantity (in Rs.) **SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS** (As per Technical Specification) 12.5/16 MVA, 33/11 KV Power Transformer with OLTC 1,65,67,796.00 1,65,67,796.00 50x6mm GI Flat for earthing, 2.36kg/mtr. 150.00 13,950.00 KG 3 40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long No 1,289.60 5 6,448.00 4 96.72 50.00 4,836.00 GI Nuts & Bolts of Assorted size Kg Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable km 10,22,940.00 0.072 73,651.68 Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, 6 EΑ 5,014.00 6 30,084.00 Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 7 EΑ 4,901.00 6 29,406.00 sqmm, HT UG cable 23,250.00 Channel 100X50X6mm, 9.56 KG/Mtr. 93.00 250 KG 9 SWITCH GEAR PANEL BOARD 11kV I/D VCB No. **Total Cost of materials** Α 1,67,49,421.68 Stock, Storage & Insurance i.e 3% of A В 5,02,482.65 С Sub Total (A+B) 1,72,51,904.33 D Contigency @ 3% of C 5,17,557.13 Ε Tools & Plants @ 2% of C 3,32,196.64 F Transportation @ 7.5% of C 12,93,892.82 G Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole 8,53,241.49 Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole) Н 4,329.71 Erection Charges @ 20% of PSC pole- Not to be used for 33kV ī J Sum of (C to I) 2,02,53,122.13 **Civil and Services Works** (As per Technical Specification) SI. Total Total Unit **Unit Rate Description of Materials** No. Quantity Amount Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation 94,500.00 1 km 0.072 6,804.00 armoured (extruded type) UG cable by open trench method. Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 2 1,900.80 6 11,404.80 Set sqmm, aluminium UG cable kits for 3core (set) Erection of **Outdoor termination kits** Heat Shrinkable type suitable for 11kV, 1 Core, 630 3 Set 1,900.80 6 11,404.80 sqmm, aluminium UG cable kits for 3core (set) 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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with No 3,700.00 5 18,500.00 cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing Demolition Work for Existing PTR BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower Cum 751.50 20 15,030.00 for the activity. Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading EΑ 75,900.00 75,900.00 of same PTR if Required. Insurance during transportation shall be in TPCODL scope. Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, EΑ 4.217.00 1 4.217.00 Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane, charges for crane will be paid separately. Civil Work for New PTR BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary Cum 482.00 20 9,640.00 tools & machinery for excavation of cable trench & other civil works.

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mahanadi Vihar PSS)						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)		
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	40	52,200.00		
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00		
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00		
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00		
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00		
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00		
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00		
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm, 75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00		
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00		
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22		
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	1	6,747.00	12	80,964.00		
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00		
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00		
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.		1,000.00	17	17,000.00		

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mahanadi Vihar PSS)						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)		
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass, small tree, plant etc.	Cum	2,235.00	47	1,05,045.00		
24	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	12	5,784.00		
25	Excavating trenches of required width and depth for pipe, cables etc including Excavation for sockets including geting out the excavated materials, returning (refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	1,305.00	48	62,640.00			
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00		
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00		
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00		
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00		
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00		
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00		
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		6,039.61	1	6,039.61		
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work	Cum	7,316.00	19	1,39,004.00		
34	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.		1,000.00	2	2,000.00		
К	Total Civil & Services						
L	L Total (J+K						
М	Other overheads (	Including	· · · · · · · · · · · · · · · · · · ·		13,00,030.77		
N				Total (L+M)	2,29,67,210.33		
0			Total GST @		41,34,097.86		
P		T : '		SS 1% of N	2,29,672.10		
Q			Material +Service		2,73,30,980.29		
R		G1022 10	tal Material +Serv	ices (in cr.)	2.73		

	ANNEXURE-13.9					
		TP CENTRAL ODISHA DISTRIBUTION LIMITED				
Name of t	he Division :-	CDD-1				
Name of t	:he Sub-Division : -	Sector-6 SDO				
Name of t	:he Work :-	Mitigation of 33/11kV PTR Overloading				
Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector 6 (CDA) 33/11kV PSS with other civil works.						
Names of	Schemes: -	TPCODL CAPEX (FY 23-24)				
		ABSTRACT OF ESTIMATE				
SI. No.	Part	Description	Amount			
1 A		Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.	₹ 2,73,30,980.29			
		Total Amount	₹ 2,73,30,980.29			
		Total Amount (In Cr)	2.73			
Total esti	mated cost is Rs. 2.7	3 Crore. (On TPCODL Capex Scheme)				

# Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Sector-6 CDA PSS)

PTR-2 (Sector-6 CDA PSS)								
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)			
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS  (As per Technical Specification)								
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00			
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00			
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00			
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00			
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68			
6	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00			
7	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00			
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00			
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-			
Α	Total Cost of materials							
В	Stock, Storage & Insurance i.e 3% of A							
С	Sub Total (A+B)							
D	Contigency @ 3% of C							
E	Tools & Plants @ 2% of C							
F	Transportation @ 7.5% of C							
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole  Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)							
<u> </u>	Erection Charges @ 10% of C (except 117/Breaker/WPB/ H-Pole/H1 stay set/PSC Pole)  Erection Charges @ 20% of PSC pole- Not to be used for 33kV							
	Sum of (C to I)							
	Civil and Services Works							

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by <b>open trench method</b> .	km	94,500.00	0.072	6,804.00
2	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane, charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	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	20	9,640.00

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Sector-6 CDA PSS)					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)	
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	40	52,200.00	
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00	
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00	
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00	
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00	
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00	
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00	
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00	
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00	
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		6,039.61	2	12,079.22	
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	1	6,747.00	12	80,964.00	
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	1	751.50	20	15,030.00	
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00	
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	1	1,000.00	17	17,000.00	

up intersitics of coarse aggregate, watering and compacting to the required density, Scope of work also includes of jungle such as grass, small free plant etc.  24 BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary countries. The provides in the provided of the pr		Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Sector-6 CDA PSS)					
a massies stone aggregate to WBM specifications in uniform thickness, hand picking to proper 3 grade and camber, applying and bromping requisite per of screening. Midning material to fill.  3 pulpristratices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungles when aggregates, watering and compacting to the required density. Scope of work also includes of jungles with an aggregate, pank et c.  3 Part will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary to the secretary and the cable trench depth upto 2.5 MTR & remove the debris using necessary to sockets including geting out the excavated materials, returning/refilligh the soil as required in slayers not exceeding 200 mm depth, including consolidating each deposited layers by comming, watering etc., stacking servicable materials for measurements and disposal of unservicable materials as direct by Et Cri braying different size of calable pices styring. Scope of work excludes laying of HUME/PVC Pices as per TECOUL drawing in Rocky soil.  3 Providing and laying Plain Cement Concrete (PCC) of proportion (13:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken grantic state metal and screened, washed sharp sand for mortar of approved quality and from approved quary, including hobiding, loverling, laying correcte, naming, watering and curing exct, consplets to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, uncloading, royelities and laces, cess, of all materials.  3 Providing and laying Plain Cement Concrete (PCC) of proportion (13:6) in foundations, french and plinths using approved quality of cement, 20mm size hard crusher broken grantic soil, conveyance, loading, uncloading, royelities and laces, cess, of all materials.  4 Providing and laying Plain Cement Concrete (PCC) of proportion (12:4) in foundations and plinths using approved quality of cement, 20mm size hard crusher	l .	Description of Materials	Unit	Unit Rate		Amount	
Executing trenches of required width and depth of pige, packes etc. including Execution for sockets including getting out the executed maturials, returning felling the soil as required in sockets including getting out the executed maturials, returning felling the soil as required in unserticible materials as direct by ICI for laying of different size of cable plans laying. Scope of work excludes laying of the public process packets and size by ICI for laying of different size of cable plans laying. Scope of work excludes laying of the public PVPC Pige as a per IPCODL drawing in focky soil.  25 Ba will Back fill the cable exervation size with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.  26 Ba will Back fill the cable exervation size with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.  27 Ba will provide hard Barricading with abera strip one use for cable exervation size for safety of the employees & pedestrians.  28 Providing and laying Plain Cement Concrete IPCC) of proportion (1:36) in foundations, Terench and plinths using approved quality of centent, 20mm size hard crusher broken genite stone metal and screened, washed sharp sand for mortar of approved quality and from genite content of the proportion (1:36) in foundations, and planting constructions, and planting constructions, and the content of approved quality and from genite content of approved quality and from genite content of activities of the proportion of the p	23	mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of	Cum	2,235.00	47	1,05,045.00	
