

# NOTICE INVITING TENDER

FOR

**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILIZERS LTD**

**(OPEN DOMESTIC COMPETITIVE BIDDING)**

**(NIT NO : PNMM/PC-183/E- 4023/NCB)**



**TALCHER FERTILIZERS LIMITED**

**[A JOINT VENTURE OF M/s GAIL (INDIA) LIMITED (GAIL), M/s RASHTRIYA  
CHEMICALS & FERTILIZERS LTD. (RCF), M/s COAL INDIA LTD. (CIL),  
& M/s FERTILIZER CORPORATION OF INDIA LTD (FCIL)]**



**ISSUED BY**



**PROJECTS & DEVELOPMENT INDIA LTD.  
(A Govt. Of India Enterprise)  
PDIL BHAWAN, A-14, Sector-1,  
NOIDA U.P. (India)**



**30.10.2023**





	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILIZERS LIMITED, ODISHA (INDIA)</b>  <b>MASTER INDEX</b>	PC183/E-4023	0	
		DOC. NO.	REV.	
		SHEET 1 OF 4		

### MASTER INDEX

<b>PART-I, COMMERCIAL</b>	
<b>Section</b>	<b>Description</b>
<b>Section-I</b>	
1.0	Invitation For Bid (IFB)
<b>Section-II</b>	
2.1	Bid Evaluation Criteria (BEC)
2.2	Evaluation Methodology
<b>Section-III</b>	
3.0	Instructions to Bidders (ITB), Annexures and Forms & Format
<b>Annexures</b>	
Annexure-I	Procedure For Action In Case Corrupt/fraudulent/Collusive/ Coercive Practices
Annexure-II	Vendor Performance Evaluation
	ANNEXURE-1: Performance Rating Data Sheet
	ANNEXURE-2: Performance Rating Data Sheet
Annexure-III	Instruction For Participation In E-Tender
Annexure-IV	Bidding Data Sheet (BDS)
Annexure-V:	Public Procurement Policy (PPP)
Annexure-VI:	Preamble to Schedule of Rates
Annexure-VII:	Provision for Procurement from a Bidder Which Shares a Land Border With India



	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILIZERS LIMITED, ODISHA (INDIA)</b>  <b>MASTER INDEX</b>	PC183/E-4023	0	
		DOC. NO.	REV.	
		SHEET 2 OF 4		

Forms & Formats	
F-1	Bidder's General Information
F-2	Proforma of "Declaration for Bid Security"
F-3	"Letter Of Authority"
F-4	Proforma of "Bank Guarantee" for "Contract Performance Security / Security Deposit"
F-5	Agreed Terms & Conditions
F-6	Acknowledgement Cum Consent Letter
F-7	Bidder's Experience
F-8	Checklist
F-8(B)	Checklist For Bid Evaluation Criteria (BEC) Qualifying Documents
F-9	Format for Certificate from Bank if Bidder's Working Capital is inadequate
F-10	Format for Chartered Accountant Certificate for Financial Capability of the Bidder
F-11	Format For Consortium Agreement(on Non- Judicial Stamp Paper of appropriate value) Consortium/ JV Agreement- NOT APPLICABLE
F-12	Bidder's Queries for Pre Bid Meeting
F-13	E-Banking Format
F-14	Integrity Pact
F-15	Indemnity Bond
F-16	Frequently Asked Questions (FAQS)
F-17	Proforma of Bank Guarantee For Mobilisations Advance Payment- NOT APPLICABLE
F-18	Proforma of Bank Guarantee For Payments Towards Placement Of All Purchase Orders Of Major Tagged Items
F-19	Format of "Letter of No Deviations"
F-20	Format For Power of Attorney
F-21	Undertaking Regarding Submission of Electronic Invoice( E-Invoice as per GST law)
F-22	Undertaking regarding submission Contract Performance Security (CPS) / Security Deposit (SD) within stipulated timeline
F-23	Proforma For Contract Agreement
F-24	No Claim Certificate
<b>Section-IV</b>	
4.0	General Conditions of Contract (GCC)
<b>Section-V</b>	
5.0	Special Conditions Of Contract (SCC)

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILIZERS LIMITED, ODISHA (INDIA)</b>  <b>MASTER INDEX</b>	PC183/E-4023	0	
		DOC. NO.	REV.	
		SHEET 3 OF 4		

### CONTENTS (TECHNICAL)

SECTION-VI	DESCRIPTION
VI-1.0	Section Project
VI-2.0	TS for H-Type Pole
VI-3.0	TS for WPB Pole
VI-4.0	TS for 33kV V Cross Arm
VI-5.0	TS for GI Channel & Angle, GI Top Bracket
VI-6.0	TS for HT Stay Set including Clamp
VI-7.0	GTP & Drawing for GI Stay Clamp
VI-8.0	GTP & Drawing for GI HT Stay Set
VI-9.0	GTP for GI Stay Wire
VI-10.0	GTP & Drawing for GI Earthing Coil
VI-11.0	GTP & Drawing for Danger Board
VI-12.0	GTP & Drawing for HT Stay Insulator
VI-13.0	GTP & Drawing for 33kV GI Pin Insulator Polymer
VI-14.0	TS for GI Earthing Pipe
VI-15.0	TS for 33kV Lightning Arrester (10 kA)
VI-16.0	TS for 33kV Polymer Disc Insulator (90kN & 120kN)
VI-17.0	TS for AAA Conductor
VI-18.0	TS for 33kV Outdoor Current Transformer
VI-19.0	TS for 33kV Outdoor Potential Transformer
VI-20.0	TS for 33kV 200A HG Fuse
VI-21.0	TS for 33kV 400A AB Switch
VI-22.0	TS for Heat Shrinkable Straight Through Joint & Terminations for 33kV Cable
VI-23.0	TS for Centre Rotating, Double Break Type Isolator (33kV – 1250A)
VI-24.0	TS for 33kV XLPE Armoured Cable

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILIZERS LIMITED, ODISHA (INDIA)</b>  <b>MASTER INDEX</b>	PC183/E-4023	0	
		DOC. NO.	REV.	
		SHEET 4 OF 4		

VI-25.0	TS for Accessories of 33kV Insulated Conductor
VI-26.0	TS for Earth Enhancement Material
VI-27.0	TS for Fuse Wire
VI-28.0	TS for GI Flats of Different Sizes
VI-29.0	TS for Disc Insulator Hardware Fittings
VI-30.0	TS for HDPE Pipe
VI-31.0	TS for GI Nut & Bolt
VI-32.0	Galvanization Procedure
VI-33.0	GTP for GI Barbed Wire
VI-34.0	TS for 33kV XLPE Covered Conductor
VI-35.0	Quality Assurance Plan
VI-36.0	TPCODL Approved Manufacturer – Distributor List
VI-37.0	Bill of Quantities
VI-38.0	Reference Drawings
VI-39.0	Reference Route Drawing (TPCODL Approved)
VI-40.0	Reference Route Drawing (Detailed)
VI-41.0	Soil Testing Report (For Reference)
<b>Section-VII</b>	Schedule of Rates

**SECTION-I**

**INVITATION FOR BID (IFB)**

**SECTION-I**  
**"INVITATION FOR BID (IFB)"**

Ref No: PNMM/PC-183/E-4023/NCB

Dated: 30.10.2023

To,

**PROSPECTIVE BIDDERS**

**SUB: CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILIZERS LTD  
ON OPEN DOMESTIC COMPETITIVE BIDDING BASIS**

Dear Sir/Madam,

**1.0 INTRODUCTION:**

- 1.1 GAIL ( India) Limited (GAIL), Rashtriya Chemicals & Fertilizers Limited (RCF), Coal India Limited (CIL) and Fertilizer Corporation of India Limited (FCIL) have formed a Joint Venture company in the name of Talcher Fertilizers Limited (TFL) hereinafter also referred to as "Owner", intends to carry out the work of **"Construction of 2 x 33kV overhead line for providing power supply to intake well at TFL Pump House from TFL-OPTCL 220/33 kV LILO substation on item Rate basis"** for its Ammonia Urea Plant, an integrated fertilizer and chemical complex comprising of Coal Gasification and Gas Purification Unit, Ammonia Synthesis Unit, Urea Plant, along with necessary offsite and utility facilities at Talcher Unit, Angul district, in the state of Odisha, India.
- 1.2 GAIL (India) Limited is a Public Sector Unit under the Ministry of Petroleum & Natural Gas and Rashtriya Chemicals & Fertilizers Limited (RCF) & Fertilizer Corporation of India Limited (FCIL) are two Public Sector Units under the Ministry of Chemicals & Fertilizers and Coal India Limited (CIL) is a Public Sector Unit under the Ministry of Coal, Govt. of India.
- 1.3 Projects and Development India Limited (PDIL), hereinafter referred to as PROJECT MANAGEMENT CONSULTANT (PMC) on behalf of M/s Talcher Fertilizers Ltd. (TFL), hereinafter referred as OWNER, has the pleasure of inviting bids from eligible domestic bidders to submit Bid ONLINE through Central Public Procurement (CPP) Portal under Single Stage Two Bid System, for the subject works.
- 1.4 "PTC India Limited" hereinafter referred to as CONSULTANT, has been retained by M/s Talcher Fertilizers Ltd. (TFL), hereinafter referred as OWNER for providing consultancy services for **"Construction of 2 x 33kV overhead line for providing power supply to intake well at TFL Pump House from TFL-OPTCL 220/33 kV LILO substation" on item Rate basis"**

2.0 The brief details of the tender are as under:

<b>(A)</b>	NAME OF WORK / BRIEF SCOPE OF SERVICE/JOB	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILIZERS LTD</b>				
<b>(B)</b>	NIT NO. & DATE	PNMM/PC-183/E-4023/NCB DATED 30.10.2023				
<b>(B1)</b>	TYPE OF TENDER	OPEN DOMESTIC COMPETITIVE BIDDING				
<b>(C)</b>	TYPE OF BIDDING SYSTEM	<table border="1"> <tr> <td>SINGLE BID SYSTEM</td> <td><input type="checkbox"/></td> </tr> <tr> <td>TWO BID SYSTEM</td> <td><input checked="" type="checkbox"/></td> </tr> </table>	SINGLE BID SYSTEM	<input type="checkbox"/>	TWO BID SYSTEM	<input checked="" type="checkbox"/>
SINGLE BID SYSTEM	<input type="checkbox"/>					
TWO BID SYSTEM	<input checked="" type="checkbox"/>					
<b>(D)</b>	TYPE OF TENDER	<table border="1"> <tr> <td>E-TENDER (CPP PORTAL)</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>MANUAL</td> <td><input type="checkbox"/></td> </tr> </table>	E-TENDER (CPP PORTAL)	<input checked="" type="checkbox"/>	MANUAL	<input type="checkbox"/>
E-TENDER (CPP PORTAL)	<input checked="" type="checkbox"/>					
MANUAL	<input type="checkbox"/>					
<b>(E)</b>	COMPLETION PERIOD	Please Refer Clause 14.0 of SPECIAL CONDITIONS OF CONTRACT.				
<b>(F)</b>	BID SECURITY /EARNEST MONEY DEPOSIT (EMD}	<table border="1"> <tr> <td>APPLICABLE</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>NOT APPLICABLE</td> <td><input type="checkbox"/></td> </tr> </table> <p>EMD value: <b>Rs.15.00 Lakhs (Rupees Fifteen Lakh Only)</b></p> <p>Exempted Bidders (i.e. MSEs, Start-ups and Govt Dept./PSUs) are required to submit declaration for Bid security as per Form F-2B (Refer clause no.16 of ITB).</p>	APPLICABLE	<input checked="" type="checkbox"/>	NOT APPLICABLE	<input type="checkbox"/>
APPLICABLE	<input checked="" type="checkbox"/>					
NOT APPLICABLE	<input type="checkbox"/>					
<b>(G)</b>	AVAILABILITY OF TENDER DOCUMENT ON WEBSITE(S)	(i) CPP Portal ( <a href="https://eprocure.gov.in/eprocure/app">https://eprocure.gov.in/eprocure/app</a> ) (ii) TFL Website - <a href="http://tflonline.co.in">http://tflonline.co.in</a> (iii) PDIL website - <a href="http://www.pdil.in">www.pdil.in</a>				
<b>(H)</b>	LAST DATE OF RECEIPT OF BIDDER'S PRE-BID QUERIES	07.11.2023				



<b>(I)</b>	DATE, TIME OF PRE-BID MEETING (Through Video Conferencing)	09.11.2023 <b><u><a href="#">Click here to join the meeting</a></u></b>
<b>(J)</b>	BID SUBMISSION START DATE	17.11.2023 at 15:00 Hrs (IST)
<b>(K)</b>	BID CLOSING DATE	<b>29.11.2023 at 15:00 Hrs. (IST)</b>
<b>(L)</b>	BID OPENING DATE	<b>30.11.2023 at 15:00 Hrs. (IST)</b>
<b>(M)</b>	<b>Address for Communication</b>	
<b>(i)</b>	PDIL	M/s Projects & Development India Limited, P.D.I.L Bhawan, A-14, Sector-1, Noida, (PIN 201301) Dist. Gautam Budh Nagar (UP). (India)  Kind Attention: Mrs. Anjali Thakur, Deputy. General Manager (M.M) Fax no. : +91-120-2529801 Tel no. : +91-120-2529842 E-mail : <a href="mailto:anjali@pdilin.com">anjali@pdilin.com</a> <a href="mailto:alam@pdilin.com">alam@pdilin.com</a>
<b>(ii)</b>	TFL	M/s Talcher Fertilizers Ltd. (TFL), C/O GAIL Training Institute, PARC Building, Plot No. 24, Sector-16A Film City, Noida District – G.B. Nagar, U.P. - 201301  Kind Attention : Mr. Satyabrata Mishra General Manager (Projects) Tel No. : +91-9927339444 E-mail : <a href="mailto:smishra@gail.co.in">smishra@gail.co.in</a> ; <a href="mailto:mannapaul@gail.co.in">mannapaul@gail.co.in</a>
<b>(N)</b>	Original Documents to be submitted at	Projects & Development India Limited, (Materials Management Department) P.D.I.L Bhawan, A-14, Sector-1, Noida, (PIN 201301) Dist. Gautam Budh Nagar (UP). (India)  Kind Attention: Mrs. Anjali Thakur , Deputy General Manager (M.M) Fax no. : +91-120-2529801 Tel no. : +91-120-2529842 E-mail : <a href="mailto:anjali@pdilin.com">anjali@pdilin.com</a>

<b>(O)</b>	Contact Person for Site visit	M/s Talcher Fertilizers Ltd. (TFL), Administrative Building, Talcher, Post: Vikrampur, Dist: Angul, Pincode-759106, Odisha  Kind Attention: Mr. Satyabrata Mishra General Manager (Projects) Tel No. : +91-9927339444 E-mail : smishra@gail.co.in
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In case the days specified above happens to be a holiday in TFL/PDIL, the next working day shall be implied.

- 3.0 Bids must be submitted strictly in accordance with Clause No. 11 of ITB (Section-III of tender) depending upon Type of Tender as mentioned at Clause no. 2.0 (D) above. The IFB is an integral and inseparable part of the bidding document.
- 4.0 Bid must be submitted only on CPP Portal (<https://eprocure.gov.in/eprocure/app>). Further, the following documents in addition to uploading the bid on CPPP's Portal shall also be submitted in Original (in physical form) within 7 (seven) days(\*) from the bid due date, provided the scanned copies of the same have been uploaded in e-tender by the bidder along with e-bid within the due date and time to the address mentioned in Clause no. 2.0 (M) of IFB:-
- i) EMD (for all bidders except exempted category) /Declaration for Bid Security (for exempted bidders)
  - ii) Power of Attorney
  - iii) Integrity Pact
  - iv) TPI Letter
  - v) Line of Credit (If applicable)
- 5.0 Bidder(s) are advised to quote strictly as per terms and conditions of the tender documents and not to stipulate any deviations/exceptions.
- 6.0 Any bidder, who meets the Bid Evaluation Criteria (BEC) and wishes to quote against this Tender Document, may download the complete Tender Document along with its amendment(s) if any from websites as mentioned at 2.0 (G) of IFB and submit their Bid complete in all respect as per terms & conditions of Tender Document on or before the Due Date & Time of Bid Submission.
- 7.0 Bid(s) received from bidders to whom tender/information regarding this Tender Document has been issued as well as offers received from the bidder(s) by downloading Tender Document from above mentioned website(s) shall be taken into consideration for evaluation & award provided that the Bidder is found responsive subject to provisions contained in Clause No. 2 of ITB (Section-III of tender).

The Tender Document calls for offers on single point "Sole Bidder" responsibility basis (except where JV/Consortium bid is allowed pursuant to clause no. 3.0 of ITB) and in total compliance of Scope of Works as specified in Tender Document.

- 8.0 Any revision, clarification, corrigendum, time extension, etc. to this Tender Document will be hosted on the website(s) only as mentioned at 2.0 (G) of IFB. Bidders are requested to visit the CPP Portal regularly to keep themselves updated. No complaint/representation shall be entertained from bidders in case they do not see / download the amendments, etc. issued to the tender document by TFL from time to time on the CPP Portal.
- 9.0 All bidders who are willing to submit their bid are required to submit F-6 (Acknowledgement cum Consent letter) duly filled within 7 days from date of receipt of tender information.

**This is not an Order.**

**Thanking You,**  
For and on behalf of  
Talcher Fertilizers limited

*Atk*  
*30/10/2023*

(Anjali Thakur)  
Dy. General Manager (M.M)  
**Projects & Development India Limited**

**PHYSICAL DOCUMENTS (EMD/Declaration for Bid Security, POA, Integrity Pact & TPIA Letter)**

**Tender Document No. : PNMM/PC-183/E-4023/NCB dated 30.10.2023**

**Description : CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILIZERS LTD**

**Due Date & Time : 29.11.2023 at 15:00 hrs.**

<b>From:</b> ..... ..... ..... .....	<b>To:</b> M/s Projects & Development India Limited, P.D.I.L Bhawan, A-14, Sector-1, Noida, (PIN 201301) Dist. Gautam Budh Nagar (UP). (India)  Kind Attention: Mrs. Anjali Thakur Dy. General Manager(M.M)
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**(To be pasted on the envelope containing Physical Document)**



**SECTION-II**

**BID EVALUATION CRITERIA**

**&**

**EVALUATION METHODOLOGY**

## SECTION-II

### **1.0 BID EVALUATION CRITERIA (BEC)**

Bids are hereby invited from competent Domestic Bidders meeting the technical and financial criteria of respective BEC stated hereunder.

Evaluation of Techno-Commercial offers shall be carried out for only those Bidders who shall meet the BEC.

#### **(A) Technical Criteria:**

- A.1** The bidder must have completed “**Similar work**” during the last seven (07) years reckoned from the original bid due date.

“**Similar work**” shall mean the following:

“**Similar work**” shall mean “Supply/Procurement, Erection / Construction and Testing/ Commissioning of at least 33 kV Transmission / Sub-Transmission line.

**Bidder meeting the criteria above must have completed either of the following:**

The bidder must have completed One “**Similar work**”, having completed value not less than **INR 8.80 Crore** (including all applicable taxes & duties).

**(OR)**

The bidder must have completed Two “**Similar works**”, each having completed value not less than **INR 5.50 Crore** (including all applicable taxes & duties).

**(OR)**

The bidder must have completed Three “**Similar works**”, each having completed value not less than **INR 4.40 Crore** (including all applicable taxes & duties).

#### **Note:**

In case bidder has executed and completed composite works which includes any of the qualifying works(s) stated above i.e. (A.1), then value of such qualifying works out of the total value of composite works shall be considered for the purpose of qualification

- A.2** The bidder must have valid ‘A’ Class Electrical Contractors License or equivalent to ‘A’ Class Electrical License issued from any State Government Agency/Authority.

**A.3 Applicability of Policy for providing preference to Domestically Manufactured Iron & Steel (DMI & SP) products.**

Bidder should have minimum prescribed domestic value addition requirement in line with the Domestic Manufactured iron & Steel Policy (DMI & SP) for the Iron & Steel products involved in execution of the contract. Bidder shall submit affidavit from the domestic manufacturers of such Iron & steel products as per the Form-I mentioned in the policy document.

A bidder who is not manufacturer of Iron & Steel product and is unable to submit the Affidavit from domestic manufacturers at bidding stage, such bidder can submit the Affidavit issued by domestic manufacturers after placement of order. In this case bidder along with his bid shall submit an undertaking as per attached format in NIT.

If a bidder does not submit above affidavit/ undertaking as per format, the offer of bidder shall be rejected.

**Additional Notes to Technical Criteria:**

- I. Job completed by a Bidder for its own plant/ project cannot be considered as experience for the purpose of meeting BEC of the tender. However, jobs completed for Subsidiary/ Fellow subsidiary/ Holding company will be considered as experience for the purpose of meeting BEC subject to submission of tax paid invoice(s) duly certified by Statutory Auditor of the Bidder towards payments of statutory tax in support of the job completed for Subsidiary/ Fellow subsidiary/ Holding company. Such Bidders to submit these documents in addition to the documents specified to meet BEC.
- II. The bidder must submit the completion certificate/acceptance certificate issued by end user/ owner (or their consultant who has been duly authorized by them to issue such certificate) only after completion of work/ supply in all aspects.
- III. Only documents (Work order, completion certificate, execution certificate etc.) which have been referred /specified in the bid shall be considered in reply to the queries during evaluation of bids.
- IV. In case more than one contract/order/agreement/DLOA are emanating against same tender, these contracts are to be considered as single contract for evaluation of credentials of a bidder for meeting their experience criteria.
- V. Experience of bidder acquired as a subcontractor is acceptable against submission of certificate from End User/ Owner by such bidder along with other specified documents.
- VI. Bids from Consortium/ Joint Venture shall not be accepted.

**(B) Financial Criteria:**

- B.1** The Average Annual financial Turnover during the three preceding financial years of the bidder should be minimum **INR 5.50 Crore**.
- B.2** Net Worth of the bidder should be positive as per last audited financial year.
- B.3** The Bidder should have minimum working capital equal to **INR 1.10 Crore** as per last audited financial year. However, if the bidder's working capital is negative or inadequate, the bidder shall submit a letter from their Bank having Net worth of the bank not less than Rs. 100.0 Crore (or equivalent USD), confirming the availability of line of credit for **INR 1.10 Crore**. The line of credit from bank shall be submitted strictly as per prescribed format.

**“Notes for B.1, B.2 & B.3”**

**Annual Turnover:** Preceding 3 financial years mentioned in aforesaid BEC refer to immediate 3 preceding financial years wherever the closing date of the bid is after 30<sup>th</sup> September of the relevant financial year. In case the tenders having the due date for submission of bid up to 30<sup>th</sup> September of the relevant financial year, and audited financial results of the immediate 3 preceding financial years are not available, the audited financial results of the 3 years immediately prior to that will be considered.

In case the date of constitution/incorporation of the bidder is less than 3 years old, the average turnover in respect of the completed financial years after the date of constitution/ incorporation shall be taken into account for minimum Average Annual Financial Turnover criteria.

**Net Worth/Working Capital:** Immediate preceding financial year mentioned in aforesaid BEC refer to audited financial results for the immediate preceding financial year wherever the closing date of the bid is after 30<sup>th</sup> September of the relevant financial year. In case the tenders having the due date for submission of bid up to 30<sup>th</sup> Sep. of the relevant financial year, and audited financial results of the immediate preceding financial year is not available, in such case the audited financial results of the year immediately prior to that year will be considered. Bidder is to submit Audited Financial Statement of immediate preceding financial years (as mentioned above) along with format F-10 accordingly for Networth / Working Capital.

If the bidder's working capital is negative or inadequate, the bidder shall submit a letter from their bank having net worth not less than Rs.100 crores (or equivalent in USD), confirming the availability of line of credit for working capital amount mentioned herein above. The line of credit letter from bank to be submitted strictly as per format at F-9. Declaration Letter/Certificate for line of credit due to short fall of working capital shall be from single bank only. Letters from multiple banks shall not be applicable. However, banking syndicate will also be acceptable wherein a group of banks can jointly provide line of credit to the bidder. The bank shall be required to issue the letter for declaration/ certificate of line of credit on their letter head along with the contact details of the issuing authority like email id, contact number etc.



Any shortfall information / documents on the Audited Annual Report / Financial Statement of the Bidder and/or line of credit for working capital issued on or before the final bid due date can only be sought against Commercial queries (CQs). Any information/ documents issued post final bid due date shall not be considered for evaluation.

**(C) General Notes (for both Technical BEC and Financial BEC) wherever applicable:**

Exchange rate for conversion of currency for evaluation of documents relating to BEC:

Exchange rate for Conversion of Currency for evaluation of documents submitted by bidders for BEC which are in a currency other than INR, shall be as follows:

- a) **BEC (Technical):** Bill Selling (foreign exchange) Rate of State Bank of India as prevailing on the date of award of order / contract submitted by bidder.
- b) **BEC (Financial)**
  - (i) **For Annual Turnover:** The average of Bill Selling (foreign exchange) Rate of State Bank of India as prevailing on the First date and Last date of the respective Financial Year.
  - (ii) **For Net Worth & Working Capital:** The Bill Selling (foreign exchange) Rate of State Bank of India as prevailing on the Last date of the respective Financial Year
- c) In case, the SBI Selling rate is not available as on the date of conversion as specified above for respective cases, the exchange rate for conversion of currency shall be taken from the internet, such as -

<https://www.xe.com/currencyconverter>

<https://economictimes.indiatimes.com/markets/forex/currency-converter>

<https://www.oanda.com/currency/converter>

**(D) BEC for START-UPS:**

The Technical and Financial BEC as stipulated above shall also be applicable for start-ups.

**(E) Documents to be submitted for Compliance to BEC**

**(i) Technical Criteria of BEC:**

- a) To meet the criteria of **A.1** above, Bidder must submit copy of Detailed Letter of Acceptance (DLOA) / Work Order /relevant extract of work Order/ Contract Agreement along with detailed scope of work and Completion / Acceptance Certificate. Such certificate shall be issued by Owner/End user.

The Detailed Letter of Acceptance (DLOA) / Work Order / Contract Agreement must *inter alia* include Scope of work, completion time, contract value, etc. Similarly, the Completion Certificate/ Acceptance Certificate must clearly indicate reference of relevant work order/DLOA/Contract Agreement, Name of Work, Completed order value and date of completion

- b) To meet criteria as mentioned above at Sr. No. **A.2** above, Bidder must submit copy of valid 'A' Class Electrical Contractors License or equivalent to 'A' Class Electrical License issued by any 'State Government Agency/Authority'.
- c) In cases where bidder has executed the work as a sub-contractor, such Completion certificate and Operation certificates (for compliance to **A.1** above) issued by the "Order issuing Authority" is also acceptable, provided that a certificate or letter from end user/Owner is submitted that the bidder has worked as a sub-contractor for that project.
- d) To meet the criteria **A.3** above, Bidder shall submit affidavit from the domestic manufacturers of Iron & steel products as per the Form-I enclosed with the policy documents. A bidder who is not manufacturer of Iron & Steel product and is unable to submit the Affidavit from domestic manufacturers at bidding stage, such bidder can submit the Affidavit issued by domestic manufacturers after placement of order. In this case bidder along with his bid shall submit an undertaking as per prescribed format.

**(ii) Financial Criteria of BEC:**

- (a) To meet the criteria for Sr. No. **B.1**, Bidder shall submit the Audited Financial Statements of the company for last three (03) preceding financial years.
- (b) To meet the criteria for Sr. No. **B.2**, Bidder shall submit the Audited Financial Statements of the last financial year.
- (c) To meet the criteria for Sr. No. **B.3**, Bidder shall submit the Audited Financial Statements of last financial year along with (i) Bank's Letter (if applicable)
- (d) If the bidder's working capital is negative or inadequate, the bidder shall submit a letter from their bank having net worth not less than Rs.100 Crores (or equivalent USD), confirming the availability of line of credit for working capital amount mentioned herein above. The line of credit letter from bank to be submitted strictly as per prescribed format.

**For E (ii) above, the "Notes for B.1, B.2 & B.3 under B" (Financial Criteria of BEC) shall apply.**

- (e) Bidder shall submit Checklist as per prescribed format in respect of documents to be submitted by bidder towards BEC.

**(F) Authentication of documents submitted against BEC**

**I. Technical BEC**

All documents in support of Sl. No. A.1 & A.2 of Technical Criteria of BEC to be furnished by the Bidder shall necessarily be duly certified/ attested by Chartered Engineer as well as Notary Public with legible stamp.

**II. Financial BEC**

Bidder shall submit "Details of financial capability of Bidder" in prescribed format (F-10) duly signed and stamped by a chartered accountant/ Certified Public Accountant (CPA).

Further, copy of audited annual financial statements submitted in bid shall be duly certified/ attested by Notary Public with legible stamp.

**2.0 EVALUATION METHODOLOGY:**

The subject work is indivisible and complete work shall be awarded to successful overall lowest bidder as per evaluation methodology described below.

- i. The TOTAL CONTRACT PRICE (Including all taxes, duties, levies and GST) as derived from the SCHEDULE OF PRICES as quoted by the Bidder.
- ii. In case any cess on GST is applicable, same shall also be considered in evaluation.
- iii. In case any unregistered bidder is submitting their bid, their prices will be loaded with applicable GST (CGST & SGST/UTGST or IGST) while evaluation of bid (if applicable as per Govt. Act/Law in vogue).
- iv. The Price Evaluation will be subject to applicability of Purchase Preference Policies as mentioned in the tender document.

**3.0 Applicability of Public Procurement (Make in India) Policy**

The said policy shall be applicable for this package. Further, as the work is non divisible/non-splittable, therefore, the relevant provisions of policy shall be applicable. The minimum local content and all other provisions shall be as per Public Procurement (Make in India) Policy latest policy no. P-45021/2/2017-PP (BE-II) dated 16th September, 2020 or as updated from time to time.

**4.0 Applicability of purchase preference of MSE's**

Considering that the subject work falls under "Works Contract", Purchase preference to MSE's Bidders shall not be applicable as per government guidelines.

Deleted

**POLICY FOR PROVIDING PREFERENCE TO DOMESTICALLY  
MANUFACTURED IRON & STEEL PRODUCTS  
IN GOVERNMENT PROCUREMENT**



# भारत का राजपत्र The Gazette of India

असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (i)

PART II—Section 3—Sub-section (i)

प्राधिकार से प्रकाशित

PUBLISHED BY AUTHORITY

सं. 324]

नई दिल्ली, बुधवार, मई 29, 2019/ज्येष्ठ 8, 1941

No. 324]

NEW DELHI, WEDNESDAY, MAY 29, 2019/JYAISTHA 8, 1941

इस्पात मंत्रालय

अधिसूचना

नई दिल्ली, 29 मई, 2019

**सा.का.नि. 385(अ).**—घरेलू रूप से उत्पादित किए जाने वाले लौह एवं स्टील उत्पाद की सरकारी खरीद को प्राथमिकता दिए जाने के लिए संशोधित नीति सामान्य सूचना हेतु प्रकाशित की जाती है।

[फा. सं. 3(2)/2018-आईडीडी]

रसिका चौबे, अपर सचिव

**सरकारी खरीद में घरेलू स्तर पर निर्मित लौह एवं इस्पात उत्पादों को बरीयता देने के लिए नीति - संशोधित, 2019**

**1. भूमिका**

- 1.1 यह नीति सरकारी खरीद में घरेलू स्तर पर निर्मित लौह एवं इस्पात उत्पादों (डी एम आई एंड एस पी) को बरीयता देती है।
- 1.2 यह नीति यथा लागू निर्धारित गुणवत्ता मानदंडों के अनुपालन में उत्पादित लौह एवं इस्पात उत्पादों जिसे परिशिष्ट क में दिया गया है और परिशिष्ट ख में दिए गए लौह एवं इस्पात उत्पादों के लिए पूंजीगत माल पर लागू होती है।
- 1.3 यह नीति सरकार के प्रत्येक मंत्रालय अथवा विभाग और उनके प्रशासनिक नियंत्रण के अधीन सभी एजेंसियों/प्रतिष्ठानों तथा सरकारी परियोजनाओं के वास्ते लौह एवं इस्पात उत्पादों की खरीद के लिए इन एजेंसियों द्वारा वित्त पोषित परियोजनाओं पर लागू है। हालांकि, यह नीति वाणिज्यिक पुनः बिक्री के उद्देश्य से अथवा वाणिज्यिक बिक्री के लिए वस्तुओं के उत्पादन में उपयोग करने के उद्देश्य से लौह एवं इस्पात उत्पादों की खरीद पर लागू नहीं होगी।

**2. परिभाषाएं**

- 2.1 **बोली** लगाने वाला लौह एवं इस्पात का कोई घरेलू/विदेशी निर्माता अथवा उनके बिक्री एजेंट/अधिकृत वितरक/अधिकृत डीलर/अधिकृत आपूर्ति गृह अथवा सरकारी एजेंसियों द्वारा वित्त पोषित निधि परियोजनाओं की बोली लगाने में कार्यरत कोई अन्य कंपनी हो सकती है।

- 2.2 **घरेलू स्तर पर निर्मित लौह एवं इस्पात उत्पाद (डी एम आई एंड एस पी)** वे लौह एवं इस्पात उत्पाद हैं जिनका निर्माण उन प्रतिष्ठानों द्वारा किया जाता है जो भारत में पंजीकृत और स्थापित हैं, जिसमें विशेष आर्थिक क्षेत्र (एम ई ज़ेड) शामिल है। इसके अलावा, इस प्रकार के उत्पाद परिशिष्ट क में किये गये उल्लेख के अनुसार घरेलू न्यूनतम मूल्यवर्धन के मानदंडों को पूरा करेंगे।
- 2.3 **घरेलू निर्माता** खंड 7 में दिशा-निर्देशों और केंद्रीय उत्पाद शुल्क अधिनियम में दी गई 'निर्माता' की परिभाषा के अनुरूप लौह एवं इस्पात उत्पादों का एक निर्माता है।
- 2.4 इस नीति के प्रयोजन से **सरकार** का तात्पर्य भारत सरकार से है।
- 2.5 **सरकारी एजेंसियों** में सरकार के सार्वजनिक क्षेत्र के उपक्रम, सरकार द्वारा स्थापित सोसायटी, ट्रस्ट और सांविधिक निकाय शामिल हैं।
- 2.6 **एम ओ एस** का आशय इस्पात मंत्रालय, भारत सरकार से है।
- 2.7 **निवल बिक्री कीमत** बीजक कीमत होगी जिसमें निवल घरेलू कर और शुल्क शामिल नहीं होंगे।
- 2.8 **अर्ध तैयार इस्पात** का तात्पर्य इनगोट्स, बिलेट, ब्लूम और स्लेब्स से है, जिसे बाद में प्रसाधित कर तैयार इस्पात बनाया जा सकता है।
- 2.9 **तैयार इस्पात** का तात्पर्य सपाट और लंबे उत्पादों से होगा जिन्हें बाद में प्रसाधित कर निर्मित मद बनाया जा सकता है।
- 2.10 **एल1** का तात्पर्य निविदा अथवा अन्य खरीद संबंधी अनुरोध के अनुसार मूल्यांकन प्रक्रिया में यथाघोषित निविदा, बोली लगाने संबंधी प्रक्रिया अथवा अन्य खरीद संबंधी अनुरोधों में प्राप्त निम्नतम निविदा अथवा निम्नतम बोली अथवा निम्नतम भाव से होगा।
- 2.11 **खरीद वरीयता के मार्जिन** का तात्पर्य उस अधिकतम सीमा से है जिस सीमा तक किसी घरेलू आपूर्तिकर्ता द्वारा लगाई गई कीमत खरीद वरीयता के प्रयोजन से एल1 से अधिक हो। डी एम आई एंड एस पी नीति के मामले में, खरीद वरीयता का मार्जिन परिशिष्ट ख में मदों के लिए 20 प्रतिशत होगा।
- 2.12 **लौह एवं इस्पात उत्पाद** का तात्पर्य ऐसे लौह एवं इस्पात उत्पादों से होगा जिनका उल्लेख परिशिष्ट क में किया गया है।
- 2.13 **घरेलू मूल्यवर्धन** निवल बिक्री कीमत (निवल घरेलू करों और शुल्कों को छोड़कर बीजक कीमत) होगी जिससे प्रतिशत में निवल बिक्री कीमत के एक अनुपात के रूप में भारत में निर्माण संयंत्र (सभी सीमा शुल्कों सहित) में आयात की गई इनपुट सामग्री की पहुंच लागत घटाई गई हो, 'घरेलू मूल्यवर्धन' परिभाषा डी पी आई आई टी (पूर्व में डी आई पी पी) के दिशानिर्देशों के अनुरूप होगी और उसमें भविष्य में डी पी आई आई टी द्वारा परिवर्तन किये जाने की स्थिति में उपयुक्त रूप से संशोधन किया जाएगा। इस नीति दस्तावेज के प्रयोजन के लिए घरेलू मूल्यवर्धन और स्थानीय विषय वस्तु का उपयोग एक दूसरे के स्थान पर किया गया है।
- 3. अपवर्जन**
- 3.1 इस्पात मंत्रालय द्वारा इस प्रकार की सभी सरकारी खरीदों के लिये निम्नलिखित शर्तों के अधीन छूट प्रदान की जाएगी।
- 3.1.1 जहां विशिष्ट शेडों के इस्पात का निर्माण इस देश में नहीं किया जाता हो, अथवा
- 3.1.2 जहां परियोजना की मांग के अनुसार इन मात्राओं को घरेलू स्रोतों के माध्यम से पूरा नहीं किया जा सकता हो।
- अपवर्जन संबंधी अनुरोधों को घरेलू स्तर पर निर्मित लौह एवं इस्पात उत्पादों के उपलब्ध न होने के पर्याप्त प्रमाण के साथ स्थायी समिति को प्रस्तुत किया जाएगा।
- 4. स्थायी समिति**
- इस नीति के कार्यान्वयन का पर्यवेक्षण करने के लिए इस्पात मंत्रालय (एम ओ एस) के अधीन एक स्थायी समिति का गठन किया जाएगा। जिसके अध्यक्ष सचिव इस्पात होंगे। इस समिति में उद्योग/उद्योग संघ/सरकारी संस्था अथवा निकाय/इस्पात मंत्रालय (एम ओ एस) से लिए गए विशेषज्ञ होंगे। इस्पात मंत्रालय में उक्त समिति के पास निम्नलिखित के लिए अधिदेश होगा :
- 4.1 इस नीति के कार्यान्वयन की मॉनीटरिंग करना
- 4.2 परिशिष्ट क और परिशिष्ट ख में यथा उल्लिखित लौह एवं इस्पात उत्पादों की सूची और घरेलू बिक्री वर्धन की आवश्यकता से संबंधित मानदंडों की समीक्षा करना और उसे अधिसूचित।

- 4.3 खंड 3 के अनुसार खरीद एजेंसियों को अपवर्जन की स्वीकृति देने सहित इस नीति के कार्यान्वयन के लिए आवश्यक स्पष्टीकरण जारी करना।
- 4.4 शिक्कायत निवारण करने के लिए एक अलग समिति का गठन करना।
- 4.5 स्थायी समिति इस्पात मंत्रालय को अनुमोदन हेतु अपनी सिफारिशें प्रस्तुत करेगी।
- 5. सरकार द्वारा खरीदे जाने वाले लौह एवं इस्पात उत्पादों को अधिसूचित करना**
- 5.1 निम्नलिखित दिशानिर्देशों का उपयोग इस नीति के अंतर्गत उपरोक्त उत्पादों की पहचान करने और उमें अधिसूचित करने के लिए किया जा सकता है :
- 5.1.1 यह नीति परिशिष्ट क में दिए गए अनुसार लौह एवं इस्पात उत्पादों और परिशिष्ट ख में लौह एवं इस्पात उत्पादों का निर्माण करने के लिए पूंजीगत माल पर लागू है।
- 5.1.2 परिशिष्ट क में लौह एवं इस्पात उत्पादों की सूची दी गई है जिसका निर्माण अनन्य रूप से घरेलू स्तर पर किया जाना है और उसका आयात इस्पात मंत्रालय के अनुमोदन के बिना नहीं किया जा सकता है।
- 5.1.3 परिशिष्ट ख में पूंजीगत माल की एक सूची (जो विस्तृत नहीं है) दी गई है जिसके लिए खरीद संबंधी बरीयता घरेलू स्तर पर निर्मित पूंजीगत माल को दी जाएगी, यदि उनकी दी गई कीमत सदृश्य आयात किये गये पूंजीगत माल के लिए दी गई कीमत के 20 प्रतिशत के अंदर आती हो।
- 5.1.4 इस नीति का उद्देश्य सभी लौह एवं इस्पात उत्पादों को अधिसूचित करना है जिसकी खरीद सरकारी एजेंसियों द्वारा सरकारी परियोजनाओं के लिए की जाती है और न कि वाणिज्यिक पुनः बिक्री के उद्देश्य से अथवा वाणिज्यिक बिक्री के लिए उत्पादों के उत्पादन में प्रयोग करने के उद्देश्य से की गई हो।
- 5.1.5 यह नीति सरकार के मंत्रालय अथवा विभाग के द्वारा निधि प्रदत्त सभी परियोजनाओं और उनके प्रशासनिक नियंत्रण के अधीन सभी एजेंसियों/प्रतिष्ठानों पर लौह एवं इस्पात उत्पादों की खरीद के लिए लागू है।
- 5.1.6 यह नीति उन परियोजनाओं पर लागू होगी जहां लौह एवं इस्पात उत्पादों का खरीद मूल्य 25 करोड़ रुपए से अधिक होता हो। यह नीति अन्य खरीद (गैर परियोजना) के लिए भी लागू होगी जहां उस सरकारी संगठन के लिए लौह एवं इस्पात उत्पादों का वार्षिक खरीद मूल्य 25 करोड़ रुपए से अधिक होता हो।
- 5.1.7 यह नीति सरकार के मंत्रालय अथवा विभाग अथवा उनके सार्वजनिक क्षेत्र के उपक्रमों की किसी अन्य आवश्यकता को पूरा करने के लिए और/अथवा ई पी सी संविदा को पूरा करने के लिए प्राइवेट एजेंसियों द्वारा लौह एवं इस्पातों की खरीद पर लागू है।
- 5.1.8 घरेलू लौह एवं इस्पात उत्पादों के विभिन्न ग्रेडों की उपलब्धता का विश्लेषण इस नीति के अंतर्गत अधिसूचित करने से पहले करना होगा। केवल उन लौह एवं इस्पात को उत्पादों को जिनके संबंध में कम से कम एक घरेलू निर्माता मौजूद हो, अधिसूचित किया जाएगा। स्थायी समिति से परामर्श किया जा सकता है।
- 5.1.9 यह नीति यथा लागू निर्धारित गुणवत्ता मानदंडों के अनुपालन में उत्पादित परिशिष्ट ख में दिए गए लौह एवं इस्पात उत्पादों का निर्माण करने के लिए पूंजीगत माल के लिए लागू है।
- 5.1.10 लौह एवं इस्पात उत्पादों का निर्माण करने के लिए पूंजीगत मालों की घरेलू खरीद के लिए नीति लौह एवं इस्पात उत्पादों का निर्माण करने के लिए और न कि वाणिज्यिक पुनः बिक्री के उद्देश्य से पूंजीगत मालों की खरीद के वास्ते और सार्वजनिक क्षेत्र के इस्पात विनिर्माताओं और उनके प्रशासनिक नियंत्रणाधीन सभी एजेंसियों/प्रतिष्ठानों पर लागू है।
- 5.1.11 यह नीति ई पी सी संविदा और/अथवा सार्वजनिक क्षेत्र से इस्पात निर्माताओं और उनके प्रशासनिक नियंत्रण के अधीन सभी एजेंसियों/प्रतिष्ठानों की किसी अन्य आवश्यकता को पूरा करने के लिए निजी एजेंसियों द्वारा लौह एवं इस्पात उत्पादों का निर्माण करने के लिए पूंजीगत माल की खरीद पर लागू है।
- 5.1.12 सरकारी एजेंसियां जो लौह एवं इस्पात उत्पादों के निर्माण के लिए पूंजीगत माल और लौह एवं इस्पात उत्पादों की खरीद में उन स्थितियों में शामिल है जहां लौह एवं इस्पात उत्पादों का उल्लेख परिशिष्ट क और परिशिष्ट ख में नहीं किया गया हो, स्थायी समिति को निर्धारित मानदंडों के साथ इस उत्पाद के विवरण और तकनीकी विनिर्देशन उपलब्ध करायेगा। स्थायी समिति खंड 3 और खंड 4 में अधिदेश के अनुसार कार्य करेगी।