sockets including geting, out the excaveted materials, returning (refillig) the soil as required in Jayers not exceeding 200 mm depth, including consolidating each deposited layers by armming, watering etc., stacking, serviciable materials for measurements and disposal of unservicibable materials as directly 9LC for Injung of different size of cabile/gipes laying. Sope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.  26 BA will Back fill the cable exervation site with same earth. BA will provide necessary Tools, Machinery & Manoperior for the activity.  27 BA will growide hard Barricading with activation of the cabile exervation site for safety of the employees 8 pedestrians.  28 Providing and laying Plain Cement Concrete (PCC) of proportion (13:6) in foundations, Terenth and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharps and for mortar of approved quality and from approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharps and for mortar of approved quality engineering. Centring and shuttering including straightening, cutting, bending, placing in position and binding all completes, cold twisted bary/TMT as per TPCODL specification (Scope also include supply of material).  29 Centring and shuttering including straightening, cutting, bending, placing in position and binding all completes, cold twisted bary/TMT as per TPCODL specification (Scope also include supply of material).  21 mm Cement Plaster of mix - 124 (Lement: 4 Fine sand (50 % fine: 50% coarse) as per as per TPCODL specification. Scope includes supply of all materials.  22 Providing and laying Plain Cement Concrete (PCC) of proportion (12:24) in foudations and plinths using approved quality of cement, 20mm six hard crusher broken granite toor mental and screened, washed sharp sand for mortar of approved quality and from approved quality including hotsiting, lowering, laying concrete, ramming, watering a	24		Cum	482.00	12	5,784.00	
Ab with provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken grantle stone metal and screened, washed sharp sand for mortar of approved quality and from approved quality, michuding hosting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, 18P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations, footings, bases of columns etc. for mass concrete includes supply of material)  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and piniths using approved quality of cement, 20mm size hard crusher broken grante stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including straightening, watering and curing etc. complete to required the exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quarry, including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quarry	25	sockets including geting out the excavated materials, returning (refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00	
A will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quary, including hosting, lovering, laying concrete, ramming, watering and curing cost, conveyance, loading, unloading, royalities and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  20 Centring and shuttering including struttling, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete PCC) and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  11 2mm Cement Plaster of mix: 1:4 (1 Cement: 4 Fine sand (50 % fine: 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2-4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other	26		Cum	200.00	15	3,000.00	
Trench and plinths using approved quality of cement, 20mm size 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 cost, conveyance, loading, unloading, royalties and taxes, ecs., of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  29 Centring and shuttering including struttling, propping etc. and removal of form for	27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety	Mtr	180.00	24	4,320.00	
Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all comprehete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  31 12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RNC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved are specification. Compared to required stone metal and screened, washed sharp sand for mortar of approved.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RNC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved approved quality and from approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved curing and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries	28	Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by	Cum	5,130.00	2	10,260.00	
and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved watering broken granite stone metal and screened, washed sharp sand for mortar of approved guality and from approved quarry, including hoisting, lowering, laying concrete, ramming, Cum  Watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work.  Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing.  K  Cum  1,000.00  2 2,000.  Cu	29		Sqm	301.00	89	26,789.00	
Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved cursher 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total Civil & Services  14,14,057.4  M Other overheads (Including 6% supervision charges) of L 13,00,030.7  N Other overheads (Including 6% supervision charges) of L 13,00,030.7  Total GST @ 18% of (N)	30	and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also	l	109.00	1503	1,63,827.00	
plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quairty, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total Civil & Services  14,14,057.4  Other overheads (Including 6% supervision charges) of the complete and other works if required at site.  Total GST @ 18% of (N) 41,34,097.8  Q Gross Total Material +Services (N+O+P) 2,273,30,380.2	31		Sqm	282.00	53	14,946.00	
mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  K  Total Civil & Services 14,14,057.4  L  Other overheads (Including 6% supervision charges) of L 13,00,030.7  N  Sub Total (L+M) 2,29,67,210.3  O  Total GST @ 18% of (N) 41,34,097.8  CESS 1% of N 2,29,672.1.3  Q  Gross Total Material +Services (N+O+P) 2,73,30,980.2	32	plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries,	Cum	6,039.61	1	6,039.61	
34 instruction. Scope of work also includes watering, ramming, consolidating and dressing Cum 1,000.00 2 2,000.00 Complete and other works if required at site.  Total Civil & Services 14,14,057.4		mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all	Cum	7,316.00	19	1,39,004.00	
L       Total (J+K)       2,16,67,179.5         M       Other overheads (Including 6% supervision charges) of L       13,00,030.7         N       Sub Total (L+M)       2,29,67,210.3         O       Total GST @ 18% of (N)       41,34,097.8         P       CESS 1% of N       2,29,672.3         Q       Gross Total Material +Services (N+O+P)       2,73,30,980.3	34	instruction. Scope of work also includes watering, ramming, consolidating and dressing	ı	1,000.00	2	2,000.00	
M         Other overheads ( Including 6% supervision charges) of L         13,00,030.7           N         Sub Total (L+M)         2,29,67,210.3           O         Total GST @ 18% of (N)         41,34,097.8           P         CESS 1% of N         2,29,672.3           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.3	-			Total Civil		14,14,057.43	
N         Sub Total (L+M)         2,29,67,210.3           O         Total GST @ 18% of (N)         41,34,097.8           P         CESS 1% of N         2,29,672.3           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.3	-						
O         Total GST @ 18% of (N)         41,34,097.8           P         CESS 1% of N         2,29,672.3           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.3	-						
P         CESS 1% of N         2,29,672.3           Q         Gross Total Material +Services (N+O+P)         2,73,30,980.2	-						
Q Gross Total Material +Services (N+O+P) 2,73,30,980.2	-						
	-						
	R		Gross To	tal Material +Serv	ices (in cr.)	2.73	

		ANNEXURE-13.10							
	TP CENTRAL ODISHA DISTRIBUTION LIMITED								
Name of t	he Division :-	ANED							
Name of t	he Sub-Division : -	Angul							
Name of t	he Work :-	Mitigation of 33/11kV PTR Overloading							
Scope:-	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.								
Names of	Schemes: -	TPCODL CAPEX (FY 23-24)							
		ABSTRACT OF ESTIMATE							
SI. No.	Part	Description	Amount						
1	А	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.	₹ 2,73,30,980.29						
		Total Amount	₹ 2,73,30,980.29						
		Total Amount (In Cr)	2.73						
Total esti	Fotal estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)								

#### **ANNEXURE-13.10**

#### Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Hemsurpada PSS)

PTR-1 (Hemsurpada PSS)						
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)	
	SUPPLY OF FOLLOWING EQUIPMENT & MATEF (As per Technical Specification)	RIALS				
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00	
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00	
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00	
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00	
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68	
6	Supply of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00	
7	Supply of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00	
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00	
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-	
Α			Total Cost o	f materials	1,67,49,421.68	
В		Stock, St	orage & Insurance	i.e 3% of A	5,02,482.65	
С				Total (A+B)	1,72,51,904.33	
D	Contigency @ 3% of C					
E						
F	1 0					
G	<u> </u>					
<u>н</u>	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)  Erection Charges @ 20% of PSC pole- Not to be used for 33kV					
<u> </u>	Erection Charges @ 20%	% OT PSC	•	n of (C to I)		
J			Sur	וו טו (כ נט ו)	2,02,53,122.13	

#### Civil and Services Works (As per Technical Specification)

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by <b>open trench method</b> .	km	94,500.00	0.072	6,804.00
2	Erection of <b>Indoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of <b>Outdoor termination kits</b> Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane, charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR		_		
8	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	20	9,640.00

	Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Hemsurpada PSS)					
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)	
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including geting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	40	52,200.00	
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00	
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00	
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00	
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00	
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00	
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00	
16	BA has to do the installation, welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm, 75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00	
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00	
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.		6,039.61	2	12,079.22	
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	1	6,747.00	12	80,964.00	
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00	
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00	
22	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	1	1,000.00	17	17,000.00	