- 5.2 इस्पात मंत्रालय (एम ओ एम) परिशिष्ट क में दिए गए न्यूनतम निर्धारित घरेलू मूल्यवर्धन के साथ लौह एवं इस्पात उत्पादों को अधिसूचित करेगा।
- 5.3 लौह एवं इस्पात उत्पादों का निर्माण करने के लिए पूंजीगत माल के संबंध में नीतिगत दिशानिर्देश, परियोजना के आकार पर विचार किये बिना परिशिष्ट ख में लौह एवं इस्पात उत्पादों का निर्माण करने के लिए पूंजीगत माल की सभी खरीदों के लिए सार्वजनिक क्षेत्र के इस्पात निर्माताओं पर लागू होंगे।
- 5.4 परिशिष्ट क में लौह एवं इस्पात उत्पादों के लिए तथा परिशिष्ट ख में लौह एवं इस्पात उत्पादों का निर्माण करने के लिए पूंजीगत माल के लिए सुझाव दिए गए न्यूनतम घरेलू मूल्यवर्धन आवश्यकता घरेलू आपूर्तिकर्ता का आधार, आपूर्तिकर्ताओं की संख्या और खपत की तुलना में आयात का अनुपात जैसे कारकों के आधार पर तय किया गया है।
- 5.5 घरेलू मूल्यवर्धन आवश्यकता संबंधी मानदंडों का इस प्रकार से निर्धारण किया जाएगा जिस से कि यह किमी दिए गए समय में लौह एवं इस्पात उत्पादों के लिए घरेलू उद्योग की औसत/औसत से अधिक निर्माण क्षमता दर्शाता हो। स्थायी समिति द्वारा समय समय पर उपयुक्त रूप से इसकी समीक्षा की जाएगी और आवश्यकता पड़ने पर इस्पात मंत्रालय के अनुमोदन से इसमें संशोधन किया जाएगा।
- 6. सरकार एवं सरकारी एजेंसियों द्वारा खरीद के लिए निविदा प्रक्रिया**
- 6.1 खरीद करने वाली/सरकारी एजेंसियां डी एम आई एंड एस पी का पालन करते समय वित्त मंत्रालय और सी वी सी के अनुदेशों के अनुसार मानक खरीद संबंधी प्रक्रियाओं का पालन करेगी। यह नीति सभी निविदाओं जहां कीमत बोली नहीं खोली गई है, में इसके अधिसूचना की तिथि से लागू होगी।
- 6.2 दोनों वस्तुओं की खरीद तथा ई पी सी संविदाओं के लिए निविदा दस्तावेज में लौह एवं इस्पात उत्पादों का निर्माण करने के लिए लौह एवं इस्पात उत्पादों तथा पूंजीगत माल (जैसा कि परिशिष्ट क और परिशिष्ट ख में दर्शाया गया है, के लिए बोली लगाने वाले द्वारा न्यूनतम निर्धारित घरेलू मूल्यवर्धन का पालन करने के लिए अर्हता मानदंडों का स्पष्ट उल्लेख होना चाहिए।
- 6.3 घरेलू उत्पादों के विकास का सहयोग करने में, लौह एवं इस्पात व्यापार क्रियाकलापों में घरेलू मूल्यवर्धन का लक्ष्य निर्धारित किया गया है जिसे परिशिष्ट क और परिशिष्ट ख में दिया गया है।
- 6.4 परिशिष्ट क में लौह और इस्पात उत्पादों के खरीद की प्रक्रिया केवल उन निर्माताओं/आपूर्तिकर्ताओं के लिए ही खुली रहेगी जिसमें घरेलू मूल्यवर्धन लक्ष्यों को पूरा करने/उमसे ज्यादा पूरा करने की क्षमता हो। घरेलू मूल्यवर्धन लक्ष्यों को पूरा न करने वाले निर्माता/आपूर्तिकर्ता बोली लगाने में भाग लेने के लिए पात्र नहीं हैं।
- 6.5 परिशिष्ट ख में दी गई मदों के मामलों में, यदि खरीद करने वाली कंपनी की राय में, निविदाओं (खरीदी गई मात्रा) को 50:50 के निर्धारित अनुपात में नहीं बांटा जा सकता है, तब उनके पास मात्रा जो 50 प्रतिशत से कम नहीं हो, जो कि विभाज्य हो, के लिए पात्र घरेलू निर्माता को संविदा देने का अधिकार होगा।
- 6.6 उपर्युक्त शर्त को जारी रखते हुए, परिशिष्ट ख की मदों के लिए, यदि निविदा दी गई मद विभाज्य न हो (खरीद करने वाली कंपनी द्वारा निविदा दस्तावेज में शामिल किए जाने के लिए) यह संविदा समग्र मात्रा के लिए पात्र घरेलू निर्माता को दी जा सकती है।
- 6.7 परिशिष्ट ख के मदों के मामलों में, यदि घरेलू मूल्यवर्धन की आवश्यकताओं को पूरा करने वाले पात्र निर्माताओं में से कोई भी एल1 की बोली के अनुरूप न हो, तब एल1 की बोली धारण करने वाले मूल बोली लगाने वाला खरीद के पूर्ण मूल्य के लिए आदेश प्राप्त करेंगे।
- 6.8 वे बोली लगाने वाले जो लौह एवं इस्पात उत्पादों के घरेलू निर्माताओं के बिक्री एजेंट/अधिकृत वितरक/अधिकृत डीलर/अधिकृत आपूर्ति गृह हैं इस नीति के अंतर्गत घरेलू निर्माताओं की ओर से बोली लगाने के लिए पात्र हैं। हालांकि, यह निम्नलिखित शर्तों के अध्वधीन होगा।
- 6.8.1 बोली लगाने वाले घरेलू स्तर पर निर्मित लौह एवं इस्पात उत्पादों की बिक्री करने के लिए घरेलू निर्माता द्वारा जारी किए गए अधिकार प्रमाण पत्र प्रस्तुत करेगा।

- 6.8.2 यदि खरीद को डी एम आई एंड एम पी नीति के परिशिष्ट क के अंतर्गत शामिल किया गया हो तब बोली लगाने वाला यह घोषणा करते हुए खरीद करने वाली एजेंसी को धरेलू निर्माता द्वारा जारी किया गया स्व-प्रमाणन का शपथ पत्र प्रस्तुत करेगा कि लौह और इस्पात उत्पादों का धरेलू स्तर पर निर्माण निर्धारित धरेलू मूल्यवर्धन के मामले में किया जाता है।
- 6.8.3 यदि खरीद को डी एम आई एंड एम पी नीति के परिशिष्ट ख के अंतर्गत शामिल किया गया हो तब बोली लगाने वाला यह घोषणा करते हुए धरेलू निर्माता को सांविधिक लेखा परीक्षक द्वारा जारी किया गया प्रमाणन प्रस्तुत करेगा कि लौह और इस्पात उद्योग में उपयोग किये जाने वाले पूंजीगत माल का धरेलू स्तर पर निर्माण निर्धारित धरेलू मूल्यवर्धन के मामले में किया जाता है।
- 6.8.4 बोली लगाने वाले की यह जिम्मेदारी होगी कि वह इस नीति के अनुसार खरीद करने वाली एजेंसी को धरेलू निर्माता द्वारा जारी किये जाने के लिए अपेक्षित अन्य आवश्यक दस्तावेज प्रस्तुत करे।

## 7. धरेलू मूल्यवर्धन आवश्यकता

- 7.1 धरेलू रूप में निर्मित लौह और इस्पात उत्पाद अथवा पूंजीगत माल के रूप में उत्पाद के रूप में पात्र होने के लिए न्यूनतम धरेलू मूल्यवर्धन आवश्यकता का उल्लेख परिशिष्ट क और परिशिष्ट ख में किया गया है।
- 7.2 धरेलू मूल्यवर्धन निवल बिक्री कीमत (निवल धरेलू करों और शुल्कों को छोड़कर बीजक कीमत) होगी जिसमें से प्रतिशत में निवल बिक्री कीमत के एक अनुपात के रूप में भारत में निर्माण करने वाले संयंत्र में आयात की गई इनपुट सामग्री की पहुंच लागत (सभी सीमा शुल्कों को शामिल करते हुए) घटाई जाएगी।
- 7.2.1 यदि लौह और इस्पात उत्पादों को धरेलू इनपुट इस्पात (अर्ध तैयार/तैयार इस्पात) का उपयोग करके निर्माण किया जाता हो, तब खरीदी गई मात्रा और अन्य संबंधित दस्तावेजों के साथ वास्तविक धरेलू उत्पादों से खरीद का बीजक खरीद करने वाली सरकारी एजेंसी को अवश्य प्रस्तुत किया जाना चाहिए।
- 7.2.2 यदि लौह एवं इस्पात उत्पादों ने इनपुट इस्पात का आयात किया हो तब खरीदी गई मात्रा और अन्य संबंधित दस्तावेजों के साथ वास्तविक उत्पादकों से खरीदों के बीजकों को अलग से प्रस्तुत किया जाना चाहिए। धरेलू मूल्यवर्धन की सीमा निकालने के लिए, दोनों इनपुट इस्पातों (आयात किये और धरेलू) की भारित औसत पर विचार यह सुनिश्चित करने के लिए किया जाएगा कि इस नीति की न्यूनतम निर्धारित धरेलू मूल्यवर्धन आवश्यकता का पालन किया गया है।
- 7.3 यह सिफारिश की जाती है कि निविदा की प्रक्रिया में भाग लेने वाले प्रत्येक बोली लगाने वाले को नीचे दिए गए सूत्र का उपयोग करते हुए धरेलू मूल्यवर्धन की गणना करनी चाहिए ताकि यह सुनिश्चित किया जा सके कि दावा किये गये धरेलू मूल्यवर्धन इस नीति के न्यूनतम निर्धारित धरेलू मूल्यवर्धन के अनुरूप है।

### लौह एवं इस्पात उत्पादों के लिए

% धरेलू मूल्यवर्धन

$$= \frac{\text{अंतिम उत्पाद की निवल बिक्री कीमत} - \text{संयंत्र में आयात किये गये लौह अथवा इस्पात की पहुंच लागत}}{\text{अंतिम उत्पाद की निवल बिक्री कीमत}} \times 100\%$$

### पूंजीगत माल के लिए

% धरेलू मूल्यवर्धन

$$= \frac{\text{अंतिम उत्पाद की निवल बिक्री कीमत} - \text{संयंत्र में आयात किये गये इनपुट सामग्री की पहुंच लागत}}{\text{अंतिम उत्पाद की निवल बिक्री कीमत}} \times 100\%$$

## 8. प्रमाणन और लेखा परीक्षण

- 8.1 परिशिष्ट क में दिए गए उत्पादों के लिए, प्रत्येक धरेलू निर्माता यह घोषणा करते हुए खरीद करने वाली सरकारी एजेंसी को स्व-प्रमाणन का शपथ पत्र प्रस्तुत करेगा कि लौह एवं इस्पात उत्पाद का निर्धारित धरेलू मूल्यवर्धन के संबंध में धरेलू स्तर पर निर्माण किया गया है। परिशिष्ट ख के पूंजीगत माल के लिए, बोली लगाने वाला यह घोषणा करते हुए धरेलू निर्माता को सांविधिक लेखा परीक्षक द्वारा जारी किया गया प्रमाणन प्रस्तुत करेगा कि पूंजीगत माल का निर्माण धरेलू स्तर पर निर्धारित धरेलू मूल्यवर्धन के संबंध में किया गया है। वे बोली लगाने वाले जो लौह एवं इस्पात उत्पादों के धरेलू निर्माताओं का एकमात्र बिक्री एजेंट/अधिकृत वितरक/अधिकृत डीलर/अधिकृत आपूर्ति गृह हैं, ई पी सी के अंतर्गत धरेलू निर्माताओं की ओर से बोली लगाने के लिए पात्र हैं।

बोली लगाने वाला घरेलू निर्माताओं के द्वारा जारी किए गए स्व-प्रमाणन और सांविधिक लेखा परीक्षकों द्वारा जारी किये गये प्रमाणनों को यह घोषणा करते हुए खरीद करने वाली एजेंसी को प्रस्तुत करेगा कि लौह एवं इस्पात उत्पादों का घरेलू स्तर पर निर्माण निर्धारित घरेलू मूल्यवर्धन के संबंध में किया गया है। स्व-प्रमाणन का शपथ पत्र इन दिशानिर्देशों से संलग्न **प्रपत्र 1** में प्रस्तुत किया जाएगा।

- 8.2 घरेलू निर्माता की यह जिम्मेदारी होगी कि वह यह सुनिश्चित करे कि इस प्रकार से दावा किये गये उत्पादों का घरेलू स्तर पर उम उत्पाद के लिए निर्धारित घरेलू मूल्यवर्धन के संबंध में किया गया है। बोली लगाने वाले से यह भी अपेक्षित होगा कि वह घरेलू निर्माता के सांविधिक लेखा परीक्षकों द्वारा विधिवत प्रमाणित अर्धवार्षिक (मिंतंबर 30 और मार्च 31) आधार पर घरेलू मूल्यवर्धन प्रमाणपत्र उपलब्ध कराये कि पहले 6 महीनों के दौरान इस उत्पाद के लिए किये गये घरेलू मूल्यवर्धन के दावे इस नीति के अनुसार हैं। इस प्रकार के प्रमाण पत्र को संबंधित सरकारी एजेंसियों को प्रत्येक छमाही के शुरू होने के 60 दिनों के भीतर प्रस्तुत किया जाएगा और उस उत्पादों की आपूर्ति को पूरा करने तक प्रस्तुत करता रहेगा।
- 8.3 खरीद करने वाली एजेंसी बोली लगाने वाले द्वारा प्रस्तुत किये गये इस्पात उत्पाद में घरेलू मूल्यवर्धन के संबंध में स्व-प्रमाणन का शपथ पत्र स्वीकार करेगा। सामान्य तौर पर खरीद करने वाली एजेंसी की यह जिम्मेदारी होगी कि वह इस दावे की सत्यता की जांच करे। इसकी सत्यता प्रदर्शित करने की जिम्मेदारी बोली लगाने वाले की होगी जब उसे ऐसा करने के लिए कहा जाए।
- 8.4 यदि खरीद करने वाली एजेंसी अथवा संबंधित सरकारी एजेंसी द्वारा लौह एवं इस्पात उत्पादों में घरेलू मूल्यवर्धन के संबंध में बोली लगाने वाले के दावे के विरुद्ध कोई शिकायत प्राप्त होती है तब खरीद करने वाली एजेंसी के पास सभी संबंधित दस्तावेजों का निरीक्षण करने और उसकी जांच करने तथा निर्णय लेने का पूर्ण अधिकार होगा। यदि कोई स्पष्टीकरण की आवश्यकता होती है तब मामले को तकनीकी सहायता के लिए अनुरोध के साथ इस्पात मंत्रालय को भेजा जा सकता है।
- 8.5 सरकारी एजेंसी को भेजे गए किसी शिकायत का निपटारा सभी आवश्यक दस्तावेजों को प्रस्तुत करने के साथ इसे भेजे जाने के 4 सप्ताह के भीतर किया जाएगा। बोली लगाने वाले से यह अपेक्षित होगा कि वह शिकायत दायर करने के 2 सप्ताह के भीतर सरकारी एजेंसी को लौह एवं इस्पात उत्पादों में दावा किये गये घरेलू मूल्यवर्धन के समर्थन में आवश्यक दस्तावेज प्रस्तुत करे।
- 8.6 यदि इस मामले को इस्पात मंत्रालय के पास भेजा जाता है तब इस्पात मंत्रालय के अधीन गठित शिकायत निवारण समिति सरकारी एजेंसी के दृष्टिकोण पर विचार करने के बाद बोली लगाने वाले से सभी दस्तावेजों के प्राप्त होने और उसका संदर्भ भेजे जाने के 4 सप्ताह के भीतर शिकायत का निपटारा करेगी। बोली लगाने वाले से यह अपेक्षित होगा कि वे इस मामले के संदर्भ के 2 सप्ताह के भीतर इस्पात मंत्रालय के अंतर्गत शिकायत निवारण समिति को लौह एवं इस्पात उत्पादों में दावा किए गए घरेलू मूल्यवर्धन के समर्थन में आवश्यक दस्तावेज प्रस्तुत करे। यदि बोली लगाने वाले द्वारा कोई सूचना प्रस्तुत नहीं की जाती है तब शिकायत निवारण समिति दावे की प्रमाणिकता अधिक करने के लिए सरकारी एजेंसी के परामर्श से आगे आवश्यक कार्रवाई कर सकती है।
- 8.7 घरेलू मूल्यवर्धन की निर्धारित सीमा का आकलन करने की लागत का वहन खरीद करने वाली एजेंसी द्वारा किया जाएगा यदि घरेलू मूल्यवर्धन प्रमाण पत्र के अनुसार सही पाया गया हो। हालांकि, यदि ऐसा पाया गया हो कि दावा किए गए अनुसार घरेलू मूल्यवर्धन सही नहीं है तब आकलन की लागत बोली लगाने वाले द्वारा भुगतान के योग्य होगी जिन्होंने एक गलत प्रमाण पत्र प्रस्तुत किया है। इसे लागू करने के तरीके को निविदा दस्तावेज में परिभाषित किया जाएगा।

## 9. प्रतिबंध

- 9.1 प्रत्येक सरकारी एजेंसी निविदा दस्तावेज में निर्धारित घरेलू मूल्यवर्धन का बोली लगाने वाले के द्वारा गलत घोषणा किए जाने की स्थिति में दण्ड को स्पष्ट रूप से परिभाषित करेगा। इस दण्ड में ऐसे निर्माता/सेवा प्रदाता की ई एम डी को जब्त करना, अन्य वित्तीय दंड लगाना और उसे काली सूची में डालना शामिल हो सकता है।
- 9.2 संबंधित बोली लगाने वाले के द्वारा इस्पात मंत्रालय को किसी प्रकार की शिकायत भेजे जाने की स्थिति में, 10 लाख रुपए अथवा खरीदी जा रही डी एम आई एंड एस पी के मूल्य का 0.2 प्रतिशत (अधिकतम 20 लाख के अध्येधीन) इसमें से जो भी अधिक हो, का शिकायत शुल्क होगा जिसका भुगतान शिकायतकर्ता द्वारा शिकायत के साथ इस्पात मंत्रालय के अधीन शिकायत निवारण समिति के पास जमा किए गए डिमाण्ड ड्राफ्ट के द्वारा किया जाएगा। यदि, शिकायत को सही नहीं पाया जाता है तब सरकारी एजेंसी के पास उक्त राशि को जब्त करने का अधिकार सुरक्षित है। यदि शिकायत पर्याप्त रूप से सही पाई जाती है तब शिकायतकर्ता द्वारा जमा किए गए शुल्क को बिना किसी ब्याज के वापिस किया जाएगा।

**10. इस्पात मंत्रालय द्वारा कार्यान्वयन की मॉनीटरिंग**

- 10.1 इस नीति के प्रावधान प्रकाशन की तिथि से 5 वर्षों की अवधि के लिए लागू रहेंगे। इस नीति की अवधि को इस्पात मंत्रालय के विवेक से और आगे बढ़ाया जा सकता है।
- 10.2 इस्पात मंत्रालय इस नीति के कार्यान्वयन की मानीटरिंग करने के लिए नोडल मंत्रालय होगा।
- 10.3 डी एम आई एंड एस पी नीति के अंतर्गत सभी लागू एजेंसियां इस नीति का कार्यान्वयन मुनिश्चित करेंगी और वार्षिक रूप से जून के महीने में एक घोषणा भेजेगी जिसमें इस नीति के अनुपालन की सीमा और पिछले वित्तीय वर्ष के दौरान उसके अनुपालन न किए जाने के कारणों को दर्शाया जाएगा।

**इस्पात मंत्रालय को संदर्भ**

किमी ऐसे प्रश्न की स्थिति में कि क्या खरीदी जा रही मद इस नीति के अंतर्गत शामिल किए जाने वाले डी एम आई एंड एस पी है, इस मामले को स्पष्टीकरण के लिए इस्पात मंत्रालय के पास भेजा जाएगा।

**परिशिष्ट क - धरेलू स्तर पर निर्मित उत्पादों के लिए अनन्य**

क्र. सं.	लौह एवं इस्पात उत्पादों की सांकेतिक सूची	लागू एच एस कोड	न्यूनतम धरेलू मूल्यवर्धन आवश्यकता
1	600 मि. मी. अथवा उससे अधिक की चौड़ाई वाले लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, हॉट रोलड, न ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7208	50%
2	600 मि. मी. अथवा उससे अधिक की चौड़ाई वाले लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, कोल्ड रोलड (कोल्ड - कम किया हुआ), न ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7209	50%
3	600 मि. मी. अथवा उससे अधिक की चौड़ाई वाले लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7210	50%
4	600 मि. मी. से कम की चौड़ाई वाले लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, न ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7211	35%
5	600 मि. मी. से कम की चौड़ाई का लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7212	35%
6	लौह एवं गैर एलॉय इस्पात का अनियमित रूप से ढंका हुआ क्वाड्रल में बार्स और रॉड, हॉट रोलड	7213	35%
7	लौह अथवा गैर एलॉय इस्पात के अन्य बार्स और रॉड्स जिसे फोर्ज किए जाने की तुलना में आगे अधिक वर्क नहीं किया हुआ, हॉट रोलड, हॉट ड्रॉन अथवा हॉट एक्सट्रूडेड परंतु रोलिंग के बाद उसे टिबिस्ट किये जाने सहित	7214	35%
8	लौह अथवा गैर एलॉय इस्पात का अन्य बार्स एंड रोड्स	7215	35%
9	लौह अथवा गैर एलॉय इस्पात का एंगल, शेप और सेक्शनस	7216	35%
10	लौह अथवा गैर एलॉय इस्पात का तार	7217	50%
11	600 मि. मी. अथवा उससे अधिक की चौड़ाई का स्टेनलैस इस्पात का फ्लेट रोलड इस्पात	7219	50%
12	600 मि. मी. से कम की चौड़ाई का स्टेनलैस इस्पात का फ्लेट रोलड इस्पात	7220	50%
13	स्टेनलैस स्टील का अन्य बार्स और रोड्स; स्टेनलैस स्टील का एंगल शेप और सेक्शनस	7222	50%
14	अन्य एलॉय इस्पात का तार	7229	35%
15	लौह अथवा इस्पात को रेल, रेलवे अथवा ट्रामवे ट्रेक निर्माण सामग्री	7302	50%

16	कास्ट लौह का ढूब, पाइप और होलो पाइप	7303	35%
17	लौह (कास्ट आयरन को छोड़कर) अथवा इस्पात का ढूब पाइप और होलो प्रोफाइल, मीमलैस	7304	35%
18	लौह अथवा इस्पात का सर्कुलर क्रॉस सेक्शन वाले अन्य ढूब और पाइप (उदाहरण के लिए, वेल्ड किया हुआ, रिबेट किया हुआ अथवा समान रूप से बंद किया गया हुआ), जिमकी बाहरी त्रिज्या 406.4 मि. मी. से अधिक हो	7305	35%
19	लौह अथवा इस्पात के अन्य ढूब, पाइप और होलो प्रोफाइल (उदाहरण के लिए ओपन मीन अथवा वेल्ड किया हुआ, रिबेट किया हुआ अथवा समान रूप से बंद किया गया हुआ)	7306	35%
20	लौह अथवा इस्पात का ढूब अथवा पाइप फिटिंग (उदाहरण के लिए, कनेक्टर/कप्लिंग, एल्बो स्लीव्स)	7307	35%
21	स्टेनलैस स्टील का अनियमित रूप से ँंठा हुआ क्वाइल में बार्स और रॉड, हॉट रोल्ड	7221	35%
22	स्टेनलैस स्टील का वायर	7223	35%
23	इलेक्ट्रिकल स्टील सहित 600 मि. मी. अथवा उससे अधिक की चौड़ाई वाले अन्य एलॉय स्टील का फ्लेट रोल्ड इस्पात	7225	35%
24	इलेक्ट्रिकल स्टील सहित 600 मि. मी. से कम की चौड़ाई वाले अन्य एलॉय स्टील का फ्लेट रोल्ड इस्पात	7226	35%
25	अन्य एलॉय स्टील का अनियमित रूप से ँंठा हुआ क्वाइल में बार्स और रोड, हॉट रोल्ड	7227	15%
26	अन्य एलॉय स्टील का अन्य बार्स और रोड्स; अन्य एलॉय स्टील का एंगल, शेप्स और सेक्शन्स; एलॉय अथवा नॉन एलॉय स्टील का होलो ड्रिल बार्स और रोड्स	7228	35%
27	लौह अथवा इस्पात की शीट पाइलिंग, चाहे ड्रिल किया हुआ हो अथवा नहीं, चाहे पंच किया हुआ हो अथवा नहीं, चाहे असेम्बल किये हुए तत्वों से बना हुआ हो अथवा नहीं; लौह अथवा इस्पात का वेल्ड किया हुआ एंगल, शेप और सेक्शन्स	7301	15%
28	स्ट्रक्चर्स (9406 के शीर्ष का प्रीफेब्रिकेटिड भवनों को छोड़कर) और स्ट्रक्चर्स का हिस्सा	7308	15%
29	300 लीटर से अधिक क्षमता का लौह अथवा इस्पात का किसी सामग्री (कम्प्रेस किए हुए अथवा सरलीकृत गैस को छोड़कर) के लिए भंडार, टैंक, वैट और समान कन्टेनर चाहे उसे लाइन किया गया हो अथवा नहीं या उसे हीट से इन्सुलेट किया गया हो अथवा नहीं लेकिन यांत्रिक अथवा तापीय उपक्रम से युक्त न हो	7309	15%
30	अधिकतम 300 लीटर की क्षमता का लौह अथवा इस्पात का किसी सामग्री (कम्प्रेस किए हुए अथवा सरलीकृत गैस को छोड़कर) के लिए टैंक, कास्ट, ड्रम, केन, बॉक्स और समान कन्टेनर चाहे उसे लाइन किया गया हो अथवा नहीं या उसे हीट से इन्सुलेट किया गया हो अथवा नहीं लेकिन यांत्रिक अथवा तापीय उपक्रम से युक्त न हो	7310	15%
31	लौह अथवा इस्पात का कम्प्रेस किया हुआ अथवा सरलीकृत गैस के लिए कन्टेनर	7311	15%
32	लौह अथवा इस्पात का स्टेंडिड वायर, रोप, केबल, प्लेटिड बैंड, स्लिंग और उसके समान वस्तु जिसे त्रिचूतीय रूप से इन्सुलेट न किया गया	7312	15%
33	लौह अथवा इस्पात का फेनसिंग के लिए उपयोग किये जाने वाला बार किया हुआ वायर; ट्रिवस्ट किया हुआ हूप अथवा सिंगल प्लेट वायर, बार्स किया हुआ अथवा नहीं और लूज तरीके से ट्रिवस्ट किया हुआ डबल वायर	7313	15%
34	लौह अथवा इस्पात तार का ड्रिल, नेटिंग और फेनसिंग; लौह अथवा इस्पात का विस्तार किया हुआ धातु	7314	15%

35	लौह अथवा इस्पात का चैन और उसका हिस्सा	7315	15%
36	लौह अथवा इस्पात का टैंकर, ग्रेपनेल्म और उसका हिस्सा	7316	15%
37	लौह एवं इस्पात की वस्तुएं	7317	15%
38	लौह एवं इस्पात की वस्तुएं	7318	15%
39	लौह एवं इस्पात की वस्तुएं	7319	15%
40	लौह अथवा इस्पात का स्प्रिंग और स्प्रिंग के लिए लीन्स	7320	15%
41	लौह अथवा इस्पात का स्टोव्स, रेंज, ग्रेड, कूकर (केंद्रीय हिटिंग के लिए सहायक बायलरों के साथ उन वस्तुओं सहित), वारवेक्यूज, ब्रेजियर्स, गैस रिंग, प्लेट वामर्स और समान गैर-विद्युतीय घरेलू उपकरण और उसका हिस्सा	7321	15%
42	लौह अथवा इस्पात का केंद्रीय हिटिंग के लिए रेडियेटर जिसे विद्युतीय रूप से हीट न किया गया हो और उसका हिस्सा; लौह अथवा इस्पात का हेयर हीटर और हॉट एयर वितरक जिसे विद्युतीय रूप से हीट न किया गया हो, फेन अथवा ब्लोअर जो मोटर से चलती हो और उसके हिस्से को शामिल करते हुए	7322	15%
43	लौह अथवा इस्पात का टेबल और समान घरेलू वस्तुएं और उसका हिस्सा	7323	15%
44	लौह अथवा इस्पात का सेनेटरी वेयर और उसको पार्ट्स	7324	15%
45	लौह अथवा इस्पात का अन्य कास्ट सामान	7325	15%
46	लौह अथवा इस्पात का विद्युतीय इस्पात और अन्य वस्तु	7326	15%
47	रेलवे अथवा ट्रामवे पेसेंजर कोच जो स्वयं आगे नहीं बढ़ता हो	8605	50%
48	रेलवे अथवा ट्रामवे माल वेन और वेगेन जो स्वयं आगे नहीं बढ़ता हो	8606	50%
49	रेलवे अथवा ट्रामवे लोकोमोटिव का हिस्सा अथवा रोलिंग स्टॉक जैसे बोगिज, बिसल बोगिज, एक्सेल और फोज्ड किया हुआ पहिया और उसका हिस्सा	8607	50%

विवरणों में शामिल किए गए उत्पाद सांकेतिक हैं, विनिर्दिष्ट एच एम कोड के अंतर्गत सभी उत्पादों को परिशिष्ट के भाग के रूप में शामिल किया गया है।

## परिशिष्ट ख

## लौह और इस्पात उत्पादों का निर्माण करने के लिए पूंजीगत माल की सांकेतिक सूची (जो विस्तृत नहीं है)

क्र. सं.	संयंत्र शॉप	पूंजीगत माल	न्यूनतम घरेलू मूल्यवर्धन आवश्यकता
1	कच्चा माल संभाल प्रणाली	चूर्ण की हुई सामग्री के लिए एप्रोन फीडर, बेरल कप्लिंग, हैवी ड्यूटी वियेरिंग, हाइड्रोलिक डिक्स ब्रेक्स, टैंकर एंड कंटेनर, पाइप कंवेयर के लिए कंवेयर बेल्ट, हार्ड एंगल कंवेयर प्रणाली, क्रशर्स, क्रेन रेल लुब्रिकेशन, चार गरडर ग्राइडर ई ओ टी क्रेन, क्रेन वेइंग प्रणाली, क्रेन एयर कंडीशनिंग, फ्यूड कप्लिंग, 4 लिफ्ट ट्रक्स, हाइड्रोलिक मोटर्स, हाइड्रोलिक सिस्टम, लॉकिंग एसेम्बली (फ्रिक्शन ग्रिप), लोड सेल्स, लेवल सेन्सर्स, पाइप कंवेयर प्रणाली, प्लग/पाडेल फीडर, न्यूमेटिक हुलाई - धना एवं लिन फेस, रिक्लेमर्स, रेडियो रिमोट कंट्रोल, रेल फिक्सिंग व्यवस्था (विशेष), रेपिड/फ्लेड लोडिंग प्रणाली, स्टेर्स, स्पेशल स्क्रीन, स्लिव रिंग वियेरिंग, ट्रिप्लर्स, ट्रांसफर कार, टॉर्स (स्पेशल), वाइब्रेशन, आइसोलेशन प्रणाली (स्प्रिंग डम्पर) वेगन टिप्लर्स, वेगन लोडर	50%
2	मिनिरल बेनिफिकेशन (लौह अयस्क और कोयला) उपकरण	इंडस्ट्रीयल क्रशर्स, ग्राइनिंग मिल, परम्परागत स्क्रीन, स्लूरी पम्पस, हिरेट थिकनर्स, फिल्टर्स, हाइड्रोक्लोन्स	50%

3	कॉक अवेन	कॉक ओवन मिलिका रिफेक्टरी, एन्क्रेज सिस्टम, ब्रंच तरडन के साथ वेस्ट गैस वाल, फ्लेस प्लेट, डोर फ्रेम, डोर बॉडी, माइनर कास्टिंग: गुजनेक, बाल बॉक्स, ए पी लिड, चार्जिंग और इंसपेक्शन होल लिड एंड फ्रेम रिचर्सिंग मंकेनिजम, केंद्रीकृत लूत्रिकेशन प्रणाली हाइड्रोजेट डोर क्लीनिंग तंत्र, कोड कंवेयर सिस्टम, स्क्रिप होइस्ट, डोर लोवरिंग रैक, आइसोलेशन/रिचर्सिंग कॉक्स, II ऑटोमेशन, अवेन मशीन	50%
4	उप-उत्पाद संयंत्र	प्राथमिक गैस कूलर, इलेक्ट्रोस्टैटिक तार प्रेसिपिटेटर, H <sub>2</sub> S, NH <sub>3</sub> और नपथलिन स्कूब्वर, कोम्बी स्ट्रीप्पर, फ्लेशिंग लिक्व पम्प, क्लास किन, क्लाक रियेक्टर, वेस्ट हीट बायलर, डिक्लेटर्स	50%
5	सिंटर संयंत्र उपकरण	पेलेट कार, ड्राइव/डिस्चार्ज इंड स्प्रोकेट एंसेम्बली कवर्ड रेल, स्लाइड रेल, हॉट सिंटर ब्रेकर और गिजली, डिप रेल एंड रनिंग रेल, प्रोसेस फेन के लिए इम्पेलर एंसेम्बली, सिंटर मशीन का ड्राइव एंसेम्बली, उच्च तीव्रता वाला मिक्सर और नोडूलाइजर	50%
6	पेलेट संयंत्र उपकरण	पेलेट कार, ड्राइव/डिस्चार्ज इंड स्प्रोकेट एंसेम्बली कवर्ड रेल, स्लाइड रेल, रनिंग रेल ब्रटिकल रोलर मिल, प्रोसेस फेन के लिए इम्पेलर एंसेम्बली, इनडूरेटिंग मशीन का ड्राइव एंसेम्बली, उच्च तीव्रता वाला मिक्सर, बालिंग डिक्स, सिंगल डेक्स रोलर स्क्रीन एंड डबल डेक्स रोलर स्क्रीन	50%
7	ब्लास्ट फरनेस उपकरण	ब्लेडर बाल के साथ बेल रहित टॉप प्रणाली, एस जी आयरन स्टेव कूलर, कोपर स्टेव कूलर, स्टॉक लेवल इंडिकेटर (रडार टाइप), मड गन, ड्रिलिंग मशीन एंड मेनिपुलेटर, गैस किल्लिंग प्लांट प्रणाली, इसके बाइस-पास वाल सहित टॉप रिक्वरी टूबाइन सिस्टम, डि-ब्रिक्किंग मशीन, रि-रेलिंग उपकरण, पी सी आई प्रणाली, पी सी आई के लिए ग्राइनिंग मिल, स्टॉक लेवल इंडिकेटर, टूयेरे स्टाक एंसेम्बली, वेस्ट हीट रिक्वरी प्रणाली, बी एफ एवं हॉट ब्लास्ट स्टोव प्रौद्योगिकीय वाल, एन्व ब्रंडन प्रोब्स, स्लग ग्रेन्यूलेशन यूनिट, टूयेरे एंड टूयेरे कूलर, टोरपेडो लेडल कार, बी एफ हरथ रिफेक्ट्री	50%
8	डायरेक्ट रिडक्शन प्लांट उपकरण	चार्ज डिस्चार्ज, अपर एंड लोअर सील लेग, रिफोमर एंड रि-क्यूरेटर सिस्टम, बर्डन फिडर्स, टूबो-एक्सपेंडर, प्रोसेस गैस कम्प्रेसर, सील गैस कम्प्रेसर एवं बोटम सील गैस कम्प्रेसर, सील गैस जेनरेटर एवं डायर्स, प्रोसेस गैस हीटर, CO <sub>2</sub> रिमूवल प्लांट	50%
9	वेमिक ऑक्सीजन फर्नेस उपकरण	मुख्य और अनुरक्षण उपकरण जिसमें कंवेटर, गनिंग मशीन, रिफेक्ट्री/स्लग मॉनीटरिंग उपकरण, कंवेटर वेसेल, ट्रनिअन रिंग एंड सम्पेशन प्रणाली, ट्रनिअन बियरिंग और हाउसिंग, कंवेटर बुल गियर यूनिट और टिल्ट ड्राइव सिस्टम, कंवेटर के रोटेरी ज्वाइंट, बोटम स्ट्रिंग सिस्टम, क्लपिंग के साथ लांस बाडी, लांस कोपर टिप्स, ऑक्सीजन ब्लोबिंग/बोटम स्टीरिंग के लिए बाल स्टेशन, सब-लान सिस्टम, प्रोसेस मॉड्यूल अर्थात् प्रोसेस माफ्टवेयर/हार्डवेयर के साथ ऑफ गैस एनेलाइजर, कंटेनर लैब मेजरमेंट प्रोब, स्विच ओवर स्टेशन, प्राइमरी गैस के लिए आई डी फेन, हॉट मेटल और स्टील लेडल, लेडल ट्रांसफर कार, लेडल अनुरक्षण उपकरण, स्लेग पोट, स्लग पोट ट्रांसफर कार, स्क्रैप बॉक्स क्रेप ट्रांसफर कार, लांस करेज, लांस गाइड, क्रेन एंड हाइस्ट, लांस होइस्ट एंड ट्राली, लांस टिल्टिंग उपकरण, लांस को लिफ्ट करने के लिए ट्रेवस, विभिन्न आकर के बंकर, बिन बाइब्रेटर, वेइंग हूपर, अनुरक्षण स्टेण्ड, डी इस्टिंग सक्शन हूड, टीमिंग/एच एम, लेडल रिलाइनिंग स्टैंड, स्टैंड कूलिंग स्टेक इंसपेक्शन उपकरण, हूड ट्रेवर्स करेज, रिफेक्ट्री, बाइपास एवं आइसोलेशन वाल्व, फ्लेयर स्टेक एवं इगनिशन सिस्टम, स्क्रबिंग टोवर सेल - चेट गैस क्लीनिंग सिस्टम, डॉंग हाउस लेडल डायर, लेडल	50%

		प्री-हीटर, लेडल कूलर, फ्यूम कोलेक्शन हूड्स, क्लीन गैस स्टेक, डस्ट सिलो, वेग ब्रिज, स्लग रिट्रैनिंग उपकरण	
10	इलेक्ट्रिक आर्क फर्नेस	फर्नेस प्रोपर (जिसमें फर्नेस लोवर सेल, अपर सेल और रूफ, टिल्टिंग प्लेटफार्म, फर्नेस गेन्ट्री शामिल है) और ट्रांसफार्मर, इलेक्ट्रोड रेगुलेशन प्रणाली, हाइड्रोलिक सिस्टम, रिफैक्ट्री, लेवल I एंड II आटोमेशन सिस्टम के पार्ट्स। एल एफ - वाटर कूल्ड लेडल रूफ, इलेक्ट्रोड मास्ट एंड आमर्स, इलेक्ट्रोड रेगुलेशन सिस्टम, वायर फिडिंग सिस्टम, बोटम इनडरट गैस स्टिरिंग बाल सिस्टम पोरुस प्लग और टॉप लांस के लिए, इमरजेंसी लांसतंत्र, ड्राइव यूनिट के साथ लांस केरेजि सिस्टम, स्वचालित तापक्रम, सेम्पलिंग और बाथ लेबल/ओ2 मेजरमेंट, तापक्रम और आक्सीजन इम्मजन लांस, ड्राइव यूनिट के साथ लांस केरेज सिस्टम, हाइड्रोलिक सिस्टम, रिफैक्ट्री, लेडल रूफ डेल्टा पोरशन, आर एच प्रोपर (जिसमें लेडल ट्रांसफर कार, बेक्यूम वेमेल, वेमेल लिफ्टिंग और लोवरिंग सिस्टम शामिल है, हाइड्रोलिंग सिस्टम, मल्टी फंक्शन लांस, वाल्व रेक्स/स्टेशन, इलेक्ट्रोड क्लेप यूनिट, इलेक्ट्रोड आमर्स का कंडक्टर, वाटर कूल्ड केबल, ए आर स्टेरिंग वाल्व रेक, लांस ट्रांसपोर्ट कार, रिफैक्ट्री लांस, हाइड्रोलिक सिलेंडर, लेडल रूफ लिफ्टिंग सिलेंडर, लूत्रिकेशन प्रणाली, सक्शन हूड, डम्पर, वाइब्रो फीडर, वेडंग होपर, वायर फिडिंग प्रणाली, इलेक्ट्रोड निपिलिंग स्टेड, क्रेन, होइस्ट, तापमान और सेम्पलिंग टिप्स, लेडल स्टैंड, ई एस पी, डिडिंटेग हूड, रिफैक्ट्री, वेग फिल्टर, क्रेन इत्यादि।	50%
11	सतत कास्टिंग उपकरण	लाइले टरेट, लेडल कवर मेनिपुलेटर, लेडल शारउड मेनिपुलेटर, टनडिस कार, कंटिन्यूअस टनडिस टेम्पेचर मेजरमेंट सिस्टम, टनडिस स्टोपर रूड मेकेनिजम, इमरजेंसी कट-आफ गेट, मोल्ड एसेम्बली, नोजल क्लिक चेंज डिवाइस, मोल्ड ओसीलेटर एंड ई एम एस सिस्टम, इलेक्ट्रो-मेगेनेटिक ब्रेकिंग सिस्टम, स्ट्रेड गाइड सेगमेंट, विदड्रावल एंड स्ट्रेघटेनिंग यूनिट (डब्ल्यू एस यू), रोल गेप चेकर इमरजेंसी टार्च कटर, टार्च कटिंग मशीन, डेबरर, मार्किंग मशीन, टेकेनोलोजी कंट्रोल सिस्टम एंड प्रोसेस मोडल, ब्लेक रिफैक्ट्रीज, स्ट्रेड गन्डे सेगमेंट, टनडिश, लाइले कवर, रोलर टेबल एंड आक्सीलिरीज, माल्ड एंड सेगमेंट मेनटेनेस इक्यूपमेंट टनडिस मेनटेनेस इक्यूपमेंट, ई एम बी आर सिस्टम	50%
12	फ्लेट मिल	लार्ज कास्टिंग एंड फाजिग लाइक मिल हाउसिंग, बेड प्लेट्स वर्क्स रोल, बेकअप रोल, इंड स्पिडल्स; रोलर टेबल, बेकअप रोल एंड वर्क रोल चक्स क्वाडलर/टेनशन रिल/अनक्वाइलर, ए जी सी सिलेंडर, शेयर्स, लेवेलेर्स, लाजेर वेल्डर, पेकेजिंग मशीन, नॉन कान्टेक्ट, गेज/प्रोफाइल गेज, एंटी-फ्रिक्शन रोल नेक बियरिंग, आयल फिल्म बियरिंग, गियर बॉक्स, मिल मोटर्स	50%
13	लॉग मिल	मिलम हाउसिंग, बेड प्लेट, वर्क रोल, बेकअप रोल, स्पिनडेल्स; रोलर टेबल, कॉयलर /टेंशन रिल /अनकॉयलर, शेयर्स, बिल्डट वेल्डर, पेकेजिंग मशीन, नान-कान्टेक्ट गॉज/प्रोफाइल गॉज, एंटी-फ्रिक्शन रोल नेक बियरिंग, आयल फिल्म बियरिंग, फिनिशिंग ब्लाक्स, गियर बॉक्स, मिल मोटर	50%

\* परिशिष्ट ख में मर्दे निर्माण करने वाले इस्पात के लिए पूंजीगत सामानों की एक सांकेतिक सूची है। यह सूची विस्तृत नहीं है। इस्पात के निर्माण के लिए सभी पूंजीगत मालों पर 50% की न्यूनतम घरेलू मूल्यवर्धन आवश्यकता के साथ इस नीति के अंतर्गत खरीद बरीयता के लिए विचार किया जाएगा।



**फार्म - 1**

100/- रुपए के स्टाम्प पेपर पर दिए जाने के लिए लौह एवं इस्पात उत्पादों/पूँजीगत मालों में घरेलू मूल्यवर्धन के संबंध में स्व-प्रमाणन शपथ के लिए प्रपत्र :

मैं \_\_\_\_\_ सुपुत्र, सुपुत्री, पत्नी, \_\_\_\_\_ का निवासी \_\_\_\_\_  
एतद् द्वारा निष्ठापूर्वक नीचे दिए गए अनुसार वचन देता हूँ और घोषण करता हूँ :

कि मैं अधिसूचना सं. : \_\_\_\_\_ के माध्यम से जारी किए गए भारत सरकार की नीति के नियम और शर्तों का पालन करने के लिए सहमत होऊंगा।

कि यहां नीचे दी गई सूचना मेरे सर्वोत्तम ज्ञान और विश्वास के अनुसार सही है और मैं घरेलू मूल्यवर्धन का आकलन करने के प्रयोजन से खरीद करने वाली एजेंसी के समक्ष संगत रिकार्ड प्रस्तुत करने का वचन देता हूँ।

कि सभी इनपुट्स के लिए घरेलू मूल्यवर्धन जिसमें उक्त लौह एवं इस्पात उत्पाद शामिल हैं का सत्यापन मेरे द्वारा कर लिया गया है और मैं उसमें किये गये दावों की सत्यता के लिए जिम्मेदार हूँ।

कि इसमें उल्लिखित उत्पाद घरेलू मूल्यवर्धन सही नहीं पाये जाने और मूल्यवर्धन के लिए निर्धारित मानदंडों को पूरा नहीं किये जाने की स्थिति में, घरेलू मूल्यवर्धन का आकलन करने के उद्देश्य से खरीद करने वाली एजेंसी के आकलन के आधार पर मैं 36 महीनों की अवधि के लिए किसी सरकारी निविदा से अयोग्य ठहराया जाऊंगा। इसके अलावा मैं इस प्रकार के आकलन की सभी लागतों का वहन करूंगा।

कि मैंने अधिसूचना संख्या \_\_\_\_\_ जिसमें सरकारी खरीद में घरेलू स्तर पर निर्मित लौह एवं इस्पात उत्पादों को बरीयता दी गई है, में संदर्भित सभी शर्तों का पालन किया है और यह कि खरीद करने वाली एजेंसी को एतद् द्वारा अधिकार दिया जाता है कि वह मेरे ई एम डी को जप्त करे। मैं यह भी वचन देता हूँ कि आकलन की लागत का भुगतान करूंगा और निविदा दस्तावेज में यथा उल्लिखित सभी दण्ड राशि का भुगतान करूंगा।

मैं 8 वर्षों की अवधि के लिए कम्पनी के रिकॉर्ड में निम्नलिखित सूचना रखने के लिए सहमत हूँ और किसी सांविधिक प्राधिकारी को सत्यापन के लिए इसे उपलब्ध कराऊंगा।

- i. बोली लगाने वाले का नाम और ब्यौरा (पंजीकृत कार्यालय, विनिर्माण इकाई का स्थान, कानूनी प्रतिष्ठान की प्रकृति)
- ii. वह तिथि जब यह प्रमाण पत्र जारी किया गया है।
- iii. लौह एवं इस्पात उत्पाद जिसके लिए इस प्रमाण पत्र को प्रस्तुत किया जाता है।
- iv. खरीद करने वाली एजेंसी जिसे यह प्रमाण पत्र प्रस्तुत किया जाता है।
- v. दावा की गई घरेलू मूल्यवर्धन की प्रतिशतता और क्या यह निर्धारित घरेलू मूल्यवर्धन के आरंभिक मूल्य को पूरा करता है।
- vi. विनिर्माता की इकाई का नाम और संपर्क विवरण
- vii. लौह और इस्पात उत्पादों की निवल बिक्री कीमत
- viii. संयंत्र तक भाड़ा, बीमा और रखरखाव
- ix. लौह एवं इस्पात उत्पादों का निर्माण करने के लिए उपयोग की जाने वाली इनपुट इस्पात (आयात किया गया) की सूची और कुल लागत मूल्य।
- x. इनपुट इस्पात जिसकी आपूर्ति घरेलू स्तर पर की जाती है की सूची और कुल लागत
- xi. कृपया यदि इनपुट इन हाऊस नहीं हो तब आपूर्तिकर्ताओं से प्राप्त घरेलू मूल्यवर्धन प्रमाणपत्र संलग्न करें।
- xii. आयात किये गये इनपुट इस्पात के लिए, सी आई एफ मूल्य, शुल्क और करों, पोर्ट पर उतारने से संबंधित प्रभारों और अंतर्देशीय भाड़े की लागत के ब्यौरे के साथ भारतीय पोर्ट पर पहुंच कीमत।

(प्रतिष्ठान/कंपनी का नाम) के लिए और उसकी ओर से

अधिकृत हस्ताक्षरकर्ता (निदेशक बोर्ड द्वारा विधिवत अधिकृत किये जाने के लिए)

<नाम, पदनाम और संपर्क सं. की प्रविष्टि करें>

## MINISTRY OF STEEL

## NOTIFICATION

New Delhi, the 29th May, 2019

**G.S.R. 385(E).**—The revised Policy for providing preference to domestically manufactured Iron & Steel Products in Government procurement is hereby published for general information.