Supplying, Laying, spreading and compacting store aggregate of specified size: 63 mm to 45 mm size storie aggregate to WBM specifications in uniform thickness, hand picking to proper 23 grade and camber, applying and brooming requisite type of screening / binding material to fill up interestices of course aggregate, wheteing and compacting to the recurred density. Stope of course, and an advantage of the course of the		Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Hemsurpada PSS)					
my size stone aggregate to WBM specifications in uniform thickness, hand picking to oroper a grade and camber, applying and foroming requisite type of screening / biolinging material for III up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of juniple such as grass, and III replant etc.  24 BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary control of the compacting of the com		Description of Materials	Unit	Unit Rate		Amount	
Excurating trenches of required width and depth for pipe, cables etc. including Excuration for solutions are provided in the control of the c	23	mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of	Cum	2,235.00	47	1,05,045.00	
Sockest including geting out the excavated materials, returning (refligiligit has oil as required in layers not exceeding 120 mm depth, including consolidating each deposited layers by ramming, watering etc., stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipse laying. Scope of work excludes laying of HUML/PVC ripes as per PPCODL drawing in Rocky soil.  26 BA will Back fill the cable execution size with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.  27 BA will provide hard Barricading with zebra strip one use for cable excavation size for safety of the employees & pedestrians  28 Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including holsting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cass, of all materials & cost of all labours, sundies, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  29 Centring and shuttering including straightening, cutting, bending, placing in position and binding all compretes, cold twisted baser/flff as per ProCODL specification, Scope also include supply of material)  31 22 mm Cement Plaster of mix -14 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per ProCODL specification. Scope includes supply of all material.  42 Providing and laying Plain Cement Concrete (PCC) of proportion (12:4) in foundations and pilnths using approved quality of cement, 20mm size hard cusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hosting, lowering,	24	_ · ·	Cum	482.00	12	5,784.00	
Ackiniery & Manpower for the activity.  27 BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  28 approved guality of the employees & pedestrians  28 approved quarry, including hobiting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, 187 and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  29 Centring and shuttering including struttling, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete  Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all completes, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  31 12 mm Cement Plaster of mix -1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per a per TPCODL specification. Scope includes supply of all materials and screened, washed sharp sand for most or approved quality and from approved quarry, collidary and should recomply and per TPCODL specification (Scope also including barry and the per TPCODL specification (Scope also including supply of material)  31 12 mm Cement Plaster of mix -1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per a per TPCODL specification. Scope includes supply of all materials.  32 including holsting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work ext., as directed by Engineer-in-Charge.  33 Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix); from RMC Batching P	25	sockets including geting out the excavated materials, returning (refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope	Cum	1,305.00	48	62,640.00	
A will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians  Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations,  Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite  stone metal and screened, washed sharp sand for mortar of approved quality and from  approved quary, including hoisting, lowering, laying concrete, ramming, watering and curring  cost, conveyence, loading, unloading, royaltes and taxes, cess, of all materials & cost of all  labours, sundries, T&P and all other machinaries required for the work etc., as directed by  Engineer-in-Charge.  29 Centring and shuttering including struttling, propping etc. and removal of form for  Sqm 301.00 89 26,78  Reinforcement for R.C. C. work including straightening, cutting, bending, placing in position  and binding all compnete, cold twisted bars/TMT as per TPCODL specification (Scope also  include supply of material)  12 mm Cement Plaster of mix - 1.4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as  per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and  plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each hayer including correct, carmoring,  watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each hayer including concrete, ramming,  watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each hayer including concrete, ramming,  consolidating and drawing etc. complete to  required levels in layers not exceeding 15cm thick in each hayer including concrete, ramming,  wa	26		Cum	200.00	15	3,000.00	
Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, roysquites and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  29	27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety	Mtr	180.00	24	4,320.00	
Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all compelete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size 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. compelete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved crusher broken granite stone metal and screened, washed sharp sand for mortar of approved vustering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work.  Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC and the structure of the work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total (H+K) 2,16,67,71 M Other overheads ( Including 6% supervision charges) of L 13,00,03 Sub Total (L+M) 2,29,67,21 O Gross Total Material +Services (N+O+P)	28	Trench and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by	Cum	5,130.00	2	10,260.00	
and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)  12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.  Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved curry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  Total (I+K) 2,16,67,17 M Other overheads (Including 6% supervision charges) of L 13,00,03 N Other overheads (Including 6% supervision charges) of L 13,00,03 P CESS 1% of N 2,29,67,18 Q Gross Total Material +Services (N+O+P) 2,733,30,98 P CESS 1% of N 2,29,67,18 Q Gross Total Material +	29		Sqm	301.00	89	26,789.00	
Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size 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 loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work  Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing  K  Total Civil & Services  14,14,05  Total Civil & Services  14,14,05  N  Other overheads (Including 6% supervision charges) of L  Total (I+M)  2,29,67,17  O  Gross Total Material +Services (N+O+P)  2,73,30,98	30	and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also	l	109.00	1503	1,63,827.00	
plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.  Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quality and from approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved q	31		Sqm	282.00	53	14,946.00	
mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.  K  Total Civil & Services 14,14,05  L  Total (J+K) 2,16,67,17  M  Other overheads (Including 6% supervision charges) of L 13,00,03  N  Sub Total (L+M) 2,29,67,21  O  Gross Total Material +Services (N+O+P) 2,73,30,98	32	plinths using approved quality of cement, 20mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries,	Cum	6,039.61	1	6,039.61	
34 instruction. Scope of work also includes watering, ramming, consolidating and dressing Cum 1,000.00 2 2,000 complete and other works if required at site.  Total Civil & Services 14,14,05 L Total (J+K) 2,16,67,17 M Other overheads (Including 6% supervision charges) of L 13,00,03 N Sub Total (L+M) 2,29,67,21 O Total GST @ 18% of (N) 41,34,09 P CESS 1% of N 2,29,67 Q Gross Total Material +Services (N+O+P) 2,73,30,98	33	mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size 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 in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all	Cum	7,316.00	19	1,39,004.00	
L         Total (J+K)         2,16,67,17           M         Other overheads (Including 6% supervision charges) of L         13,00,03           N         Sub Total (L+M)         2,29,67,21           O         Total GST @ 18% of (N)         41,34,09           P         CESS 1% of N         2,29,67           Q         Gross Total Material +Services (N+O+P)         2,73,30,98	34	instruction. Scope of work also includes watering, ramming, consolidating and dressing	ı	1,000.00	2	2,000.00	
M         Other overheads ( Including 6% supervision charges) of L         13,00,03           N         Sub Total (L+M)         2,29,67,21           O         Total GST @ 18% of (N)         41,34,09           P         CESS 1% of N         2,29,67           Q         Gross Total Material +Services (N+O+P)         2,73,30,98				Total Civil		14,14,057.43	
N         Sub Total (L+M)         2,29,67,21           O         Total GST @ 18% of (N)         41,34,09           P         CESS 1% of N         2,29,67           Q         Gross Total Material +Services (N+O+P)         2,73,30,98							
O         Total GST @ 18% of (N)         41,34,09           P         CESS 1% of N         2,29,67           Q         Gross Total Material +Services (N+O+P)         2,73,30,98							
P         CESS 1% of N         2,29,67           Q         Gross Total Material +Services (N+O+P)         2,73,30,98							
Q Gross Total Material +Services (N+O+P) 2,73,30,98							
	_						
R Gross Total Material +Services (in cr.)	R		Gross To	tal Material +Serv	ices (in cr.)	2.73	