[F. No.3(2)/2018-IDD]

RASIKA CHAUBE, Addl. Secy.

**POLICY FOR PROVIDING PREFERENCE TO DOMESTICALLY MANUFACTURED IRON & STEEL PRODUCTS IN GOVERNMENT PROCUREMENT- REVISED, 2019****1 Background**

- 1.1 This policy provides preference to Domestically Manufactured Iron and Steel Products (DMI&SP) in Government procurement.
- 1.2 The policy is applicable to iron & steel products as provided in Appendix A and capital goods for manufacturing iron & steel products in Appendix B, produced in compliance to prescribed quality standards, as applicable.
- 1.3 The policy is applicable to every Ministry or Department of Government and all agencies/entities under their administrative control and to projects funded by these agencies for purchase of iron & steel products for government projects. However, this policy shall not apply for purchase of iron & steel products with a view to commercial resale or with a view to use in the production of goods for commercial sale.

**2 Definitions**

- 2.1 **Bidder** may be a domestic/ foreign manufacturer of iron & steel or their selling agents/ authorized distributors/ authorized dealers/ authorized supply houses or any other company engaged in the bidding of projects funded by Government agencies.
- 2.2 **Domestically Manufactured Iron & Steel Products (DMI&SP)** are those iron and steel products which are manufactured by entities that are registered and established in India, including in Special Economic Zones (SEZs). In addition, such products shall meet the criteria of domestic minimum value-addition as mentioned in Appendix A.
- 2.3 **Domestic Manufacturer** is a manufacturer of iron & steel products conforming to guidelines in section 7 and confirming to the definition of 'manufacturer' as per Central Excise Act.
- 2.4 **Government** for the purpose of the Policy means Government of India.
- 2.5 **Government agencies** include Government PSUs, Societies, Trusts and Statutory bodies set up by the Government.
- 2.6 **MoS** shall mean Ministry of Steel, Government of India.
- 2.7 **Net Selling Price** shall be the invoiced price excluding net domestic taxes and duties
- 2.8 **Semi-Finished Steel** shall mean Ingots, billet, blooms and slabs, which can be subsequently processed to finished steel.
- 2.9 **Finished Steel** shall mean Flat and Long products, which can be subsequently processed into manufactured items.
- 2.10 **L1** means the lowest tender or the lowest bid or the lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per the tender or other procurement solicitation.
- 2.11 **Margin of purchase preference** means the maximum extent to which the price quoted by a domestic supplier may be above L1 for the purpose of purchase preference. In case of DMI&SP policy, the margin of purchase preference shall be 20% for items in Appendix B.
- 2.12 **Iron & Steel Product(s)** shall mean such iron and steel product(s) which are mentioned in Appendix A.
- 2.13 **Domestic value addition** shall be the net selling price (invoiced price excluding net domestic taxes and duties) minus the landed cost of imported input materials at the manufacturing plant in India (including all customs duties) as a proportion of the net selling price, in percent. The 'domestic value addition' definition shall be in line with the DPIIT (formerly DIPP) guidelines, and shall be suitably amended in case of any changes by DPIIT in the future. For the purpose of this policy document, domestic value addition and local content have been used interchangeably.

### 3 Exclusions

3.1 Waivers shall be granted by the Ministry of Steel to all such Government procurements subject to the below conditions,

3.1.1 Where specific grades of steel are not manufactured in the country, or

3.1.2 Where the quantities as per the demand of the project cannot be met through domestic sources

The exclusion requests shall be submitted to the Standing Committee along with sufficient proof of unavailability of domestically manufactured iron & steel products

### 4 Standing Committee

A Standing Committee under the Ministry of Steel (MoS) to be chaired by the Secretary (Steel), shall be constituted to oversee the implementation of the policy. The Committee shall comprise of experts drawn from Industry / Industry Association / Government Institution or Body / Ministry of Steel (MoS). The said Committee in MoS shall have the mandate for the following:

4.1 Monitoring the implementation of the policy

4.2 Review and notify the list of Iron & Steel products and the domestic value addition requirement criteria as mentioned at Appendix A and Appendix B.

4.3 Issue necessary clarifications for implementation of the policy including grant of exclusions to procuring agencies as per section 3

4.4 Constitute a separate committee to carry out grievance redressal

4.5 The Standing Committee shall submit its recommendations for approval to Ministry of Steel.

### 5 Notifying Iron & Steel Products Procured by Government

5.1 The following guidelines may be used for identifying and notifying the aforementioned products under the policy:

5.1.1 The policy is applicable to iron & steel products as provided in Appendix A and to capital goods for manufacturing iron & steel products in Appendix B.

5.1.2 Appendix A contains list of iron & steel products which are to be exclusively domestically manufactured and cannot be imported without the approval of the Ministry of Steel

5.1.3 Appendix B contains a list (non-exhaustive) of capital goods for which purchase preference shall be provided to domestically manufactured capital goods, if their quoted price falls within 20% of the price quoted for corresponding imported capital good.

5.1.4 The objective of the policy is to notify all iron & steel products which are procured by Government Agencies for government projects and not with a view to commercial resale or with a view to use in the production of products for commercial sale.

5.1.5 The policy is applicable to all projects funded by Ministry or Department of Government and all agencies/entities under their administrative control for purchase of iron & steel products.

5.1.6 The policy shall be applicable to projects where the procurement value of iron and steel products is greater than Rs. 25 crores. The policy shall also be applicable for other procurement (non-project), where annual procurement value of iron and steel products for that Government organization is greater than Rs. 25 crores.

5.1.7 The policy is applicable to purchase of iron & steel products by private agencies for fulfilling an EPC contract and/or any other requirement of Ministry or Department of Government or their PSUs.

5.1.8 Analysis of the availability of various grades of domestic iron and steel products needs to precede for notification under the policy. Only those iron & steel products, in respect of which at least one domestic manufacturer exists, shall be notified. Consultation may be carried out by the Standing Committee.

5.1.9 The policy is applicable to capital goods for manufacturing iron & steel products in Appendix B produced in compliance to prescribed quality standards, as applicable.

5.1.10 Policy for domestic procurement of capital goods for manufacturing iron and steel products is applicable to all public sector steel manufacturers and all agencies/entities under their administrative control for purchase of capital goods for manufacturing iron & steel products, not with a view to commercial resale.

5.1.11 The policy is applicable to purchase of capital goods for manufacturing iron & steel products by private agencies for fulfilling an EPC contract and/or any other requirement of public sector steel manufacturers and all agencies/entities under their administrative control

- 5.1.12 Government agencies which are involved in procurement of iron and steel products, and capital goods for manufacturing of iron and steel products, in cases where the iron and steel products are not mentioned in Appendix A and Appendix B, shall provide description and technical specifications of the product along with prescribed standards to the Standing Committee. The Standing Committee will act as per mandate in section 3 and section 4.
- 5.2 The Ministry of Steel (MoS) would notify iron & steel products along with the minimum prescribed domestic value addition, furnished at Appendix A.
- 5.3 The policy guidelines on capital goods for manufacturing iron & steel products shall be applicable to public sector steel manufacturers for all purchases of capital goods for manufacturing iron & steel products in Appendix B, irrespective of the project size.
- 5.4 Minimum domestic value addition requirement suggested for iron and steel products in Appendix A, and for capital goods for manufacturing iron and steel products in Appendix B have been decided on the basis of factors such as domestic supplier base, number of suppliers and import to consumption ratio.
- 5.5 The domestic value addition requirement norm shall be so calibrated that it reflects the average/above average manufacturing capability of the domestic industry for the iron & steel products at a point of time. This shall be suitably reviewed by the Standing Committee from time to time and amended, if required with the approval of Ministry of Steel.

## **6 Tender procedure for procurement by government and government agencies**

- 6.1 The procuring/ Government agencies shall follow standard procurement procedures, in accordance with instructions of Ministry of Finance and CVC while adhering to DMI&SP. The policy shall come into effect from the date of its notification in all tenders where price bid have not been opened.
- 6.2 The tender document, for procurement of both Goods as well as for EPC contracts, should explicitly outline the qualification criteria for adherence to minimum prescribed domestic value addition by the bidder for iron and steel products and capital goods for manufacturing iron & steel products(as indicated in Appendix A and Appendix B)
- 6.3 In supporting the growth of domestic products, the target of domestic value addition in iron and steel business activities has been set as contained in **Appendix A and Appendix B**.
- 6.4 For iron and steel products in Appendix A, the procurement process shall be open only to the manufacturers / suppliers having the capability of meeting / exceeding the domestic value addition targets. Manufacturers / suppliers not meeting the domestic value addition targets are not eligible to participate in the bidding.
- 6.5 In case of Appendix B items, if in the opinion of the procuring company, the tenders (procured quantity) cannot be divided in the prescribed ratio of 50:50, then they shall have the right to award contract to the eligible domestic manufacturer for quantity not less than 50%, as may be divisible.
- 6.6 In continuation to the above clause, for Appendix B items, if the tendered item is non divisible, (to be included in the tender document by procuring company) the contract can be awarded to the eligible domestic manufacturer for the entire quantity.
- 6.7 In case of Appendix B items, if none of the eligible manufacturers meeting domestic value addition requirements match the L1 bid, the original bidder holding L1 bid shall secure the order for full value of procurement.
- 6.8 The bidders who are selling agents/ authorized distributors/ authorized dealers/ authorized supply houses of the domestic manufacturers of iron & steel products are eligible to bid on behalf of the domestic manufacturers under the policy. However, this shall be subject to the following conditions:
- 6.8.1 The bidder shall furnish the authorization certificate issued by the domestic manufacturer for selling domestically manufactured iron & steel products.
- 6.8.2 In case the procurement is covered under Appendix A of the DMI&SP policy, the bidder shall furnish the Affidavit of self-certification issued by the domestic manufacturer to the procuring agency declaring that the iron & steel products is domestically manufactured in terms of the domestic value addition prescribed.
- 6.8.3 In case the procurement is covered under Appendix B of the DMI&SP policy, the bidder shall furnish the certification issued by the statutory auditor to domestic manufacturer declaring that the capital goods to be used in Iron & Steel industry are domestically manufactured in terms of the domestic value addition prescribed.
- 6.8.4 It shall be the responsibility of the bidder to furnish other requisite documents required to be issued by the domestic manufacturer to the procuring agency as per the policy.

**7 Domestic value addition requirement**

- 7.1 Minimum domestic value addition requirement to qualify the product as a domestically manufactured iron & steel product or a Capital good are mentioned in Appendix A and B.
- 7.2 Domestic value addition shall be the net selling price (invoiced price excluding net domestic taxes and duties) minus the landed cost of imported input materials at the manufacturing plant in India (including all customs duties) as a proportion of the net selling price, in per cent.
- 7.2.1 In case the iron & steel products are made using domestic input steel (semi-finished/ finished steel), invoices of purchases from the actual domestic producers along with quantities purchased and the other related documents must be furnished to the procuring Government agency.
- 7.2.2 In case the iron & steel products have imported input steel, the invoices of purchases from the actual producers along with quantities purchased and the other related documents must be furnished separately. To derive the extent of domestic value addition, the weighted average of both (imported & domestic) input steel shall be considered to ensure that the minimum stipulated domestic value addition requirement of the policy is complied with.
- 7.3 It is recommended that each bidder participating in the tender process should calculate the domestic value addition using the below formula below so as to ensure the domestic value addition claimed is consistent with the minimum stipulated domestic value addition requirement of the policy.

**For Iron and Steel products**

*% Domestic value addition*

$$= \frac{\text{Net selling price of final product} - \text{Landed cost of imported iron or steel at plant}}{\text{Net selling price of final product}} \times 100\%$$

**For Capital Goods**

*% Domestic value addition*

$$= \frac{\text{Net selling price of final product} - \text{Landed cost of imported input materials at plant}}{\text{Net selling price of final product}} \times 100\%$$

**8 Certification and audit**

- 8.1 For products in Appendix A, each domestic manufacturer shall furnish the Affidavit of self-certification to the procuring Government agency declaring that the iron & steel products are domestically manufactured in terms of the domestic value addition prescribed. For capital goods in Appendix B, the bidder shall furnish the certification issued by the statutory auditor to the domestic manufacturer declaring that the capital goods are domestically manufactured in terms of the domestic value addition prescribed. The bidders who are sole selling agents / authorized distributors / authorized dealers / authorized supply houses of the domestic manufacturers of iron & steel products are eligible to bid on behalf of domestic manufacturers under the policy. The bidder shall furnish the Affidavits of self-certification issued by the domestic manufacturers and the certifications issued by the statutory auditors, to the procuring agency declaring that the iron & steel products are domestically manufactured in terms of the domestic value addition prescribed. The Affidavit of self-certification shall be furnished in **Form I** attached to these guidelines.
- 8.2 It shall be the responsibility of the domestic manufacturer to ensure that the products so claimed are domestically manufactured in terms of the domestic value addition prescribed for the product. The bidder shall also be required to provide a domestic value addition certificate on half-yearly basis (Sep 30 and Mar 31), duly certified by the Statutory Auditors of the domestic manufacturer, that the claims of domestic value addition made for the product during the preceding 6 months are in accordance with the Policy. Such certificate shall be filed within 60 days of commencement of each half year, to the concerned Government agencies and shall continue to be filed till the completion of supply of the said products.
- 8.3 The procuring agency shall accept the Affidavit of self-certification regarding domestic value addition in a steel product submitted by a bidder. It shall not normally be the responsibility of procuring agency to verify the correctness of the claim. The onus of demonstrating the correctness of the same shall be on the bidder when asked to do so.
- 8.4 In case a complaint is received by the procuring agency or the concerned Government Agency against the claim

of a bidder regarding domestic value addition in iron & steel products, the procuring agency shall have full rights to inspect and examine all the related documents and take a decision. In case any clarification is needed, matter may be referred to MoS with a request for technical assistance.

- 8.5 Any complaint referred to the Government Agency shall be disposed off within 4 weeks of the reference along with submission of all necessary documents. The bidder shall be required to furnish the necessary documentation in support of the domestic value addition claimed in iron & steel products to the Government Agency within 2 weeks of filing the complaint.
- 8.6 In case, the matter is referred to the Ministry of Steel, the grievance redressal committee setup under the MoS shall dispose of the complaint within 4 weeks of its reference and receipt of all documents from the bidder after taking in consideration, the view of the Government Agency. The bidder shall be required to furnish the necessary documentation in support of domestic value addition claimed in iron & steel products to the grievance redressal committee under MoS within 2 weeks of the reference of the matter. If no information is furnished by the bidder, the grievance redressal committee may take further necessary action, in consultation with Government Agency to establish bonafides of claim.
- 8.7 The cost of assessing the prescribed extent of domestic value addition shall be borne by the procuring agency if the domestic value addition is found to be correct as per the certificate. However, if it is found that the domestic value addition as claimed is incorrect, the cost of assessment will be payable by the bidder who has furnished an incorrect certificate. The manner of enforcing the same shall be defined in the tender document.

#### 9 Sanctions

- 9.1 Each Government Agency shall clearly define the penalties, in case of wrong declaration by the bidder of the prescribed domestic value addition, in the tender document. The penalties may include forfeiting of the EMD, other financial penalties and blacklisting of such manufacturer/ service provider.
- 9.2 In case of reference of any complaint to MoS by the concerned bidder, there would be a complaint fee of Rs. 10 Lakh or 0.2 % of the value of the DMI&SP being procured (subject to a maximum of Rs. 20 Lakh), whichever is higher, to be paid by Demand Draft deposited with the grievance redressal committee under MoS along with the complaint by the complainant. In case, the complaint is found to be incorrect, the Government Agency reserves the right to forfeit the said amount. In case, the complaint is found to be substantially correct, deposited fee of the complainant would be refunded without any interest.

#### 10 Implementation monitoring by Ministry of Steel

- 10.1 The policy provisions shall be applicable for a period of 5 years from the date of publication. The policy period may further be extended at the discretion of Ministry of Steel.
- 10.2 MoS shall be the nodal ministry to monitor the implementation of the policy.
- 10.3 All applicable agencies under DMI&SP policy shall ensure implementation of the policy and shall annually, in the month of June, send a declaration indicating the extent of compliance to the policy and reasons for noncompliance thereof, during the preceding financial year.

#### Reference to Ministry of Steel

In case of a question whether an item being procured is a DMI&SP to be covered under the policy, the matter would be referred to the Ministry of Steel for clarification.

#### Appendix A - Exclusive for domestically manufactured products

Sl. No.	Indicative list of Iron & Steel Products	Applicable HS code	Minimum domestic value addition requirement
1	Flat-rolled products of iron or non alloy steel, of a width of 600 mm or more, hot rolled, not clad, plated or coated	7208	50%
2	Flat-rolled products of iron or non alloy steel, of a width of 600 mm or more, cold rolled (cold-reduced), not clad, plated or coated	7209	50%
3	Flat-rolled products of iron or non alloy steel, of a width of 600 mm or more, clad, plated or coated	7210	50%

4	Flat-rolled products of iron or non alloy steel, of a width of less than 600 mm, not clad, plated or coated	7211	35%
5	Flat-rolled products of iron or non alloy steel, of a width of less than 600 mm, clad, plated or coated	7212	35%
6	Bars and rods, hot-rolled, in irregularly wound coils, of iron or non-alloy steel	7213	35%
7	Other bars and rods of iron or non alloy steel, not further worked than forged, hot rolled, hot-drawn or hot-extruded, but including those twisted after rolling	7214	35%
8	Other bars and rods of iron or non alloy steel	7215	35%
9	Angles, shapes and sections of iron or non-alloy steel	7216	35%
10	Wire of iron or non-alloy steel	7217	50%
11	Flat-rolled products of stainless steel, of a width of 600 mm or more	7219	50%
12	Flat-rolled products of stainless steel, of a width of less than 600 mm	7220	50%
13	Other bars and rods of stainless steel; angles, shapes and sections of stainless steel	7222	50%
14	Wire of other alloy steel	7229	35%
15	Rails, railway or tramway track construction material of iron or steel	7302	50%
16	Tubes, pipes and hollow profiles, of cast iron	7303	35%
17	Tubes, pipes and hollow profiles, seamless, of iron (other than cast iron) or steel	7304	35%
18	Other tubes and pipes (for example, welded, riveted or similarly closed), having circular cross-sections, the external diameter of which exceeds 406.4 mm, of iron or steel	7305	35%
19	Other tubes, pipes and hollow profiles (for example, open seam or welded, riveted or similarly closed), of iron or steel	7306	35%
20	Tube or pipe fittings (for example, connectors/couplings, elbow sleeves), of iron or steel	7307	35%
21	Bars and rods, hot-rolled, in irregularly wound coils, of stainless steel	7221	35%
22	Wire of stainless steel	7223	35%
23	Flat-rolled products of other alloy steel, of a width of 600 mm or more, including electrical steel	7225	35%
24	Flat-rolled products of other alloy steel, of a width of less than 600 mm, including electrical steel	7226	35%
25	Bars and rods, hot-rolled, in irregularly wound coils, of other alloy steel	7227	15%
26	Other bars and rods of other alloy steel; angles, shapes and sections, of other alloy steel; hollow drill bars and rods, of alloy or nonalloy steel	7228	35%
27	Sheet piling of iron or steel, whether or not drilled, punched or made from assembled elements; welded angles, shapes and sections, of iron or steel	7301	15%
28	Structures (excluding prefabricated buildings of heading 9406) and parts of structures	7308	15%
29	Reservoirs, tanks, vats and similar containers for any material (other than compressed or liquefied gas), of iron or steel, of a capacity exceeding 300 whether or not lined or heatinsulated, but not fitted with mechanical or Thermal equipment	7309	15%

30	Tanks, casks, drums, cans, boxes and similar containers, for any material (other than compressed or liquefied gas), of iron or steel, of a capacity not exceeding 300 L, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	7310	15%
31	Containers for compressed or liquefied gas, of iron or steel	7311	15%
32	Stranded wire, ropes, cables, plaited bands, slings and the like, of iron or steel, not electrically insulated	7312	15%
33	Barbed wire of iron or steel; twisted hoop or single flat wire, barbed or not, and loosely twisted double wire, of a kind used for fencing, of iron or steel	7313	15%
34	Grill, netting and fencing, of iron or steel wire; expanded metal of iron or steel	7314	15%
35	Chain and parts thereof, of iron or steel	7315	15%
36	Anchors, grapnels and parts thereof, of iron or steel	7316	15%
37	Articles of iron and steel	7317	15%
38	Articles of iron and steel	7318	15%
39	Articles of iron and steel	7319	15%
40	Springs and leaves for springs, of iron or steel	7320	15%
41	Stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel	7321	15%
42	Radiators for central heating, not electrically heated, and parts thereof, of iron or steel; air heaters and hot air distributors, not electrically heated, incorporating a motor-driven fan or blower, and parts thereof, of iron or steel	7322	15%
43	Tables and similar household articles and parts thereof, of iron or steel	7323	15%
44	Sanitary ware and parts thereof, of iron or steel	7324	15%
45	Other cast articles of iron or steel	7325	15%
46	Electrical steel and other articles of iron or steel	7326	15%
47	Railway or tramway passenger coaches, not self-propelled	8605	50%
48	Railway or tramway goods vans and wagons, not self-propelled	8606	50%
49	Parts of railway or tramway locomotives or rolling-stock; such as bogies, bissel-bogies, axles and forged wheels, and parts thereof	8607	50%

Products included in descriptions are indicative; all products under the specified HS codes are included as part of the appendix

#### Appendix B

#### Indicative list of capital goods(non-exhaustive) for manufacturing iron & steel products

Sl. No.	Plant shop	Capital goods	Minimum domestic value addition requirement
1	Raw material handling system	Apron feeder, barrel couplings, heavy duty bearings, hydraulic disc brakes, tanker & container for powdered materials, conveyor belt for pipe conveyors, high angle conveyor system, crushers, crane rail lubrication system, four girder EOT Crane, crane weighing system, crane air conditioning, fluid couplings, fork lift trucks, hydraulic motors, hydraulic system, locking assembly (friction grip), load cells, level sensors, pipe	50%



		conveyor system, plough/ paddle feeder, pneumatic transportation - dense & lean phase, reclaimers, radio remote control, rail fixing arrangements (special), rapid/ flood loading system, stackers, special screen, slew ring bearings, tippers, transfer cars, tongs (special), vibration, isolation system (spring damper), wagon tippers, wagon loaders	
2	Mineral beneficiation (iron ore and coal) equipment	Industrial crushers, grinding mills, conventional screens, slurry pumps, hire thickeners, filters, hydroclones	50%
3	Coke oven	Coke Oven Silica Refractory, Anchorage System, Waste gas valve with branch pipe, Flash Plate, Door Frame, door body, Minor Casting: Gooseneck, Valve box, AP Lid, Charging & inspection hole lid and frame Reversing mechanism, Centralised lubrication system, Hydrojet Door Cleaning Mechanism, Spillage code conveyor system, skip hoist, Door Lowering Rack, Isolation/ Reversing Cocks, Level II automation, Oven machines	50%
4	By-product plant	Primary Gas Cooler, Electrostatic Tar Precipitator, H <sub>2</sub> S, NH <sub>3</sub> & Naphthalene Scrubber, Combi Stripper, Flushing Liquor Pump, Claus Kiln, Claus reactors, Waste Heat Boilers, Decanters	50%
5	Sinter plant equipment	Pallet car, Drive/discharge end Sprocket assembly, Curved rail, Slide rails, Hot sinter breaker and Grizzly, Dip rail & running rail, Impeller assembly for Process fan, Drive assembly of Sinter machine, Hi-intensity Mixer & Noduliser	50%
6	Pellet plant equipment	Pallet car, Drive/discharge end Sprocket assembly, Curved rail, Slide rails, running rail, Vertical roller mill, Impeller assembly for Process fan, Drive assembly of Indurating machine, Hi-intensity Mixer, Balling disc, Single deck roller screen and Double deck roller screen	50%
7	Blast furnace equipment	Bell less top system with Bleeder valve, SG Iron stove coolers, Copper stove coolers, Stock level indicator (Radar Type), Mud gun, Drilling machine and Manipulator, Gas Cleaning Plant system, Top Recovery Turbine system including its by-pass valve, De-bricking Machine, Re-railing equipment, PCI system, Grinding mill for PCI, Stock level indicator, Tuyere Stock assembly, Waste Heat Recovery system, BF & Hot Blast Stoves Technological Valves, Above Burden probes, Slag granulation unit, Tuyere & Tuyere cooler, Torpedo Ladle Car, BF hearth refractory	50%
8	Direct reduction plant equipment	Charge distributor, Upper & lower seal leg, Reformer & Re-cuperator system, Burden feeders, Turbo-expander, Process Gas Compressor, Seal gas compressors & bottom seal gas compressors, Seal gas generators & driers, Process Gas Heater, CO <sub>2</sub> removal plant	50%
9	Basic oxygen furnace equipment	Main and Maintenance equipment comprising of converter, gunning machine, Refractory/ slag monitoring device, converter vessel, trunnion ring and suspension system, trunnion bearings and housing, Converter bull gear unit and tilt drive system, Rotary joint for converter, bottom stirring system, Lance body with clamping, Lance copper tips, Valve stations for oxygen blowing/ bottom stirring, Sub-lance system, Off gas analyzer with process module i.e. Process software/ hardware, container lab Measurement probes, Switch over station, ID fan for primary gas, Hot metal and steel ladle, Ladle Transfer car, Ladle maintenance equipment, Slag pot, Slag pot transfer car, Scrap boxes, Scrap Transfer car, Lance carriage, Lance guide, Crane & hoist, Lance hoist & trolley, Lance tilting device, Traverse for lifting lances, Bunker of various sizes, Bin Vibrator, Weighing Hopper, Maintenance stands, De dusting suction hood, Teeming/HM, ladle relining stands, Stand Cooling stack inspection device, Hood traverse carriage, Refractories, Bypass & isolation valves, Flare stack & ignition system, Scrubbing tower	50%

		shell - Wet gas cleaning system, Dog house, Ladle drier, ladle pre-heater, ladle cooler, Fume collection hoods, Clean gas stack, Dust silo, Weigh Bridge, Slag retaining device	
10	Electric arc furnace	Furnace proper (includes furnace lower shell, upper shell and roof, Tilting platform, Furnace Gantry) and transformer, Electrode regulation system, Hydraulic system, Refractories, Parts of Level I & Level II Automation system. LF - water cooled ladle roof, electrode mast and arms, electrode regulating system, wire feeding system, Bottom inert gas stirring Valve stand for porous plug and top lance, Emergency lance mechanism, Lance carriage system with drive unit, Automatic temperature, sampling & bath level / O2 measurement, Temp. & oxygen immersion lance, lance carriage system with drive unit, Hydraulic system, Refractories, Ladle roof Delta portion, RH proper (includes Ladle transfer car, vacuum vessel, Vessel lifting & lowering system. Hydraulic system, Multi Function lance, Valve racks/station, Electrode clamp unit, conductor of electrode arms, water cooled cable, A R stirring valve rack, lance transport car, Refractory lance, Hydraulic cylinder, Ladle roof lifting cylinder, Lubrication system, Suction hood, damper, Vibro feeder, weighing hopper, wire feeding system, Electrode nippling stand, Cranes, hoist, Temperature & sampling tips, ladle stands, ESP, Deducing hoods, Refractories, bag filter, Cranes etc.	50%
11	Continuous casting equipment	Ladle turret, ladle cover manipulator, Ladle Shroud manipulator, tundish car, Continuous tundish temperature measurement system, Tundish stopper rod mechanism, emergency cut-off gate, mould assembly, Nozzle quick change device, mould oscillator and EMS system. Electro-Magnetic braking system, Strand guide segment, Withdrawal & Straightening unit (WSU), Roll gap checker, Emergency torch cutter, Torch cutting machine, Deburrer, Marking machine, Technological control system & process models, Black Refractories, strand gunde segment, tundish, ladle cover, roller tables & auxiliaries, mould& segment maintenance equipments, tundish maintenance equipments, EMBR system	50%
12	Flat product mills	Large castings and forgings like mill housing, bed plates, work rolls, backup rolls, end spindles; roller tables, backup roll and work roll chucks, coilers / tension reels / uncoilers, AGC cylinders, shears, levelers, lazer welders, packaging machines, non-contact gauges / profile gauges, anti-friction roll neck bearings, oil film bearings, gear boxes, mill motors	50%
13	Long product mills	Mill housing, bed plates, work rolls, backup rolls, spindles; roller tables, coilers / tension reels / uncoilers, shears, billet welder, packaging machines, non-contact gauges / profile gauges, anti-friction roll neck bearings, oil film bearings, finishing blocks, gear boxes, mill motors	50%

*\*Items in appendix B are an indicative list of capital goods for manufacturing steel, the list is not exhaustive. All capital goods for steel manufacturing shall be considered for purchase preference under the policy with a minimum domestic value addition requirement of 50%*

#### Form-1

**Format for Affidavit of Self Certification regarding Domestic Value Addition in Iron & Steel Products/capital goods to be provided on Rs.100/- Stamp Paper Date:**

I \_\_\_\_\_ S/o, D/o, W/o, \_\_\_\_\_ Resident of \_\_\_\_\_ hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the policy of Government of India issued vide Notification No: \_\_\_\_\_.

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring agency (ies) for the purpose of assessing the domestic value addition.

That the domestic value addition for all inputs which constitute the said iron & steel products has been verified by me and I am responsible for the correctness of the claims made therein.

That in the event of the domestic value addition of the product mentioned herein is found to be incorrect and not meeting the prescribed value-addition criteria, based on the assessment of procuring agency (ies) for the purpose of assessing the domestic value-addition, I will be disqualified from any Government tender for a period of 36 months. In addition, I will bear all costs of such an assessment.

That I have complied with all conditions referred to in the Notification No. \_\_\_\_\_ wherein preference to domestically manufactured iron & steel products in Government procurement is provided and that the procuring agency (ies) is hereby authorized to forfeit and my EMD. I also undertake to pay the assessment cost and pay all penalties as specified in the tender document.

I agree to maintain the following information in the Company's record for a period of 8 years and shall make this available for verification to any statutory authority.

- i. Name and details of the Bidder (Registered Office, Manufacturing unit location, nature of legal entity)
- ii. Date on which this certificate is issued
- iii. Iron & Steel Products for which the certificate is produced
- iv. Procuring agency to whom the certificate is furnished
- v. Percentage of domestic value addition claimed and whether it meets the threshold value of domestic value addition prescribed
- vi. Name and contact details of the unit of the manufacturer (s)
- vii. Net Selling Price of the iron & steel products
- viii. Freight, insurance and handling till plant
- ix. List and total cost value of input steel (imported) used to manufacture the iron & steel products
- x. List and total cost of input steel which are domestically sourced.
- xi. Please attach domestic value addition certificates from suppliers, if the input is not in house.
- xii. For imported input steel, landed cost at Indian port with break-up of CIF value, duties & taxes, port handling charges and inland freight cost.

**For and on behalf of (Name of firm / entity)**

Authorized signatory (To be duly authorized by the Board of Directors)

<Insert Name, Designation and Contact No.>



**भारत का राजपत्र**  
**The Gazette of India**

सी.जी.-डी.एल.-अ.-04012021-224171  
CG-DL-E-04012021-224171

असाधारण  
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (i)  
PART II—Section 3—Sub-section (i)

प्राधिकार से प्रकाशित  
PUBLISHED BY AUTHORITY

सं. 1]  
No. 1]

नई दिल्ली, शुक्रवार, जनवरी 1, 2021/पौष 11, 1942  
NEW DELHI, FRIDAY, JANUARY 1, 2021/PAUSHA 11, 1942

इस्पात मंत्रालय

अधिसूचना

नई दिल्ली, 31 दिसम्बर, 2020

**सा.का.नि. 1(अ).**—सरकारी प्रापण में देशी निर्मित लोहा और इस्पात उत्पादों को प्राथमिकता प्रदान करने हेतु नीति (डीएमआई एंड एसपी नीति) - परिशोधित, 2019 में संशोधनों को आम सूचना के लिए एतद्वारा प्रकाशित किया जाता है:

\*सं. S-13026/1/-2020-आईडीडी

इस्पात मंत्रालय

आईडी प्रभाग

उद्योग भवन,

नई दिल्ली 31 दिसंबर, 2020

**विषय :** सरकारी खरीद में घरेलू निर्मित लोहा और इस्पात उत्पादों को प्राथमिकता प्रदान करने की नीति-परिशोधित, 2019-में संशोधन/परिवर्धन

सरकारी खरीदमें स्वदेशी निर्मित लोहा और इस्पात उत्पादों को प्राथमिकता प्रदान करने की नीति-परिशोधित, 2019-(डीएमआईएंडएसपी परिशोधित, 2019) में निम्नलिखित संशोधन/ परिवर्धन तत्काल प्रभाव से लागू हैं। ये संशोधन/

परिवर्धन ऐसी निविदा या खरीद पर लागू नहीं होंगे जिनके लिए निविदा आमंत्रित करने वाला नोटिस अथवा अन्य प्रकार का खरीद अधिवाचन इस अधिसूचना के जारी होने से पूर्व जारी हुआ है।

1 - संशोधन:तालिका 1

क्रम सं.	डीएमआईएंडएसपी परिशोधित 2019 ,में मौजूदा खंड	डीएमआईएंडएसपी परिशोधित 2019 ,में संशोधित खंड
1	<p><b>खंड 1.3:</b></p> <p>यह नीति सरकार के प्रत्येक मंत्रालय अथवा विभाग और उनके प्रशासनिक नियंत्रण के अधीन सभी एजेंसियों/ प्रतिष्ठानों तथा सरकारी परियोजनाओं के वास्ते लौह एवं इस्पात उत्पादों की खरीद के लिए इन एजेंसियों द्वारा वित्तपोषित परियोजनाओं पर लागू है। हालांकि, यह नीति वाणिज्यिक पुनः बिक्री के उद्देश्य से अथवा वाणिज्यिक बिक्री के लिए वस्तुओं के उत्पादन में उपयोग करने के उद्देश्य से लौह एवं इस्पात उत्पादों की खरीद पर लागू नहीं होगी।</p>	<p><b>खंड 1.3:</b></p> <p>यह नीति सरकार के प्रत्येक मंत्रालय अथवा विभाग और उनके प्रशासनिक नियंत्रण के अधीन सभी एजेंसियों/ प्रतिष्ठानों तथा सरकारी परियोजनाओं के वास्ते लौह एवं इस्पात उत्पादों की खरीद के लिए इन एजेंसियों द्वारा वित्त पोषित परियोजनाओं पर लागू है। केन्द्रीय क्षेत्र की सभी योजनाएं (सीएस)/ केन्द्रीय प्रायोजित योजनाएं (सीएसएस) जिनके लिए राज्यों और स्थानीय निकायों द्वारा खरीद की जाती है, इस नीति की परिधि में आएंगी यदि उस परियोजना/योजना को भारत सरकार द्वारा पूर्णतया/ अंशतः वित्तपोषित किया जाता है।</p> <p>हालांकि, यह नीति वाणिज्यिक पुनः बिक्री के उद्देश्य से अथवा वाणिज्यिक बिक्री के लिए वस्तुओं के उत्पादन में उपयोग करने के उद्देश्य से लौह एवं इस्पात उत्पादों की खरीद पर लागू नहीं होगी।</p>
2	<p><b>खंड 2.13:</b></p> <p>घरेलू मूल्यवर्धन निवल बिक्री कीमत(निवलघरेलू करों और शुल्कों को छोड़कर बीजक कीमत) होगी जिससे प्रतिशत में निवल बिक्री कीमत के एक अनुपात के रूप में भारत में निर्माण संयंत्र(सभी सीमा शुल्कों सहित) में आयात की गई इनपुट सामग्री की पहुंच लागत घटाई गई हो, 'घरेलू मूल्यवर्धन'परिभाषा डी पी आई आई टी (पूर्व में डी आई पी पी) के दिशानिर्देशों के अनुरूप होगी और उसमें भविष्य में डी पी आई आई टी द्वारा परिवर्तन किये जाने की स्थिति में उपयुक्त रूप से संशोधन किया जायेगा। इस नीति दस्तावेज के प्रयोजन के लिए घरेलूमूल्यवर्धन और स्थानीय विषय वस्तु का उपयोग एक दूसरे के स्थान पर किया गया है।</p>	<p><b>खंड 2.13:</b></p> <p>घरेलू मूल्यवर्धन का तात्पर्य है- भारत में वर्धित मूल्य की राशि जो खरीदी/बेची जाने वाली वस्तुओं का कुल मूल्य होगा (निवल घरेलू अप्रत्यक्ष करों को छोड़कर)- खरीदी/बेची जाने वाली वस्तुओं के कुल मूल्य के समानुपात के रूप में प्रतिशत में मद में आयातित सामग्री का मूल्य (सभी सीमा शुल्कों सहित)। घरेलू मूल्यवर्धन निवल बिक्री कीमत (निवल घरेलू करों और शुल्कों को छोड़कर बीजक कीमत) होगी जिससे प्रतिशत में निवल बिक्री कीमत के एक अनुपात के रूप में भारत में निर्माण संयंत्र (सभी सीमा शुल्कों सहित) में आयात की गई इनपुट सामग्री की पहुंच लागत घटाई गई हो, 'घरेलू मूल्यवर्धन'परिभाषा डी पी आई आई टी (पूर्व में डी आई पी पी) के दिशानिर्देशों के अनुरूप होगी और उसमें भविष्य में डी पी आई आई टी द्वारा परिवर्तन किये जाने की स्थिति में उपयुक्त रूप से संशोधन किया जायेगा। इस नीति दस्तावेज के प्रयोजन के लिए घरेलू मूल्यवर्धन और स्थानीय विषय वस्तु का उपयोग एक दूसरे के स्थान पर किया गया है।</p>

<p><b>3 खंड 5.1.5</b></p> <p>यह नीति सरकार के मंत्रालय अथवा विभाग के द्वारा वित्त-पोषित सभी परियोजनाओं और उनके प्रशासनिक नियंत्रण के अधीन सभी एजेंसियों/ प्रतिष्ठानों पर लौह एवं इस्पात उत्पादों की खरीद के लिए लागू है।</p>	<p><b>खंड 5.1.5</b></p> <p>यह नीति सरकार के मंत्रालय अथवा विभाग के द्वारा वित्त पोषित सभी परियोजनाओं और उनके प्रशासनिक नियंत्रण के अधीन सभी एजेंसियों/ प्रतिष्ठानों पर लौह एवं इस्पात उत्पादों की खरीद के लिए लागू है। केन्द्रीय क्षेत्र की सभी योजनाएं (सीएस)/ केन्द्रीय प्रायोजित योजनाएं (सीएसएस) जिनके लिए राज्यों और स्थानीय निकायों द्वारा खरीद की जाती है, इस नीति की परिधि में आएंगी यदि उस परियोजना/योजना को भारत सरकार द्वारा पूर्णतया/ अंशतः वित्तपोषित किया जाता है।</p>
<p><b>4 खंड 5.1.6</b></p> <p>यह नीति उन परियोजनाओं पर लागू होगी जहां लौह एवं इस्पात उत्पादों का खरीद मूल्य 25 करोड़ रुपए से अधिक होता हो। यह नीति अन्य खरीद (गैर परियोजना) के लिए भी लागू होगी जहां उस सरकारी संगठन के लिए लौह एवं इस्पात उत्पादों का वार्षिक खरीद मूल्य 25 करोड़ रुपए से अधिक होता हो।</p>	<p><b>खंड 5.1.6</b></p> <p>यह नीति उन परियोजनाओं पर लागू होगी जहां लौह एवं इस्पात उत्पादों (डीएमआई एंड एसपी नीति का परिशिष्ट-क) का खरीद मूल्य 5लाख रुपए से अधिक होता हो। यह नीति अन्य खरीद (गैर परियोजना) के लिए भी लागू होगी जहां उस सरकारी संगठन के लिए लौह एवं इस्पात उत्पादों का वार्षिक खरीद मूल्य 5 लाख करोड़ रुपए से अधिक होता हो। तथापि, प्रापण इकाइयों द्वारा इस बात को सुनिश्चित किया जाएगा कि इस नीति के प्रावधानों से बचने के प्रयोजनार्थ खरीद का विभाजन न किया जाए।</p>
<p><b>5 खंड 7.2</b></p> <p>घरेलू मूल्यवर्धन निवल बिक्री कीमत (निवल घरेलू करों और शुल्कों को छोड़कर बीजककीमत) होगी जिसमें से प्रतिशत में निवल बिक्री कीमत के एक अनुपात के रूप में भारत में निर्माण करने वाले संयंत्र में आयात की गई इनपुट सामग्री की पहुंच लागत (सभी सीमा शुल्कों को शामिल करते हुए) घटाई जायेगी।</p>	<p><b>खंड 7.2</b></p> <p>घरेलू मूल्यवर्धन का तात्पर्य है- भारत में वर्धित मूल्य की राशि जो खरीदी/बेची जाने वाली वस्तुओं का कुल मूल्य होगा (निवल घरेलू अप्रत्यक्ष करों को छोड़कर)- खरीदी/बेची जाने वाली वस्तुओं के कुल मूल्य के समानुपात के रूप में प्रतिशत में मद में आयातित सामग्री का मूल्य (सभी सीमा शुल्कों सहित)।</p>
<p><b>6 खंड 7.3</b></p> <p>यह सिफारिश की जाती है कि निविदा की प्रक्रिया में भाग लेने वाले प्रत्येक बोली लगाने वाले को नीचे दिए गए सूत्र का उपयोग करते हुए घरेलू मूल्यवर्धन की गणना करनी चाहिए ताकि यह सुनिश्चित किया जा सके कि दावा किये गये घरेलू मूल्यवर्धन इस नीति के न्यूनतम निर्धारित घरेलू मूल्यवर्धन के अनुरूप है।</p> <p>लौह एवं इस्पात उत्पादों के लिए % घरेलू मूल्यवर्धन</p> <p>अंतिम उत्पाद की निवल बिक्री कीमत- संयंत्र में आयात किये गये लौह अथवा इस्पात की पहुंच लागत----- X100%</p>	<p><b>खंड 7.3</b></p> <p>यह सिफारिश की जाती है कि प्रापण करने वाली सरकारी एजेंसी/ निविदा की प्रक्रिया में भाग लेने वाले प्रत्येक बोली लगाने वाले को नीचे दिए गए सूत्र का उपयोग करते हुए घरेलू मूल्यवर्धन की गणना करनी चाहिए ताकि यह सुनिश्चित किया जा सके कि दावा किये गये घरेलू मूल्यवर्धन इस नीति के न्यूनतम निर्धारित घरेलू मूल्यवर्धन के अनुरूप है।</p> <p>लौह एवं इस्पात उत्पादों तथा पूंजीगत माल के लिए % घरेलू मूल्यवर्धन</p> <p>खरीदी/बेची जाने वाली वस्तु का कुल मूल्य (निवल घरेलू अप्रत्यक्ष करों को छोड़कर - मद में आयातित सामग्री का मूल्य (सभी सीमा शुल्कों सहित) ----- -----X100%</p>

अंतिम उत्पाद की निबल ब्रिकी कीमत पूँजीगत माल के लिए % घरेलू मूल्यवर्धन अंतिम उत्पाद की निबल ब्रिकी कीमत- संयंत्र में आयात किये गये इनपुट सामग्री की पहुंच लागत-----X 100% अंतिम उत्पाद की निबल ब्रिकी कीमत	खरीदी/बेची जाने वाली वस्तु का कुल मूल्य
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II डीएमआईएंडएसपी परिशोधित, 2019 के परिशिष्ट क में निम्नलिखित संशोधन किया जाता है:- जहां कहीं न्यूनतम घरेलू मूल्य वर्धन आवश्यकता कॉलम के अंतर्गत डीएमआईएंडएसपी परिशोधित, 2019 के परिशिष्ट क में 15% का न्यूनतम घरेलू मूल्य वर्धन विनिर्दिष्ट होगा, वहां उसे 20% न्यूनतम घरेलू मूल्यवर्धन से प्रतिस्थापित कर दिया जाएगा (परिशोधित परिशिष्ट-क संलग्न है)

### III- परिवर्धन/सन्निवेशन: तालिका 2

क्रम सं	डीएमआईएंडएसपी परिशोधित, 2019 में शामिल/जोड़े गये खंड
1	<p><b>खण्ड 5.1.13 को खण्ड 5.1.12 के नीचे निम्नवत जोड़ा जाता है:</b></p> <p>खण्ड 5.1.13: लोहे और इस्पात उत्पादों की खरीद से संबंधित निविदाओं के लिए कोई वैश्विक निविदा इन्क्वायरी (जीटीई) आमंत्रित नहीं की जाएगी (डीएमआई और एसपी नीति का परिशिष्ट-क)। लोहे और इस्पात उत्पादों के विनिर्माण जिनका अनुमानित मूल्य 200 करोड़ रु तक हो, (डीएमआई और एसपी नीति के परिशिष्ट- ख) के लिए पूँजीगत सामानों की खरीद से संबंधित निविदाओं के लिए कोई वैश्विक निविदा इन्क्वायरी (जीटीई) व्यय विभाग द्वारा यथा नाम-निर्दिष्ट सक्षम प्राधिकारी के अनुमोदन के अलावा आमंत्रित नहीं की जाएगी,</p>
2	<p><b>खंड 6.9 को खंड 6.8 के नीचे निम्नवत जोड़ा जाता है:</b></p> <p><b>खंड 6.9: निविदाओं और अन्य खरीद अधियाचनों में विनिर्देशन:</b></p> <p><b>6.9.1</b> प्रत्येक क्रय इकाई यह सुनिश्चित करेगी कि किसी भी निविदा या अधियाचन में निर्धारित पिछले अनुभव के संबंध में पात्रता की शर्तों हेतु अन्य देशों में आपूर्ति के प्रमाण या निर्यात के प्रमाण की आवश्यकता नहीं है।</p> <p><b>6.9.2</b> क्रय इकाईयाँ यह देखने का प्रयास करेंगी कि पात्रता की शर्तें, जैसे टर्नओवर, उत्पादन क्षमता और वित्तीय ताकत जैसे मामलों में वैसे स्थानीय आपूर्तिकर्ता का अनुचित अपवर्जन नहीं होता है जो आपूर्तिकर्ता की गुणवत्ता या साख संबंधी पात्रता सुनिश्चित करने के लिए जो आवश्यक है, उससे परे अन्यथा पात्र होंगे।</p> <p><b>6.9.3</b> क्रय इकाईयाँ, इस नीति के जारी होने के 2 महीने के भीतर ऊपर उप-पैराग्राफ 6.9.1 और 6.9.2 के संदर्भ में सभी मौजूदा पात्रता मानदंडों और शर्तों की समीक्षा करेंगी।</p> <p><b>6.9.4</b> यदि इस्पात मंत्रालय इस बात से संतुष्ट है कि लौह और इस्पात उत्पादों के भारतीय आपूर्तिकर्ताओं को प्रतिबंधात्मक निविदा शर्तों के कारण किसी भी विदेशी सरकार द्वारा खरीद में भाग लेने और / या प्रतिस्पर्धा करने की अनुमति नहीं है, जिसका भारतीय कंपनियों को प्रतिबंधित करने पर प्रत्यक्ष या अप्रत्यक्ष प्रभाव पड़ता है, जैसे कि प्रापण देश में पंजीकरण, प्रापण देश इत्यादि में विशिष्ट मूल्य की परियोजना का निष्पादन इत्यादि। यदि उपयुक्त समझा जाएगा तो उस देश के बोलीदाताओं को इस्पात मंत्रालय से संबंधित उस वस्तु तथा/ या अन्य वस्तुओं की खरीद के लिए पात्रता से प्रतिबंधित या अपवर्जित किया जा सकता है।</p> <p><b>6.9.5</b> ऊपर उप-पैरा 6.9.4 के प्रयोजन से, किसी आपूर्तिकर्ता या बोलीदाता को उस देश से माना जाएगा यदि (i) इकाई को उस देश में निगमित किया गया है, या (ii) उसकी शेयरधारिता या इकाई का प्रभावी नियंत्रण उस देश से किया जाता है; या (iii) आपूर्ति की जा रही वस्तु के मूल्य का 50% से अधिक उस देश में शामिल किया गया है। भारतीय आपूर्तिकर्ताओं का अर्थ उन संस्थाओं से होगा जो भारत के संबंध में इनमें से किसी भी मानदंड को पूरा करते हैं। किसी देश की 'इकाई' (एन्टिटी) शब्द का अर्थ वहीं होगा जो डीपीआईआईटी की एफडीआई नीति के तहत समय-समय पर यथा संशोधित के अंतर्गत है।</p>

3	<p>खंड 6.10 को खंड 6.9 के नीचे निम्नवत जोड़ा जाता है:</p> <p><b>खंड 6.10:</b> यदि घरेलू आपूर्तिकर्ताओं के खिलाफ प्रतिबंधात्मक या भेदभावपूर्ण शर्तों को बोली दस्तावेजों में शामिल किया जाता है, तो उस के लिए जिम्मेदारी तय करने के लिए खरीद (इसके प्रशासनिक नियंत्रणाधीन किसी ईकाई द्वारा खरीद सहित) करने वाले प्रशासनिक विभाग द्वारा जांच शुरू की जाएगी। तत्पश्चात्, संबंधित प्रावधानों के तहत खरीद संस्थाओं के अधिकारियों के खिलाफ उचित, प्रशासनिक या अन्यथा कार्रवाई की जाएगी। ऐसी सभी कार्रवाई की सूचना डीएमआई और एसपी नीति के तहत स्थायी समिति को भेजी जाएगी।</p>
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संशोधित परिशिष्ट क - घरेलू स्तर पर निर्मित उत्पादों के लिए विशिष्ट रूप से

क्र. सं.	लौह एवं इस्पात उत्पादों की सांकेतिक सूची	लागू एच एस कोड	न्यूनतम घरेलू मूल्यवर्धन आवश्यकता
1	600 मि. मी. अथवा उससे अधिक की चौड़ाई वाले लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, हॉट रोल्ड, न ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7208	50%
2	600 मि. मी. अथवा उससे अधिक की चौड़ाई वाले लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, कोल्ड रोल्ड (कोल्ड - कम किया हुआ), न ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7209	50%
3	600 मि. मी. अथवा उससे अधिक की चौड़ाई वाले लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7210	50%
4	600 मि. मी. से कम की चौड़ाई वाले लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, न ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7211	35%
5	600 मि. मी. कम की चौड़ाई का लौह अथवा गैर एलॉय इस्पात का फ्लेट रोल उत्पाद, ढका हुआ, प्लेट लगाया हुआ अथवा कोट किया हुआ	7212	35%
6	लौह एवं गैर एलॉय इस्पात का अनियमित रूप से ऎंठा हुआ क्वाइल में बार्स और रॉड, हॉट रोल्ड	7213	35%
7	लौह अथवा गैर एलॉय इस्पात के अन्य बार्स और रॉड्स जिसे फोर्ज किए जाने की तुलना में आगे अधिक वर्क नहीं किया हुआ, हॉट रोल्ड, हॉट ड्रॉन अथवा हॉट एक्सट्रूडेड परंतु रोलिंग के बाद उसे टिक्विस्ट किये जाने सहित	7214	35%
8	लौह अथवा गैर एलॉय इस्पात का अन्य बार्स एंड रॉड्स	7215	35%
9	लौह अथवा गैर एलॉय इस्पात का एंगल, शेष और सेक्शन्स	7216	35%
10	लौह अथवा गैर एलॉय इस्पात का तार	7217	50%
11	600 मि. मी. अथवा उससे अधिक की चौड़ाई का स्टेनलैस इस्पातका फ्लेट रोल्ड इस्पात	7219	50%
12	600 मि. मी. से कम की चौड़ाई का स्टेनलैस इस्पातका फ्लेट रोल्ड इस्पात	7220	50%
13	स्टेनलैस स्टील का अन्य बार्स और रॉड्स; स्टेनलैस स्टील का एंगल शेष और सेक्शन्स	7222	50%
14	अन्य एलॉय इस्पात का तार	7229	35%
15	लौह अथवा इस्पात को रेल, रेलवे अथवा ट्रामवे ट्रेक निर्माण सामग्री	7302	50%



16	कास्ट लौह का ट्यूब, पाइप और होलो पाइप	7303	35%
17	लौह (कास्ट आयरन को छोड़कर) अथवा इस्पात का ट्यूब पाइप और होलो प्रोफाइल, सीमलैस	7304	35%
18	लौह अथवा इस्पात का सर्कुलर क्रॉस सेक्शन वाले अन्य ट्यूब और पाइप (उदाहरण के लिए, वेल्ड किया हुआ, रिबेट किया हुआ अथवा समान रूप से बंद किया गया हुआ), जिसकी बाहरी त्रिज्या 406.4 मि. मी. से अधिक हो	7305	35%
19	लौह अथवा इस्पात के अन्य ट्यूब, पाइप और होलो प्रोफाइल (उदाहरण के लिए ओपन सीन अथवा वेल्ड किया हुआ, रिबेट किया हुआ अथवा समान रूप से बंद किया गया हुआ)	7306	35%
20	लौह अथवा इस्पात का ट्यूब अथवा पाइप फिटिंग (उदाहरण के लिए, कनेक्टर/ कप्लिंग, एल्बो स्लीव्स)	7307	35%
21	स्टेनलैस स्टील का अनियमित रूप से ऎंठा हुआ क्वाइल में बार्स और रॉड, हॉट रोल्ड	7221	35%
22	स्टेनलैस स्टील का वायर	7223	35%
23	इलेक्ट्रिकल स्टील सहित 600 मि. मी. अथवा उससे अधिक की चौड़ाई वाले अन्य एलॉय स्टील का फ्लेट रोल्ड इस्पात	7225	35%
24	इलेक्ट्रिकल स्टील सहित 600 मि. मी. से कम की चौड़ाई वाले अन्य एलॉय स्टील का फ्लेट रोल्ड इस्पात	7226	35%
25	अन्य एलॉय स्टील का अनियमित रूप से ऎंठा हुआ क्वाइल में बार्स और रॉड, हॉट रोल्ड	7227	20%
26	अन्य एलॉय स्टील का अन्य बार्स और रॉड्स; अन्य एलॉय स्टील का एंगल, शेप्स और सेक्शन्स; एलॉय अथवा नॉन एलॉय स्टील का होलो ड्रिल बार्स और रॉड्स	7228	35%
27	लौह अथवा इस्पात की शीट पाइलिंग, चाहे ड्रिल किया हुआ हो अथवा नहीं, चाहे पंच किया हुआ हो अथवा नहीं, चाहे असेम्बल किये हुए तत्वों से बना हुआ हो अथवा नहीं; लौह अथवा इस्पात का वेल्ड किया हुआ एंगल, शेप और सेक्शन्स	7301	20%
28	स्ट्रक्चर्स (9406 के शीर्ष का प्रीफेब्रिकेटिड भवनों को छोड़कर) और स्ट्रक्चर्स का हिस्सा	7308	20%
29	300 से अधिक क्षमता का लौह अथवा इस्पात का किसी सामग्री (कम्प्रेस किए हुए अथवा सरलीकृत गैस को छोड़कर) के लिए भंडार, टैंक, वैट और समान कन्टेनर चाहे उसे लाइन किया गया हो अथवा नहीं या उसे हीट से इन्सुलेट किया गया हो अथवा नहीं लेकिन यांत्रिक अथवा तापीय उपक्रम से युक्त न हो	7309	20%
30	अधिकतम 300 लीटर की क्षमता का लौह अथवा इस्पात का किसी सामग्री (कम्प्रेस किए हुए अथवा सरलीकृत गैस को छोड़कर) के लिए टैंक, कास्ट, ड्रम, केन, बॉक्स और समान कन्टेनर चाहे उसे लाइन किया गया हो अथवा नहीं या उसे हीट से इन्सुलेट किया गया हो अथवा नहीं लेकिन यांत्रिक अथवा तापीय उपक्रम से युक्त न हो	7310	20%
31	लौह अथवा इस्पात का कम्प्रेस किया हुआ अथवा सरलीकृत गैस के लिए कन्टेनर	7311	20%

32	लौह अथवा इस्पात का स्टेडिड वायर, रोप, केबल, प्लेटिड बैंड, स्लिंग और उसके समान वस्तु जिसे विद्युतीय रूप से इन्सुलेट न किया गया	7312	20%
33	लौह अथवा इस्पात का फेनसिंग के लिए उपयोग किये जाने वाला बार किया हुआ वायर; ट्विस्ट किया हुआ हूप अथवा सिंगल फ्लेट वायर, बार्स किया हुआ अथवा नहीं और लूज तरीके से ट्विस्ट किया हुआ डबल वायर	7313	20%
34	लौह अथवा इस्पात तार का ड्रील, नेटिंग और फेनसिंग; लौह अथवा इस्पात का विस्तार किया हुआ धातु	7314	20%
35	लौह अथवा इस्पात का चैन और उसका हिस्सा	7315	20%
36	लौह अथवा इस्पात का टैंकर, ग्रेपनेल्स और उसका हिस्सा	7316	20%
37	लौह एवं इस्पात की वस्तुएं	7317	20%
38	लौह एवं इस्पात की वस्तुएं	7318	20%
39	लौह एवं इस्पात की वस्तुएं	7319	20%
40	लौह अथवा इस्पात का स्प्रिंग और स्प्रिंग के लिए लीन्स	7320	20%
41	लौह अथवा इस्पात का स्टोव्स, रेंज, ग्रेड, कूकर (केंद्रीय हिटिंग के लिए सहायक बायलरों के साथ उन वस्तुओं सहित), बारबेक्यूज, ब्रेजियर्स, गैस रिंग, प्लेट वामर्स और समान गैर-विद्युतीय घरेलू उपकरण और उसका हिस्सा	7321	20%
42	लौह अथवा इस्पात का केंद्रीय हिटिंग के लिए रेडियेटर जिसे विद्युतीय रूप से हीट न किया गया हो और उसका हिस्सा; लौह अथवा इस्पात का हेयर हीटर और हॉट एयर वितरक जिसे विद्युतीय रूप से हीट न किया गया हो, फेन अथवा ब्लोअर जो मोटर से चलती हो और उसके हिस्से को शामिल करते हुए	7322	20%
43	लौह अथवा इस्पात का टेबल और समान घरेलू वस्तुएं और उसका हिस्सा	7323	20%
44	लौह अथवा इस्पात का सेनेटरी वेयर और उसके पार्ट्स	7324	20%
45	लौह अथवा इस्पात का अन्य कास्ट सामान	7325	20%
46	लौह अथवा इस्पात का विद्युतीय इस्पात और अन्य वस्तु	7326	20%
47	रेलवे अथवा ट्रामवे पैसेंजर कोच जो स्वयं आगे नहीं बढ़ता हो	8605	50%
48	रेलवे अथवा ट्रामवे माल वेन और वेगेन जो स्वयं आगे नहीं बढ़ता हो	8606	50%
49	रेलवे अथवा ट्रामवे लोकोमोटिव का हिस्सा अथवा रोलिंग स्टॉक जैसे बोगिज, बिसल बोगिज, एक्सेल और फोज्ड किया हुआ पहिया और उसका हिस्सा	8607	50%

विवरणों में शामिल किए गए उत्पाद सांकेतिक हैं, विनिर्दिष्ट एच एस कोड के अंतर्गत सभी उत्पादों को परिशिष्ट के भाग के रूप में शामिल किया गया है।"

[फा. सं. एस-13026/1/2020-आईडीडी]

रसिका चौबे, अपर सचिव

**MINISTRY OF STEEL  
NOTIFICATION**

New Delhi, the 31st December, 2020

**G.S.R. 1(E).**—The amendments in the Policy for providing preference to domestically manufactured Iron & Steel products in Government procurement (DMI&SP Policy)—Revised, 2019 is hereby published for general information.

"No. S-13026/1/2020- IDD

Ministry of Steel

ID Division

Udyog Bhawan,

New Delhi 31<sup>st</sup> December, 2020

**Sub.: Amendments / additions to the Policy for Providing Preference to Domestically Manufactured Iron & Steel Products in Government Procurement - revised, 2019**

The following amendments / additions to the Policy for Providing Preference to Domestically Manufactured Iron & Steel Products in Government Procurement - revised, 2019 (DMI&SP revised, 2019) are applicable with immediate effect. These amendments / additions shall not apply to any tender or procurement for which notice inviting tender or other form of procurement solicitation has been issued before the issue of this notification.

**I - Amendments: Table 1**

Sl. No.	Existing Clause in DMI&SP revised, 2019	Amended Clause in DMI&SP revised, 2019
1	<p><b>Clause 1.3:</b> The policy is applicable to every Ministry or Department of Government and all agencies/entities under their administrative control and to projects funded by these agencies for purchase of iron &amp; steel products for government projects. However, this policy shall not apply for purchase of iron &amp; steel products with a view to commercial resale or with a view to use in the production of goods for commercial sale.</p>	<p><b>Clause 1.3:</b> The policy is applicable to every Ministry or Department of Government and all agencies/entities under their administrative control and to projects funded by these agencies for purchase of iron &amp; steel products for government projects. <u>All Central Sector Schemes (CS)/Centrally Sponsored Schemes (CSS) for which procurement is made by States and Local Bodies, would come within the purview of this Policy, if that project / scheme is fully / partly funded by Government of India.</u> However, this policy shall not apply for purchase of iron &amp; steel products with a view to commercial resale or with a view to use in the production of goods for commercial sale.</p>
2	<p><b>Clause 2.13:</b> Domestic value addition shall be the net selling price (invoiced price excluding net domestic taxes and duties) minus the landed cost of imported input materials at the manufacturing plant in India (including all customs duties) as a proportion of the net selling price, in percent. The 'domestic value addition' definition shall be in line with the DPIIT (formerly DIPP) guidelines, and shall be suitably amended in case of any changes by DPIIT in the future. For the purpose of this policy document, domestic value addition and local content have been used interchangeably.</p>	<p><b>Clause 2.13:</b> Domestic value addition means - <u>amount of value added in India which shall be the total value of the item to be procured / sold (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value of the item to be procured / sold, in percent.</u> The 'domestic value addition' definition shall be in line with the DPIIT (formerly DIPP) guidelines, and shall be suitably amended in case of any changes by DPIIT in the future. For the purpose of this policy document, domestic value addition and local content have been used interchangeably.</p>

3	<p><b>Clause 5.1.5</b> The policy is applicable to all projects funded by Ministry or Department of Government and all agencies/ entities under their administrative control for purchase of iron &amp; steel products.</p>	<p><b>Clause 5.1.5:</b> The policy is applicable to all projects funded by Ministry or Department of Government and all agencies/ entities under their administrative control for purchase of iron &amp; steel products. <u>All Central Sector Schemes (CS)/Centrally Sponsored Schemes (CSS) for which procurement is made by States and Local Bodies, would come within the purview of this Policy, if that project / scheme is fully / partly funded by Government of India.</u></p>
4	<p><b>Clause 5.1.6:</b> The policy shall be applicable to projects where the procurement value of iron and steel products is greater than Rs. 25 crores. The policy shall also be applicable for other procurement (non-project), where annual procurement value of iron and steel products for that Government organization is greater than Rs. 25 crores.</p>	<p><b>Clause 5.1.6</b> The policy shall be applicable to projects where the procurement value of iron and steel products (Appendix - A of the DMI&amp;SP Policy) is greater than Rs. 5 lakhs. The policy shall also be applicable for other procurements (non-project), where annual procurement value of iron and steel products for that Government organization is greater than Rs. 5 lakhs. However, it shall be ensured by procuring entities that procurement is not split for the purpose of avoiding the provisions of this policy.</p>
5	<p><b>Clause 7.2:</b> Domestic value addition shall be the net selling price (invoiced price excluding net domestic taxes and duties) minus the landed cost of imported input materials at the manufacturing plant in India (including all customs duties) as a proportion of the net selling price, in per cent.</p>	<p><b>Clause 7.2:</b> Domestic value addition means - amount of value added in India which shall be the total value of the item to be procured / sold (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value of the item to be procured / sold, in percent.</p>
6	<p><b>Clause 7.3:</b> It is recommended that each bidder participating in the tender process should calculate the domestic value addition using the below formula below so as to ensure the domestic value addition claimed is consistent with the minimum stipulated domestic value addition requirement of the policy.</p> <p><b>For iron and steel products</b></p> <p><b>% domestic value addition</b></p> <p><i>Net selling price of final product - landed cost of imported iron or steel at the plant</i>----- ----- X 100 %</p> <p><i>Net selling price of final product</i></p> <p><b>For capital goods</b></p> <p><b>% domestic value addition</b></p> <p><i>Net selling price of final product - landed cost of imported iron or steel at the plant</i>----- ----- X 100 %</p> <p><i>Net selling price of final product</i></p>	<p><b>Clause 7.3:</b> It is recommended that procuring Government agency / bidder participating in the tender process should calculate the domestic value addition using the below formula so as to ensure that the domestic value addition claimed is consistent with the minimum stipulated domestic value addition requirement of the policy.</p> <p><b>For iron and steel products &amp; capital goods</b></p> <p><b>% domestic value addition</b></p> <p><i>Total value of the item to be procured / sold (excluding net domestic indirect taxes) - the value of imported content in the item (including all customs duties)</i> ----- ----- X 100 %</p> <p><i>Total value of the item to be procured / sold</i></p>

**II - Following amendment is made to the Appendix A of the DMI&SP revised, 2019 :-** Wherever minimum domestic value addition of **15%** is specified in the Appendix - A of the DMI&SP revised, 2019 under the column Minimum domestic value addition requirement, same shall be replaced with **20%** minimum domestic value addition). (Revised Appendix - A is attached)

**III - Additions / Insertions: Table 2**

Sl. No.	Added / Inserted Clause in DMI&SP revised, 2019
1	<p>Clause 5.1.13 is inserted below Clause 5.1.12 as:</p> <p><b>Clause 5.1.13:</b> No Global Tender Enquiry (GTE) shall be invited for tenders related to procurement of iron and steel products (Appendix-A of the DMI&amp;SP Policy). No Global Tender Enquiry (GTE) shall be invited for tenders related to procurement of Capital Goods for manufacturing iron &amp; steel products (Appendix- B of the DMI&amp;SP Policy) having estimated value upto Rs. 200 Crore except with the approval of competent authority as designated by Department of Expenditure.</p>
2	<p>Clause 6.9 is inserted below Clause 6.8 as:</p> <p><b>Clause 6.9: Specifications in Tenders and other procurement solicitations:</b></p> <p><b>6.9.1</b> Every procuring entity shall ensure that the eligibility conditions in respect of previous experience fixed in any tender or solicitation do not require proof of supply in other countries or proof of exports.</p> <p><b>6.9.2</b> Procuring entities shall endeavour to see that eligibility conditions, including on matters like turnover, production capability and financial strength do not result in unreasonable exclusion of local supplier' who would otherwise be eligible, beyond what is essential for ensuring quality or creditworthiness of the supplier.</p> <p><b>6.9.3</b> Procuring entities shall, within 2 months of the issue of this policy review all existing eligibility norms and conditions with reference to sub-paragraphs 6.9.1 and 6.9.2 above.</p> <p><b>6.9.4</b> If Ministry of Steel is satisfied that Indian suppliers of iron and steel products are not allowed to participate and/ or compete in procurement by any foreign government due to restrictive tender conditions which have direct or indirect effect of barring Indian companies such as registration in the procuring country, execution of project of specific value in the procuring country etc., it may, if deemed appropriate, restrict or exclude bidders from that country from eligibility for procurement of that item and/ or other items relating to Ministry of Steel.</p> <p><b>6.9.5</b> For the purpose of sub-paragraph 6.9.4 above, a supplier or bidder shall be considered to be from a country if (i) the entity is incorporated in that country, or (ii) a majority of its shareholding or effective control of the entity is exercised from that country; or (iii) more than 50% of the value of the item being supplied has been added in that country. Indian suppliers shall mean those entities which meet any of these tests with respect to India. The term 'entity' of a country shall have the same meaning as under the FDI Policy of DPIIT as amended from time to time.</p>
3	<p>Clause 6.10 is inserted below Clause 6.9 as:</p> <p><b>Clause 6.10:</b> In case restrictive or discriminatory conditions against domestic suppliers are included in bid documents, an inquiry shall be conducted by the Administrative Department undertaking the procurement (including procurement by any entity under its administrative control) to fix responsibility for same. Thereafter, appropriate action, administrative or otherwise, shall be taken against erring officials of procurement entities under relevant provisions. Intimation on all such action shall be sent to the Standing Committee under the DMI&amp;SP Policy.</p>

**IV - Revised Appendix A - Exclusive for domestically manufactured products**

Sl. No	Indicative list of Iron & Steel Products	Applicable HS code	Minimum domestic value addition requirement
1	Flat-rolled products of iron or non alloy steel, of a width of 600 mm or more, hot rolled, not clad, plated or coated	7208	50%
2	Flat-rolled products of iron or non alloy steel, of a width of 600	7209	50%

	mm or more, cold rolled (cold-reduced), not clad, plated or coated		
3	Flat-rolled products of iron or non alloy steel, of a width of 600 mm or more, clad, plated or coated	7210	50%
4	Flat-rolled products of iron or non alloy steel, of a width of less than 600 mm, not clad, plated or coated	7211	35%
5	Flat-rolled products of iron or non alloy steel, of a width of less than 600 mm, clad, plated or coated	7212	35%
6	Bars and rods, hot-rolled, in irregularly wound coils, of iron or non-alloy steel	7213	35%
7	Other bars and rods of iron or non alloy steel, not further worked than forged, hot rolled, hot-drawn or hot-extruded, but including those twisted after rolling	7214	35%
8	Other bars and rods of iron or non alloy steel	7215	35%
9	Angles, shapes and sections of iron or non-alloy steel	7216	35%
10	Wire of iron or non-alloy steel	7217	50%
11	Flat-rolled products of stainless steel, of a width of 600 mm or more	7219	50%
12	Flat-rolled products of stainless steel, of a width of less than 600 mm	7220	50%
13	Other bars and rods of stainless steel; angles, shapes and sections of stainless steel	7222	50%
14	Wire of other alloy steel	7229	35%
15	Rails, railway or tramway track construction material of iron or steel	7302	50%
16	Tubes, pipes and hollow profiles, of cast iron	7303	35%
17	Tubes, pipes and hollow profiles, seamless, of iron (other than cast iron) or steel	7304	35%
18	Other tubes and pipes (for example, welded, riveted or similarly closed), having circular cross-sections, the external diameter of which exceeds 406.4 mm, of iron or steel	7305	35%
19	Other tubes, pipes and hollow profiles (for example, open seam or welded, riveted or similarly closed), of iron or steel	7306	35%
20	Tube or pipe fittings (for example, connectors/couplings, elbow sleeves), of iron or steel	7307	35%
21	Bars and rods, hot-rolled, in irregularly wound coils, of stainless steel	7221	35%
22	Wire of stainless steel	7223	35%
23	Flat-rolled products of other alloy steel, of a width of 600 mm or more, including electrical steel	7225	35%
24	Flat-rolled products of other alloy steel, of a width of less than 600 mm, including electrical steel	7226	35%
25	Bars and rods, hot-rolled, in irregularly wound coils, of other alloy steel	7227	20%

26	Other bars and rods of other alloy steel; angles, shapes and sections, of other alloy steel; hollow drill bars and rods, of alloy or nonalloy steel	7228	35%
27	Sheet piling of iron or steel, whether or not drilled, punched or made from assembled elements; welded angles, shapes and sections, of iron or steel	7301	20%
28	Structures (excluding prefabricated buildings of heading 9406) and parts of structures	7308	20%
29	Reservoirs, tanks, vats and similar containers for any material (other than compressed or liquefied gas), of iron or steel, of a capacity exceeding 300 whether or not lined or heatinsulated, but not fitted with mechanical or Thermal equipment	7309	20%
30	Tanks, casks, drums, cans, boxes and similar containers, for any material (other than compressed or liquefied gas), of iron or steel, of a capacity not exceeding 300 L, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	7310	20%
31	Containers for compressed or liquefied gas, of iron or steel	7311	20%
32	Stranded wire, ropes, cables, plaited bands, slings and the like, of iron or steel, not electrically insulated	7312	20%
33	Barbed wire of iron or steel; twisted hoop or single flat wire, barbed or not, and loosely twisted double wire, of a kind used for fencing, of iron or steel	7313	20%
34	Grill, netting and fencing, of iron or steel wire; expanded metal of iron or steel	7314	20%
35	Chain and parts thereof, of iron or steel	7315	20%
36	Anchors, grapnels and parts thereof, of iron or steel	7316	20%
37	Articles of iron and steel	7317	20%
38	Articles of iron and steel	7318	20%
39	Articles of iron and steel	7319	20%
40	Springs and leaves for springs, of iron or steel	7320	20%
41	Stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel	7321	20%
42	Radiators for central heating, not electrically heated, and parts thereof, of iron or steel; air heaters and hot air distributors, not electrically heated, incorporating a motor-driven fan or blower, and parts thereof, of iron or steel	7322	20%
43	Tables and similar household articles and parts thereof, of iron or steel	7323	20%
44	Sanitary ware and parts thereof, of iron or steel	7324	20%
45	Other cast articles of iron or steel	7325	20%

46	Electrical steel and other articles of iron or steel	7326	20%
47	Railway or tramway passenger coaches, not self-propelled	8605	50%
48	Railway or tramway goods vans and wagons, not self-propelled	8606	50%
49	Parts of railway or tramway locomotives or rolling-stock, such as bogies, bissel-bogies, axles and forged wheels, and parts thereof	8607	50%

*Products included in descriptions are indicative; all products under the specified HS codes are included as part of the appendix."*

[F. No. S-13026/1/2020-IDD]

RASIKA CHAUBE, Addl. Secy.



**POLICY FOR PROVIDING PREFERENCE TO DOMESTICALLY MANUFACTURED IRON  
& STEEL PRODUCTS IN GOVERNMENT PROCUREMENT (TO BE SUBMITTED ON BIDDER'S  
LETTERHEAD) SELF-CERTIFICATE**

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To,  
M/s Talcher Fertilizers Limited

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SUB:  
TENDER NO:

Dear Sir,

This has reference to "Policy for providing Preference to Domestically Manufactured Iron & Steel Products in Government Procurement" issued by Ministry of Steel, Govt. of India, vide their revised notification "The Gazette of India, Notification No. 385 (E) dated 29.05.2019".

We confirm that we will obtain Affidavit of Self Certification of Domestic value addition in Iron & Steel Products from manufacturer before supply of iron and steel products required under the tender/bidding document.

Sign & Stamp of bidder

**SECTION-III**

**INSTRUCTION TO BIDDERS**

**[TO BE READ IN CONJUNCTION WITH BIDDING DATA  
SHEET (BDS)]**

## **SECTION-III**

### **INSTRUCTION TO BIDDERS**

#### **INDEX**

##### **[A] GENERAL:**

1. SCOPE OF BID
2. ELIGIBLE BIDDERS
3. BIDS FROM CONSORTIUM
4. ONE BID PER BIDDER
5. COST OF BIDDING
6. SITE-VISIT

##### **[B] BIDDING DOCUMENTS:**

7. CONTENTS OF BIDDING DOCUMENTS
8. CLARIFICATION OF TENDER DOCUMENTS
9. AMENDMENT OF BIDDING DOCUMENTS

##### **[C] PREPARATION OF BIDS:**

10. LANGUAGE OF BID
11. DOCUMENTS COMPRISING THE BID
12. BID PRICES
13. GST (CGST & SGST/ UTGST or IGST )
14. BID CURRENCIES
15. BID VALIDITY
16. EARNEST MONEY DEPOSIT/BID SECURITY
17. PRE-BID MEETING
18. FORMAT AND SIGNING OF BID
19. ZERO DEVIATION & REJECTION CRITERIA
20. E-PAYMENT

##### **[D] SUBMISSION OF BIDS:**

21. SUBMISSION, SEALING AND MARKING OF BIDS
22. DEADLINE FOR SUBMISSION OF BIDS
23. LATE BIDS
24. MODIFICATION AND WITHDRAWAL OF BIDS

##### **[E] BID OPENING AND EVALUATION:**

25. EMPLOYER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS
26. BID OPENING
27. CONFIDENTIALITY
28. CONTACTING THE EMPLOYER
29. EXAMINATION OF BIDS AND DETERMINATION OF RESPONSIVENESS
30. CORRECTION OF ERRORS
31. CONVERSION TO SINGLE CURRENCY FOR COMPARISON OF BIDS
32. EVALUATION AND COMPARISON OF BIDS
33. COMPENSATION FOR EXTENDED STAY
34. PURCHASE PREFERENCE

**[F] AWARD OF CONTRACT:**

35. AWARD
36. NOTIFICATION OF AWARD / FAX OF ACCEPTANCE [FOA]
37. SIGNING OF AGREEMENT
38. CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT
39. PROCEDURE FOR ACTION IN CASE CORRUPT/FRAUDULENT/COLLUSIVE/COERCIVE PRACTICES
40. PUBLIC PROCUREMENT POLICY FOR MICRO AND SMALLENTERPRISE
41. AHR ITEMS
42. VENDOR EVALUATION PROCEDURE
43. INCOME TAX & CORPORATE TAX
44. DISPUTE RESOLUTION MECHANISM
45. DISPUTES BETWEEN CPSE'S/GOVERNMENT DEPARTMENT'S/ ORGANIZATIONS
46. INAM-PRO (PLATFORM FOR INFRASTRUCTURE AND MATERIALS PROVIDERS)
47. PROMOTION OF PAYMENT THROUGH CARDS AND DIGITALMEANS
48. CONTRACTOR TO ENGAGE CONTRACT MANPOWER BELONGING TO SCHEDULED CASTES AND WEAKER SECTIONS OF THE SOCIETY
49. PROVISIONS FOR STARTUPS (AS DEFINED IN GAZETTENOTIFICATION NO. D.L-33004/99 DATED 18.02.2016 AND 23.05.2017 OF MINISTRY OF COMMERCE AND INDUSTRY AND AS AMENDED FROM TIME TO TIME)
50. PROVISION REGARDING INVOICE FOR REDUCED VALUE OR CREDIT NOTE TOWARDS PRS
51. UNIQUE DOCUMENT IDENTIFICATION NUMBER BY PRACTICINGCHARTERED ACCOUNTANTS POLICY
52. PROVISION FOR PROCUREMENT FROM A BIDDER WHICH SHARES A LAND BORDER WITH INDIA.
53. DOCUMENTS FOR PAYMENT

**[G] ANNEXURES:**

1. Annexure-I : PROCEDURE FOR ACTION IN CASE CORRUPT/FRAUDULENT/ COLLUSIVE/ COERCIVE PRACTICES
2. Annexure-II : VENDOR PERFORMANCE EVALUATION PROCEDURE:
  - : ANNEXURE-1: Performance Rating Data Sheet
  - : ANNEXURE-2: Performance Rating Data Sheet
3. Annexure-III : INSTRUCTION FOR SUBMISSION OF BID ONLINE THROUGH CPP PORTAL
4. Annexure-IV : BIDDING DATA SHEET (BDS)
  - Annexure-V : PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017
    - : **FORM-I OF ANNEXURE-V** : Certificate from Statutory Auditor or Cost Auditor of the company (in the case of companies) or from a Practicing Cost Accountant or Practicing Chartered Accountant (in respect of suppliers other than companies)
    - : **FORM-II OF ANNEXURE-V**: Salient points of Public Procurement (Preference to Make in India) Policy.
5. Annexure-VI : PREAMBLE TO SCHEDULE OF RATES
6. Annexure-VII: PROVISION FOR PROCUREMENT FROM A BIDDER WHICH SHARES A LAND BORDER WITH INDIA
  - : **Form-I to Annexure-VII**: Undertaking on Letter Head

**INSTRUCTION TO BIDDERS [ITB]**

**(TO BE READ IN CONJUNCTION WITH BIDDING DATA SHEET (BDS))**

**[A] – GENERAL**

**1 SCOPE OF BID**

- 1.1 The Employer as defined in the "General Conditions of Contract [GCC]", wishes to receive Bids as described in the Invitation For Bid (the “**Tender Document /Bid Document**”) issued by Employer. Employer/Owner/TFL occurring herein under shall be considered synonymous.
- 1.2 SCOPE OF BID: The scope of work/ Services shall be as defined in Section-VI of the Tender documents.
- 1.3 The successful bidder will be expected to complete the scope of Bid within the period stated in Special Conditions of Contract.
- 1.4 Throughout the Tender Documents, the terms 'Bid', 'Tender' & 'Offer' and their derivatives [Bidder/Tenderer, Bid/Tender/Offer etc.] are synonymous. Further, 'Day' means 'Calendar Day' and 'Singular' also means 'Plural'.

**2 ELIGIBLE BIDDERS**

- 2.1 Provision for procurement from a bidder which shares a land border with India has been attached as **Annexure-VII** herewith.
- 2.2 The Bidder shall not be under a declaration of ineligibility by Employer for Corrupt/ Fraudulent/ Collusive/ Coercive practices, as defined in "Instructions to Bidders [ITB], Clause No. 39" (Action in case Corrupt/ Fraudulent/ Collusive/ Coercive Practices).
- 2.3 The Bidder is not put on 'Holiday' by TFL or any of the JV partner of OWNER (viz. GAIL, RCF, CIL) or Public-Sector Project Management Consultant (like PDIL,EIL, MECON only due to “poor performance” or “corrupt and fraudulent practices”) or banned/blacklisted by Government department/ Public Sector on due date of submission of bid. Further, neither bidder nor their allied agency/(ies) (as defined in the Procedure for Action in case of Corrupt/Fraudulent/Collusive/ Coercive Practices)are on banning list of TFL or any of the JV partner of OWNER viz. GAIL, RCF, CIL.

If the Bidding documents were issued inadvertently/ downloaded from website, offers submitted by such bidders shall not be considered for opening/ evaluation/Award and will be returned immediately to such bidders.

In case there is any change in status of the declaration prior to award of contract, the same has to be promptly informed to TFL/PDIL by the bidder.

It shall be the sole responsibility of the bidder to inform about their status regarding para 1 of clause 2.2 herein above on due date of submission of bid and during the course of finalization of the tender. Concealment of the facts shall tantamount to misrepresentation of facts and shall lead to action against such Bidders as per clause 39 of ITB.

- 2.4 The Bidder should not be under any liquidation court receivership or similar proceedings on due date of submission of bid. In case there is any change in status of the declaration prior to award of contract, the same has to be promptly informed to TFL/PDIL by the bidder.

It shall be the sole responsibility of the bidder to inform TFL there status on above on due date of submission of bid and during the course of finalization of the tender. Concealment of the facts shall tantamount to misrepresentation of facts and shall lead to action against such Bidders as per clause no. 39 of ITB.

- 2.5 Bidder shall not be affiliated with a firm or entity:

- (i) that has provided consulting services related to the work to the Employer during the preparatory stages of the work or of the project of which the works/services forms a part of or
- (ii) that has been hired (proposed to be hired) by the Employer as an Engineer/ Consultant for the contract.

- 2.6 Neither the firm/entity appointed as the Project Management Consultant (PMC) for a contract nor its affiliates/ JV'S/ Subsidiaries shall be allowed to participate in the tendering process unless it is the sole Licensor/Licensor nominated agent/ vendor.

- 2.7 Pursuant to qualification criteria set forth in the bidding document, the Bidder shall furnish all necessary supporting documentary evidence to establish Bidder's claim of meeting qualification criteria.

2.8 **Power of Attorney:**

Power of Attorney (PoA) to be issued by the bidder in favour of the authorised employee(s), in respect of the particular tender, for purpose of signing the documents including bid, all subsequent communications, agreements, documents etc. pertaining to the tender and act and take any and all decision on behalf of the bidder (including Consortium). Any consequence resulting due to such signing shall be binding on the Bidder (including Consortium).

- (I) In case of a Single Bidder, the Power of Attorney shall be issued as per the constitution of the bidder as below:
  - a) **In case of Proprietorship:** By Proprietor
  - b) **In case of Partnership:** by all Partners or Managing Partner.
  - c) **In case of Limited Liability Partnership:** by any bidder's employee authorized in terms of Deed of LLP.
  - d) **In case of Public /Limited Company:** PoA in favour of authorized employee(s) by Board of Directors through Board Resolution or by the designated officer authorized by Board to do so. Such Board Resolution should be duly countersigned by Company Secretary / MD / CMD / CEO.

The Power of Attorney should be valid till award of contract/order to successful bidder.

- (II) In case of a Consortium, Power of Attorney shall be issued both by Leader as well as Consortium Member(s) of the Consortium as per procedure defined herein above in favour of employee of Leader of Consortium.

### **3 BIDS FROM "CONSORTIUM"/"JOINT VENTURES"**

Not Applicable for this tender.

### **4 ONE BID PER BIDDER**

4.1 A Bidder shall submit only 'one [01] Bid' in the same Bidding Process either as single entity or as a member of any consortium (wherever consortium bid is allowed). A Bidder who submits or participates in more than 'one [01] Bid' will cause all the proposals in which the Bidder has participated to be disqualified.

4.2 A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices. The bidder found to have a conflict of interest shall be disqualified. A bidder shall be considered to have a conflict of interest with one or more bidders in this bidding process, if:

- a) they have controlling partner (s) in common; or
- b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or
- c) they have the same legal representative/authorized signatory/agent for purposes of this bid; or
- d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or
- e) Bidder participates in more than one bid in bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid.
- f) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid;
- g) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business.

Bidders are required to submit a confirmation for no conflict of interest with other bidders in Format F-5.

Failure to comply this clause during tendering process will disqualify all such bidders from process of evaluation of bids.

4.3 Alternative Bids shall not be considered.

4.4 The provisions mentioned at sl. no. 4.1 and 4.2 shall not be applicable wherein bidders are quoting for different Items / Sections / Parts / Groups/ SOR items of the same tender which specifies evaluation on Items / Sections / Parts / Groups/ SOR items basis.



## **5 COST OF BIDDING**

The Bidder shall bear all costs associated with the preparation and submission of the Bid including but not limited to Documentation Charges, Bank charges all courier charges translation charges, authentication charges and any associated charges including taxes & duties thereon. Further, TFL/PDIL will in no case, be responsible or liable for these costs, regardless of the outcome of the bidding process.

## **6 SITE VISIT**

- 6.1 The Bidder is advised to visit and examine the site of works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Bid and entering into a Contract for the required job. The costs of visiting the site shall be borne by the Bidder.
- 6.2 The Bidder or any of its personnel or agents shall be granted permission by the Employer to enter upon its premises and land for the purpose of such visits, but only upon the express conditions that the Bidder, its personnel and agents will release and indemnify the Employer and its personnel, agents from and against all liabilities in respect thereof, and will be responsible for death or injury, loss or damage to property, and any other loss, damage, costs, and expenses incurred as a result of inspection.
- 6.3 The Bidder shall not be entitled to hold any claim against TALCHER FERTILIZERS LIMITED for non-compliance due to lack of any kind of pre-requisite information as it is the sole responsibility of the Bidder to obtain all the necessary information with regard to site, surrounding, working conditions, weather etc. on its own before submission of the bid.

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## **[B] –BIDDING DOCUMENTS**

### **7 CONTENTS OF BIDDING DOCUMENTS**

- 7.1 The contents of Bidding Documents /Tender documents are those stated below, and should be read in conjunction with any 'Addendum / Corrigendum and Clarification(s)' issued in accordance with "ITB: Clause-8 & 9":

- Section-I : Invitation for Bid [IFB]
- Section-II : BID EVALUATION CRITERIA [BEC] & Evaluation methodology
- Section-III : Instructions to Bidders [ITB], Annexure, Forms & Formats
- Section-IV : General Conditions of Contract [GCC]
- Section-V : Special Conditions of Contract [SCC]
- Section-VI : Scope of Work & Technical Specifications
- Section-VII : Price Schedule/ Schedule of Rates

\*'Request for Quotation', wherever applicable, shall also form part of the Bidding document.

For participation in e-tender, instructions are mentioned at Annexure-III to Section-III of tender.

- 7.2 The Bidder is expected to examine all instructions, forms, terms & conditions in the Bidding Documents. The "Request for Quotation [RFQ] & Invitation for Bid (IFB)" together with all its attachments thereto, shall be considered to be read, understood and accepted by the Bidders. Failure to furnish all information required by the Bidding Documents or submission of a Bid not substantially responsive to the Bidding Documents in every respect will be at Bidder's risk and may result in the rejection of his Bid.

## **8 CLARIFICATION OF TENDER DOCUMENTS**

- 8.1 A prospective Bidder requiring any clarification(s) of the Bidding Documents may notify TFL in writing or through CPP Portal (<https://eprocure.gov.in/eprocure/app>) or email at PDIL's mailing address indicated in the BDS no later than 02 (two) days prior to pre-bid meeting (in cases where pre-bid meeting is scheduled) or 05 (five) days prior to the due date of submission of bid in cases where pre-bid meeting is not scheduled. TFL/PDIL reserves the right to ignore the bidders request for clarification if received after the aforesaid period. TFL/PDIL may respond in writing to the request for clarification. TFL/PDIL's response including an explanation of the query, but without identifying the source of the query will be uploaded on the websites mentioned at Clause No. 2.0 (G) of IFB. Hence, bidders are requested to regularly visit the said websites for updates.
- 8.2 Any clarification or information required by the Bidder but same not received by the Employer at clause 8.1 (refer BDS for address) above is liable to be considered as "no clarification / information required".

## **9 AMENDMENT OF BIDDING DOCUMENTS**

- 9.1 At any time prior to the 'Bid Due Date', Employer for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by addenda / corrigendum.
- 9.2 Any corrigendum thus issued shall be integral part of the Tender Document and shall be hosted only on the websites as provided at clause no. 2.0 (G) of IFB. Bidders, in their own interest, are advised to regularly check the websites for any amendment/Corrigendum/Addendum. Bidders have to take into account all such amendment / corrigendum before submitting their Bid. TFL/PDIL will not take any responsibility or entertain any representation whatsoever, in case bidders have not checked/seen/downloaded such amendment/Corrigendum/Addendum or reply to pre-bid queries uploaded on the said websites.
- 9.3 The Employer, if it considers necessary, may extend the Bid Due Date in order to allow the Bidders a reasonable time to furnish their most competitive bid taking into account the addenda / corrigendum issued thereof.
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## [C] – PREPARATION OF BIDS

### **10 LANGUAGE OF BID:**

The bid prepared by the Bidder and all correspondence, drawing(s), document(s), certificate(s) etc. relating to the Bid exchanged by Bidder and TFL shall be written in English language only. In case a document, certificate, printed literature etc. furnished by the Bidder in a language other than English, the same should be accompanied by an English translation duly authenticated by the Indian Chamber of Commerce , in which case, for the purpose of interpretation of the Bid, the English translation shall govern.