	Annexure-14 DT Augmentation								
SI. No.	Description	Quantity (in nos.)	Amount (in cr.)						
1	100kVA to 250kVA	43	5.51						
2	250kVA to 500kVA	20	4.49						
	Total		10.00						

100kVA to 250kVA (DT Augmentation)							
	No. of DP Mounted DSS (Ref. Drawing No TPCODL)			1			
	MATERIALS FOR DP Mod	unted DS	<u>ss</u>				
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
	SUPPLY OF FOLLOWING EQUIPMEN	T & MA1	TERIALS	•			
1	250 KVA , 11/ 0.4 KV (Cu) Transformer with Tap Changer BIS Energy level II	Nos.	5,73,210.00	1	5,73,210.00		
2	LT Distribution Box with MCCB, Aluminium Busbar for 3 Bay with kit kat fuse for 250 KVA S/S	Nos.	1,30,000.00	1	1,30,000.00		
3	Lightning Arrester(12KV,10KA) Station Class 2	Nos.	4,402.00	3	13,206.00		
4	1 Cx 400 mm2 LT XLPE Cable(Un-Armoured)	Mtr.	359.66	120	43,159.20		
5	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	7	9,114.00		
6	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5x7 mtr. For mesh formation, 12 Mtr. For LA and 2.5 mtr. For raising, 11 mtr for AB switch, 2.8 mtr for DD Fuse, 5x2 mtr. for DTR Nutral, (1.3+4.5) mtr. For DTR Body, 0.500 mtr for LTDB & AB Switch operating handle, 3 mtr. for Fencing) ( Each 65.6x 2.36= 154.82 Kg)	KG	93.00	154.82	14,397.89		
Α		<u>I</u>	Total Cost of	of materials	7,83,087.09		
В	Sto	ck, Stora	age & Insurance	i.e 3% of A	23,492.61		
С			Sub	Total (A+B)	8,06,579.70		
D			Contigenc	y @ 3% of C	24,197.39		
Е	Tools & Plants @ 2% of C						
F	Transportation @ 7.5% of C						
G	Erection Charges				29,520.32		
Н	Erection Charges @ 10% of C (except Trf/Breaker/		<del>-</del>		20,678.60		
ı	Erection Charges @ 20% of	PSC po			9,57,601.08		
J	Sum of (C to I)						