### **11. DOCUMENTS COMPRISING THE BID**

11.1 Bidders are requested to refer instructions for participating in e-Tendering (Annexure-I to Section III of tender), Ready Reckoner for Bidders and FAQs available in e-portal and bids submitted manually shall be rejected. All pages of the Bid must be digitally signed by the "authorized signatory" of the Bidder holding Power of Attorney. The bids must be submitted on e-tendering website of CPP portal (<https://eprocure.gov.in/eprocure/app>) comprising following documents:-

11.1.1 **PART-I: "TECHNO-COMMERCIAL / UN-PRICED BID"** shall contain the following:

- (a) 'Covering Letter' on Bidder's 'Letterhead' clearly specifying the enclosed Contents with index
- (b) 'Bidder's General Information', as per 'Form F-1'.
- (c) Copies of documents, as specified in tender document
- (d) Copy of Schedule of Rates (SOR) with prices blanked out mentioning quoted / not quoted (as applicable) written against each item as a confirmation that the prices are quoted in requisite format .
- (e) 'Letter of Authority' on the Letter Head, as per 'Form F-3'
- (f) 'Agreed Terms and Conditions', as per 'Form F-5'
- (g) 'ACKNOWLEDGEMENT CUM CONSENT LETTER', as per 'Form F-6'
- (h) Duly attested documents in accordance with the "BID EVALUATION CRITERIA [BEC]" establishing the qualification.
- (i) Copy of Power of Attorney as per 'F-20'/copy of Board Resolution, in favour of the authorized signatory of the Bid, as per clause no. 2.8 of ITB (Original to be submitted physically).
- (j) Copy of EMD / Declaration for Bid Security in original as per Clause 16 of ITB (Original to be submitted physically)
- (k) Undertaking as per Form-I to Annexure-V to Section-III and Certification from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of other than companies) as per Form-II to Annexure-V to Section-III (Applicable for all bidders irrespective of seeking purchase preference or not).
- (l) Undertaking as per Form-I & Form II to Annexure VII regarding Provisions for Procurement from a bidder which shares a land border with India.
- (m) All forms and Formats including Annexures
- (n) 'Integrity Pact' as per 'Form F-14'
- (o) 'Indemnity Bond' as per 'Form F-15'

- (p) Checklist for Bid Evaluation Criteria (BEC) qualifying documents for bidder as per 'Form F-8A & F-8B
- (q) Tender Document, its Corrigendum/Amendment/Clarification(s) duly signed on each page (in case of manual tendering)/ digitally signed (in case of e-Tender) by the Authorized Signatory holding POA.
- (r) Additional document specified in BDS, SCC, Scope of Supply or mentioned elsewhere in the Tender Document, its Corrigendum/Amendment/Clarification(s).
- (s) Any other information/details required as per Tender Document

**Note:**

1. All the pages of the Bid must be signed/ digitally signed by the "Authorized Signatory" of the Bidder holding POA.

**11.1.2 PART-II: Price Bid**

The Prices are to be filled strictly in the Schedule of Rate of the bidding documents and provision mentioned at para 11.1.2 hereinabove and to uploaded in SOR attachment/Conditions of CPP portal.

- 11.2 "TECHNO-COMMERCIAL/UN-PRICED BID" comprising all the above documents mentioned at 11.1.1 along with copy of EMD/Bid Security, copy of Power of Attorney and copy of integrity pact should be uploaded in the CPP portal. Further, Bidders must submit the original " EMD, Power of Attorney, Integrity Pact (wherever applicable) and any other documents specified in the Tender Document to the address mentioned in IFB, in a sealed envelope, superscribing the details of Tender Document (i.e. tender number & tender for) within 7 days from the date of un-priced bid opening.

Bidders are required to submit the EMD in original by Due Date and Time of Bid Submission or upload a scanned copy of the same in the Part-I of the Bid. If the Bidder is unable to submit EMD in original by Due Date and Time of Bid Submission, the Bidder is required to upload a scanned copy of the EMD in Part-I of Bid, provided the original EMD, copy of which has been uploaded, is received within 7 days from the Due Date of Bid Opening, failing which the Bid will be rejected irrespective of their status/ranking in tendering process and notwithstanding the fact that a copy of EMD was earlier uploaded by the Bidder.

- 11.3 In case of bids invited under *single bid system*, a single envelope containing all documents specified at Clause 11.1.1 & 11.1.2 of ITB above form the BID. All corresponding conditions specified at Clause 11.1.1 & 11.1.2 of ITB shall become applicable in such a case.

**12 BID PRICES**

- 12.1 Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole works as described in Bidding Documents, based on the rates and prices submitted by the Bidder and accepted by the Employer. The prices quoted by the Bidders will be inclusive of all taxes except **GST (CGST & SGST/UTGST or IGST)**. Applicable rate of **GST (CGST & SGST/UTGST or IGST)** on the contract value shall be indicated in SOR under column for GST.

- 12.2 Prices must be filled in format for "Schedule of Rates [SOR] " enclosed as part of Tender document. If quoted in separate typed sheets and any variation in item description, unit or quantity is noticed; the Bid is liable to be rejected.

- 12.3 Bidder shall quote for all the items of "SOR" after careful analysis of cost involved for the performance of the completed item considering all parts of the Bidding Document. In case any activity though specifically not covered in description of item under "SOR" but is required to complete the works as per Specifications, Scope of Work / Service, Standards, General Conditions of Contract ("GCC"), Special Conditions of Contract ("SCC") or any other part of Bidding Document, the prices quoted shall be deemed to be inclusive of cost incurred for such activity.
- 12.4 All duties, taxes and other levies [if any] payable by the Contractor under the Contract, or for any other cause except final **GST (CGST & SGST/ UTGST or IGST)** shall be included in the rates / prices and the total bid-price submitted by the Bidder.
- 12.5 Prices quoted by the Bidder, shall remain firm and fixed and valid till completion of the Contract and will not be subject to variation on any account unless any price escalation/variation is allowed elsewhere in Tender Document.
- 12.6 Bidder shall also mention the **Service Accounting Codes (SAC) / Harmonized System of Nomenclature (HSN)** at the designated place in Techno-Commercial / Un-Priced bid.

### **13 GST (CGST & SGST/ UTGST or IGST)**

- 13.1 Bidders are required to submit a copy of the GST Registration Certificate, while submitting the bids wherever **GST(CGST & SGST/UTGST or IGST)** is applicable
- 13.2 Quoted prices should be inclusive of all taxes and duties, except **GST (CGST & SGST or IGST or UTGST)**. Please note that the responsibility of payment of **GST (CGST & SGST or IGST or UTGST)** lies with the Contractor only. Contractor providing taxable service shall issue an e- Invoice/ Invoice / Bill, as the case may be as per rules/ regulation of GST. Further, returns and details required to be filled under GST laws & rules should be timely filed by Contractor with requisite details.
- Payments to Contractor for claiming **GST (CGST & SGST/UTGST or IGST)** amount will be made provided the above formalities are fulfilled. Further, TFL may seek copies of challan and certificate from Chartered Accountant for deposit of **GST (CGST & SGST/UTGST or IGST)** collected from Owner.
- 13.3 In case CBIC (Central Board of Indirect Taxes and Customs)/ any tax authority / any equivalent Government agency brings to the notice of TFL that the Contractor has not remitted the amount towards **GST (CGST & SGST/UTGST or IGST)** collected from TFL to the government exchequer, then, that Contractor shall be put under Holiday list of TFL for period of six months after following the due procedure. This action will be in addition to the right of recovery of financial implication arising on TFL.
- 13.4 For statutory variation in **GST (CGST & SGST/UTGST or IGST)**, please refer clause no. **13.0 of SCC (Section V of NIT)**
- 13.5 Where TFL is entitled to avail the input tax credit of **GST (CGST & SGST/UTGST or IGST):-**

13.5.1 Owner/TFL will reimburse the **GST (CGST & SGST/UTGST or IGST)** to the Contractor at actuals against submission of E-Invoices/Invoices as per format specified in rules/ regulation of GST, to enable Owner/TFL to claim input tax credit of **GST (CGST & SGST/UTGST or IGST)** paid. In case of any variation in the executed quantities, the amount on which the **GST (CGST & SGST/UTGST or IGST)** is applicable shall be modified in same proportion. Returns and details required to be filled under GST laws & rules should be timely filed by supplier with requisite details.

13.6 Where TFL is not entitled to avail/take the full input tax credit of **GST (CGST & SGST/UTGST or IGST)**:

13.6.1 Owner/TFL will reimburse **GST (CGST & SGST/UTGST or IGST)** to the Contractor at actuals against submission of E-Invoices/Invoices as per format specified in rules/ regulation of GST subject to the ceiling amount of **GST (CGST & SGST/UTGST or IGST)** as quoted by the bidder, subject to any statutory variations, except variations arising due to change in turnover. In case of any variation in the executed quantities (If directed and/or certified by the Engineer-In-Charge) the ceiling amount on which **GST (CGST & SGST/UTGST or IGST)** is applicable will be modified on pro-rata basis.

13.7 TFL will prefer to deal with registered supplier of goods/ services under GST. Therefore, bidders are requested to get themselves registered under GST, if not registered yet.

However, in case any unregistered bidder is submitting their bid, Bids will be evaluated as per quoted prices without loading of **GST (CGST & SGST/UTGST or IGST)**, if not quoted. their prices will be loaded with applicable GST (CGST & SGST/UTGST or IGST) while evaluation of bid (if applicable as per Govt. Act/ Law in vogue). Where TFL is entitled for input credit of **GST (CGST & SGST/UTGST or IGST)**, the same will be considered for evaluation of bid as per evaluation methodology of tender document. Further, an unregistered bidder is required to mention its Income Tax PAN in bid document.

13.8 In case TFL is required to pay entire/certain portion of applicable **GST (CGST & SGST/UTGST or IGST)** and remaining portion, if any, is to be deposited by Bidder directly as per **GST (CGST & SGST/UTGST or IGST)** laws, entire applicable rate/amount of **GST (CGST & SGST/UTGST or IGST)** to be indicated by bidder in the SOR.

Where TFL has the obligation to discharge **GST (CGST & SGST/UTGST or IGST)** liability under reverse charge mechanism and TFL has paid or is /liable to pay **GST (CGST & SGST/UTGST or IGST)** to the Government on which interest or penalties becomes payable as per GST laws for any reason which is not attributable to TFL or ITC with respect to such payments is not available to TFL for any reason which is not attributable to TFL, then TFL shall be entitled to deduct/ setoff / recover such amounts against any amounts paid or payable by TFL to Contractor /Supplier.

13.9 Contractor shall ensure timely submission of correct invoice(s)/e-invoice(s), as per GST rules/regulation, with all required supporting document(s) within a period specified in Contract to enable TFL to avail input credit of GST (CGST & SGST/UTGST or IGST). Further, returns and details required to be filled under GST laws & rules should be timely filed by Contractor with requisite details.

If input tax credit is not available to TFL for any reason not attributable to TFL, then TFL shall not be obligated or liable to pay or reimburse GST (CGST & SGST/UTGST or IGST) claimed in the invoice(s) and shall be entitled to deduct/ setoff/ recover such GST amount (CGST & SGST/UTGST or IGST) or Input Tax Credit amount together with penalties and interest, if any, against any amounts paid or becomes payable by TFL in future to the Contractor under this contract or under any other contract

**13.10 Anti-profiteering clause**

As per Clause 171 of GST Act it is mandatory to pass on the benefit due to reduction in rate of tax or from input tax credit to the consumer by way of commensurate reduction in prices. The Contractor may note the above and quote their prices accordingly.

13.11 In case the GST rating of Contractor on the GST portal / Govt. official website is negative / black listed, then the bids may be rejected by TFL. Further, in case rating of bidder is negative / black listed after award of work, then TFL shall not be obligated or liable to pay or reimburse GST to such Contractor and shall also be entitled to deduct / recover such GST along with all penalties / interest, if any, incurred by TFL.

13.12 GST (CGST & SGST/UTGST or IGST) is implemented w.e.f. 01.07.2017 which subsumed various indirect taxes and duties applicable before 01.07.2017. Accordingly, the provisions of General Condition of Contract relating to taxes and duties which are subsumed in GST are modified to aforesaid provisions mentioned in clause no. 12 and 13 of ITB.

13.13 GST, as quoted by the bidder in Schedule of Rates, shall be deemed as final and binding for the purpose of bid evaluation (applicable for tenders where bidder quotes the GST rates). In case a bidder enters "zero/blank" GST or an erroneous GST, the bid evaluation for finalizing the L1 bidder will be done considering the "Zero" or quoted GST rate GST rate, as the case may be. No request for change in GST will be entertained after submission of bids. In case GST column is left blank in the SOR, the quoted prices shall be considered as "Inclusive of GST" and evaluation shall be done accordingly.

In cases where the successful bidder quotes a wrong GST rate, for releasing the order, the following methodology will be followed:

- In case the actual GST rate applicable is lower than the quoted GST rate, the actual GST rate will be added to the quoted basic prices. The final cash outflow will be based on actual GST rate.
- In case the actual GST rate applicable is more than the quoted GST rate, the basic prices quoted will be reduced proportionately, keeping the final cash outflow the same as the overall quoted amount.

Based on the Total Cash Outflow calculated as above, TFL shall place orders.

13.14 Wherever TDS under GST Laws has been deducted from the invoices raised / payments made to the Contractors, as per the provisions of the GST law / Rules, Contractors should accept the corresponding GST-TDS amount populated in the relevant screen on GST common portal (www.gst.gov.in). Further, Vendors should also download the GST TDS certificate from GST common portal (reference path: Services>User Services>View/Download Certificates option).

13.15 **Provision w.r.t. E- Invoicing requirement as per GST laws:** Supplier who is required to comply with the requirements of E-invoice for B2B transactions as per the requirement of GST Law will ensure the compliance of requirement of E Invoicing under GST law. If the invoice issued without following this process, such invoice can-not be processed for payment by TFL as no ITC is allowed on such invoices.

Therefore, all the payments to such supplier who is liable to comply with e-invoice as per GST Laws shall be made against the proper e-invoice(s) only. Further, returns and details required to be filled under GST laws & rules against such e-invoices should be timely filed by Supplier of Goods with requisite details.

If input tax credit is not available to TFL for any reason attributable to supplier (both for E-invoicing cases and non-E-invoicing cases), then TFL shall not be obligated or liable to pay or reimburse GST (CGST & SGST/UTGST or IGST) claimed in the invoice(s) and shall be entitled to deduct / setoff / recover such GST amount (CGST & SGST/UTGST or IGST) or Input Tax Credit amount together with penalties and interest, if any, by adjusting against any amounts paid or becomes payable in future to the contractor under this contract or under any other supplier .

To ensure compliance, undertaking in requisite format is to be submitted by supplier as per format enclosed at Form F-21 along with documents for release of payment.

13.16 **New Taxes & duties:** Any new taxes & duties, if imposed by the State/ Central Govt. of India after the due date of bid submission but before the Contractual Completion Date, shall be reimbursed to the Service Provider on submission of copy of notification(s) issued from State/ Central Govt. Authorities along with documentary evidence for proof of payment of such taxes & duties, but only after ascertaining it's applicability with respect to the Contract.

13.17 Full payment including GST will be released at the time of processing of invoice for payment, where the GST amount reflects in Form GSTR-2A of TFL. However, in case where the GST amount doesn't reflect in Form GSTR-2A of TFL, the amount of GST will be released after reflection of GST amount of corresponding invoice in Form GSTR-2A of TFL.

#### **14 BID CURRENCIES:**

Bidders must submit bid in Indian Rupees only.

#### **15 BID VALIDITY**

15.1 Bids shall be kept valid for period specified in BDS from the final Due date of submission of bid'. A Bid valid for a shorter period may be rejected by TFL as 'non-responsive'.



- 15.2 In exceptional circumstances, prior to expiry of the original 'Bid Validity Period', the Employer may request the Bidders to extend the 'Period of Bid Validity' for a specified additional period. The request and the responses thereto shall be made in writing or by email. A Bidder may refuse the request without forfeiture of his EMD / Bid Security.

A Bidder agreeing to the request will not be required or permitted to modify his Bid, but will be required to extend the validity of its EMD for the period of the extension and in accordance with "ITB: Clause-16" in all respects.

## **16 EARNEST MONEY DEPOSIT**

- 16.1 Bid must be accompanied with earnest money (i.e. Earnest Money Deposit (EMD) also known as Bid Security) in the form of '**Demand Draft**' / '**Banker's Cheque**' / '**Insurance Surety Bond**' / '**Fixed Deposit Receipt**' [in favour of **Talcher Fertilizers Limited** payable at place mentioned in BDS] or 'Bank Guarantee' strictly as per the format given in form F-2A (as the case may be) of the Tender Document. Bidder shall ensure that EMD submitted in the form of 'Bank Guarantee' should have a validity of at least "two [02] months" beyond the validity of the Bid. EMD submitted in the form of 'Demand Draft' or 'Banker's Cheque' should be valid for three months.

Bid not accompanied with EMD, or EMD not in requisite format shall be liable for rejection. The EMD shall be submitted in Indian Rupees only.

- 16.2 The bidder can also submit the EMD through online banking transaction i.e. IMPS/NEFT/RTGS etc. For this purpose, the details of TFL's Bank Account are mentioned under BDS. While remitting, the bidder must indicate EMD and tender/E-tender no. under remarks. Bidders shall be required to submit/ upload the successful transaction details along with their bid/e-bid in addition to forwarding the details to dealing officer through email/letter with tender reference number immediately after remittance of EMD. In absence of submitting/ uploading the remittance details, the bid is likely to be considered as bid not accompanied with EMD. Further, in case of the online transaction, submission of EMD in original is not applicable.
- 16.3 OWNER shall not be liable to pay any documentation charges, Bank charges, commission, interest etc. on the amount of EMD. In case EMD is in the form of a "Bank Guarantee", the same shall be from any Indian scheduled Bank (excluding Co-operative banks and Regional Rural bank) or a branch of an International Bank situated in India and registered with "Reserve Bank of India" as Scheduled Foreign Bank. However, in case of „Bank Guarantee" from Banks other than the Nationalized Indian Banks, the Bank must be commercial Bank having network in excess of Rs. 100 Crores [Rupees One Hundred Crores] and a declaration to this effect should be made by such commercial Bank either in the "Bank Guarantee" itself or separately on its letterhead. Purchaser will verify the BG from issuing bank.
- 16.4 Any Bid not secured in accordance with "ITB: Clause-16.1 & Clause-16.3" may be rejected by TFL as non-responsive.
- 16.5 Unsuccessful Bidder's EMD will be discharged/ returned as promptly as possible, but not later than "thirty [30] days" after finalization of tendering process.
- 16.6 The successful Bidder's EMD will be discharged upon the Bidder's acknowledging the "Award" and signing the "Agreement" (if applicable) and furnishing the Contract Performance Security (CPS)/ Security Deposit" pursuant to clause no. 38 of ITB.

- 16.7 Notwithstanding anything contained herein, the EMD may also be forfeited in any of the following cases:
- (a) If a Bidder withdraws his Bid during the "Period of Bid Validity"
  - (b) If a Bidder has indulged in corrupt/fraudulent /collusive/coercive practice
  - (c) If the Bidder modifies Bid during the period of bid validity (after Due Date and Time for Bid Submission).
  - (d) Violates any other condition, mentioned elsewhere in the Tender Document, which may lead to forfeiture of EMD.
  - (e) In case of Cartelization of bid.
  - (f) In the case of a successful Bidder, if the Bidder fails to:
    - (i) to acknowledge receipt of the "Notification of Award" / Fax of Acceptance[FOA] / Detailed Letter of Acceptance [DLOA]",
    - (ii) to furnish "Contract Performance Security / Security Deposit", in accordance with "ITB: Clause-38".
- 16.8 In case EMD is in the form of „Bank Guarantee“, the same must indicate the Tender Document No. and the name of Tender Document for which the Bidder is quoting. This is essential to have proper correlation at a later date.
- 16.9 MSEs (Micro & Small Enterprises) are exempted from submission of EMD in accordance with the provisions of PPP-2012 and Clause 40 of ITB. However, Traders/Dealers/ Distributors /Stockiest /Wholesaler are not entitled for exemption of EMD. The Government Departments/PSUs are also exempted from the payment of EMD. Further, Startups are also exempted from the payment of EMD.
- 16.10 In case of forfeiture of EMD/ Bid Security, the forfeited amount will be considered inclusive of tax and tax invoice will be issued by TFL. The forfeiture amount will be subject to final decision of TFL based on other terms and conditions of order/contract.
- 16.11 EMD/Bid Bond will not be accepted in case the same has reference of 'remitter'/'financer' other than bidder on the aforementioned financial instrument of EMD/ Bid Bond submitted by the bidder and bid of such bidder will be summarily rejected.**
- 16.A **DECLARATION FOR BID SECURITY**
- MSEs (Micro & Small Enterprises), Start-ups and CPSEs (to whom exemption is allowed as per extant guidelines in vogue) are required to submit, "DECLARATION FOR BID SECURITY" as per prescribed format (F-2B).
- 17 PRE-BID MEETING (IF APPLICABLE)**
- 17.1 The Bidder(s) or his designated representative are invited to attend a "Pre-Bid Meeting" which will be held at address specified in IFB. It is expected that a bidder shall not depute more than 02 representatives for the meeting.
- 17.2 Purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage and give hands-on e-tendering.

- 17.3 Text of the questions raised and the responses given, together with any responses prepared after the meeting, will be uploaded on Central Public Procurement (CPP) Portal (<https://eprocure.gov.in/eprocure/app>) websites. Any modification of the Contents of Bidding Documents listed in "ITB: Clause-7.1", that may become necessary as a result of the Pre-Bid Meeting shall be made by the Employer exclusively through the issue of an Corrigendum pursuant to "ITB: Clause-9", and not through the minutes of the Pre-Bid Meeting.
- 17.4 Non-attendance of the Pre-Bid Meeting will not be a cause for disqualification of Bidder.

## **18 FORMAT AND SIGNING OF BID**

- 18.1 The original and all copies of the Bid shall be typed or written in indelible ink [in the case of copies, photocopies are also acceptable] and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder (as per POA). The name and position held by each person signing, must be typed or printed below the signature. All pages of the Bid except for unamendable printed literature where entry(s) or amendment(s) have been made shall be initialed by the person or persons signing the Bid.
- 18.2 The Bid shall contain no alterations, omissions, or additions, unless such corrections are initialed by the person or persons signing the Bid.
- 18.3 In case of e-tendering, digitally Digitally signed documents to be uploaded as detailed in addendum to ITB (Annexure-III of Section –III).

## **19 ZERO DEVIATION AND REJECTION CRITERIA**

- 19.1 ZERO DEVIATION: Deviation to terms and conditions of "Bidding Documents" may lead to rejection of bid. TFL will accept bids based on terms & conditions of "Bidding Documents" only. Bidder may note TFL will determine the substantial responsiveness of each bid to the Tender documents pursuant to provision contained in clause 29 of ITB. For purpose of this, a substantially responsive bid is one which conforms to all terms and conditions of the Bidding documents without deviations or reservations. TFL's determination of a bid's responsiveness is based on the content of the bid itself without recourse to extrinsic evidence.

Bidder is requested not to take any deviation(s)/exception(s) to the terms & conditions of Tender Document, and submit all requisite documents as mentioned in this Tender Document, failing which their Bid will be liable for rejection. If a Bidder does not reply to the queries in the permitted time frame then its Bid shall be evaluated based on the documents available in the Bid.

As a principle, clarifications from bidders after opening of tenders will not be sought. However, where clarifications / documents from the bidders on important aspects are absolutely necessary for finalization of tender, clarifications from bidder can be asked. The request for clarification shall be given in email/portal, asking the bidder to respond by a specified date, and also mentioning therein that, if the bidder does not comply or respond by the date, his tender will be liable to be rejected. Depending on the outcome, such tenders are to be ignored or considered further. No change in prices or substance of the bid including specifications, shall be offered or permitted. No post-bid clarification at the initiative of the bidder shall be entertained. The shortfall information/ documents should be sought only in case of historical documents which pre-existed bids and which have not undergone change since then.

19.2 **REJECTION CRITERIA:** Notwithstanding the above, deviation to the following clauses of Tender document shall lead to summarily rejection of Bid:

- a) Bidder not meeting Bid Evaluation Criteria as per Tender Document
- b) Firm Price
- c) EMD / Declaration for Bid Security (as applicable)
- d) Specifications & Scope of Work
- e) Schedule of Rates / Price Schedule / Price Basis
- f) Duration / Period of Contract/ Completion Period
- g) Payment Terms
- h) Period of Validity of Bid
- i) Integrity Pact
- j) Mutually Agreed Damages
- k) Overall ceiling on total liability
- l) Contract Performance Security
- m) Guarantee / Defect Liability Period
- n) Arbitration / Settlement of Dispute
- o) Governing laws, language & measures
- p) Force Majeure
- q) Undertaking forms, Form I of Annexure VII for provision for procurement from a bidder which shares a land border with India
- r) Bidder quoting less than 20% as minimum Local content (as per make in India PPLC policy)
- s) Any other condition specifically mentioned in the tender document elsewhere that non-compliance of the clause lead to rejection of bid

Note: Further, it is once again reminded not to mention any condition in the Bid which is contradictory to the terms and conditions of Tender document.

## 20 **E-PAYMENT**

OWNER has initiated payments to Contractors electronically, and to facilitate the payments electronically through '**e-banking**'.

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## **[D] – SUBMISSION OF BIDS**

### 21 **SUBMISSION, SEALING AND MARKING OF BIDS**

- 21.1 In case of e-tendering, bids shall be submitted through e-tender in the manner specified elsewhere in tender document. No Manual/ Hard Copy (Original) offer shall be acceptable. Physical documents shall be addressed to the owner at address specified in IFB.
- 21.2 Deleted
- 21.3 Bids submitted under the name of AGENT/ REPRESENTATIVE /RETAINER/ ASSOCIATE etc. on behalf of a bidder/affiliate shall not be accepted.

## **22 DEADLINE FOR SUBMISSION OF BIDS**

- 22.1 In case of e-bidding, the bids must be submitted through e-tender mode not later than the date and time specified in the tender document/BDS (Bidding Data Sheet).
- 22.2 Deleted.
- 22.3 TFL may, in exceptional circumstances and at its discretion, extend the deadline for submission of Bids (clause 8 and/or 9 of ITB refers). In which case all rights and obligations of TFL and the Bidders, previously subject to the original deadline will thereafter be subject to the deadline as extended Notice for extension of due date of submission of bid will be uploaded on website only as mentioned in Clause No. 2.0(G) of IFB.

## **23 LATE BIDS**

- 23.1 Any bids received after the notified date and time of closing of tenders will be treated as late bids.
- 23.2 In case of e-tendering, e-tendering system of CPP Portal (eprocure.gov.in) shall close immediately after the due date for submission of bid and no bids can be submitted thereafter.
- 23.3 Physical documents received to address other than one specifically stipulated in the Tender Document will not be considered for evaluation/opening/award if not received to the specified destination within stipulated date & time.
- 23.4 Unsolicited Bids or Bids received to address other than one specifically stipulated in the tender document will not be considered for evaluation/opening/award if not received to the specified destination within stipulated date & time.

## **24 MODIFICATION AND WITHDRAWAL OF BIDS**

- 24.1 Modification and withdrawal of bids shall be as follows:-

### **24.1.1 IN CASE OF E- TENDERING**

The bidder may withdraw or modify its bid after bid submission but before the due date and time for submission as per tender document.

### **24.1.2 IN CASE OF MANUAL BIDDING**

Deleted.

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## **[E] – BID OPENING AND EVALUATION**

## **25 EMPLOYER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS**

- 25.1 TFL reserves the right to accept or reject any Bid, and to annul the Bidding process and reject all Bids, at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder(s) or any obligations to inform the affected Bidder(s) of the ground for TFL's action. However, Bidder if so desire may seek the reason (in writing) for rejection of their Bid to which TFL shall respond quickly.

- 25.2 A bidder is to be permitted to send his representation in writing to dealing officer specified in tender for rejection of bid. But, such representation has to be sent upto 10(ten) days from the date of Notification of Award/FOA. A decision on representation will be taken by TFL within 15 (fifteen) days of the receipt of the representation. Only a directly affected bidder can represent in this regard:
- i) Only a bidder who has participated in tender can make such representation
  - ii) In case technical bid has been evaluated before the opening of the financial bid, an application for review in relation to the financial bid may be filed only by a bidder whose technical bid is found to be acceptable
- 25.3 However, following decisions of TFL shall not be subject to review:
- a) Determination of the need for procurement;
  - b) Selection of the mode of procurement or bidding system;
  - c) Choice of selection procedure;
  - d) Provisions limiting participation of bidders in the procurement process;
  - e) The decision to enter into negotiations with the L1 bidder;
  - f) Cancellation of the procurement process except where it is intended to subsequently re-tender the same requirements;
  - g) Issues related to ambiguity in contract terms may not be taken up after a contract has been signed, all such issues should be highlighted before consummation of the contract by the vendor/ contractor; and
  - h) Complaints against specifications except under the premise that they are either vague or too specific so as to limit competition may be permissible.

## **26 BID OPENING**

### **26.1 Unpriced Bid Opening:**

TFL/PDIL will open the price bids of those Bidders who meet the qualification requirement and whose bid is determined to be technically and commercially responsive. Techno-commercial bid evaluation status will be are to be informed to all bidders (including informing the techno-commercially not qualified Bidders). Price bids are to be opened in the presence of only techno-commercially acceptable bidders, who are willing to attend the bid opening, at a pre-publicised date, time and place or on the portal in case of e-procurement. The bidder's name, bid price, discount (if any) and any such details considered appropriate shall be read out during the price bid opening. Offers should not, repeat not, be circulated amongst the bidder's representative. Bidders selected for opening of their price bid shall be informed about the date & time of price bid opening. Bidders may depute their authorized representative to witness the price bid opening. The Bidders' representatives, who are present shall sign a Price Bid Opening Register evidencing their attendance and may be required to be present even on a short notice.

## 26.2 **Priced Bid Opening:**

26.2.1 TFL will open the price bids of those bidders who meet the qualification requirement and whose bids is determined to be technically and commercially responsive. Bidders selected for opening of their price bids shall be informed about the date of price bid opening.

Bidders may depute their authorized representative to attend the bid opening. The bidders' representatives, who are present shall sign a register evidencing their attendance and may be required to be present even on a short notice.

26.2.2 The price bids of those Bidders who were not found to be techno-commercially responsive shall not be opened.

In case of bids invited under the single bid system, bid shall be opened on the specified date & time.

26.3 **Reverse Auction-** Not Applicable for this tender.

## 27 **CONFIDENTIALITY**

Information relating to the examination, clarification, evaluation and comparison of bids, and recommendations for the award of a contract, shall not be disclosed to bidders or any other person not officially concerned with such a process until the award to the successful bidder.

## 28 **CONTACTING THE EMPLOYER**

28.1 From the time of bid opening to the time of contract award, no bidder shall contact TFL on any matter related to the bid, except on request and prior written permission.

28.2 Any effort by the bidder to influence TFL in bid evaluation, bid comparison or contract award decisions will vitiate the process and will result in the rejection of the bidder's bid and action shall be initiated as per the TFL's procedure for action in case Corrupt / Fraudulent / Collusive / Coercive practices in this regard apart from forfeiture of EMD/ Bid Security, if any.

## 29 **EXAMINATION OF BIDS AND DETERMINATION OF RESPONSIVENESS**

29.1 The employer's determination of a bid's responsiveness is based on the content of the bid only. Prior to the detailed evaluation of Bids, the Employer will determine whether each Bid:

- (a) Meets the "Bid Evaluation Criteria" of the Bidding Documents ;
- (b) Has been properly signed;
- (c) Is accompanied by the required 'Earnest Money / Bid Security / Bid Security Declaration'
- (d) Is substantially responsive to the requirements of the Bidding Documents ; and
- (d) Provides any clarification and/or substantiation that the Employer may require to determine responsiveness pursuant to "ITB: Clause-29.2"

29.2 A substantially responsive Bid is one which conforms to all the terms, conditions and specifications of the Bidding Documents without material deviations or reservations or omissions for this purpose employer defines the foregoing terms below:

- a) "Deviation" is departure from the requirement specified in the tender documents.

- b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirement in the tender documents.
- c) "Omission" is the failure to submit part or all of the information or documentation required in the tender document for evaluation of bid.

29.3 A material deviation, reservation or omission is one that,

- a) If accepted would,
  - i) Affect in any substantial way the scope, quality, or performance of the job as specified in tender documents.
  - ii) Limit, in any substantial way, inconsistent with the Tender Document, the Employer's rights or the tenderer's obligations under the proposed Contract.
- b) If rectified, would unfairly affect the competitive position of other bidders presenting substantially responsive bids.

29.4 The employer shall examine all aspects of the bid to confirm that all requirements have been met without any material deviation, reservation or omission.

29.5 Tenders that do not meet the basic requirements specified in the bid documents are to be treated as unresponsive (both during Techno-commercial evaluation and Financial Evaluation in case of Two Bid System ) and will be ignored. All tenders received will first be scrutinized to see whether the tenders meet the basic requirements as incorporated in the Bid document and to identify unresponsive tenders, if any. Unresponsive offers may not subsequently be made responsive by correction or withdrawal of the non- conforming stipulation. Some important points on the basis of which a tender may be declared as unresponsive and be ignored during the initial scrutiny are :

- i) The tender is not in the prescribed format or is unsigned or not signed as per the stipulations in the bid document;
- ii) The required EMD has not been provided or exemption from EMD is claimed without acceptable proof of exemption;
- iii) The bidder is not eligible to participate in the bid as per laid down eligibility criteria
- iv) The bid departs from the essential requirements specified in the bidding document (for example, the tenderer has not agreed to give the required contract performance security); or
- v) Against a schedule in the list of requirements in the tender enquiry, the tenderer has not quoted for the entire requirement as specified in that schedule (example: in a schedule, it has been stipulated that the tenderer will supply the equipment, install and commission it and also train the TFL's personnel for operating the equipment. The tenderer has, however, quoted only for supply of the equipment).

**30 CORRECTION OF ERRORS-**

Not Applicable.

**31 CONVERSION TO SINGLE CURRENCY FOR COMPARISON OF BIDS**

Not Applicable. All bids submitted must be in the currency specified at clause 14 of ITB.

**32 EVALUATION AND COMPARISON OF BIDS**

Bid shall be evaluated as per evaluation criteria mentioned in Section-II of bidding documents on lowest bid basis.



In case of a tie at the lowest bid (L1) position between two or more bidders, the order/LoA will be placed on the bidder who has higher/ highest turnover in last audited financial year.

In case there is a tie at the lowest bid (L1) position between only startup bidders and none of them has past turnover, the order/FOA will be placed on the startup who is registered earlier with Department for Promotion of Industry and Internal Trade (wherever applicable).

**33 COMPENSATION FOR EXTENDED STAY [FOR APPLICABILITY OF THIS CLAUSE REFER BDS]:**

Not Applicable

**34 PURCHASE PREFERENCE**

Purchase Preference as per Policy to Provide Purchase Preference as per Public Procurement (Preference to Make in India), Order 2017 Domestically Manufactured Telecom Products (DMTP) shall be allowed as per Government instructions in vogue, as applicable from time to time.

The Policy to Provide Purchase Preference as per Public Procurement (Preference to Make in India), Order is enclosed as Annexure V to ITB herewith.

Bidders are required to select the applicable purchase preference (i.e. preference category) option while submitting the bid on GePNIC portal. However, evaluation and applicability of purchase preference policy will be based on the confirmations & documents submitted by the bidder in the their bid irrespective of selection made on GePNIC portal.

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**[F] – AWARD OF CONTRACT**

**35 AWARD**

Subject to "ITB: Clause-29", Owner will award the Contract to the successful Bidder whose Bid has been determined to be substantially responsive and has been determined as the lowest provided that bidder, is determined to be qualified to satisfactorily perform the Contract.

***“TFL intends to place the contract directly on the address from where Goods are produced / dispatched or Services are rendered. In case, bidder wants contract at some other address or supply of Goods/ Services from multiple locations, bidder is required to provide in their bid address on which order is to be placed.”***

TFL will place the Contract directly on the successful bidder from whom the bid has been received & evaluated and will not place order on other entities such as subsidiary, business associate or partner, dealer/distributor etc. of the Bidder.

## **36 NOTIFICATION OF AWARD / FAX OF ACCEPTANCE**

- 36.1 Prior to the expiry of 'Period of Bid Validity', Notification of Award for acceptance of the Bid will be intimated to the successful Bidder by TFL either by E-mail /Letter or like means defined as the "Fax of Acceptance (FOA)". The Contract shall enter into force on the date of FOA and the same shall be binding on TFL and successful Bidder (i.e. Contractor). The Notification of Award/FOA will constitute the formation of a Contract. The detailed Letter of Acceptance shall be issued thereafter incorporating terms & conditions of Tender Document, Corrigendum, Clarification(s), Bid and agreed variation(s)/acceptable deviation(s), if any. TFL may choose to issue Notification of Award in form of detailed Letter of Acceptance without issuing FOA and in such case the Contract shall enter into force on the date of Detailed Letter of Acceptance only.
- 36.2 Contract period shall commence from the date of "Notification of Award" or as mentioned in the Notification of Award. The "Notification of Award" will constitute the formation of a Contract, until the Contract has been effected pursuant to signing of Contract as per "ITB: Clause-37".
- 36.3 Upon the successful Bidder's / Contractor's furnishing of 'Contract Performance Security / Security Deposit', pursuant to "ITB: Clause-38", TFL will promptly discharge his 'Earnest Money Deposit / Bid Security (if applicable)', pursuant to "ITB: Clause-16".
- 36.4 The Order/ contract value mentioned above is subject to Mutually Agreed Damages clause.
- 36.5 TFL will award the Contract to the successful Bidder, who, within 'fifteen [15] days' of receipt of the same, shall sign and return the acknowledged copy to TFL.

## **37 SIGNING OF AGREEMENT**

The successful Bidder/Contractor shall be required to execute an 'Agreement' in the proforma given in this Bidding Document) on a 'non-judicial stamp paper' of appropriate value [cost of the 'stamp-paper' shall be borne by the successful Bidder/Contractor] and of 'state of India' specified in Bidding Data Sheet (BDS) only, within 'fifteen [15] days' of receipt of the "Fax of Acceptance (FOA)" by the successful Bidder/Contractor failure on the part of the successful Bidder/Contractor to sign the 'Agreement' within the above stipulated period, shall constitute sufficient grounds for forfeiture of EMD / Security Deposit / Action as per Bid Security declaration.

## **38 CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT(CPS/SD)**

- 38.1 Within 30 days of the receipt of the notification of award/ Fax of Acceptance from GAIL, the successful bidder shall furnish the Contract Performance Security (CPS) in accordance with of General Conditions of the Contract. The CPS shall be in the form of either Banker's Cheque or Demand Draft or or Insurance Surety Bond or Fixed Deposit Receipt or Bank Guarantee or Letter of Credit and shall be in the currency of the Contract. However, CPS shall not be applicable in cases wherein the individual contract value as specified in Notification of Award is less than INR 5 Lakh (exclusive of GST).
- 38.2 The contract performance security shall be for an amount equal to specified in Bidding Data Sheet (BDS) towards faithful performance of the contractual obligations and performance of equipment. For the purpose of CPS, Contract/order value shall be exclusive of GST (CGST & SGST/UTGST or IGST).

Bank Guarantee towards CPS shall be from any Indian scheduled bank (excluding Co-operative banks and Regional Rural bank) or a branch of an International bank situated in India and registered with Reserve bank of India as scheduled foreign bank. However, in case of bank guarantees from banks other than the Nationalized Indian banks, the bank must be a commercial bank having net worth in excess of Rs 100 crores and a declaration to this effect should be made by such commercial bank either in the Bank Guarantee itself or separately on its letterhead.

- 38.3 Failure of the successful bidder to comply with the requirements of this article shall constitute sufficient grounds for consideration of the annulment of the award and forfeiture of the EMD / action as per declaration for Bid Security.
- 38.4 The CPS has to cover the entire contract value including extra works/services also. As long as the CPS submitted at the time of award take cares the extra works/ services executed and total executed value are within the awarded contract price, there is no need for additional CPS. As soon as the total executed value is likely to burst the ceiling of awarded contract price, the contractor should furnish additional CPS.
- 38.5 DELETED
- 38.6 In addition to existing specified form (i.e. Demand Draft (DD)/ Banker's Cheque/ Bank Guarantee) mentioned in tender documents for submission of Security Deposit/ Contract Performance Security, the successful bidder can also submit the Security Deposit/ Contract Performance Security through online banking transaction i.e. IMPS/NEFT/RTGS/SWIFT etc. For this purpose, the details of TFL's Bank Account is mentioned in BDS. Further, in case a successful Bidder is willing to furnish CPS through SWIFT, the details may be obtained from Purchase Officer immediately after receipt of FOA.

While remitting such online transaction, the bidder must indicate "**Security Deposit/ Contract Performance Security against FOA/DLOA no. \_\_\_\_\_(contractor to specify the FOA/DLOA No.)**" under remarks column of such transaction of respective bank portal. The contractor/vendor shall be required to submit the successful transaction details to the dealing officer immediately through email/letter and necessarily within 30 days from the date of Fax of Acceptance.

- 38.7 In case of forfeiture of Contract Performance Security/ Security Deposit in terms of GCC, the forfeited amount will be considered inclusive of tax and tax invoice will be issued by TFL. The forfeiture amount will be subject to final decision of TFL based on other terms and conditions of order/ contract.
- 38.8 The Contractor will also submit covering letter along with CPS as per format at F-4.
- 38.9 CPBG/Security Deposit will not be accepted in case the same has reference of 'remitter'/financer' other than bidder on the aforementioned financial instrument of CPBG/ Security Deposit submitted by the Contractor.
- 38.10 The first payment to vendor is to be released only after submission of CPS / Security Deposit (SD).
- 38.11 Before the CPS / Security Deposit (SD) is released a "No Claim Certificate" is to be submitted by the supplier/vendor.

38.12 In case, TFL allows additional time for submission of CPBG/SD beyond 30 days, a penal interest of Marginal Cost of Fund based Lending Rate (MCLR) for one year charged by SBI (applicable on due date of submission of CPBG/SD i.e. 30th day after issuance of FOA/Notification of award) plus 4.0% p.a (on CPBG/SD amount) shall be charged for delay beyond 30 days i.e. from 31st days after issuance of FOA.

38.13 **In addition to submission of the Security cum Performance Bank Guarantee (CS cum PBG) for 10% of the TOTAL CONTRACT PRICE as stipulated above, the successful bidder is required to submit a Additional Bank Guarantee as specified in Clause 52.0 of SCC.**

**39 PROCEDURE FOR ACTION IN CASE CORRUPT/FRAUDULENT/COLLUSIVE/ COERCIVE PRACTICES**

39.1 Procedure for action in case Corrupt/ Fraudulent/Collusive/Coercive Practices is enclosed at Annexure-I.

39.2 Name and contact details of nodal officer for TFL, Talcher is as under:

Shri S K Hota  
Tel: +916760-261260  
Email: skhota@rcfltd.com

39.4 **NON-APPLICABILITY OF ARBITRATION CLAUSE IN CASE OF BANNING OF VENDORS/ SUPPLIERS / CONTRACTORS/ BIDDERS/ CONSULTANTS INDULGED IN FRAUDULENT/ COERCIVE PRACTICES**

Notwithstanding anything contained contrary in GCC and other "CONTRACT DOCUMENTS", in case it is found that the Contractors/Bidders indulged in fraudulent/ coercive practices at the time of bidding, during execution of the contract etc. and/or on other grounds as mentioned in OWNER's "Procedure for action in case Corrupt/Fraudulent/Collusive/Coercive Practices" (Annexure-I to Section-III of tender), the contractor/bidder shall be banned (in terms of aforesaid procedure) from the date of issuance of such order by TFL, to such Contractors/Bidders.

The Contractor/ Bidder understands and agrees that in such cases where Contractor/ Bidder has been banned (in terms of aforesaid procedure) from the date of issuance of such order by TFL, such decision of TFL shall be final and binding on such Contractor/ Bidder and the 'Arbitration clause' in the GCC and other "CONTRACT DOCUMENTS" shall not be applicable for any consequential issue /dispute arising in the matter.

**40 PUBLIC PROCUREMENT POLICY FOR MICRO AND SMALL ENTERPRISES**

40.1 Government of India, vide Gazette of India No. 503 dated 26.03.2012 proclaimed the Public Procurement Policy for Micro and Small Enterprises (MSEs). The following benefit is available in case of work contract also:

- i) Issue of tender document to MSEs free of cost.
- ii) Exemption to MSEs from payment of EMD/Bid Security .

40.2 **In case Bidder is a Micro or Small Enterprise, the Bidder shall submit Udyam Registration Certificate for availing benefit under Public Procurement Policy for MSEs-2012.**

Vide Gazette notification dated 18.10.2022 of Ministry of MSME, the following is notified:

*“In case of an upward change in terms of investment in plant and machinery or equipment or turnover or both, and consequent re-classification, an enterprise shall continue to avail of all nontax benefits of the category (micro or small or medium) it was in before the re-classification, for a period of three years from the date of such upward change”*

**Accordingly, in case of upward change in status, MSE bidder is required to submit the previous certificate also to get the MSE benefit.**

The above documents submitted by the bidder shall be duly certified by the Chartered Accountant (not being an employee or a Director or not having any interest in the bidder's company/firm) and notary public with legible stamp.

If the bidder does not provide the above confirmation or appropriate document or any evidence, then it will be presumed that they do not qualify for any preference admissible in the Public Procurement Policy (PPP) 2012.

Further, MSEs who are availing the benefits of the Public Procurement Policy (PPP) 2012 get themselves registered with MSME Data Bank being operated by NSIC, under SME Division, M/o MSME, in order to create proper data base of MSEs which are making supplies to CPSUs.

- 41.3 If against an order placed by TFL, successful bidder(s) (other than Micro/Small Enterprise) is procuring material/services from their sub-vendor who is a Micro or Small Enterprise as per provision mentioned at clause no.40.2 with prior consent in writing of the purchasing authority/Engineer-in-charge, the details like Name, Registration No., Address, Contact No. details of material & value of procurement made, etc. of such Enterprises shall be furnished by the successful bidder at the time of submission of invoice/Bill.
- 41.4 The benefit of policy are not extended to the traders/dealers/ Distributors /Stockiest/Wholesalers.
- 41.5 NSIC has initiated a scheme of “Consortia and Tender Marketing Scheme” under which they are assisting the Micro & Small enterprises to market their products and services through tender participation on behalf of the individual unit or through consortia. Accordingly, if the MSEs or the consortia, on whose behalf the bid is submitted by NSIC, is meeting the BEC and other terms and conditions of tender their bid will be considered for further evaluation. Further, in such cases a declaration is to be submitted by MSE/ consortia on their letter head (s) that all the terms and conditions of tender document shall be acceptable to them.
- 40.6 It may be noted that Government of India has implemented Trade Receivable Discounting System (TReDS) to address challenges faced by MSMEs in delayed payments (after receipt/acceptance of Material/Services) from Government buyers leading to shortfall of Working Capital. TReDS is an online electronic institutional mechanism for facilitating the financing of trade receivables of MSMEs through multiple financiers. TFL is already registered on the following TReDS platform:
- M/s Receivable Exchange of India (RXIL), Mumbai
  - M/s Mynd Solutions Private Limited (Mynd), New Delhi
  - M/s A. TREDS (Invoicemart), Mumbai

MSME Bidders are required to register on the TReDS platform. The MSME vendors can avail the TReDS facility, if they want to.

- 40.7 Interest payment on delayed payments to MSME is payable in line with Micro, Small and Medium Enterprises Development Act, 2006

**42 AHR ITEMS**

Not applicable.

**42 VENDOR PERFORMANCE EVALUATION**

Shall be as stipulated Annexure II to ITB herewith.

**43 INCOME TAX & CORPORATE TAX**

- 43.1 Income tax deduction shall be made from all payments made to the contractor as per the rules and regulations in force and in accordance with the Income Tax Act prevailing from time to time.

- 43.2 Corporate Tax liability, if any, shall be to the contractor's account.

**43.3 TDS**

- (i) TDS, wherever applicable, shall be deducted as per applicable act/law/rule.

(ii) **Higher rate of TDS for non-filers of ITR**

As per Section 206AB of Income Tax Act, 1961, in case of any vendor/customer who does not file their Income Tax Return for both of the two previous years preceding to current year and aggregate amount of TDS is more than or equal to 50,000/- in each of those previous two years (or limit defined by Govt. from time to time), then TDS will be deducted at the higher of following rates:

- (I) Twice the rate mentioned in relevant TDS section.
- (II) Twice the rate or rates in force
- (III) 5%

**43.4 MENTIONING OF PAN NO. IN INVOICE/BILL**

As per CBDT Notification No. 95/2015 dated 30.12.2015, mentioning of PAN no. is mandatory for procurement of goods / services/works/consultancy services exceeding Rs. 2 Lacs per transaction or as amended from time to time.

Accordingly, contractor should mention their PAN no. in their invoice/ bill for any transaction exceeding Rs. 2 lakhs or as amended from time to time. As provided in the notification, in case contractor do not have PAN no., they have to submit declaration in Form 60 along with invoice/ bill for each transaction.

Payment of contractor shall be processed only after fulfilment of above requirement.

#### **44. DISPUTE RESOLUTION MECHANISM**

##### **44.1 QUARTERLY CLOSURE OF THE CONTRACT**

During execution of orders, various issues may arise. In order to timely detect and to address the contractual issue(s) during the execution of contracts, TFL has introduced a mechanism of Quarterly Closure of the contract, under which all the related issues /disputes will be monitored and addressed on quarterly basis for resolution. Vendor (hereinafter referred 'Vendor') should first refer any issues/disputes to Engineer-in-Charge(EIC) for LOA/contracts/ Dealing C&P Executive for Purchase Orders and co-operate them for smooth execution of the contract and to timely address the issues, if any. For applicability of 'Quarterly Closure', please refer BDS.

##### **44.2 ARBITRATION**

All issue(s)/dispute(s) excluding the matters that have been specified as excepted matters and listed at clause no. 2.6 and which cannot be resolved through Conciliation, such issue(s)/dispute(s) shall be referred to arbitration for adjudication by Sole Arbitrator.

The party invoking the Arbitration shall have the option to either opt for Ad-hoc Arbitration as provided at Clause 2.1 below or Institutionalized Arbitration as provided at Clause 2.2 below, the remaining clauses from 2.3 to 2.7 shall apply to both Ad-hoc and Institutional Arbitration:-

2.1 On invocation of the Arbitration clause by either party, TFL shall suggest a panel of three independent and distinguished persons (Retd Supreme Court & High Court Judges only) to the other party from the Panel of Arbitrators maintained by 'Delhi International Arbitration Centre (DIAC) to select any one among them to act as the Sole Arbitrator. In the event of failure of the other party to select the Sole Arbitrator within 30 days from the receipt of the communication from TFL suggesting the panel of arbitrators, the right of selection of the sole arbitrator by the other party shall stand forfeited and TFL shall appoint the Sole Arbitrator from the suggested panel of three Arbitrators for adjudication of dispute(s). The decision of TFL on the appointment of the sole arbitrator shall be final and binding on the other party. The fees payable to Sole Arbitrator shall be governed by the fee Schedule of "Delhi International Arbitration Centre".

OR

2.2 If a dispute arises out of or in connection with this contract, the party invoking the Arbitration shall submit that dispute to any one of the Arbitral Institutions i.e ICADR/ICA/DIAC/SFCA and that dispute shall be adjudicated in accordance with their respective Arbitration Rules. The matter shall be adjudicated by a Sole Arbitrator who shall necessarily be a Retd. Supreme Court/High Court Judge to be appointed/nominated by the respective institution. The cost/expenses pertaining to the said Arbitration shall also be governed in accordance with the Rules of the respective Arbitral Institution. The decision of the party invoking the Arbitration for reference of dispute to a specific Arbitral institution for adjudication of that dispute shall be final and binding on both the parties and shall not be subject to any change thereafter. The institution once selected at the time of invocation of dispute shall remain unchanged.

2.3 The cost of arbitration proceedings shall be shared equally by the parties.

- 2.4 The Arbitration proceedings shall be in English language and the seat, venue and place of Arbitration shall be New Delhi, India only.
- 2.5 Subject to the above, the provisions of Arbitration & Conciliation Act 1996 and any amendment thereof shall be applicable. All matter relating to this Contract and arising out of invocation of Arbitration clause are subject to the exclusive jurisdiction of the Court(s) situated at New Delhi.
- 2.6 List of Excepted matters:
- a) Dispute(s)/issue(s) involving claims below Rs 25 lakhs and above Rs 25 crores.
  - b) Dispute(s)/issue(s) relating to indulgence of Contractor/Vendor/Bidder in corrupt/fraudulent/collusive/coercive practices and/or the same is under investigation by CBI or Vigilance or any other investigating agency or Government.
  - c) Dispute(s)/issue(s) wherein the decision of Engineer-In-Charge/owner/TFL has been made final and binding in terms of the Contract.
- 2.7. Disputes involving claims below Rs 25 Lakhs and above Rs. 25 crores:- Parties mutually agree that dispute(s)/issue(s) involving claims below Rs 25 Lakhs and above Rs 25 crores shall not be subject matter of Arbitration and are subject to the exclusive jurisdiction of the Court(s) situated at New Delhi.

#### **44.3 GOVERNING LAW AND JURISDICTION:**

The Contract shall be governed by and construed in accordance with the laws in force in India. The Parties hereby submit to the exclusive jurisdiction of the Courts situated at New Delhi for adjudication of disputes, injunctive reliefs, actions and proceedings, if any, arising out of this Contract.

#### **45. DISPUTES BETWEEN CPSE'S/ GOVERNMENT DEPARTMENT'S / ORGANIZATIONS**

Subject to conciliation as provided above, in the event of any dispute (other than those related to taxation matters) or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments /Organizations , such dispute or difference shall be taken up by either party for resolution only through AMRCD as mentioned in OPE OM No. 4(1)/2013-DPE(GM)/FTS-1835 dated 22-05-2018.

Any party aggrieved with the decision of the Committee at the First level (tier) may prefer an appeal before the Cabinet Secretary at the Second level (tier) within 15 days from the date of receipt of decision of the Committee at First level, through it's administrative Ministry/Department, whose decision will be final and binding on all concerned.

The above provisions mentioned at clause no. 44 & 45 shall supersede provisions relating to Conciliation, Arbitration, Governing Law & Jurisdiction and Disputes between CPSE's/ Government Department's/ Organizations mentioned in General Conditions of Contract (GCC) and elsewhere in tender document.



46 **INAM-PRO (PLATFORM FOR INFRASTRUCTURE AND MATERIALS PROVIDERS)**

INAM-Pro (Platform for infrastructure and materials providers) is a web based platform for infrastructure provides and materials suppliers and was developed by Ministry of Road Transport and Highways (MoRT&H) with a view to reduce project execution delays on account of supply shortages and inspire greater confidence in contractors to procure cement to start with directly from the manufacturers. Presently, numerous cement companies are registered in the portal and offering cement for sale on the portal with a commitment period of 3 years. These companies have bound themselves by ceiling rates for the entire commitment period, wherein they are allowed to reduce or increase their cement rates any number of times within the ceiling rate, but are not permitted to exceed the said ceiling rate.

MoRT&H is expanding the reach of this web-portal by increasing both the product width as well as the product depth. They are working on incorporating 60 plus product categories. The product range will span from large machineries like Earth Movers and Concrete Mixers, to even the smallest items like road studs. MoRT&H intend to turn it into a portal which services every infrastructure development related need of a modern contractor.

TFL's contractors may use this innovative platform, wherever applicable. The usage of web – Portal is a completely voluntary exercise. The platform, however, can serve as a benchmark for comparison of offered prices and products.

47 **PROMOTION OF PAYMENT THROUGH CARDS AND DIGITAL MEANS**

To promote cashless transactions, the onward payments by Contractors to their employees, service providers, sub-contractors and suppliers may be made through Cards and Digital means to the extent possible

48 **CONTRACTOR TO ENGAGE CONTRACT MANPOWER BELONGING TO SCHEDULED CASTES AND WEAKER SECTIONS OF THE SOCIETY**

While engaging the contractual manpower, Contractors are required to make efforts to provide opportunity of employment to the people belonging to Scheduled Castes and weaker sections of the society also in order to have a fair representation of these sections.

49 **PROVISIONS FOR STARTUPS (AS DEFINED IN GAZETTE NOTIFICATION NO. D.L-33004/99 DATED 18.02.2016 AND 23.05.2017 OF MINISTRY OF COMMERCE AND INDUSTRY AND AS AMENDED FROM TIME TO TIME) [FOR APPLICABILITY REFER BDS]**

As mentioned in Section-II, Technical and Financial BEC shall be applicable for all Startups [whether Micro & Small Enterprises (MSEs) or otherwise].

Further, the Startups are also exempted from submission of EMDs (if applicable).

If a Startup emerge lowest bidder, the LoA on such Startup shall be placed for entire tendered quantity/group/item/part (as the case may be). However, during the Kick of Meeting monthly milestones/ check points would be drawn. Further, the performance of such contractor/ service provider will be reviewed more carefully and action to be taken as per provision of contract in case of failure/ poor performance.

**50 PROVISION REGARDING INVOICE FOR REDUCED VALUE OR CREDIT NOTE TOWARDS MAD**

MAD is the reduction in the consideration / contract value for the / services covered under this contract. In case of delay in execution of service provider should raise invoice for reduced value as per MAD) clause. If service provider has raised the invoice for full value, then service provider should issue Credit Note towards the applicable MAD amount with applicable taxes.

In such cases if service provider fails to submit the invoice with reduced value or does not issue credit note as mentioned above, TFL will release the payment to service provider after giving effect of the MAD clause with corresponding reduction of taxes charged on service provider's invoice, to avoid delay in payment.

In case any financial implication arises on TFL due to issuance of invoice without reduction in price or non-issuance of Credit Note, the same shall be to the account of service provider. TFL shall be entitled to deduct / setoff / recover such GST amount (CGST & SGST/UTGST or IGST) together with penalties and interest, if any, against any amounts paid or becomes payable by OWNER in future to the service provider's under this contract or under any other contract.

**51. UNIQUE DOCUMENT IDENTIFICATION NUMBER BY PRACTICING CHARTERED ACCOUNTANTS**

Practicing Chartered Accountants shall generate Unique Document Identification Number (UDIN) for all certificates issued by them as per provisions of Tender Document.

However, UDIN may not be required for documents being attested by Chartered Accountants in terms of provisions of Tender Document.

**52. PROVISION FOR PROCUREMENT FROM A BIDDER WHICH SHARES A LANDBORDER WITH INDIA.**

The clause regarding provision for procurement from a bidder which shares a land with India is enclosed as Annexure-VII to ITB herewith.

**53. DOCUMENTS FOR PAYMENT:**

Payment terms shall be as mentioned in GCC-Works/SCC.

However, for release of payment, Contractor is required to submit invoice along with other documents as mentioned in SCC. The final bill is to be submitted within one month after completion.

Further, TFL is in process of implementing Vendor Invoice Management (VIM). After implementation of same (to be communicated separately), Contractor/ Vendor to forward the invoice on VIM Collection Center or upload digital invoice on Portal (details of same will be provided separately). The copy of invoice and all other document mentioned above or in order/ contract is to be forwarded to address provided in order/contract.

**PROCEDURE FOR ACTION IN CASE CORRUPT/FRAUDULENT/COLLUSIVE/COERCIVE PRACTICES**

**Annexure-I**

**A Definitions:**

- A.1 “Corrupt Practice” means the offering, giving, receiving or soliciting, directly or indirectly, anything of value to improperly influence the actions in selection process or in contract execution.
- “Corrupt Practice” also includes any omission for misrepresentation that may mislead or attempt to mislead so that financial or other benefit may be obtained or an obligation avoided.
- A.2 “Fraudulent Practice” means and include any act or omission committed by a agency or with his connivance or by his agent by misrepresenting/ submitting false documents and/ or false information or concealment of facts or to deceive in order to influence a selection process or during execution of contract/ order.
- A.3 “Collusive Practice amongst bidders (prior to or after bid submission)” means a scheme or arrangement designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.
- A.4 “Coercive practice” means impairing or harming or threatening to impair or harm directly or indirectly, any agency or its property to influence the improperly actions of an agency, obstruction of any investigation or auditing of a procurement process.
- A.5 “Vendor/Supplier/Contractor/Consultant/Bidder” is herein after referred as “Agency”
- A.6 “Appellate Authority” shall mean Committee of Directors consisting of Director (Finance) and Director (BD) for works centers under Director (Projects). For all other cases committee of Directors shall consist of Director (Finance) & Director (Projects).
- A.7 “Competent Authority” shall mean the authority, who is competent to take final decision for Suspension of business dealing with an Agency/ (ies) and Banning of business dealings with Agency/ (ies) and shall be the “Director” concerned.
- A.8 “Allied Agency” shall mean all concerns which come within the sphere of effective influence of the banned/suspended agency shall be treated as allied agency. In determining this, the following factors may be taken into consideration:
- a) Whether the management is common;
  - b) Majority interest in the management is held by the partners or directors of banned/ suspended agency;
  - c) Substantial or majority shares are owned by the banned/ suspended agency and by virtue of this it has a controlling voice.
  - d) Directly or indirectly controls, or is controlled by or is under common control with another bidder.

- e) All successor agency will also be considered as allied agency.
- A.9 "Investigating Agency" shall mean any department or unit of TFL investigating into the conduct of Agency/ party and shall include the Vigilance Department of the TFL, Central Bureau of Investigation, State Police or any other agency set up by the Central or state government having power to investigate.
- A.10 "Obstructive practice": materially impede the procuring entity's investigation into allegations of one or more of the above mentioned practices either by deliberately destroying, falsifying, altering; or by concealing of evidence material to the investigation; or by making false statements to investigators and/ or by threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or by impeding TFL's rights of audit or access to information.

## **B Actions against bidder(s) indulging in corrupt /fraudulent/ collusive/ coercive practice**

### **B.1 Irregularities noticed during the evaluation of the bids :**

If it is observed during bidding process/ bids evaluation stage that a bidder has indulged in corrupt/fraudulent /collusive/coercive practice, the bid of such Bidder (s) shall be rejected and its Earnest Money Deposit (EMD) shall be forfeited.

Further, such agency shall be banned for future business with TFL for a period specified in para B 2.2 below from the date of issue of banning order.

### **B.2 Irregularities noticed after award of contract**

#### **(i) During execution of contract:**

If an agency, is found to have indulged in corrupt/fraudulent/ collusive/coercive practices, action shall be initiated for putting the agency on banning list.

After conclusion of process and issuance of Speaking order for putting party on banning list, the order (s)/ contract (s) where it is concluded that such irregularities have been committed shall be terminated and Contract cum Performance Bank Guarantee (CPBG) submitted by agency against such order (s)/ contract (s) shall also be forfeited. Further such order/ contract will be closed following the due procedure in this regard.

The amount that may have become due to the contractor on account of work already executed by him shall be payable to the contractor and this amount shall be subject to adjustment against any amounts due from the contractor under the terms of the contract. No risk and cost provision will be enforced in such cases.

#### **Suspension of order/ contract:**

Further, only in the following situations, the concerned order (s)/ contract(s) (where Corrupt/Fraudulent/ Collusive/ Coercive Practices are observed) and payment shall be suspended after issuance of Suspension cum Show Cause Notice:

- (i) Head of Corporate Vigilance Department/CVO based on the investigation by them, recommend for specific immediate action against the agency.
- (ii) Head of Corporate Vigilance Department/CVO based on the input from investigating agency, forward for specific immediate action against the agency.

Suspension cum Show Cause Notice being issued in above cases after approval of the competent authority (as per provisions mentioned under Clause no. D) shall also include the provision for suspension of Order (s)/ Contract (s) and payment. Accordingly, after issuance of Suspension cum Show Cause Notice, the formal communication for suspension of Order (s)/ Contract (s) and payment with immediate effect will be issued by the concerned person of TFL.

During suspension, Contractor/ Service Providers will be allowed to visit the plant/ site for upkeep of their items/ equipment, TFL's issued materials (in case custody of same is not taken over), demobilizing the site on confirmation of EIC, etc.

In addition to above, Recovery of payments (other than due payments) including balance advance payments, if any, made by along with interest thereon at the prevailing rate shall be recovered.

**(ii) After execution of contract and during Defect liability period (DLP)/ Warranty/Guarantee Period:**

If an agency is found to have indulged in corrupt/fraudulent/ collusive/coercive practices, after execution of contract and during DLP/ Warranty/Guarantee Period, the agency shall be banned for future business with TFL for a period specified in para B 2.2 below from the date of issue of banning order.

Further, the Contract cum Performance Bank Guarantee (CPBG)/Contract Performance Security (CPS) submitted by agency against such order (s)/ contract (s) shall be forfeited.

**(iii) After expiry of Defect liability period (DLP)/ Warranty/Guarantee Period**

If an agency is found to have indulged in corrupt/fraudulent/ collusive/coercive practices, after expiry of Defect liability period (DLP)/ Warranty/Guarantee Period, the agency shall be banned for future business with TFL for a period specified in para B 2.2 below from the date of issue of banning order.

**B.2.2 Period of Banning**

The period of banning of agencies indulged in Corrupt/ Fraudulent/ Collusive/ Coercive Practices shall be as under and to be reckoned from the date of banning order:

S. No.	Description	Period of banning from the date of issuance of Banning order
1	<p>Misrepresentation/False information other than pertaining to BEC of tender but having impact on the selection process.</p> <p>For example, if an agency confirms not being in holiday in TFL/PSU's PMC or banned by PSUs/ Govt. Dept., liquidation, bankruptcy &amp; etc. and subsequently it is found otherwise, such acts shall be considered in this category.</p>	06 months

2	Corrupt/Fraudulent (except mentioned sl. no. 1 above) /Collusive/Coercive Practices	2 years (in addition to the period already served)
2.1	If an agency again commits Corrupt/Fraudulent (except mentioned sl. no. 1 above) /Collusive/ Coercive Practices in subsequent cases after their banning, such situation of repeated offense to be dealt with more severity	
3	Indulged in unauthorized disposal of materials provided by TFL	2 years
4	If act of vendor/ contractor is a threat to the National Security	2 years

**C Effect of banning on other ongoing contracts/ tenders**

- C.1 If an agency is put on Banning, such agency should not be considered in ongoing tenders/future tenders.
- C.2 However, if such an agency is already executing other order (s)/ contract (s) where no corrupt/fraudulent/ collusive/coercive practice is found, the agency should be allowed to continue till its completion without any further increase in scope except those incidental to original scope mentioned in the contract.
- C.3 If an agency is put on the Banning List during tendering and no irregularity is found in the case under process:
  - C.3.1 after issue of the enquiry /bid/tender but before opening of Technical bid, the bid submitted by the agency shall be ignored.
  - C.3.2 after opening Technical bid but before opening the Price bid, the Price bid of the agency shall not be opened and BG/EMD submitted by the agency shall be returned to the agency.
  - C.3.3 after opening of price, BG/EMD made by the agency shall be returned; the offer of the agency shall be ignored & will not be further evaluated. . In case such agency is lowest (L-1), next lowest bidder shall be considered as L-1

**D. Procedure for Suspension of Bidder**

**D.1 Initiation of Suspension**

Action for suspension business dealing with any agency/(ies) shall be initiated by Corporate C&P Department when

- (i) Corporate Vigilance Department based on the fact of the case gathered during investigation by them recommend for specific immediate action against the agency.
- (ii) Corporate Vigilance Department based on the input from Investigating agency, forward for specific immediate action against the agency.
- (iii) Non performance of Vendor/Supplier/Contractor/Consultant leading to termination of Contract/ Order.

**D.2 Suspension Procedure:**

- D.2.1 The order of suspension would operate initially for a period not more than six months and is to be communicated to the agency and also to Corporate Vigilance Department. Period of suspension can be extended with the approval of the Competent Authority by one month at a time with a ceiling of six months pending a conclusive decision to put the agency on banning list.

- D.2.2 During the period of suspension, no new business dealing may be held with the agency.
- D.2.3 Period of suspension shall be accounted for in the final order passed for banning of business with the agency.
- D.2.4 The decision regarding suspension of business dealings should also be communicated to the agency.
- D.2.5 If a prima-facie, case is made out that the agency is guilty on the grounds which can result in banning of business dealings, proposal for issuance of suspension order and show cause notice shall be put up to the Competent Authority. The suspension order and show cause notice must include that (i) the agency is put on suspension list and (ii) why action should not be taken for banning the agency for future business from TFL.  
The competent authority to approve the suspension will be same as that for according approval for banning.

**D 3 Effect of Suspension of business:**

Effect of suspension on other on-going/future tenders will be as under:

- D.3.1 No enquiry/bid/tender shall be entertained from an agency as long as the name of agency appears in the Suspension List.
- D.3.2 If an agency is put on the Suspension List during tendering:
  - D.3.2.1 after issue of the enquiry /bid/tender but before opening of Technical bid, the bid submitted by the agency shall be ignored.
  - D.3.2.2 after opening Technical bid but before opening the Price bid, the Price bid of the agency shall not be opened and BG/EMD submitted by the agency shall be returned to the agency.
  - D.3.2.3 after opening of price, BG/EMD made by the agency shall be returned; the offer of the agency shall be ignored & will not be further evaluated. . In case such agency is lowest (L-1), next lowest bidder shall be considered as L-1D.3.3 The existing contract (s)/ order (s) under execution shall continue.
- D.3.4 Tenders invited for procurement of goods, works and services shall have provision that the bidder shall submit a undertaking to the effect that (i) neither the bidder themselves nor their allied agency/(ies) are on banning list of TFL and(ii) bidder is not banned by any Government department/ Public Sector.

**F. Appeal against the Decision of the Competent Authority:**

- F.1 The agency may file an appeal against the order of the Competent Authority for putting the agency on banning list. The appeal shall be filed to Appellate Authority. Such an appeal shall be preferred within one month from the of receipt of banning order.
- F.2 Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the party as well as the Competent Authority.
- F.3 Appeal process may be completed within 45 days of filing of appeal with the Appellate Authority.

- G. Wherever there is contradiction with respect to terms of 'Integrity pact' , GCC and 'Procedure for action in case of Corrupt/Fraudulent/ Collusive/Coercive Practice', the provisions of 'Procedure for action in case of Corrupt/Fraudulent/ Collusive/Coercive Practice' shall prevail.

**PROCEDURE FOR EVALUATION OF PERFORMANCE OF VENDORS/ SUPPLIERS/  
CONTRACTORS/ CONSULTANTS**

1.0 **GENERAL**

A system for evaluation of Vendors/ Suppliers/Contractors/ Consultants and their performance is a key process and important to support an effective purchasing & contracting function of an organization.

Performance of all participating Vendors/ Suppliers/Contractors/ Consultants need to be closely monitored to ensure timely receipt of supplies from a Vendor, completion of an assignment by a Consultant or complete execution of order by a contractor within scheduled completion period. For timely execution of projects and meeting the operation & maintenance requirement of operating plants, it is necessary to monitor the execution of order or contracts right from the award stage to completion stage and take corrective measures in time.

2.0 **OBJECTIVE**

The objective of Evaluation of Performance aims to recognize, and develop reliable Vendors/ Suppliers/Contractors/ Consultants so that they consistently meet or exceed expectations and requirements.

The purpose of this procedure is to put in place a system to monitor performance of Vendors/ Suppliers/Contractors/ Consultants associated with TFL so as to ensure timely completion of various projects, timely receipt of supplies including completion of works & services for operation and maintenance of operating plants and quality standards in all respects.

3.0 **METHODOLOGY**

- i) **Preparation of Performance Rating Data Sheet**  
Performance rating data Sheet for each and every Vendor/ Supplier/Contractor/Consultant for all orders/Contracts with a value of Rs. 50 Lakhs and above is recommended to be drawn up. Further, Performance rating data Sheet for orders/contracts of Vendor/Supplier/Contractor/ Consultant who are on watch list/holiday list/ banning list shall be prepared irrespective of order/ contract value. These data sheets are to be separately prepared for orders/ contracts related to Projects and O&M. Format, Parameters, Process, responsibility for preparation of Performance Rating Data Sheet are separately mentioned.
- ii) **Measurement of Performance**  
Based on the parameters defined in Data Sheet, Performance of concerned Vendor/ Supplier/Contractor/ Consultant would be computed and graded accordingly. The measurement of the performance of the Party would be its ability to achieve the minimum scoring of 60% points in the given parameters.
- iii) **Initiation of Measures:**  
Depending upon the Grading of Performance, corrective measures would be initiated by taking up the matter with concerned Vendor/ Supplier/Contractor/ Consultant. Response of Vendor/ Supplier/Contractor/ Consultant would be considered before deciding further course of action.
- iv) **Implementation of Corrective Measures:**



Based on the response of Vendor/ Supplier/Contractor/ Consultant, concerned Engineer-in-Charge for the Projects and/or OIC in case of O&M would recommend for continuation or discontinuation of such party from the business of TFL.

- v) Orders/contracts placed on Proprietary/OEM basis for O&M will be evaluated and, if required, corrective action will be taken for improvement in future.

#### 4.0 **EXCLUSIONS:**

The following would be excluded from the scope of evaluation of performance of Vendors/ Suppliers/Contractors/ Consultants :

- i) Orders/Contracts below the value of Rs. 50 Lakhs if Vendor/ Supplier/Contractor/ Consultant is not on watch list/ holiday list/ banning list.
- ii) Orders for Misc./Administrative items/ Non stock Non valued items (PO with material code ending with 9).

However, concerned Engineer-in-Charge /OICs will continue to monitor such cases so as to minimize the impact on Projects/O&M plants due to non performance of Vendors/ Suppliers/Contractors/ Consultants in all such cases.

#### 5.0 **PROCESS OF EVALUATION OF PERFORMANCE OF VENDORS/ SUPPLIERS/ CONTRACTORS/ CONSULTANTS**

##### 5.1 FOR PROJECTS

- i) Evaluation of performance of Vendors/ Suppliers/Contractors/ Consultants in case of PROJECTS shall be done immediately with commissioning of any Project.
- ii) On commissioning of any Project, EIC (Engineer-in-charge)/ Project-in-charge shall prepare a Performance Rating Data Sheet (Format at Annexure-1) for all Orders and Contracts.
- iii) Depending upon the Performance Rating, following action shall be initiated by Engineer-in-charge/Project-in-charge:

Sl.No.	Performance Rating	Action
1	POOR	Seek explanation for Poor performance
2	FAIR	Seek explanation for Fair performance
3	GOOD	Letter to the concerned for improving performance in future
4	VERY GOOD	No further action

- iv) Reply from concerned Vendor/ Supplier/Contractor/ Consultant shall be examined. In case of satisfactory reply, Performance Rating data Sheet to be closed with a letter to the concerned for improving performance in future.
- v) When no reply is received or reasons indicated are unsatisfactory, the following actions need to be taken:

- A) Where performance rating is “POOR” (as per Performance Rating carried out after execution of Order/ Contract and where no reply/ unsatisfactory reply is received from party against the letter seeking the explanation from Vendor/Supplier/Contractor/ Consultant along with sharing the performance rating)

Recommend such defaulting Vendor / Supplier / Contractor / Consultant for the following action:

1. Poor Performance on account of Quality (if marks obtained against Quality parameter is less than 20):
  - (a) **First Instance: Holiday (Red Card) for one Years**
  - (b) **Subsequent instance (s) in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Holiday (Red Card) for two Years**
2. Poor Performance on account of other than Quality (if marks obtained against Quality parameter is more than 20):
  - (a) **First such instance: Advisory notice(Yellow Card)** shall be issued and Vendor/Supplier/Contractor/ Consultant shall be put on watch list for a period of Two (2) Years.
  - (b) **Second such instance in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Putting on Holiday (Red Card) for a period of One Year**
  - (c) **Subsequent instances (more than two) in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Putting on Holiday (Red Card) for a period of Two Years.**

- B) Where Poor/Non-Performance leading to termination of contract or Offloading of contract due to poor performance attributable to Vendor/Supplier/ Contractor/Consultant (under clause no. 34.2.3 of GCC)

- (a) **First instance: Advisory notice (Yellow Card)** shall be issued and Vendor/Supplier/Contractor /Consultant shall be put on watch list for a period of Two (2) Years.  
Further such vendor will not be allowed to participate in the re-tender of the same supply/work/services of that location which has terminated / offloaded. Moreover, it will be ensured that all other action as per provision of contract including forfeiture of Contract Performance Security (CPS) etc. are undertaken.  
However, such vendor will be allowed to participate in all other tenders and to execute other ongoing order/ contract (s) or new contract/ order (s).

The Yellow card will be automatically revoked after a period of two years unless the same is converted into Red Card due to subsequent instances of poor/ non-performance in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant.

- (b) **Second instances** in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: **Holiday (Red Card)** for period of One Year and they shall also to be considered for Suspension.
- (c) **Subsequent instances (more than two)** in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: **Holiday (Red Card) for period of Two Years and they shall also to be considered for Suspension.**

(C) Where Performance rating is “FAIR”:

Issuance of warning to such defaulting Vendor/ Supplier/Contractor/ Consultant to improve their performance.

5.2 FOR CONSULTANCY JOBS

Monitoring and Evaluation of consultancy jobs will be carried out in the same way as described in para 5.1 for Projects.

5.3 FOR OPERATION & MAINTENANCE

- i) Evaluation of performance of Vendors/ Suppliers/Contractors/ Consultants in case of Operation and Maintenance shall be done immediately after execution of order/ contract.
- ii) After execution of orders a Performance Rating Data Sheet (Format at Annexure-2) shall be prepared for Orders by Site C&P and for Contracts/Services by respective Engineer-In-Charge.
- iii) Depending upon Performance Rating, following action shall be initiated by EIC:

Sl. No.	Performance Rating	Action
1	<b>POOR</b>	Seek explanation for Poor performance
2.	<b>FAIR</b>	Seek explanation for Fair performance
3	<b>GOOD</b>	Letter to the concerned for improving performance in future.
4	<b>VERY GOOD</b>	No further action

- iv) Reply from concerned Vendor/ Supplier/Contractor/ Consultant shall be examined. In case of satisfactory reply, Performance Rating data Sheet to be closed with a letter to the concerned for improving performance in future.
- v) When no reply is received or reasons indicated are unsatisfactory, the following actions need to be taken:

- A) Where performance rating is “POOR” (as per Performance Rating carried out after execution of Order/ Contract and where no reply/ unsatisfactory reply is received from party against the letter seeking the explanation from Vendor/Supplier/Contractor/ Consultant along with sharing the performance rating)

Recommend such defaulting Vendor / Supplier / Contractor / Consultant for the following action:

1. Poor Performance on account of Quality (if marks obtained against Quality parameter is less than 20):
  - (a) **First Instance: Holiday (Red Card) for one Year**
  - (b) **Subsequent instance (s) in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Holiday (Red Card) for Two Years**
2. Poor Performance on account of other than Quality (if marks obtained against Quality parameter is more than 20):
  - (a) **First such instance: Advisory notice(Yellow Card)** shall be issued and Vendor/Supplier/Contractor/ Consultant shall be put on watch list for a period of Two (2) Years.
  - (b) **Second such instance in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Putting on Holiday (Red Card) for a period of One Year**
  - (c) **Subsequent instances (more than two) in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Putting on Holiday (Red Card) for a period of Two Years.**

- B) Where Poor/Non-Performance leading to termination of contract or Offloading of contract due to poor performance attributable to Vendor/Supplier/ Contractor/Consultant (under clause no. 34.2.3 of GCC)

- (a) **First instance: Advisory notice (Yellow Card)** shall be issued and Vendor/Supplier/Contractor /Consultant shall be put on watch list for a period of two (2) Years.

Further such vendor will not be allowed to participate in the re-tender of the same supply/work/services of that location which has terminated / offloaded. Moreover, it will be ensured that all other action as per provision of contract including forfeiture of Contract Performance Security (CPS) etc. are undertaken.

However, such vendor will be allowed to participate in all other tenders and to execute other ongoing order/ contract (s) or new contract/ order (s).

The Yellow card will be automatically revoked after a period of two years unless the same is converted into Red Card due to subsequence instances of poor/ non-performance in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant.

(b) **Second instances** in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: **Holiday (Red Card)** for period of One Year and they shall also to be considered for Suspension.

(c) **Subsequent instances (more than two)** in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: **Holiday (Red Card) for period of Two Years and they shall also to be considered for Suspension.**

(C) Where Performance rating is "FAIR"

Issuance of warning to such defaulting Vendors/Contractors/Consultants to improve their performance.

## 6.0 **REVIEW & RESTORATION OF PARITES PUT ON HOLIDAY**

6.1 An order for Holiday passed for a certain specified period shall deemed to have been automatically revoked on the expiry of that specified period and it will not be necessary to issue a specific formal order of revocation.

Further, in case Vendor/ Supplier/Contractor/ Consultant is put on holiday due to quality, and new order is placed on bidder after restoration of Vendor/ Supplier/Contractor/ Consultant, such order will be properly monitored during execution stage by the concerned site.

## 7.0 **EFFECT OF HOLIDAY**

7.1 If a Vendor/ Supplier/Contractor/ Consultant is put on Holiday, such Vendor/ Supplier/Contractor/ Consultant shall not be considered in ongoing tenders/future tenders.

7.2 However, if such Vendor/ Supplier/Contractor/ Consultant is already executing any other order/ contract and their performance is satisfactory in terms of the relevant contract, should be allowed to continue till its completion without any further increase in scope except those incidental to original scope mentioned in the contract. In such a case CPBG will not be forfeited and payment will be made as per provisions of concerned contract. However, this would be without prejudice to other terms and conditions of the contract.

7.3. Effect on other ongoing tendering:

7.3.1 after issue of the enquiry /bid/tender but before opening of Technical bid, the bid submitted by the party shall be ignored.

7.3.2 after opening of price, BG/EMD made by the party shall be returned; the offer of the party shall be ignored & will not be further evaluated. In case such agency is lowest (L-1), next lowest bidder shall be considered as L-1.

7.3.3 after opening of price, BG/EMD made by the party shall be returned; the offer of the party shall be ignored & will not be further evaluated. If errant party emerges as the lowest (L1), then such tender shall also be cancelled and re-invited.

8.0 While putting the Vendor/ Supplier/Contractor/ Consultant on holiday as per the procedure, the holding company, subsidiary, joint venture, sister concerns, group division of the errant Vendor/ Supplier/Contractor/ Consultant shall not be considered for putting on holiday list. Any bidder, put on holiday, will not be allowed to bid through consortium route also in new tender during the period of holiday.

9.0 If an unsuccessful bidder makes any vexatious, frivolous or malicious complaint against the tender process with the intention of delaying or defeating any procurement or causing loss to TFL or any other bidder, such bidder will be put on holiday for a period of six months, if such complaint is proved to be vexatious, frivolous or malicious, after following the due procedure.

**10. APPEAL AGAINST THE DECISION OF THE COMPETENT AUTHORITY:**

- (a) The party may file an appeal against the order of the Competent Authority for putting the party on Holiday list. The appeal shall be filed to Appellate Authority. Such an appeal shall be preferred within one month from the of receipt of Holiday order.
- (b) Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the party as well as the Competent Authority.
- (c) Appeal process may be completed within 45 days of filing of appeal with the Appellate Authority.
- (d) "Appellate Authority" shall mean Committee of Directors consisting of Director (Finance) and Director (BD) for works centers under Director (Projects). For all other cases committee of Directors shall consist of Director (Finance) & Director (Projects).

**11. ERRANT BIDDER**

In case after price bid opening the lowest evaluated bidder (L1) is not awarded the job for any mistake committed by him in bidding or withdrawal of bid or modification of bid or varying any term in regard thereof leading to re-tendering, TFL shall forfeit EMD if paid by the bidder and such bidders shall be debarred from participation in retendering of the same job(s)/item(s). Further, such bidder will be put on Watch List (Yellow Card) for a period of two years after following the due procedure. However, during the period in watch list such vendor will be allowed to participate in all other tenders and to execute other ongoing order/ contract (s) or new contract/ order (s).

In case of subsequent instances of default in other tender(s) during aforesaid watch list period, the action shall be initiated as per provision of sl. no. 2 of para A of Clause no. 5.1 (v) and 5.3 (v).

The Yellow card will be automatically revoked after specified period unless the same is converted into Red Card

12. In case CBIC (Central Board of Indirect Taxes and Customs)/ any tax authority / any equivalent government agency brings to the notice of TFL that the Supplier has not remitted the amount towards GST (CGST & SGST/UTGST or IGST) collected from TFL to the government exchequer, then, that Supplier shall be put under Holiday list of TFL for period of six months after following the due procedure. This action will be in addition to the right of recovery of financial implication arising on TFL.

**TALCHER FERTIZERS LIMITED  
PERFORMANCE RATING DATA SHEET  
(FOR PROJECTS/ CONSULTANCY JOBS)**

- i) Project/Work Centre :  
 ii) Order/ Contract No. & date :  
 iii) Brief description of Items :  
 Works/Assignment  
 iv) Order/Contract value (Rs.) :  
 v) Name of Vendor/Supplier/ :  
 Contractor/ Consultant  
 vi) Contracted delivery/ :  
 Completion Schedule  
 vii) Actual delivery/ :  
 Completion date

Performance Parameter	Delivery/ Completion Performance	Quality Performance	Reliability Performance#	Total
Maximum Marks	40	40	20	100
Marks Allocated				

Note:

Remarks (if any)

PERFORMANCE RATING (\*\*)

Note :

(#) Vendor/Supplier/Contractor/Consultant who seek repeated financial assistance or deviation beyond contract payment term or seeking direct payment to the sub-vendor/sub-contractor due to financial constraints, then '0' marks should be allotted against Reliability Performance.

(\*) Allocation of marks should be as per enclosed instructions

(\*\*) Performance rating shall be classified as under :

Sl. No.	Range (Marks)	Rating	Signature of Authorised Signatory:
1	60 & below	POOR	Name: Designation:
2	61-75	FAIR	
3	76-90	GOOD	
4	More than 90	VERY GOOD	

**Instructions for allocation of marks**

1. Marks are to be allocated as under :

**1.1 DELIVERY/ COMPLETION PERFORMANCE**

**40 Marks**

**Delivery Period/  
Completion Schedule**

**Delay in Weeks**

**Marks**

a) Upto 3 months	Before CDD	40
	Delay upto 4 weeks	35
	"    8 weeks	30
	"   10 weeks	25
	"   12 weeks	20
	"   16 weeks	15
	More than 16 weeks	0
b) Above 3 months	Before CDD	40
	Delay upto 4 weeks	35
	"    8 weeks	30
	"   10 weeks	25
	"   16 weeks	20
	"   20 weeks	15
	"   24 weeks	10
	More than 24 weeks	0

**1.2 QUALITY PERFORMANCE 40 Marks**

For Normal Cases : No Defects/ No Deviation/ No failure:		40 marks
i) Rejection/Defects	Marks to be allocated on prorata basis for acceptable quantity as compared to total quantity for normal cases	10 marks
ii) When quality failure endanger system integration and safety of the system	Failure of severe nature - Moderate nature - low severe nature	0 marks 5 marks 10-25 marks
iii) Number of deviations	1. No deviation 2. No. of deviations $\leq 2$ 3. No. of deviations $> 2$	5 marks 2 marks 0 marks

**1.3 RELIABILITY PERFORMANCE 20 Marks**

A.	FOR WORKS/CONTRACTS	
i)	Submission of order acceptance, agreement, PBG, Drawings and other documents within time	4 marks
ii)	Mobilization of resources as per Contract and in time	4 marks
iii)	Liquidation of Check-list points	4 marks
iv)	Compliance to statutory and HS&E requirements or Reliability of Estimates/Design/Drawing etc. in	4 marks



	case of Consultancy jobs	
v)	Timely submission of estimates and other documents for Extra, Substituted & AHR items	4 marks
<b>B.</b>	<b>FOR SUPPLIES</b>	
i)	Submission of order acceptance, PBG, Drawings and other documents within time	5 marks
ii)	Attending complaints and requests for after sales service/ warranty repairs and/ or query/ advice (upto the evaluation period).	5 marks
iii)	Response to various correspondence and conformance to standards like ISO	5 marks
iv)	Submission of all required documents including Test Certificates at the time of supply	5 marks

**TALCHER FERTILIZERS LIMITED  
PERFORMANCE RATING DATA SHEET  
(FOR O&M)**

- i) Location :  
 ii) Order/ Contract No. & date :  
 iii) Brief description of Items :  
 Works/Assignment  
 iv) Order/Contract value (Rs.) :  
 v) Name of Vendor/Supplier/ :  
 Contractor/ Consultant  
 vi) Contracted delivery/ :  
 Completion Schedule  
 vii) Actual delivery/ :  
 Completion date

Performance Parameter	Delivery Performance	Quality Performance	Reliability Performance#	Total
Maximum Marks	40	40	20	100
Marks Allocated (*)				

Remarks (if any)

**PERFORMANCE RATING (\*\*)**

Note :

- (#) Vendor/Supplier/Contractor/Consultant who seek repeated financial assistance or deviation beyond contract payment term or seeking direct payment to the sub-vendor/sub-contractor due to financial constraints, then '0' marks should be allotted against Reliability Performance
- (\*) Allocation of marks should be as per enclosed instructions
- (\*\*) Performance rating shall be classified as under :

Sl. No.	Range (Marks)	Rating
1	60 & below	POOR
2	61-75	FAIR
3	76-90	GOOD
4	More than 90	VERY GOOD

Signature of  
Authorised Signatory:

Name:

Designation:

**Instructions for allocation of marks (For O&M)**

1. Marks are to be allocated as under :

**1.1 DELIVERY/ COMPLETION PERFORMANCE 40 Marks**

**Marks**      **Delivery Period/**      **Delay in Weeks**  
**Completion Schedule**

a) Upto 3 months	Before CDD		40
	Delay upto 4 weeks	35	
	" 8 weeks	30	

"	10 weeks	25
"	12 weeks	20
"	16 weeks	15
	More than 16 weeks	0
b) Above 3 months	Before CDD	40
	Delay upto 4 weeks	35
	" 8 weeks	30
	" 10 weeks	25
	" 16 weeks	20
	" 20 weeks	15
	" 24 weeks	10
	More than 24 weeks	0

## 1.2 QUALITY PERFORMANCE

**40 Marks**

For Normal Cases : No Defects/ No Deviation/ No failure:		40 marks
i) Rejection/Defects	Marks to be allocated on prorata basis for acceptable quantity as compared to total quantity for normal cases	10 marks
ii) When quality failure endanger system integration and safety of the system	Failure of severe nature - Moderate nature - low severe nature	0 marks 5 marks 10-25 marks
iii) Number of deviations	1. No deviation 2. No. of deviations $\leq 2$ 3. No. of deviations $> 2$	5 marks 2 marks 0 marks

## 1.3 RELIABILITY PERFORMANCE

**20 Marks**

A.	FOR WORKS/CONTRACTS	
i)	Submission of order acceptance, agreement, PBG, Drawings and other documents within time	4 marks
ii)	Mobilization of resources as per Contract and in time	4 marks
iii)	Liquidation of Check-list points	4 marks
iv)	Compliance to statutory and HS&E requirements or Reliability of Estimates/Design/Drawing etc. in case of Consultancy jobs	4 marks
v)	Timely submission of estimates and other	4 marks

	documents for Extra, Substituted & AHR items	
<b>B.</b>	<b>FOR SUPPLIES</b>	
i)	Submission of order acceptance, PBG, Drawings and other documents within time	5 marks
ii)	Attending complaints and requests for after sales service/ warranty repairs and/ or query/ advice (upto the evaluation period).	5 marks
iii)	Response to various correspondence and conformance to standards like ISO	5 marks
iv)	Submission of all required documents including Test Certificates at the time of supply	5 marks

**INSTRUCTIONS FOR SUBMISSION OF BID ONLINE THROUGH CPP PORTAL**

1. The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.  
More information useful for submitting online bids on the CPP Portal may be obtained at: <https://eprocure.gov.in/eprocure/app>.