## Civil and Services Works (As per Technical Specification)

SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
1	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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	7	25,900.00	
2	LTDB Plinth	NO	3,000.00	1	3,000.00	
3	DTR Plinth	No.	25,000.00	1	25,000.00	
4	Dismantling				-	
i	Dismantling of 100kVA transformer	EA	3,189.60	1	3,189.60	
ii	Dismantling of Channel	kg	7.92	100	792.00	
iii	Dismantling of LA	EA	50.00	3	150.00	
iv	Dismantling of LTDB	EA	550.00	1	550.00	
К			Total Civi	l & Services	58,581.60	
L	Total (J+K)					
М	Other overheads (Including 6% supervision charges) of L					
N	Sub Total (L+M)					
0	Total GST @ 18% of (N)					
Р	Total CESS @ 1%of (N)					
Q	Gross Total Material +Services (N+O+P)					

250kVA to 500kVA (DT Augmentation)						
	No. of DP Mounted DSS (Ref. Drawing No TPCODL)			1		
	MATERIALS FOR DP Mou	nted DS	<u>ss</u>			
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount	
	SUPPLY OF FOLLOWING EQUIPMENT	& MA	ΓERIALS			
1	500 KVA , 11/ 0.4 KV (Cu) Transformer with Tap Changer BIS Energy level II	Nos.	11,62,260.00	1	11,62,260.00	
2	LT Distribution Box with MCCB, Aluminium Busbar for 3 Bay with kit kat fuse for 500 KVA S/S	Nos.	1,70,000.00	1	1,70,000.00	
3	Lightning Arrester(12KV,10KA) Station Class 2	Nos.	4,402.00	3	13,206.00	
4	1 Cx 400 mm2 LT XLPE Cable(Un-Armoured)	Mtr.	359.66	180	64,738.80	
5	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	7	9,114.00	
6	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5x7 mtr. For mesh formation, 12 Mtr. For LA and 2.5 mtr. For raising, 11 mtr for AB switch, 2.8 mtr for DD Fuse, 5x2 mtr. for DTR Nutral, (1.3+4.5) mtr. For DTR Body, 0.500 mtr for LTDB & AB Switch operating handle, 3 mtr. for Fencing) ( Each 65.6x 2.36= 154.82 Kg)	KG	93.00	154.82	14,397.89	
Α			Total Cost o	f materials	14,33,716.69	
В	Stoc	k, Stor	age & Insurance	i.e 3% of A	43,011.50	
C			Sub 1	Total (A+B)	14,76,728.19	
D			Contigency	/ @ 3% of C	44,301.85	
Е	Tools & Plants @ 2% of C					
F	Transportation @ 7.5% of C					
G	<u> </u>					
Н	Erection Charges @ 10% of C (except Trf/Breaker/W		<del>-</del>		27,021.30	
-	Erection Charges @ 20% of	PSC po			17,48,196.90	
J	Sum of (C to I)					

### Civil and Services Works (As per Technical Specification)

(As per Technical Specification)							
SI. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount		
1	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 . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No	3,700.00	7	25,900.00		
2	Dismantling				-		
i	Dismantling of 250kVA transformer	EA	4,794.30	1	4,794.30		
ii	Dismantling of LTDB	EA	550.00	1	550.00		
K			Total Civil	& Services	31,244.30		
L				Total (J+K)	17,79,441.20		
М	Other overheads ( Inclu	uding 6	% supervision cl	narges) of L	1,06,766.47		
N	- · · · · · · · · · · · · · · · · · · ·						
0							
Р	Total CESS @ 1%of (N						
Q	Gross	Total N	Naterial +Service	es (N+O+P)	22,44,587.13		