**2. REGISTRATION**

- i. Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: <https://eprocure.gov.in/eprocure/app>) by clicking on the link “Online bidder Enrollment” on the CPP Portal which is free of charge.
- ii. As part of the enrollment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- iii. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
- iv. Bidders are advised to make ensure the accessibility & availability of java software in their system (PC) either download & install the latest version of java software or click on the below link to install the java in their system prior to proceed further.  
<https://www.oracle.com/technetwork/java/javase/downloads/index.html>
- v. Upon enrollment, the bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile.
- vi. Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC’s to others which may lead to misuse.
- vii. Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

**3. SEARCHING FOR TENDER DOCUMENTS**

- i. There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.

- ii. Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / email in case there is any corrigendum issued to the tender document.
- iii. The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

#### 4. PREPARATION OF BIDS

- i. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
- ii. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
- iii. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
- iv. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" or "Other Important Documents" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

Note: My Documents space is only a repository given to the Bidders to ease the uploading process. If Bidder has uploaded his Documents in My Documents space, this does not automatically ensure these Documents being part of Technical Bid.

#### 5. SUBMISSION OF BIDS

- i. Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
- ii. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
- iii. Bidder should submit EMD / Declaration for Bid security (as applicable) strictly as per format Form F-2B provided in the NIT. Otherwise the uploaded bid will be rejected.

- iv. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard SOR format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the SOR file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the SOR file is found to be modified by the bidder, the bid will be rejected.
- v. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
- vi. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- vii. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- viii. Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
- ix. The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

#### 6. ASSISTANCE TO BIDDERS

- i. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
- ii. Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk.

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## BIDDING DATA SHEET (BDS)

ITB TO BE READ IN CONJUNCTION WITH THE FOLLOWING:

A. GENERAL					
ITB clause	Description				
1.1	The Employer/Owner is: The Employer/Owner is: Talcher Fertilizers Limited				
1.2	The name of the Works/Services to be performed is: <b>“CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILIZERS LTD, ODISHA (INDIA)”</b> .				
3	BIDS FROM CONSORTIUM/ JOINT VENTURE: <table border="1"> <tr> <td>APPLICABLE</td> <td>✓</td> </tr> <tr> <td>NOT APPLICABLE</td> <td>✗</td> </tr> </table>	APPLICABLE	✓	NOT APPLICABLE	✗
APPLICABLE	✓				
NOT APPLICABLE	✗				
B. BIDDING DOCUMENT					
ITB clause	Description				
8.1	For <b>clarification purposes</b> only, the communication address is: M/s Projects & Development India Limited, P.D.I.L Bhawan, A-14, Sector-1, Noida, (PIN 201301) Dist. GautamBudh Nagar (UP). (India)  Kind Attention: Mrs. Anjali Thakur, Dy. General Manager (M.M) Fax no. : +91-120-2529801 Tel no. : +91-120-2529842 E-mail : anjali@pdilin.com alam@pdilin.com				
C. PREPARATION OF BIDS					
ITB clause	Description				
11.1.1 (r)	Additional documents to be submitted by the Bidder with its Part-I (Techno-commercial/ Unpriced bid) :As per SCC/Scope of Work.				
13	Details of Buyer: <table border="1"> <tr> <td>Services to be rendered at</td> <td>M/s Talcher Fertilizers Ltd. (TFL), Administrative Building, Talcher, Post: Vikrampur, Dist: Angul, Pincode-759106, Odisha</td> </tr> </table>	Services to be rendered at	M/s Talcher Fertilizers Ltd. (TFL), Administrative Building, Talcher, Post: Vikrampur, Dist: Angul, Pincode-759106, Odisha		
Services to be rendered at	M/s Talcher Fertilizers Ltd. (TFL), Administrative Building, Talcher, Post: Vikrampur, Dist: Angul, Pincode-759106, Odisha				



	PAN No.	AAFCT8667A	
	GST no.	21AAFCT8667A1ZH	
<b>14</b>	The currency of the Bid shall be INR		
<b>15</b>	The bid validity period shall be 90 days from final 'Bid Due Date'.		
<b>16.1, 16.10 and 38.6</b>	<p>In case '<b>Earnest Money / Bid Security</b>' or "<b>Contract Performance Security</b>" is in the form of '<b>Demand Draft</b>' or '<b>Banker's Cheque</b>', the same should be favour of "Talcher Fertilizers Limited", payable at New Delhi.</p> <p>In case of submission through online banking transaction i.e. IMPS / NEFT / RTGS / SWIFT, etc, the details of TFL's Bank account are as under:</p> <p>Account Holder's Name: Talcher Fertilizers Limited  Bank Name: State Bank of India  Branch: CAG II, New Delhi  Account number: 41256023769  Type (Current/Saving): Current  Branch Code-17313  Bidder to mention reference no. "EMD/....." in narration while remitting the EMD / Bid Security amount and to mention reference no. "CPS/....." in narration while remitting the CPS amount in TFL's Bank Account</p>		
<b>D. SUBMISSION AND OPENING OF BIDS</b>			
<b>ITB clause</b>	<b>Description</b>		
<b>18</b>	In addition to the original of the Bid, the number of copies required is one. Not applicable in case of e-tendering.		
<b>4.0 of IFB</b>	<p>The submission of physical document as per clause no. 4.0 of IFB shall at following address:</p> <p>M/s Projects &amp; Development India Limited,  P.D.I.L Bhawan, A-14, Sector-1,  Noida, (PIN 201301)  Dist. Gautam Budh Nagar (UP). (India)</p> <p>Kind Attention:  Mr. P.R.Sahu, Addl. General Manager (M.M)  Fax no. : +91-120-2529801  Tel no. : +91-120-2544063</p>		
<b>E. EVALUATION, AND COMPARISON OF BIDS</b>			
<b>ITB clause</b>	<b>Description</b>		
<b>32</b>	Evaluation Methodology is mentioned in Section-II of tender.		

33	Compensation for Extended Stay: APPLICABLE	<input checked="" type="checkbox"/>
	NOT APPLICABLE	<input checked="" type="checkbox"/>
<b>F. AWARD OF CONTRACT</b>		
<b>ITB clause</b>	<b>Description</b>	
37	State of India of which stamp paper is required for Contract Agreement: <b>Uttar Pradesh/ State where Bidder's Registered or Corporate Office is located.</b>	
38	Contract Performance Security/ Security Deposit	
	APPLICABLE	<input checked="" type="checkbox"/>
	NOT APPLICABLE	<input checked="" type="checkbox"/>
<u>The value/ amount of Contract Performance Security/ Security Deposit:</u> CPS/SD @ 10% of Total Order / Contract value (excluding GST)		
41	Provision of AHR Item :	
	APPLICABLE	<input checked="" type="checkbox"/>
	NOT APPLICABLE	<input checked="" type="checkbox"/>
44.1	Quarterly Closure of Contract:	
	APPLICABLE	<input checked="" type="checkbox"/>
	NOT APPLICABLE	<input checked="" type="checkbox"/>
49	Applicability of BEC relaxation relating to Startups:	
	APPLICABLE	<input checked="" type="checkbox"/>
	NOT APPLICABLE	<input checked="" type="checkbox"/>

**PUBLIC PROCUREMENT  
(PREFERENCE TO MAKE IN INDIA), ORDER 2017**

No. P-45021/2/2017-PP (BE-II)  
Government of India  
Ministry of Commerce and Industry  
Department for Promotion of Industry and Internal Trade  
(Public Procurement Section)

Udyog Bhawan, New Delhi  
Dated: 16<sup>th</sup> September, 2020

To

All Central Ministries/Departments/CPSUs/All concerned

**ORDER**

**Subject: Public Procurement (Preference to Make in India), Order 2017– Revision; regarding.**

Department for Promotion of Industry and Internal Trade, in partial modification [Paras 2, 3, 5, 10 & 13] of Order No.P-45021/2/2017-B.E.-II dated 15.6.2017 as amended by Order No.P-45021/2/2017-B.E.-II dated 28.05.2018, Order No.P-45021/2/2017-B.E.-II dated 29.05.2019 and Order No.P-45021/2/2017-B.E.-II dated 04.06.2020, hereby issues the revised 'Public Procurement (Preference to Make in India), Order 2017' dated 16.09.2020 effective with immediate effect.

**Whereas** it is the policy of the Government of India to encourage 'Make in India' and promote manufacturing and production of goods and services in India with a view to enhancing income and employment, and

**Whereas** procurement by the Government is substantial in amount and can contribute towards this policy objective, and

**Whereas** local content can be increased through partnerships, cooperation with local companies, establishing production units in India or Joint Ventures (JV) with Indian suppliers, increasing the participation of local employees in services and training them,

**Now therefore the following Order is issued:**

1. This Order is issued pursuant to Rule 153 (iii) of the General Financial Rules 2017.
2. **Definitions:** For the purposes of this Order:

*'Local content'* means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.

*'Class-I local supplier'* means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for 'Class-I local supplier' under this Order.

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'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for 'Class-II local supplier' but less than that prescribed for 'Class-I local supplier' under this Order.

'Non - Local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than that prescribed for 'Class-II local supplier' under this Order.

'L1' means the lowest tender or lowest bid or the lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per the tender or other procurement solicitation.

'Margin of purchase preference' means the maximum extent to which the price quoted by a "Class-I local supplier" may be above the L1 for the purpose of purchase preference.

'Nodal Ministry' means the Ministry or Department identified pursuant to this order in respect of a particular item of goods or services or works.

'Procuring entity' means a Ministry or department or attached or subordinate office of, or autonomous body controlled by, the Government of India and includes Government companies as defined in the Companies Act.

'Works' means all works as per Rule 130 of GFR- 2017, and will also include 'turnkey works'.

### **3. Eligibility of 'Class-I local supplier'/ 'Class-II local supplier'/ 'Non-local suppliers' for different types of procurement**

(a) In procurement of all goods, services or works in respect of which the Nodal Ministry / Department has communicated that there is sufficient local capacity and local competition, only 'Class-I local supplier', as defined under the Order, shall be eligible to bid irrespective of purchase value.

(b) Only 'Class-I local supplier' and 'Class-II local supplier', as defined under the Order, shall be eligible to bid in procurements undertaken by procuring entities, except when Global tender enquiry has been issued. In global tender enquiries, 'Non-local suppliers' shall also be eligible to bid along with 'Class-I local suppliers' and 'Class-II local suppliers'. In procurement of all goods, services or works, not covered by sub-para 3(a) above, and with estimated value of purchases less than Rs. 200 Crore, in accordance with Rule 161(iv) of GFR, 2017, Global tender enquiry shall not be issued except with the approval of competent authority as designated by Department of Expenditure.

(c) For the purpose of this Order, works includes Engineering, Procurement and Construction (EPC) contracts and services include System Integrator (SI) contracts.

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### 3A. Purchase Preference

(a) Subject to the provisions of this Order and to any specific instructions issued by the Nodal Ministry or in pursuance of this Order, purchase preference shall be given to 'Class-I local supplier' in procurements undertaken by procuring entities in the manner specified here under.

(b) In the procurements of goods or works, which are covered by para 3(b) above and which are divisible in nature, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

- i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract for full quantity will be awarded to L1.
- ii. If L1 bid is not a 'Class-I local supplier', 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the 'Class-I local supplier' will be invited to match the L1 price for the remaining 50% quantity subject to the Class-I local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such 'Class-I local supplier' subject to matching the L1 price. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price or accepts less than the offered quantity, the next higher 'Class-I local supplier' within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on Class-I local suppliers, then such balance quantity may also be ordered on the L1 bidder.

(c) In the procurements of goods or works, which are covered by para 3(b) above and which are not divisible in nature, and in procurement of services where the bid is evaluated on price alone, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

- i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract will be awarded to L1.
- ii. If L1 is not 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price subject to Class-I local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price.
- iii. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the 'Class-I local supplier' within the margin of purchase preference matches the L1 price, the contract may be awarded to the L1 bidder.

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(d) "Class-II local supplier" will not get purchase preference in any procurement, undertaken by procuring entities.

**3B. Applicability in tenders where contract is to be awarded to multiple bidders -** In tenders where contract is awarded to multiple bidders subject to matching of L1 rates or otherwise, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

a) In case there is sufficient local capacity and competition for the item to be procured, as notified by the nodal Ministry, only Class I local suppliers shall be eligible to bid. As such, the multiple suppliers, who would be awarded the contract, should be all and only 'Class I Local suppliers'.

b) In other cases, 'Class II local suppliers' and 'Non local suppliers' may also participate in the bidding process along with 'Class I Local suppliers' as per provisions of this Order.

c) If 'Class I Local suppliers' qualify for award of contract for at least 50% of the tendered quantity in any tender, the contract may be awarded to all the qualified bidders as per award criteria stipulated in the bid documents. However, in case 'Class I Local suppliers' do not qualify for award of contract for at least 50% of the tendered quantity, purchase preference should be given to the 'Class I local supplier' over 'Class II local suppliers' / 'Non local suppliers' provided that their quoted rate falls within 20% margin of purchase preference of the highest quoted bidder considered for award of contract so as to ensure that the 'Class I Local suppliers' taken in totality are considered for award of contract for at least 50% of the tendered quantity.

d) First purchase preference has to be given to the lowest quoting 'Class-I local supplier', whose quoted rates fall within 20% margin of purchase preference, subject to its meeting the prescribed criteria for award of contract as also the constraint of maximum quantity that can be sourced from any single supplier. If the lowest quoting 'Class-I local supplier', does not qualify for purchase preference because of aforesaid constraints or does not accept the offered quantity, an opportunity may be given to next higher 'Class-I local supplier', falling within 20% margin of purchase preference, and so on.

e) To avoid any ambiguity during bid evaluation process, the procuring entities may stipulate its own tender specific criteria for award of contract amongst different bidders including the procedure for purchase preference to 'Class-I local supplier' within the broad policy guidelines stipulated in sub-paras above.

**4. Exemption of small purchases:** Notwithstanding anything contained in paragraph 3, procurements where the estimated value to be procured is less than Rs. 5 lakhs shall be exempt from this Order. However, it shall be ensured by procuring entities that procurement is not split for the purpose of avoiding the provisions of this Order.

**5. Minimum local content:** The 'local content' requirement to categorize a supplier as 'Class-I local supplier' is minimum 50%. For 'Class-II local supplier', the 'local content' requirement is minimum 20%. Nodal Ministry/ Department may prescribe only a higher

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percentage of minimum local content requirement to categorize a supplier as 'Class-I local supplier'/ 'Class-II local supplier'. For the items, for which Nodal Ministry/ Department has not prescribed higher minimum local content notification under the Order, it shall be 50% and 20% for 'Class-I local supplier'/ 'Class-II local supplier' respectively.

6. **Margin of Purchase Preference:** The margin of purchase preference shall be 20%.
7. **Requirement for specification in advance:** The minimum local content, the margin of purchase preference and the procedure for preference to Make in India shall be specified in the notice inviting tenders or other form of procurement solicitation and shall not be varied during a particular procurement transaction.
8. **Government E-marketplace:** In respect of procurement through the Government E-marketplace (GeM) shall, as far as possible, specifically mark the items which meet the minimum local content while registering the item for display, and shall, wherever feasible, make provision for automated comparison with purchase preference and without purchase preference and for obtaining consent of the local supplier in those cases where purchase preference is to be exercised.
9. **Verification of local content:**
  - a. The 'Class-I local supplier'/ 'Class-II local supplier' at the time of tender, bidding or solicitation shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement for 'Class-I local supplier'/ 'Class-II local supplier', as the case may be. They shall also give details of the location(s) at which the local value addition is made.
  - b. In cases of procurement for a value in excess of Rs. 10 crores, the 'Class-I local supplier'/ 'Class-II local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.
  - c. Decisions on complaints relating to implementation of this Order shall be taken by the competent authority which is empowered to look into procurement-related complaints relating to the procuring entity.
  - d. Nodal Ministries may constitute committees with internal and external experts for independent verification of self-declarations and auditor's/ accountant's certificates on random basis and in the case of complaints.
  - e. Nodal Ministries and procuring entities may prescribe fees for such complaints.
  - f. False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.



- g. A supplier who has been debarred by any procuring entity for violation of this Order shall not be eligible for preference under this Order for procurement by any other procuring entity for the duration of the debarment. The debarment for such other procuring entities shall take effect prospectively from the date on which it comes to the notice of other procurement entities, in the manner prescribed under paragraph 9h below.
- h. The Department of Expenditure shall issue suitable instructions for the effective and smooth operation of this process, so that:
  - i. The fact and duration of debarment for violation of this Order by any procuring entity are promptly brought to the notice of the Member-Convenor of the Standing Committee and the Department of Expenditure through the concerned Ministry /Department or in some other manner;
  - ii. on a periodical basis such cases are consolidated and a centralized list or decentralized lists of such suppliers with the period of debarment is maintained and displayed on website(s);
  - iii. in respect of procuring entities other than the one which has carried out the debarment, the debarment takes effect prospectively from the date of uploading on the website(s) in the such a manner that ongoing procurements are not disrupted.

**10. Specifications in Tenders and other procurement solicitations:**

- a. Every procuring entity shall ensure that the eligibility conditions in respect of previous experience fixed in any tender or solicitation do not require proof of supply in other countries or proof of exports.
- b. Procuring entities shall endeavour to see that eligibility conditions, including on matters like turnover, production capability and financial strength do not result in unreasonable exclusion of 'Class-I local supplier'/ 'Class-II local supplier' who would otherwise be eligible, beyond what is essential for ensuring quality or creditworthiness of the supplier.
- c. Procuring entities shall, within 2 months of the issue of this Order review all existing eligibility norms and conditions with reference to sub-paragraphs 'a' and 'b' above.

**d. Reciprocity Clause**

- i. When a Nodal Ministry/Department identifies that Indian suppliers of an item are not allowed to participate and/ or compete in procurement by any foreign government, due to restrictive tender conditions which have direct or indirect effect of barring Indian companies such as registration in the procuring country, execution of projects of specific value in the procuring country etc., it shall provide such details to all its procuring entities including CMDs/CEOs of PSEs/PSUs, State Governments and other procurement agencies under their administrative control and GeM for appropriate reciprocal action.

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- ii. Entities of countries which have been identified by the nodal Ministry/Department as not allowing Indian companies to participate in their Government procurement for any item related to that nodal Ministry shall not be allowed to participate in Government procurement in India for all items related to that nodal Ministry/ Department, except for the list of items published by the Ministry/ Department permitting their participation.
  - iii. The stipulation in (ii) above shall be part of all tenders invited by the Central Government procuring entities stated in (i) above. All purchases on GeM shall also necessarily have the above provisions for items identified by nodal Ministry/ Department.
  - iv. State Governments should be encouraged to incorporate similar provisions in their respective tenders.
  - v. The term 'entity' of a country shall have the same meaning as under the FDI Policy of DPIIT as amended from time to time.
- e. Specifying foreign certifications/ unreasonable technical specifications/ brands/ models in the bid document is restrictive and discriminatory practice against local suppliers. If foreign certification is required to be stipulated because of non-availability of Indian Standards and/or for any other reason, the same shall be done only after written approval of Secretary of the Department concerned or any other Authority having been designated such power by the Secretary of the Department concerned.
- f. "All administrative Ministries/Departments whose procurement exceeds Rs. 1000 Crore per annum shall notify/ update their procurement projections every year, including those of the PSEs/PSUs, for the next 5 years on their respective website."

**10A. Action for non-compliance of the Provisions of the Order:** In case restrictive or discriminatory conditions against domestic suppliers are included in bid documents, an inquiry shall be conducted by the Administrative Department undertaking the procurement (including procurement by any entity under its administrative control) to fix responsibility for the same. Thereafter, appropriate action, administrative or otherwise, shall be taken against erring officials of procurement entities under relevant provisions. Intimation on all such actions shall be sent to the Standing Committee.

**11. Assessment of supply base by Nodal Ministries:** The Nodal Ministry shall keep in view the domestic manufacturing / supply base and assess the available capacity and the extent of local competition while identifying items and prescribing the higher minimum local content or the manner of its calculation, with a view to avoiding cost increase from the operation of this Order.

**12. Increase in minimum local content:** The Nodal Ministry may annually review the local content requirements with a view to increasing them, subject to availability of sufficient local competition with adequate quality.

**13. Manufacture under license/ technology collaboration agreements with phased indigenization:** While notifying the minimum local content, Nodal Ministries may make special provisions for exempting suppliers from meeting the stipulated local content if the product is being manufactured in India under a license from a foreign manufacturer who holds intellectual property rights and where there is a technology collaboration agreement / transfer of technology agreement for indigenous manufacture of a product developed abroad with clear phasing of increase in local content.

13A. In procurement of all goods, services or works in respect of which there is substantial quantity of public procurement and for which the nodal ministry has not notified that there is sufficient local capacity and local competition, the concerned nodal ministry shall notify an upper threshold value of procurement beyond which foreign companies shall enter into a joint venture with an Indian company to participate in the tender. Procuring entities, while procuring such items beyond the notified threshold value, shall prescribe in their respective tenders that foreign companies may enter into a joint venture with an Indian company to participate in the tender. The procuring Ministries/Departments shall also make special provisions for exempting such joint ventures from meeting the stipulated minimum local content requirement, which shall be increased in a phased manner.

**14. Powers to grant exemption and to reduce minimum local content:** The administrative Department undertaking the procurement (including procurement by any entity under its administrative control), with the approval of their Minister-in-charge, may by written order, for reasons to be recorded in writing,

- a. reduce the minimum local content below the prescribed level; or
- b. reduce the margin of purchase preference below 20%; or
- c. exempt any particular item or supplying entities from the operation of this Order or any part of the Order.

A copy of every such order shall be provided to the Standing Committee and concerned Nodal Ministry / Department. The Nodal Ministry / Department concerned will continue to have the power to vary its notification on Minimum Local Content.

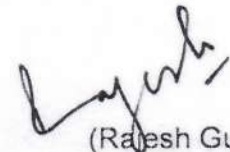
**15. Directions to Government companies:** In respect of Government companies and other procuring entities not governed by the General Financial Rules, the administrative Ministry or Department shall issue policy directions requiring compliance with this Order.

**16. Standing Committee:** A standing committee is hereby constituted with the following membership:

- Secretary, Department for Promotion of Industry and Internal Trade—Chairman
- Secretary, Commerce—Member
- Secretary, Ministry of Electronics and Information Technology—Member
- Joint Secretary (Public Procurement), Department of Expenditure—Member
- Joint Secretary (DPIIT)—Member-Convenor

The Secretary of the Department concerned with a particular item shall be a member in respect of issues relating to such item. The Chairman of the Committee may co-opt technical experts as relevant to any issue or class of issues under its consideration.

17. **Functions of the Standing Committee:** The Standing Committee shall meet as often as necessary, but not less than once in six months. The Committee
- a. shall oversee the implementation of this order and issues arising therefrom, and make recommendations to Nodal Ministries and procuring entities.
  - b. shall annually assess and periodically monitor compliance with this Order
  - c. shall identify Nodal Ministries and the allocation of items among them for issue of notifications on minimum local content
  - d. may require furnishing of details or returns regarding compliance with this Order and related matters
  - e. may, during the annual review or otherwise, assess issues, if any, where it is felt that the manner of implementation of the order results in any restrictive practices, cartelization or increase in public expenditure and suggest remedial measures
  - f. may examine cases covered by paragraph 13 above relating to manufacture under license/ technology transfer agreements with a view to satisfying itself that adequate mechanisms exist for enforcement of such agreements and for attaining the underlying objective of progressive indigenization
  - g. may consider any other issue relating to this Order which may arise.
18. **Removal of difficulties:** Ministries /Departments and the Boards of Directors of Government companies may issue such clarifications and instructions as may be necessary for the removal of any difficulties arising in the implementation of this Order.
19. **Ministries having existing policies:** Where any Ministry or Department has its own policy for preference to local content approved by the Cabinet after 1<sup>st</sup> January 2015, such policies will prevail over the provisions of this Order. All other existing orders on preference to local content shall be reviewed by the Nodal Ministries and revised as needed to conform to this Order, within two months of the issue of this Order.
20. **Transitional provision:** This Order shall not apply to any tender or procurement for which notice inviting tender or other form of procurement solicitation has been issued before the issue of this Order.



(Rajesh Gupta)  
Director

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**CERTIFICATE FROM STATUTORY AUDITOR OR COST AUDITOR OF THE COMPANY (IN THE CASE OF COMPANIES) OR FROM A PRACTICING COST ACCOUNTANT OR PRACTICING CHARTERED ACCOUNTANT (IN RESPECT OF SUPPLIERS OTHER THAN COMPANIES) TOWARDS MINIMUM LOCAL CONTENT**

**(FOR SUPPLY OF GOODS/ SERVICES / WORKS / EPC / LSTK)**

To,  
M/s Talcher Fertilizers Limited

SUB:

TENDER NO:

Dear Sir

A. We..... the Statutory Auditor / Cost Auditor / Practicing Cost Accountant / Practicing Chartered Accountant) have verified relevant records of M/s ..... **(Name of the bidder)** and certify that M/s ..... **(Name of the bidder)** meets the following:

Sl. No.	Description	Confirmation
a	Bidder meets the mandatory minimum Local content requirement of 20% for participating in the Bidding process under Public Procurement (Preference to Make in India) Policy. (In case bidder does not meet the minimum Local content requirement of 20%, such bidders are not allowed to participate in the Bidding process)	Confirmed.
b	The bidder meets mandatory minimum Local content requirement of 50% for claiming purchase preference under Public Procurement (Preference to Make in India) Policy	Confirmed / Not Confirmed

B. The **details of the location** at which the local value addition is made as follows:

Sl. No.	Item Description	Details of the Location(s) where the local value addition is made
1.		
2.		
3.		

Name of Audit Firm / Chartered Accountant: [Signature of Authorized Signatory]

Name:

Date:

Designation:

Seal:

Membership No.:

UDIN:

**Salient Points of Public Procurement (Preference to Make in India) Policy**

<b>Sr. No.</b>	<b>Description</b>	<b>Parameter / Document</b>
<b>1</b>	<b>Minimum Local Content (LC) for Availing Preference under this Policy</b>	50%
<b>2</b>	<b>Margin of Purchase Preference</b>	20%
<b>3</b>	<b>Local Content (LC) % declared by bidder</b> (Documents to be submitted as per Sr. No. 4 below)	[Tick (✓) whichever is applicable] a) LC Equal to or more than 50% <input type="checkbox"/> b) LC More than 20% but less than 50% <input type="checkbox"/>
<b>4</b>	<b>Documents to be submitted by bidder under this Policy</b>	Certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant as per <u>Form-I</u> to be submitted by bidder.
<b>5</b>	<b>Whether tender is divisible or not divisible</b>	Not Divisible; Clause No. 3A (c) of revised Policy dated 16.09.2020 shall be applicable

**PREAMBLE TO SCHEDULE OF RATES**

1. The “Schedule of Rates (SOR)” will be in Excel format (password protected) and will be uploaded during tender creation. This will be downloaded by the bidder and bidder will quote price on this Excel file for entire scope of work as per NIT. Thereafter, the bidder will upload the same Excel file during bid submission.
2. The SOR format is provided in a spread sheet file (BoQ\_xxxx.xls). The rates offered should be entered in the allotted space only and uploaded after filling the relevant columns. The SOR template must not be modified / replaced by the bidder; else the bid submitted shall be rejected.
3. Bidder shall quote for all the items in INR only.
4. Quantities mentioned in the Schedule of Rates are indicative and not exhaustive in nature. Payment shall be made as per actual quantity used/certified at site by Owner’s Engineer-in-charge. Quantities indicated in Schedule of Rates are approximate and subject to variation on either side. The quantity of individual item may be deleted. Contractor shall not be entitled for any compensation on this account and the quoted rates shall hold good for such quantity variations etc. Payments on bills shall, however, be made on actual measurements of quantities of work done as per approved drawings.
5. Goods & Services Tax (GST) is applicable @ 18% on the quoted rates (being Works Contract)
6. It is mandatory to quote prices in SOR. It will be the responsibility of the contractor to quote for all items as per scope of work and terms and conditions defined in NIT.
7. A copy of SOR, with prices/figures completely blanked out but with the word “QUOTED” in all columns is to be uploaded along with the unpriced bid, as a confirmation of price/data quoted against each head.

**CLAUSE REGARDING PROVISION FOR PROCUREMENT FROM A BIDDER WHICH SHARES A  
LAND BORDER WITH INDIA**

1. OM no. 7/10/2021-PPD(1) dated 23.02.2023, Department of Expenditure, Ministry of Finance, Govt. of India refers. The same are available at website <https://doe.gov.in/procurement-policy-divisions>.
2. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. For details of competent authority refer to Annexure I of Order (Public Procurement no. 4) dated 23.02.2023.

Further, any bidder (including bidder from India) having specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India, shall also require to be registered with the same competent authority.

Further the above will not apply to bidders from those countries (even if sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects. Updated lists of countries to which lines of credit have been extended or in which development projects are undertaken are given in the website of the Ministry of External Affairs, Govt. of India

3. **"Bidder"** (including the term 'tenderer', 'consultant' 'vendor' or 'service provider' in certain contexts) **for purpose of this provision** means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency, branch or office controlled by such person, participating in a procurement process.
4. **"Bidder from a country which shares a land border with India"** for the purpose of this:
  - a. An entity incorporated, established or registered in such a country; or
  - b. A subsidiary of an entity incorporated, established or registered in such a country; or
  - c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
  - d. An entity whose beneficial owner is situated in such a country; or
  - e. An Indian (or other) agent of such an entity; or
  - f. A natural person who is a citizen of such a country; or
  - g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
5. **"Beneficial owner"** for the purpose of above (4) will be as under:



- i. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person(s), has a controlling ownership interest or who exercises control through other means.

Explanation—

- a) "Controlling ownership interest" means ownership of, or entitlement to, more than twenty-five per cent of shares or capital or profits of the company;
  - b) "Control" shall include the right to appoint the majority of the directors or to control the management or policy decisions, including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;
- ii) In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;
  - iii) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
  - iv) Where no natural person is identified under (i) or (ii) or (iii) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
  - v) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

- 6. **"Agent"** for the purpose of this Order is a person employed to do any act for another, or to represent another in dealings with third persons

Note :

- (i) A person who procures and supplies finished goods from an entity from a country which shares a land border with India will, regardless of the nature of his legal or commercial relationship with the producer of the goods, be deemed to be an Agent for the purpose of this Order.
- (ii) However, a bidder who only procures raw material, components etc. from an entity from a country which shares a land border with India and then manufactures or converts them into other goods will not be treated as an Agent.]

7. **"Transfer of Technology"** means dissemination and transfer of all forms of commercially usable knowledge such as transfer of know-how, skills, technical expertise, designs, processes and procedures, trade secrets, which enables the acquirer of such technology to perform activities using the transferred technology independently. (Matters of interpretation of this term shall be referred to the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade, and the interpretation of the Committee shall be final.)
8. **"Specified Transfer of Technology"** means a transfer of technology in the sectors and/ or technologies, specified at Schedule-I, II & 3 of this order.

9. **SUBMISSION OF CERTIFICATE IN BIDS:**

Bidder shall submit a certificate in this regard as Form-I.

For cases falling under the category of Transfer of Technology, Bidder shall submit a certificate in this regard as Form-II.

If such certificate given by a bidder whose bid is accepted is found to be false, this would be a ground for immediate rejection of the bid/termination and further action as per "Procedure for Action in case of Corrupt/Fraudulent/ Collusive / Coercive Practices" of tender document.

10. The registration, wherever applicable, should be valid at the time of submission of bids and at the time of acceptance of bids. In respect of supply otherwise than by tender, registration should be valid at the time of placement of order. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution.

11. **PROVISION TO BE IN WORKS CONTRACTS, INCLUDING TURNKEY CONTRACTS:**

The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. The definition of "contractor from a country which shares a land border with India" shall be as in Para 4 herein above. A Certificate to this regard is to be submitted by bidder is placed at Form-I.

[Note: Procurement of raw material, components, etc. does not constitute sub-contracting]

**UNDERTAKING ON LETTERHEAD**

To,  
M/s Talcher Fertilizers Limited

---

SUB:

TENDER NO:

Dear Sir

We have read the clause regarding Provisions for Procurement from a Bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; we certify that, bidder M/s \_\_\_\_\_ (**Name of Bidder**) is:

- (i) not from such a country [     ]
- (ii) if from such a country, has been registered with the Competent Authority. [     ]  
(Evidence of valid registration by the Competent Authority shall be attached)

***(Bidder is to tick appropriate option (✓ or X) above).***

We further certify that bidder **M/s** \_\_\_\_\_ (**Name of Bidder**) will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority.

We hereby certify that bidder **M/s** \_\_\_\_\_ (**Name of Bidder**) fulfills all requirements in this regard and is eligible to be considered.

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:

**UNDERTAKING ON LETTERHEAD**

***(Applicable in case of Transfer of Technology cases only)***

To,

M/s TALCHER FERTILIZERS LIMITED

\_\_\_\_\_

SUB:

TENDER NO:

Dear Sir

We have read the clause regarding Provisions for Procurement from a Bidder having Transfer of Technology (ToT) arrangement which shares a land border with India, we certify that, bidder M/s\_\_\_\_\_ ***(Name of Bidder)*** is :

- (i) Does not have ToT with such a country [     ]
- (ii) If having ToT from such a country, has been registered with the Competent Authority. [     ]

(Evidence of valid registration by the Competent Authority shall be attached)

***(Bidder is to tick appropriate option (✓) above).***

We hereby certify that bidder M/s\_\_\_\_\_ ***(Name of Bidder)*** fulfills all requirements in this regard and is eligible to be considered against the tender.

Place: [Signature of Authorized Signatory of Bidder]

Date: Name:

Designation:

Seal:

## **Schedule I**

### **List of Category-I Sensitive sectors:**

<b>Sr. No.</b>	<b>Sector</b>
(i)	Atomic Energy
(ii)	Brocasting/ Print and Digital Media
(iii)	Defense
(iv)	Space
(v)	Telecommunications

## **Schedule II**

### **List of Category-II Sensitive sectors:**

<b>Sr.No.</b>	<b>Sector</b>
(i)	Power and Energy (including exploration/ generation/transmission/ distribution/ pipeline)
(ii)	Banking and Finance including Insurance
(iii)	Civil Aviation
(iv)	Construction of ports and dams & river valley projects
(v)	Electronics and Microelectronics
(vi)	Meteorology and Ocean Observation
(vii)	Mining and extraction (including deep sea projects)

(viii)	Railways
(ix)	Pharmaceuticals & Medical Devices
(x)	Agriculture
(xi)	Health
(xii)	Urban Transportation

**Schedule III**

List of Sensitive Technologies:

<b>Sr.No.</b>	<b>Sensitive Technologies</b>
(i)	Additive Manufacturing (e.g. 3D Printing)
(ii)	Any equipment having electronic programmable components or autonomous systems (e.g. SCADA systems)
(iii)	Any technology used for uploading and streaming of data including broadcasting, satellite communication etc.
(iv)	Chemical Technologies
(v)	Biotechnologies including Genetic Engineering and Biological Technologies
(vi)	Information and Communication Technologies
(vii)	Software

## **FORMS & FORMATS**

**LIST OF FORMS & FORMATS**

<b>Form No.</b>	<b>Description</b>
F-1	BIDDER'S GENERAL INFORMATION
F-2A	PROFORMA OF "BANK GUARANTEE"FOR "EARNEST MONEY / BID SECURITY"
F-2B	FORMAT OF " DECLARATION FOR BID SECURITY "
F-3	LETTER OF AUTHORITY
F-4	PROFORMA OF "BANK GUARANTEE" FOR "CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT"
F-4(a)	MATTER TO BE MENTIONED IN COVERING LETTER TO BE SUBMITTED BY VENDOR ALONG WITH BANK GUARANTEE (BG)
F-5	AGREED TERMS & CONDITIONS
F-6	ACKNOWLEDGEMENT CUM CONSENT LETTER
F-7	BIDDER'S EXPERIENCE
F-8(A)	CHECKLIST
F-8(B)	CHECKLIST FOR BID EVALUATION CRITERIA (BEC) QUALIFYING DOCUMENTS
F-9	FORMAT FOR CERTIFICATE FROM BANKIF BIDDER'S WORKING CAPITAL IS INADEQUATE
F-10	FORMAT FOR CHARTERED ACCOUNTANT CERTIFICATE FOR FINANCIAL CAPABILITY OF THE BIDDER
F-11	FORMAT FOR CONSORTIUM AGREEMENT
F-12	BIDDER'S QUERIES FOR PRE BID MEETING
F-13	E-BANKING FORMAT
F-14	INTEGRITY PACT
F-15	INDEMNITY BOND
F-16	FREQUENTLY ASKED QUESTIONS (FAQS)
F-17	PROFORMA OF BANK GUARANTEE FOR MOBILISATIONS ADVANCE PAYMENT
F-17 (a)	MATTER TO BE MENTIONED IN COVERING LETTER TO BE SUBMITTED BY VENDOR ALONG WITH BANK GUARANTEE (BG)
F-18	PROFORMA OF BANK GUARANTEE FOR PAYMENTS TOWARDS PLACEMENT OF ALL PURCHASE ORDERS OF MAJOR TAGGED ITEMS
F-19	FORMAT OF LETTER OF NO DEVIATIONS
F-20	FORMAT FOR POWER OF ATTORNEY
F-21	UNDERTAKING REGARDING SUBMISSION OF ELECTRONIC INVOICE( E-INVOICE AS PER GST LAW)
F-22	UNDERTAKING REGARDING SUBMISSION CONTRACT PERFORMANCE SECURITY (CPS) / SECURITY DEPOSIT (SD) WITHIN STIPULATED TIME LINE



F-23	PROFORMA FOR CONTRACT AGREEMENT
F-24	NO CLAIM CERTIFICATE

**F-1**

**BIDDER'S GENERAL INFORMATION**

To,  
**M/s Talcher Fertilizers Limited**

TENDER NO:

1	Bidder Name:	M/s.....
2	Status of Firm	Proprietorship Firm/Partnership firm/ Public Limited/ Pvt. Limited/ Govt. Dept. / PSU/ Others If Others Specify: _____  [Enclose relevant certificates / partnership deed/certificate of Registration, as applicable]
3	Name of Proprietor/ Partners/ Directors of the firm/company	1. 2. 3.
4	Name of Power of Attorney holders of bidder	
5	Number of Years in Operation	
6	Address of Registered Office	_____ City: _____ District: _____  State: _____  PIN/ZIP : _____
7	Bidder's address where order/contract is to be placed	_____ City: _____ District: _____  State: _____  PIN/ZIP : _____
8	Office responsible for executing the contract with GST no.(In case supply of works are from multiple locations, addresses and GST no. of all such locations are to be provided)	City: District:  State: PIN/ZIP:  GST No.:
9	Telephone Number & Contact Information of address where order is to be placed	_____ (Country Code) (Area Code) (Telephone Number) FAX No. : ..... e-mail ID: .....
10	E-mail Address	

11	ISO Certification, if any {If yes, please furnish details}	
12	PAN No	[Enclose copy of relevant document]
13	GST No. (refer sl. no. 8 above)	[Enclose copy of relevant document]
14	EPF Registration No.	[Enclose copy of relevant document]
15	ESI code No.	[Enclose copy of relevant document]
16	Whether Micro or Small Enterprise	Yes / No (If Yes, Bidder to submit requisite documents as specified in ITB: Clause No. 40)
	Whether MSE is owned by SC/ST Entrepreneur(s)	Yes / No (If Yes, Bidder to submit requisite documents as specified in ITB: Clause No. 40)
	Whether MSE is owned by Women	Yes / No (If Yes, Bidder to submit requisite documents as specified in ITB: Clause No. 40)
17	Whether Bidder is Startups or not	Yes / No (If Yes, Bidder to submit requisite documents as specified in ITB: Clause No. 49)
18	In case of Start-up confirm the following: (i) Date of its incorporation/ registration (ii) Whether turnover for any financial years since incorporation/ registration has exceeded Rs.100 Crores.	

Note: \* TFL intent to place the contract directly on the address from where Works are to be supplied. In case, bidder wants contract at some other address or Works are to be supplied from multiple locations, bidder is required to provide in their bid, the address on which contract is to be placed.

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:

**FORMAT F-2A**

**PROFORMA OF "BANK GUARANTEE"**  
**FOR "EARNEST MONEY / BID SECURITY"**

(To be stamped in accordance with the Stamp Act)

To, Talcher Fertilizers Limited (TFL) _____	<b>Bank Guarantee No.</b>	
	<b>Date of BG</b>	
	<b>BG Valid up to (Expiry date)</b>	
	<b>Claim period up to (indicate date of expiry of claim period which includes minimum three months from the expiry date)</b>	
	<b>Stamp Sl. No./e-Stamp Certificate No.</b>	

**Dear Sir(s),**

In accordance with Letter Inviting Tender under your reference No \_\_\_\_\_ M/s. \_\_\_\_\_ having their Registered / Head Office at \_\_\_\_\_ (hereinafter called the Tenderer), wish to participate in the said tender for \_\_\_\_\_

As an irrevocable Bank Guarantee against Earnest Money for the amount of \_\_\_\_\_ is required to be submitted by the Tenderer as a condition precedent for participation in the said tender which amount is liable to be forfeited on the happening of any contingencies mentioned in the Tender Document.

We, the \_\_\_\_\_ Bank at \_\_\_\_\_ having our Head Office \_\_\_\_\_ (Local Address) guarantee and undertake to pay immediately on demand without any recourse to the tenderers by Talcher Fertilizers Limited, the amount \_\_\_\_\_ without any reservation, protest, demur and recourse. Any such demand made by TFL, shall be conclusive and binding on us irrespective of any dispute or difference raised by the Tenderer.

This guarantee shall be irrevocable and shall remain valid up to \_\_\_\_\_ [this date should be two (02) months beyond the validity of the bid]. If any further extension of this guarantee is required, the same shall be extended to such required period on receiving instructions from M/s. \_\_\_\_\_ whose behalf this guarantee is issued.

Notwithstanding anything contained herein:

- a) The Bank's liability under this Guarantee shall not exceed (currency in figures) . . . . . (currency in words only) . . . . .
- b) This Guarantee shall remain in force upto \_\_\_\_\_ (this expiry date of BG should be two months beyond the validity of bid) and any extension(s) thereof; and
- c) The Bank shall be released and discharged from all liability under this Guarantee unless a written claim or demand is issued to the Bank on or before the midnight of .....(indicate date of expiry of claim period which includes minimum three months from the expiry of this Bank Guarantee) and if extended, the date of expiry of the last extension of this Guarantee. If a claim has been received by us within the said date, all the rights of TFL under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

In witness whereof the Bank, through its authorized officer, has set its hand and stamp on this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_ at \_\_\_\_\_.

WITNESS:

(SIGNATURE)  
(NAME)

(SIGNATURE)  
(NAME)  
Designation with Bank Stamp

(OFFICIAL ADDRESS)

Attorney as per  
Power of Attorney No. \_\_\_\_\_  
Date: \_\_\_\_\_

**INSTRUCTIONS FOR FURNISHING "BID SECURITY / EARNEST MONEY" BY "BANK  
GUARANTEE"**

1. The Bank Guarantee by Bidders will be given on non-judicial stamp paper as per "Stamp Duty" applicable. The non-judicial stamp paper should be in the name of the issuing Bank.
2. The expiry date should be arrived at in accordance with "ITB: Clause-16.1".
3. The Bank Guarantee by bidders will be given from Bank as specified in "ITB Clause-16.2".
4. A letter from the issuing Bank of the requisite Bank Guarantee confirming that said Bank Guarantee / all future communication relating to the Bank Guarantee shall be forwarded to the Employer at its address as mentioned at "ITB".
5. Bidders must indicate the full postal address of the Bank along with the Bank's E-mail / Fax / Phone from where the Earnest Money Bond has been issued as per proforma provided below.
6. If a Bank Guarantee is issued by a commercial Bank, then a letter to Employer confirming its net worth is more than Rs. 1,000,000,000.00 [Rupees One Hundred Crores] or equivalent along with documentary evidence in the Bank Guarantee itself.

**FORMAT F-2B**

**DECLARATION FOR BID SECURITY**  
(To be submitted on Letter head of Bidder)

To,

M/s TALCHER FERTILIZERS LIMITED

\_\_\_\_\_

SUB:

TENDER NO:

Dear Sir,

After examining / reviewing provisions of above referred tender documents (including all corrigendum/ Addenda), we M/s \_\_\_\_\_ (Name of Bidder) have submitted our offer/ bid no. \_\_\_\_\_.

We, M/s \_\_\_\_\_ (Name of Bidder) hereby understand that, according to your conditions, we are submitting this Declaration for Bid Security.

We understand that we will be put on watch list/holiday/ banning list (as per policies of TALCHER FERTILIZERS LIMITED in this regard), if we are in breach of our obligation(s) as per following:

- (a) have withdrawn/modified/amended, impairs or derogates from the tender, my/our Bid during the period of bid validity specified in the form of Bid; or
- (b) having been notified of the acceptance of our Bid by the TALCHER FERTILIZERS LIMITED during the period of bid validity:
  - (i) fail or refuse to execute the Contract, if required, or
  - (ii) fail or refuse to furnish the Contract Performance Security, in accordance provisions of tender document.
  - (iii) fail or refuse to accept 'arithmetical corrections' as per provision of tender document.
- (c) having indulged in corrupt/fraudulent /collusive/coercive practice as per procedure.

Place:  
Date:

[Signature of Authorized Signatory of Bidder]  
Name:  
Designation:

Seal

**F-3**

**LETTER OF AUTHORITY**

[Pro forma for Letter of Authority for Attending 'Pre-Bid Meetings' /'Un-priced Bid Opening' / 'Price Bid Opening']

Ref:

Date:

To,  
**M/s TALCHER FERTILIZERS LIMITED,**

SUB:  
TENDER NO:

**Dear Sir,**

I/We, \_\_\_\_\_ hereby authorize the following representative(s) for attending any 'Meetings [Pre-Bid Meeting]', 'Un-priced Bid Opening' and 'Price Bid Opening' against the above Tender Documents:

[1] Name & Designation \_\_\_\_\_ Signature \_\_\_\_\_  
Phone/Cell:

E-mail: ..... @ .....

[2] Name & Designation \_\_\_\_\_ Signature \_\_\_\_\_  
Phone/Cell:

E-mail: ..... @ .....

We confirm that we shall be bound by all commitments made by aforementioned authorised representative(s).