# Annex-15

Teseting Equipment	Make	Model	Mfg year	Defective since	Type of defect	Quantity	Circle
Transformer Turn Ratio meter	Sivananda	ATRM-1(μp)			NOT known		BBSR2
Insulation Tester	SONEL	MIC 5010			NOT known		BBSR2
	SONEL	MIC 5010			NOT known		BBSR2
	WACO				NOT known		BBSR2
Earth Tester	Motwane	DET-20			NOT known		BBSR2
Clamp on meter	Metrix	1250 AC			NOT known		BBSR2
	Metrix	1250 AC			NOT known		BBSR2
	Metrix	1250 AC			NOT known		BBSR2
	Metrix	1250 AC			NOT known		BBSR2
	Fluke	302+			NOT known		BBSR2
	TES	3010			NOT known		BBSR2
		3010			NOT KITOWIT		DDJNZ
	Rishabh						
	instrument	1000A			NOT known		BBSR2
	pvt. Ltd.						
Oil Testing Kit	NTPL				NOT known		BBSR2
Digital clamp meter	Metrix	DT-1250	N/A	2019	NOT known	2	СТС
Analog multimeter	Motwane	N/A	N/A	2007	NOT known	1	СТС
Transformer ratio meter	LTEL Industrie		12.01.2007		NOT known	1	CTC
Motorised megger(2.5 KV)	Riken	MV5250 XT	N/A	2007	NOT known	2	CTC
Motorised megger(5 KV)	MEGGER	model serie		2013	NOT known	1	CTC
Digital earth tester	CIE	DET-2000	N/A	2013	NOT known	1	CTC
Digital earth tester	MOTWANE	DET-2000	N/A	2013	NOT known	1	CTC
Analog earth tester	CIE	N/A	N/A	2013	NOT known	1	CTC
Secondary injection kit	PCI ltd	SVERKER 750	N/A	2015	NOT known	1	CTC
Field transformer oil testing kit	N/A	N/A	N/A	N/A	NOT known	1	СТС
Insulation tester(megger 5 KV)		MIC 5010	Jul-13	2020	Battery defective	1	CTC
Digital earth tester	gabras labora	MTD20KWe	N/A	2019	NOT known	1	CTC
Insulation tester(megger 5 KV)	MEGGER	MIT520/2	24.11.2011	2017	NOT known	1	CTC
Winding resistance meter	SCOPE pvt ltd	TRM 104	N/A	N/A	NOT known	1	CTC
Secondary injection kit	ISA	T1000 Plus	NA	NA	Manfunctioning	1	DKL
IR Tester	Sonel	MIC-5010	2013	2019	1.No Battery Back up. 2.One no.Testing terminal damaged.	1	BBSR1
IR Tester	MEGGER	MIT-520/2	NA	2019	<ol> <li>No Battery Back up.</li> <li>One no.Testing terminal damaged.</li> </ol>	1	BBSR1
IR Tester	CIE(1KV)	CIF/444	NA	2015	Abnormal Reading	1	BBSR1
IR Tester	WACO(5 KV)	SH Model,Serie s-1	1998	2010	Abnormal Reading	1	BBSR1
IR Tester	WACO(1KV)	NA	NA	2010	Abnormal Reading	1	BBSR1
BDV Kit	Sivananda	OTS-100M	2013	2018	Abnormal Reading	1	BBSR1
BDV Kit	Motwane	IS-6792	1992	2012	Abnormal Reading	1	BBSR1
BDV Kit(ODSSP-Vanivihar)	Motwane	-	2016	2020	Variac Problem	1	BBSR1
Turns Ratio Meter	Eltel	TRM-200	2003	2013	Abnormal Reading	1	BBSR1
. a		200		2013	Display Fluctuating &	_	223111
Winding Resistance Meter	Eltel	TWRM-10	2003	2011	Abnormal reading.	1	BBSR1
Earth Resistance Tester	AVO	DT-3/2	NA	NA	Abnormal Reading	1	BBSR1
		NA	NA	2011	Damaged	1	BBSR1
Single Phase Wattmeter	WNP				Damaged	1 1	BBSR1
	WNP	NA	NA	2011	Daillageu	1	DDSINI
Single Phase Wattmeter	1	NA NA	NA NA	2011	Damaged	1	BBSR1
Single Phase Wattmeter Single Phase Wattmeter	WNP				_		
Single Phase Wattmeter Single Phase Wattmeter Cable Fault Locator	WNP WNP	NA	NA	2011	Damaged	1	BBSR1
Single Phase Wattmeter Single Phase Wattmeter Cable Fault Locator Clamp Meter	WNP WNP Motwane	NA 	NA NA	2011 2015	Damaged Damaged Damaged	1 1	BBSR1 BBSR1
Single Phase Wattmeter Single Phase Wattmeter Cable Fault Locator Clamp Meter Clamp Meter	WNP WNP Motwane Metravi	NA 	NA NA NA	2011 2015 2015	Damaged Damaged	1 1 3	BBSR1 BBSR1 BBSR1