Place: [Signature of Authorized Signatory of Bidder]  
Date: Name:  
Designation:  
Seal:

- (i) Note: This "Letter of Authority" should be on the "**letter head**" of the Bidder and should be signed by a person competent and having the 'Power of Attorney' to bind the Bidder. Not more than 'two [02] persons per Bidder' are permitted to attend 'Pre-Bid Meetings' /'Un-priced Bid Opening' / 'Price Bid Opening'..
- (ii) Bidder's authorized representative is required to carry a copy of this authority letter while attending the 'Pre-Bid Meetings' /'Un-priced Bid Opening' .



**F-4**

**PROFORMA OF "BANK GUARANTEE" FOR "CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT"**  
**(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)**

To,  M/s Talcher Fertilizers Limited, Noida	<b>Bank Guarantee No.</b>	
	<b>Date of BG</b>	
	<b>BG Valid up to</b>	
	<b>Claim period up to (There should be three months gap between expiry date of BG &amp; Claim period)</b>	
	<b>Stamp Sl. No./e-Stamp Certificate No.</b>	

**Dear Sir(s),**

M/s. \_\_\_\_\_ having registered office at \_\_\_\_\_ (herein after called the "contractor" which expression shall wherever the context so require include its successors and assignees) have been placed/ awarded the job/work of \_\_\_\_\_ vide LOA /FOA No. \_\_\_\_\_ dated \_\_\_\_\_ for Talcher Fertilizers Limited having registered office at Plot 2/H, Kalpana Area, BJB Nagar, Khorda, Bhubaneswar-751014, Odisha (herein after called the "TFL" which expression shall wherever the context so require include its successors and assignees).

The Contract conditions provide that the CONTRACTOR shall pay a sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) as full Contract Performance Guarantee in the form therein mentioned. The form of payment of Contract Performance Guarantee includes guarantee executed by Nationalized Bank/Scheduled Commercial Bank, undertaking full responsibility to indemnify Talcher Fertilizers Limited, in case of default.

The said M/s. \_\_\_\_\_ has approached us and at their request and in consideration of the premises we having our office at \_\_\_\_\_ have agreed to give such guarantee as hereinafter mentioned.

1. We \_\_\_\_\_ hereby undertake to give the irrevocable & unconditional guarantee to you that if default shall be made by M/s. \_\_\_\_\_ in performing any of the terms and conditions of the tender/order/contract or in payment of any money payable to Talcher Fertilizers Limited we shall on first demand pay without demur, contest, protest and/ or without any recourse to the contractor to TFL in such manner as TFL may direct the said amount of Rupees \_\_\_\_\_ only or such portion thereof not exceeding the said sum as you may require from time to time.

2. You will have the full liberty without reference to us and without affecting this guarantee, postpone for any time or from time to time the exercise of any of the powers and rights conferred on you under the order/contract with the said \_\_\_\_\_ M/s. \_\_\_\_\_ and to enforce or to forbear from endorsing any powers or rights or by reason of time being given to the said M/s. \_\_\_\_\_ and such postponement forbearance would not have the effect of releasing the bank from its obligation under this debt.
3. Your right to recover the said sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) from us in manner aforesaid is absolute & unequivocal and will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said M/s. \_\_\_\_\_ and/or that any dispute or disputes are pending before any officer, tribunal or court or arbitrator or any other authority/forum and any demand made by you in the bank shall be conclusive and binding. The bank shall not be released of its obligations under these presents by any exercise by you of its liberty with reference to matter aforesaid or any of their or by reason or any other act of omission or commission on your part or any other indulgence shown by you or by any other matter or changed what so ever which under law would, but for this provision, have the effect of releasing the bank.
4. The guarantee herein contained shall not be determined or affected by the liquidation or winding up dissolution or changes of constitution or insolvency of the said contractor but shall in all respects and for all purposes be binding and operative until payment of all money due to you in respect of such liabilities is paid.
5. The bank undertakes not to revoke this guarantee during its currency without your previous consent and further agrees that the guarantee shall continue to be enforceable until it is discharged by TFL in writing. However, if for any reason, the contractor is unable to complete the work within the period stipulated in the order/contract and in case of extension of the date of delivery/completion resulting extension of defect liability period/guarantee period of the contractor fails to perform the work fully, the bank hereby agrees to further extend this guarantee at the instance of the contractor till such time as may be determined by TFL. If any further extension of this guarantee is required, the same shall be extended to such required period on receiving instruction from M/s. \_\_\_\_\_ (contractor) on whose behalf this guarantee is issued.
6. Bank also agrees that TFL at its option shall be entitled to enforce this Guarantee against the bank (as principal debtor) in the first instant, without proceeding against the contractor and notwithstanding any security or other guarantee that TFL may have in relation to the /contractor's liabilities.
7. The amount under the Bank Guarantee is payable forthwith without any delay by Bank upon the written demand raised by TFL. Any dispute arising out of or in relation to the said Bank Guarantee shall be subject to the exclusive jurisdiction of courts at New Delhi.
8. Therefore, we hereby affirm that we are guarantors and responsible to you on behalf of the Contractor up to a total amount of \_\_\_\_\_ (amount of guarantees in words and figures) and we undertake to pay you, upon your first written demand declaring the Contractor to be in default under the order/contract and without caveat or argument, any sum or sums within the limits of (amounts of guarantee) as aforesaid, without your needing to prove or show grounds or reasons for your demand or the sum specified therein.

9. We have power to issue this guarantee in your favor under Memorandum and Articles of Association and the undersigned has full power to do under the Power of Attorney, dated \_\_\_\_\_ granted to him by the Bank.

10. Notwithstanding anything contained herein:

11.

- a) The Bank's liability under this Guarantee shall not exceed (currency in figures) \_\_\_\_\_ (currency in words only) \_\_\_\_\_
- b) This Guarantee shall remain in force upto \_\_\_\_\_ (this date should be expiry date of defect liability period of the Contract) and any extension(s) thereof; and
- c) The Bank shall be released and discharged from all liability under this Guarantee unless a written claim or demand is issued to the Bank on or before the midnight of \_\_\_\_\_ (indicate date of expiry of claim period which includes minimum three months from the expiry of this Bank Guarantee) and if extended, the date of expiry of the last extension of this Guarantee. If a claim has been received by us within the said date, all the rights of TFL under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

Yours faithfully,

\_\_\_\_\_  
Bank by its Constituted Attorney

\_\_\_\_\_  
Signature of a person duly  
Authorized to sign on behalf of the Bank

INSTRUCTIONS FOR FURNISHING  
"CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT" BY "BANK GUARANTEE"

1. The Bank Guarantee by successful Bidder(s) will be given on non-judicial stamp paper as per 'stamp duty' applicable. The non-judicial stamp paper should be in name of the issuing bank..
2. The Bank Guarantee by Bidders will be given from bank as specified in Cl no. 38.3 of ITB [Section-III] of Tender Document .
3. A letter from the issuing bank of the requisite Bank Guarantee confirming that said Bank Guarantee and all future communication relating to the Bank Guarantee shall be forwarded to Employer.
4. If a Bank Guarantee is issued by a commercial bank, then a letter to Employer and copy to Consultant (if applicable) confirming its net worth is more than Rs. 100,00,00,000.00 [Rupees One Hundred Crores] or its equivalent in foreign currency alongwith documentary evidence OR in the Bank Guarantee itself.
5. Contractor shall submit attached cover letter (Annexure) while submitting Contract Performance Security.

**Form-4 (a)**

**MATTER TO BE MENTIONED IN COVERING LETTER TO BE SUBMITTED BY VENDOR ALONG WITH BANK GUARANTEE (BG)**

<b>1. Bank Guarantee No.</b>				
<b>2. Vendor Name/ VENDOR CODE</b>	NAME			
	VENDOR CODE			
<b>BANK GUARANTEE AMOUNT</b>				
<b>PURCHASE ORDER/LOA</b>				
<b>1. Nature of Bank Guarantee [Please Tick ( <input type="checkbox"/> ) whichever is applicable]</b>	Performance Security (CPS)	SECURITY DEPOSIT	ADVANCE	EMD
<b>2. BG ISSUING Bank DETAILS:</b>				
<b>(A) E-MAIL ID</b>				
<b>(B) ADDRESS</b>				
<b>(C) Phone No. / Mobile No.</b>				

**F-5**

**AGREED TERMS & CONDITIONS**

To,  
**M/s TALCHER FERTILIZERS LIMITED**

SUB:  
TENDER NO:

This Questionnaire duly filled in, signed & stamped must form part of Bidder's Bid and should be returned along with Un-priced Bid. Clauses confirmed hereunder need not be repeated in the Bid.

SI.	DESCRIPTION	BIDDER'S CONFIRMATION
1.	Bidder's name, Vendor Code of TFL (If any) and address	Bidder's Name:  TFL's Vendor Code:  Address:
2.	Bidder confirms the currency of quoted prices is in Indian Rupees	
3.	Bidder confirms quoted prices will remain firm and fixed till complete execution of the order (except where price escalation/variation is allowed in the Tender).	
4.	Bidder confirms that they have quoted <b>GST (CGST &amp; SGST/ UTGST or IGST)</b> in Price Schedule / Schedule of Rates (SOR) of Price bid.	Confirmed
4.1	Whether in the instant tender services/works are covered in reverse charge rule of <b>GST (CGST &amp; SGST/UTGST or IGST)</b>  If yes, Bidder confirms that they have quoted rate of applicable GST (CGST & SGST/ UTGST or IGST) in Price Schedule / Schedule of Rates of Price Bid	
4.2	Indicate Harmonized System of Nomenclature (HSN)/Service Accounting Codes (SAC).	HSN/SAC Code (as applicable): <hr/>
4.3	Bidder hereby confirms that the quoted prices are in compliance with the Section 171 of CGST Act/ SGST Act as mentioned as clause no. 13.10 of ITB (Anti-profiteering clause).	
4.4	a. Whether bidder is liable to raise E-Invoice as per GST Act. b. If yes, bidder will raise E-Invoice and confirm compliance to provision of tender in this regard.	a. _____  b. _____
4.5	Whether bidder is liable to raise E-Invoice as per GST Act.  If yes, bidder will raise E-Invoice and confirm compliance to provision of tender in this regard.	
5.	Bidder confirms acceptance of relevant Terms of Payment specified in the Bid Document.	
6.	Bidder confirms that Contract Performance Security will be furnished as per Bid Document within 30 days of FOA in case of successful bidder.	

SI.	DESCRIPTION	BIDDER'S CONFIRMATION				
7.	Bidder confirms that Contract Performance Security shall be from any Indian scheduled bank or a branch of an International bank situated in India and registered with Reserve bank of India as scheduled foreign bank. However, in case of bank guarantees from banks other than the Nationalised Indian banks, the bank must be a commercial bank having net worth in excess of Rs 100 crores and a declaration to this effect shall be made by such commercial bank either in the Bank Guarantee itself or separately on its letterhead.					
8.	Bidder confirms compliance to Completion Schedule as specified in Bid document and the same shall be reckoned from the date of Fax of Acceptance.					
9.	(i) Bidder confirms acceptance of Mutually Agreed Damages for delay in completion schedule specified in Bid document. (ii) In case of delay, the bills/invoices shall be submitted after reducing the price reduction due to delay (refer MAD Clause).					
10.	a) Bidder confirms acceptance of all terms and conditions of Bid Document (all sections). b) Bidder confirms that printed terms and conditions of bidder are not applicable.					
11.	Bidder confirms that their offer is valid for period specified in BDS from Final/Extended due date of opening of Techno-commercial Bids.					
12.	Bidder have furnished EMD/Bid Security details as under: a) EMD/ Bid Security No. & date b) Value c) Validity d) Bank Address/e-mail ID/Mobile no. [in case of BG] <b>OR</b> Bidder furnishes bid security declaration [applicable for MSEs, Start-Ups and CPSEs (to whom exemption is allowed as per extant guidelines in vogue)]					
13.	As per requirement of tender, bidder (having status as Pvt. Ltd. or Limited company) must upload bid duly digitally signed on e-portal through class-3B digital signature (DS). In case, class of DS or name of employee or name of employer is not visible in the digitally signed documents, the bid digitally signed as submitted by the person shall be binding on the bidder.					
14.	Bidder confirms that (i) none of Directors (in Board of Director) of bidder is a relative of any Director (in Board of Director) of TFL or (ii) the bidder is not a firm in which any Director (in Board of Director) of TFL or their relative is a partner.	<table border="1"> <tr> <td>Confirmed</td> <td></td> </tr> <tr> <td>Not confirmed</td> <td></td> </tr> </table>	Confirmed		Not confirmed	
Confirmed						
Not confirmed						
15.	All correspondence must be in ENGLISH language only					

SI.	DESCRIPTION	BIDDER'S CONFIRMATION
16.	Bidder confirms the contents of this Tender Document have not been modified or altered by them. In case, it is found that the tender document has been modified / altered by the bidder, the bid submitted by them shall be liable for rejection.	
17.	Bidder confirms that all Bank charges associated with Bidder's Bank regarding release of payment etc. shall be borne by Bidder.	
18.	<p><u>No Deviation Confirmation:</u> It may be note that any 'deviation / exception' in any form may result in rejection of Bid. Therefore, Bidder confirms that they have not taken any 'exception / deviation' anywhere in the Bid. In case any 'deviation / exception' is mentioned or noticed, Bidder's Bid may be rejected.</p>	
19.	<p>If Bidder becomes a successful Bidder pursuant to the provisions of the Tender Document, the following Confirmation shall be automatically become enforceable:</p> <p>"We agree and acknowledge that the Employer is entering into the Contract/Agreement solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood &amp; agreed that the Government of India is not a party to the Contract/Agreement and has no liabilities, obligations or rights thereunder. It is expressly understood and agreed that the Purchaser is authorized to enter into Contract/Agreement, solely on its own behalf under the applicable laws of India. We expressly agree, acknowledge and understand that the Purchaser is not an agent, representative or delegate of the Government of India. It is further understood and agreed that the Government of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the Agreement. Accordingly, we hereby expressly waive, release and forego any and all actions or claims, including cross claims, VIP claims or counter claims against the Government of India arising out of the Agreement and covenants not to sue to Government of India as to any manner, claim, cause of action or things whatsoever arising of or under the Agreement."</p>	
20.	Bidder to ensure all documents as per tender including clause 11 of Section III of tender and all Formats are included in their bid.	
21.	Bidder understands that Tender Document is not exhaustive. In case any activity though specifically not covered in description of 'Schedule of Rates' but is required to complete the work as per Scope of Work, Conditions of Contract, or any other part of Bidding document, the quoted rates will deemed to be inclusive of cost incurred for such activities unless otherwise specifically excluded. Bidder confirms to perform for fulfilment of the contract and completeness of the supplies in all respect within the scheduled time frame and quoted price.	
22.	Bidder hereby confirms that they are not on 'Holiday' by OWNER or any of the JV partners of TFL (viz. GAIL, RCF, CIL, FCIL) or Public Sector Project Management Consultant (like PDIL, EIL, Mecon only due to "poor performance" or "corrupt and fraudulent	



SI.	DESCRIPTION	BIDDER'S CONFIRMATION
	<p>practices”) or banned by Government department/ Public Sector on due date of submission of bid.</p> <p>Further, Bidder confirms that neither they nor their allied agency/(ies) (as defined in the Procedure for Action in case of Corrupt/Fraudulent/Collusive/ Coercive Practices) are on banning list of TFL or any of the JV partner of TFL viz. GAIL, RCF, CIL, FCIL.</p> <p>Bidder also confirms that they are not under any liquidation, court receivership or similar proceedings or 'bankruptcy'.</p> <p>In case it comes to the notice of TFL/PDIL that the bidder has given wrong declaration in this regard, the same shall be dealt as 'fraudulent practices' and action shall be initiated as per the Procedure for action in case of Corrupt/Fraudulent/Collusive/Coercive Practices.</p> <p>Further, Bidder also confirms that in case there is any change in status of the declaration prior to award of contract, the same will be promptly informed to TFL/PDIL by them.</p>	
23	<p>Bidder confirms that (i) any variation in GST at the time of supplies for any reasons, other than statutory, including variations due to turnover, shall be borne by them and (ii) any error of interpretation of applicability of rate of GST (CGST &amp; SGST/ UTGST or IGST) on components of an item and/or various items of tender by them shall be dealt as per clause no. 13.13 of Section-III of tender.</p>	
24	<p>Bidders confirm to submit signed copy of Integrity Pact (wherever included in tender).</p> <p>If Bidder is a partnership concern or a consortium, this agreement must be signed by all partners or consortium members.</p>	
25.	<p>Bidder confirms that, in case of contradiction between the confirmations provided in this format and to the terms &amp; conditions mentioned elsewhere in the offer, the confirmations given in this format shall prevail.</p>	
26.	<p>Bidder's offer No. &amp; Date</p>	
27	<p>Bidder confirms that there is no conflict of interest with other bidders, as per clause no.4.2 of Section-III (ITB) of Tender Document.</p>	

Place:  
Date:

[Signature of Authorized Signatory of Bidder]  
Name:  
Designation:  
Seal:

**F-6**

**ACKNOWLEDGEMENT CUM CONSENT LETTER**

**(On receipt of tender document/information regarding the tender, Bidder shall acknowledge the receipt and confirm his intention to bid or reason for non-participation against the enquiry /tender through e-mail to concerned executive in TFL/PDIL issued the tender, by filling up the Format)**

To,  
**M/s TALCHER FERTILIZERS LIMITED  
NOIDA**

SUB:  
TENDER NO:

Dear Sir,

We hereby acknowledge receipt of a complete set of bidding documents along with enclosures for subject item/job and/or the information regarding the subject tender.

- We intend to bid as requested for the subject item/job and furnish following details with respect to our quoting office:

Postal Address with Pin Code : .....

Telephone Number : .....

Contact Person : .....

E-mail Address : .....

Mobile No. : .....

Date : .....

Seal/Stamp : .....

- We are unable to bid for the reason given below:

Reasons for non-submission of bid:

---

Agency's Name : .....

Signature : .....

Name : .....

Designation : .....

Date : .....

Seal/Stamp : .....

**F-7**  
**BIDDER'S EXPERIENCE**

To,

**M/s TALCHER FERTILIZERS LIMITED  
NOIDA**

SUB:

TENDER NO:

Sl. No	Detailed Description of Job	LOA/WO No. and date	Full Postal Address & phone nos. of Client. <i>Name, designation and address of Engineer/Officer-in-Charge</i>	Capacity	Value of Contract/Order ( <i>Specify Currency Amount</i> )	Date of Commencement	Scheduled Completion Time (Months)	Date of Actual Completion	Reasons for delay in execution, if any	Details of satisfactory operation from the date of Acceptance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:

**Note:**As per Note III of Clause No. A.1 of Section-II, only documents (Work Order, Completion certificate, Execution Certificate etc.) which have been referred/ specified in the bid shall be considered in reply to queries during evaluation of Bids.

**F-8(A)**  
**CHECK LIST**

Bidders are requested to duly fill in the checklist. This checklist gives only certain important items to facilitate the bidder to make sure that the necessary data/information as called for in the bid document has been submitted by them along with their offer. This, however, does not relieve the bidder of his responsibilities to make sure that his offer is otherwise complete in all respects.

Please ensure compliance and tick (√) against following points:

S. No.	DESCRIPTION	CHECK BOX
1.0	Digitally Signing (in case of e-bidding)/ Signing and Stamping (in case of manual bidding) on each sheet of offer, original bidding document including SCC, ITB,GCC, SOR DRAWINGS Corrigendum (if any)	
2.0	Confirm that the following details have been submitted in the Un-priced part of the bid	
i	Covering Letter, Letter of Submission	
ii	EMD / Declaration for Bid Security as per provisions of Tender (as applicable)	
iii.	Digitally signed (in case of e-tendering) or 'signed & stamped (in case of Manual tender) tender document along with drawings and addendum (if any)	
iv	Power of Attorney in the name of person signing the bid.	
v	Confirm submission of document alongwith unpriced bid as per bid requirement (including cl.no.11.1.1 of Section-III of tender).	
3.0	Confirm that all format duly filled in are enclosed with the bid duly Digitally Signed (in case of e-bidding)/ / Signed and Stamped (in case of manual bidding) by authorised person(s)	
4.0	Confirm that the price part as per Price Schedule format submitted with Bidding Document/uploaded in case of e-bid.	
5.0	Confirm that Undertaking as per <i>Form-I to Annexure-V to Section-III of tender</i> and Certification from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of other than companies) as per <i>Form-II to Annexure-V of Section-II of tender</i> are submitted.	
6.0	Confirm that Undertaking as per Form-1to Annexure-VII have been submitted by the bidder (Guidelines from Procurement from a Country sharing a Land Border with India)	
7.0	Confirm submission of Checklist against Bid Evaluation Criteria as per format F-8(B)	

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

**F-8(B)**  
**CHECKLIST FOR BID EVALUATION CRITERIA (BEC) QUALIFYING DOCUMENTS**  
**(refer Section II of Tender document)**

Sl. No.	Description	Documents required for qualification	Documents Submitted by Bidder	Documents attested as per Section-II of Tender	Reference Page No. of the Bid submitted
<b>Technical BEC</b>					
1.	<b>Experience</b>	<p>(a) Copy of Detailed Letter of Acceptance (DLOA) / Work Order /relevant extract of work Order/ Contract Agreement along with detailed scope of work and Completion / Acceptance Certificate. Such certificate shall be issued by order issuing authority/ Owner/End user.</p> <p>(b) The Detailed Letter of Acceptance (DLOA) / Work Order / Contract Agreement must inter alia include Scope of work, completion time, contract value, etc. Similarly, the Completion Certificate/ Acceptance Certificate must clearly indicate reference of relevant work order/DLOA/Contract Agreement, Name of Work, Completed order value and date of completion</p> <p>(c) Copy of valid 'A' Class Electrical Contractors License or equivalent to 'A' Class Electrical License issued by any 'State Government Agency/Authority'.</p> <p>(d) Any other documents as per BEC requirement.</p>		Yes/No	
2.	<b>Experience of bidder acquired as a subcontractor</b>	certificate from end user		Yes/No	
3.	<b>Job executed for Subsidiary / Fellow subsidiary/ Holding company.</b>	Tax paid invoice(s) duly certified by statutory auditor of the bidder towards payment of statutory tax in support of the job executed for Subsidiary / Fellow subsidiary/ Holding company.		Yes/No	

4.	<b>Any other technical criteria in BEC</b>	Bidder shall submit affidavit from the domestic manufacturers of such Iron & steel products as per the Form-I enclosed with the policy documents. A bidder who is not manufacturer of Iron & Steel product and is unable to submit the Affidavit from domestic manufacturers at bidding stage, such bidder can submit the Affidavit issued by domestic manufacturers after placement of order. In this case bidder along with his bid shall submit an undertaking as per prescribed format. Any other documents as per BEC requirement		Yes/No	
<b>Financial BEC</b>					
1.	<b>Annual Turn Over</b>	Audited Financial Statements [including Auditor's Report, Balance sheet, Profit & Loss Accounts statements, Notes & schedules etc.] for last Audited Financial Year. [In case the Annual Turnover criteria is not met in last Audited Financial Year, then the Audited Financial Statements for previous two years of last Audited Financial Year is to be submitted]	Submitted  <i>(Mention specific year..... ...)</i>	Yes/No	
2.	<b>Net Worth</b>	Audited Financial Statements [including Auditor's Report, Balance sheet, Profit & Loss Accounts statements, Notes & schedules etc.] for last Audited Financial Year.	Submitted <i>(Mention specific year.....)</i>	Yes/No	
3.	<b>Working Capital</b>	Audited Financial Statements [including Auditor's Report, Balance sheet, Profit & Loss Accounts statements, Notes & schedules etc.] for last Audited Financial Year.  If the bidder's working capital is negative or inadequate, the bidder shall submit a letter (in prescribed format) from their bank having net worth not less than Rs.100 Crores, confirming the availability of line of credit for at least working capital requirement as stated above.	Submitted <i>(Mention specific year..... ...)</i>  Submitted/ Not Applicable <i>(Bidder to tick appropriate option)</i>	Yes/No	

4.	<b>Format Details financial capability of Bidder</b>	<b>for of of</b> Bidder shall submit "Details of financial capability of Bidder" in prescribed format duly signed and stamped by a chartered accountant / Certified Public Accountant (CPA).	Submitted		
----	--	--	-----------	--	--

Place:  
Date:

[Signature of Authorized Signatory of Bidder]  
Name:  
Designation:  
Seal :

**F-9**

**FORMAT FOR CERTIFICATE FROM BANK  
IF BIDDER'S WORKING CAPITAL IS INADEQUATE/NEGATIVE**

(To be provided on Bank's letter head)

Date:

To,  
**M/s. TALCHER FERTILIZERS LIMITED  
NOIDA**

Dear Sir,

This is to certify that M/s ..... (name of the Bidder with address)  
(hereinafter referred to as Customer) is an existing Customer of our Bank.

The Customer has informed that they wish to bid for TFL's Tender / NIT no.  
..... dated ..... for .....(Name of the  
supply/work/services/consultancy) and as per the terms of the said Tender/NIT Document they have  
to furnish a certificate from their Bank confirming the availability of line of credit.

Accordingly M/s ..... (name of the Bank with address) confirms availability of  
line of credit to M/s ..... (name of the Bidder) for at least an amount of Rs.  
\_\_\_\_\_

It is also confirmed that the net worth of the Bank is more than Rs. 100 Crores (or Equivalent USD)  
and the undersigned is authorized to issue this certificate.

Yours truly

for ..... (Name & address of Bank)

(Authorized signatory)

Name of the signatory:

Designation :

Email Id :

Contact No. :

Stamp

**Note:**

**This Declaration/Letter for line of credit shall be from single bank only. Letters from multiple  
banks shall not be applicable. However, banking syndicate will be acceptable wherein a  
group of banks can jointly provide line of credit to the bidder.**



**F-10**

**FORMAT FOR CHARTERED ACCOUNTANT CERTIFICATE/ CERTIFIED PUBLIC ACCOUNTANT (CPA) FOR FINANCIAL CAPABILITY OF THE BIDDER**

We have verified the Audited Financial Statements and other relevant records of M/s..... (Name of the bidder) and certify the following:

**A. AUDITED ANNUAL TURNOVER\* OF PRECEDING THREE FINANCIAL YEARS:**

Year	Amount (Currency)
Year 1:	
Year 2:	
Year 3:	

**B. NETWORTH\* AS PER AUDITED FINANCIAL STATEMENT OF PRECEDING FINANCIAL YEAR:**

Description	Year _____
	Amount (Currency)
1. Net Worth	

**C. WORKING CAPITAL\* AS PER AUDITED FINANCIAL STATEMENT OF PRECEDING FINANCIAL YEAR:**

Description	Year _____
	Amount (Currency)
1. Current Assets	
2. Current Liabilities	
3. Working Capital (Current Assets-Current liabilities)	

***\*Refer Instructions***

**Notes:**

- (i) It is further certified that the above mentioned applicable figures are matching with the returns filed with Registrar of Companies (ROC) [Applicable only in case of Indian Companies]
- (ii) We confirm the above figures after referring instructions at page 2 of 2 of Format F-10.
- (iii) Practicing Chartered Accountants shall generate Unique Document Identification Number (UDIN) for all certificates issued by them.

Name of Audit Firm:  
Chartered Accountant/CPA  
Date:

[Signature of Authorized Signatory]

Name:  
Designation:  
Seal:  
UDIN:

Membership No.:

**Instructions for Format F-10:**

1. The Separate Pro-forma shall be used for each member in case of JV/ Consortium (If applicable).
2. The financial year would be the same as one normally followed by the bidder for its Annual Report.
3. The bidder shall provide the audited annual financial statements as required for this Tender document. Failure to do so would result in the Proposal being considered as non- responsive.
4. For the purpose of this Tender document:
  - (i) **Annual Turnover** shall be “Revenue from Operations” as per Profit & Loss account of audited annual financial statements
  - (ii) **Working Capital** shall be “Current Assets less Current liabilities” and
  - (iii) **Net Worth** shall be Aggregate value of the paid-up share capital and all reserves created out of the profits and securities premium account, after deducting the aggregate value of the accumulated losses, deferred expenditure and miscellaneous expenditure not written off, if any, but does not include reserves created out of revaluation of assets, write back of depreciation and amalgamation.
5. **Above figures shall be calculated after considering the qualification, if any, made by the statutory auditor on the audited financial statements of the bidder including quantified financial implication.**
6. This certificate is to be submitted on the letter head of Chartered Accountant/CPA.

F-11

**DELETED**

**F-12**

**BIDDER'S QUERIES FOR PRE BID MEETING**

To,

M/s TALCHER FERTILIZERS LIMITED  
NOIDA

SUB:

TENDER NO:

SI. NO.	REFERENCE OF TENDER DOCUMENT				BIDDER'S QUERY	OWNER'S REPLY
	SEC. NO.	Page No.	Clause No	Subject		

**NOTE:** The Pre-Bid Queries may be sent by e-mail before due date for receipt of Bidder's queries.

**SIGNATURE OF BIDDER:** \_\_\_\_\_

**NAME OF BIDDER:** \_\_\_\_\_

**F-13**

**E-Banking Mandate Form**

(To be issued on vendors letter head)

1. Vendor/customer Name :
2. Vendor/customer Code:
3. Vendor /customer Address:
4. Vendor/customer e-mail id:
5. Particulars of bank account
  - a) Name of Bank
  - b) Name of branch
  - c) Branch code:
  - d) Address:
  - e) Telephone number:
  - f) Type of account (current/saving etc.)
  - g) Account Number:
  - h) RTGS IFSC code of the bank branch
  - i) NEFT IFSC code of the bank branch
  - j) 9 digit MICR code

I/We hereby authorize TFL to release any amount due to me/us in the bank account as mentioned above. I/We hereby declare that the particulars given above are correct and complete. If the transaction is delayed or lost because of incomplete or incorrect information, we would not hold the TFL responsible.

(Signature of vendor/customer)

**BANK CERTIFICATE**

We certify that ----- has an Account no. ----- with us and we confirm that the details given above are correct as per our records.

Bank stamp

Date

(Signature of authorized officer of bank)

**F-14**

**INTEGRITY PACT**

# **INTEGRITY PACT**

## INTEGRITY PACT

### INTRODUCTION:

TFL as one of its endeavour to maintain and foster most ethical and corruption free business environment, have decided to adopt the Integrity Pact, a tool developed by the Transparency International, to ensure that all activities and transactions between the Company (TFL) and its Counterparties (Bidders, Contractors, Vendors, Suppliers, Service Providers/Consultants etc.) are handled in a fair and transparent manner, completely free of corruption.

Considering the above, the details mentioned at attached Annexure-1 are applicable as stated in Instruction to Bidders of Bid Document in addition to the existing stipulation regarding Corrupt and Fraudulent Practices.

The attached copy of the Integrity Pact at Annexure - 2 shall be included in the Bid submitted by the bidder (to be executed by the bidder for all tenders of value Rs. 1 (One) crore and above). In case a bidder does not sign the Integrity Pact, his bid shall be liable for rejection.





## ANNEXURE-1

**Bidder is required to sign the Integrity Pact with TFL as per format & terms and conditions enclosed with tender. In case a bidder does not sign the Integrity Pact, his bid shall be liable for rejection.**

### **I COMMITMENTS AND OBLIGATIONS OF THE “COUNTERPARTY”**

- a) The Counterparty, directly or indirectly (through agent, consultant, advisor, etc.), shall not pay any bribe/ influence or give undue/ unlawful benefit to anyone to gain undue advantage in dealing with TFL.
- b) The Counterparty will not engage in collusion of any kind including price fixation etc. with other Counterparts.
- c) The counterparty will not pass TFL's confidential information to any third party unless specifically authorized by TFL in writing.
- d) The Counterparties shall promote and observe best ethical practices within their respective organizations.
- e) The Counterparty shall inform the Independent External Monitor.
  - i) If it received any demand, directly or indirectly, for a bribe/ favour or any illegal gratification/ payment / benefit;
  - ii) If it comes to know of any unethical or illegal payment / benefit;
  - iii) If it makes any payment to any TFL associate.
- f) The Counterparty shall not make any false or misleading allegations against TFL or its associates.

### **II VIOLATIONS & CONSEQUENCES:**

- a) If a Counterparty commits a violation of its Commitments and Obligations under the Integrity Pact Programme during bidding process, their entire Earnest Money Deposit/ Bid Security, would be forfeited and in addition, action shall be taken as per “Procedure for action in case Corrupt /Fraudulent/ Collusive/Coercive Practices”
- b) In case of violation of the Integrity pact by Counterparty after award of the Contract, TFL shall be entitled to terminate the Contract. Further, TFL would forfeit the security deposits/ Contract Performance Bank Guarantee and in addition, action shall be taken as per “Procedure for action in case Corrupt /Fraudulent/ Collusive/Coercive Practices”



### **INDEPENDENT EXTERNAL MONITORS (IEMS)**

Presently the panel consisting of the following Independent External Monitors (IEMs) have been appointed by TFL, in terms of Integrity Pact (IP) which forms part of TFL Tenders / Contracts.

- i) Shri Sanjeev Prasad Narain Singh (Email ID: [spns108@gmail.com](mailto:spns108@gmail.com))
- ii) Shri Anil Kumar Sharma (Email ID: [aksharma1512@gmail.com](mailto:aksharma1512@gmail.com))

This panel is authorised to examine / consider all references made to it under this tender/ contract. "The bidder(s), in case of any dispute(s) / complaint(s) pertaining to this tender falling under provisions of Integrity Pact may raise the same either directly with the IEMs on the panel viz Shri Sanjeev Prasad Narain Singh (Email ID: [spns108@gmail.com](mailto:spns108@gmail.com)) & Shri Anil Kumar Sharma (Email ID: [aksharma1512@gmail.com](mailto:aksharma1512@gmail.com)) or with CC to them through their Nodal Officer - Sh. Manna Paul, DGM (C&P) – Email: [mannapaul@gail.co.in](mailto:mannapaul@gail.co.in), Address: Talcher Fertilizers Limited, C/o GAIL Training Institute, PARC Building, Plot No. 24, Sector-16A, Film City, Noida (U.P.) - 201301. On receipt of such complaints/representations, Nodal Officer shall coordinate with IEM Panel and TFL authorities concerned for their disposal as per extant guidelines."



**INTEGRITY PACT**

(To be executed on plain paper)

Between Talcher Fertilizers Limited (TFL) [here-in-after referred to as "Principal"].

**AND**

\_\_\_\_\_ (here-in-after referred to as "The Bidder/ Contractor").

(Principal and the Bidder / Contractor are here-in-after are referred to individually as "Party" or collectively as "Parties").

**PREAMBLE**

The Principal intends to award under laid down organizational procedures, contract/s for \_\_\_\_\_. The Principal values full compliance with all relevant laws of land rules, regulations, and economic use of resources and of fairness /transparency in its relations with its Bidder (s) and/or Contractor (s).

In order to achieve these goals, the Principal will appoint Independent External Monitors (IEMs) who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

**Section 1 – Commitments of the Principal**

1. The Principal commits itself to take all measures necessary to prevent corruption and to observe the following Principles:-
  - i) No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or for a third person, any material or immaterial benefit which the person is not legally entitled to.
  - ii) The Principal will, during the tender process treat all Bidder(s) with equity and reasons. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.



- iii) The Principal will exclude from the process all known prejudiced persons.
2. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal Code (IPC) / Prevention of Corruption Act (PC Act), or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officers and in addition can initiate disciplinary actions.

**Section 2 – Commitments of the Bidder (s)/Contractor (s)**

1. The Bidder(s) / Contractor(s) commits themselves to take all measures necessary to prevent corruption. The Bidder(s) / Contractor(s) commits themselves to observe the following principles during participation in the tender process and during the contract execution:
- i) The Bidder (s) / Contractor (s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
  - ii) The Bidder (s) / Contractor (s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other action to restrict competitiveness or to introduce cartelisation in the bidding process.
  - iii) The Bidder (s) / Contractor (s) will not commit any offence under the relevant IPC/PC Act; further, the Bidder (s) / Contractor (s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
  - iv) The Bidder (s)/ Contractor (s) of foreign origin shall disclose the name and address of the Agents/ representatives in India, if any. Similarly, the Bidder (s)/ Contractor (s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further, all the payments made to the Indian agent/ representative have to be in India Rupees only.
  - v) The Bidder (s) / Contractor (s) will, when presenting their bid, disclose any and all payments made, is committed to or intends to make to agents,



brokers or any other intermediaries in connection with the award of the contract.

- vi) Bidder(s) / Contractor(s) who have signed the Integrity Pact shall not approach the Courts while representing the matter to IEMs and shall wait for their decision in the matter.
2. The Bidder(s)/ Contractor(s) shall not instigate third person to commit offences outlined above or be an accessory to such offences.

**Section 3 – Disqualification from tender process and exclusion from future contracts**

If the Bidder (s) / Contractor (s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put their reliability or credibility in question, the Principal is entitled to disqualify the Bidder (s) / Contractor (s) from the tender process or take action as per provisions of "Procedure for action in case Corrupt /Fraudulent/ Collusive/Coercive Practices".

**Section 4 – Compensation for Damages**

1. If the Principal has disqualified the Bidder (s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit / Bid Security.
2. If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equal to the Contract Value or the amount equivalent to Performance Bank Guarantee.

**Section 5 – Previous transgression**

1. The Bidder declares that no previous transgression occurred in the last three years, with any other Company in any country conforming to the anti-corruption approach or with any Public Sector Enterprise in India that could justify his exclusion from the tender process.
2. If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or actions can be taken as per provisions of "Procedure for action in case Corrupt /Fraudulent/ Collusive/Coercive Practices"



### **Section 6 – Equal treatment to all Bidders / Contractors / Subcontractors**

1. In case of sub-contracting, the Principal contractor shall take the responsibility of the adoption of IP by the sub-contractor. It is to be ensured by him that all sub-contractors also sign the IP.
2. The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

### **Section 7 – Criminal charges against violating Bidder (s) / Contractor (s) / Sub-contractor (s)**

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

### **Section 8 –Independent External Monitor / Monitors**

1. The Principal appoints competent and credible Independent External Monitor for this Pact after approval by Central Vigilance Commission. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
2. The Monitor is not subject to instructions by the representatives of the parties and performs his/her functions neutrally and independently. The Monitor would have access to all documents / records pertaining to the contract for which a complaint or issue is raised before them, as and when warranted. However, the documents / records / information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed. It will be obligatory for him/her to treat the information and documents of the Bidders / Contractors as confidential. He / she reports to MD, TFL.
3. The Bidder (s)/ Contractor (s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his/her request and demonstration of a valid interest, unrestricted and unconditional access to their project documentation. The same is applicable to Sub-contractors.
4. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an



impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

5. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he/she will so inform the Management of the Principal and request the Management to discontinue or to take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
6. The Monitor will submit a written report to MD, TFL within 30 days from the date of reference or intimation to him by the 'Principal' and, should the occasion arise, submit proposals for correcting problematic situations.
7. If the Monitor has reported to MD, TFL, a substantiated suspicion of an offence under relevant IPC/PC Act, and MD, TFL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, then, only in case of very serious issue having a specific verifiable Vigilance angle, the matter should be reported directly to the Central Vigilance Commission.
8. The word 'Monitor' would include both singular and plural.
9. In case of any complaints referred under IP Program, the role of IEMs is advisory and would not be legally binding and it is restricted to resolving the issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidder.
10. After award of contract, the IEMs shall look into any issue relating to execution of contract, if specifically raised before them. As an illustrative example, if a contractor who has been awarded the contract, during the execution of contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs.

### **Section 9 – Pact Duration**

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded. Any violation to the same would entail disqualification of the bidders and exclusion from future business dealing.

If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by MD, TFL.

### **Section 10 – Miscellaneous provisions**



1. This agreement is subject to Indian Law. Place of performance and exclusive jurisdiction is the Registered Office of the Principal, i.e. New Delhi.
2. Changes and supplements as well as termination notices, if any, need to be made in writing. Side agreements have not been made.
3. If the Contractor/Bidder is a Joint Venture or a partnership concern or a consortium, this agreement must be signed by all partners or consortium members.
4. Should one or several of the provisions of this agreement turn out to be invalid, the remainder of this agreement shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions in such a case.
5. Issues like warranty / guarantee, etc. shall be outside the purview of IEMs.
6. In the event of any contradiction between the Integrity Pact and its Annexure, the Clause in Integrity Pact will prevail.



-----  
 मनीष कुमार/MAANOJ KUMAR  
 (For & on Behalf of Principal)  
 जे.ए.ए.सी. फर्टिलाइजर लिमिटेड/J.A.A.S.I. Fertilizers Ltd.  
 जी.टी.पार्क बिल्डिंग/GTI PARC Building  
 प्लॉट नं.- 24, सेक्टर-16ए, नोएडा-201 301 (उ.प्र.)  
 Plot No. 24, Sec.-16A, Noida-201 301 (U.P.)  
 (Office Seal)

-----  
 (For & on Behalf of  
 Bidder/Contractor)  
  
 (Office Seal)

Place -----

Date -----

Witness 1:  
 (Sign, Name & Address)  
 [FOR PRINCIPAL]

Geogyan [SORA DEOYAM, DM (CLP)]  
 TALCHER FERTILIZERS LIMITED (TFL)  
 PLOT NO. 24, SECTOR-16A, NOIDA,  
 U.P. - 201301

Witness 2:  
 (Sign, Name & Address)  
 [FOR BIDDER / CONTRACTOR]

.....  
 .....  
 .....



**F-15**

**INDEMNITY BOND**

WHEREAS TALCHER FERTILIZERS LIMITED (hereinafter referred to as “TFL”) which expression shall, unless repugnant to the context include its successors and assigns, having its registered office at Plot 2/H, Kalpana Area, BJB Nagar, Khorda, Bhubaneswar – 751014 has entered into a contract with M/s\*..... (hereinafter referred to as the “Contractor”) which expression shall unless repugnant to the context include its representatives, successors and assigns, having its registered office at \*..... and on the terms and conditions as set out, inter-alia in the ..... **[mention the work order/FOA/Tender No.]** and various documents forming part thereof, hereinafter collectively referred to as the ‘CONTRACT’ which expression shall include all amendments, modifications and / or variations thereto.

TFL has also advised the Contractor to execute an Indemnity Bond in general in favour of TFL indemnifying TFL and its employees and Directors including Independent Directors from all consequences which may arise out of any prospective litigation or proceedings filed or may be initiated by any third party, including any Banker / financial institution / worker(s) /vendor(s)/ subcontractor(s) etc. who may have been associated or engaged by the Contractor directly or indirectly with or without consent of TFL for above works.

NOW, THEREFORE, in consideration of the promises aforesaid, the Contractor hereby irrevocably and unconditionally undertakes to indemnify and keep indemnified TFL and all its employees, Directors, including Independent Directors, from and against all/any claim(s), damages, loss, which may arise out of any litigations/ liabilities that may be raised by the Contractor or any third party against TFL under or in relation to this contract. The Contractor undertakes to compensate and pay to TFL and/or any of its employees, Directors including Independent Directors, forth with on demand without any protest the amount claimed by TFL for itself and for and on behalf of its employees, Directors including Independent Directors together with direct/indirect expenses including all legal expenses incurred by them or any of them on account of such litigation or proceedings.

AND THE CONTRACTOR hereby further agrees with TFL that:

- (i) This Indemnity shall remain valid and irrevocable for all claims of TFL and/or any of its employees and Directors including Independent Directors arising out of said contract with respect to any such litigation / court case for which TFL and/or its employees and Directors including Independent Directors has been made party until now or here-in-after.
- (ii) This Indemnity shall not be discharged/ revoked by any change/ modification/ amendment/ assignment of the contract or any merger of the Contractor with other entity or any change in the constitution/structure of the Contractor’s firm/ Company or any conditions thereof including insolvency etc. of the Contractor, but shall be in all respects and for all purposes binding and operative until any/ all claims for payment of TFL are settled by the Contractor and/or TFL discharges the Contractor in writing from this Indemnity.

The undersigned has full power to execute this Indemnity Bond for and on behalf of the Contractor and the same stands valid.

SIGNED BY :  
For [ Contractor]

*Authorised Representative*

Place:

Dated:

Witnesses:1.

2

**F-16**

**FREQUENTLY ASKED QUESTIONS (FAQs)**

<b>SL.NO.</b>	<b>QUESTION</b>	<b>ANSWER</b>
1.0	Can any vendor quote for subject Tender?	Yes. A Vendor has to meet Bid Evaluation Criteria given under Section II of Tender document in addition to other requirements.
2.0	Should the Bid Evaluation Criteria documents be attested?	Yes. Please refer Section II of Tender document
3.0	Is attending Pre Bid Meeting mandatory.	No. Refer Clause No. 17 of Instruction to Bidders of Tender Document. However attending Pre Bid Meeting is recommended to sort out any issue before submission of bid by a Bidder.
4.0	Can a vendor submit more than 1 offer?	No. Please refer Clause No. 4 of Instruction to Bidders of Tender Document.
5.0	Is there any Help document available for e-Tender.	Refer FAQs as available on CPP Portal e-Procurement).
6.0	Are there are any MSE (Micro & Small Enterprises) benefits available?	Refer Clause No. 40 of Instructions to Bidders of Tender Document.
7.0	Are there are any benefits available to Startups?	Refer Clause No. 49 of Instructions to Bidders of Tender Document.

All the terms and conditions of Tender remain unaltered.

**Form F-17**

**DELETED**

**F-17 (A)**  
**MATTER TO BE MENTIONED IN COVERING LETTER TO BE SUBMITTED BY**  
**VENDOR ALONG WITH BANK GUARANTEE (BG)**

<b>1. Bank Guarantee No.</b>		
<b>2. Vendor Name</b>		
<b>3. Nature of Bank Guarantee [Please Tick (☐) whichever is applicable]</b>	Contract Performance	
	Security (CPS)	
<b>Purchase Order (PO) / Fax of Acceptance (FOA) / Detailed Letter of Acceptance (DLOA) No.</b>		
<b>Details of Bank issuing Bank Guarantee (BG)</b>		
<b>A. Name</b>		
<b>B. E-mail ID</b>		
<b>C. Address</b>		
<b>D. Phone No. / Mobile No.</b>		

**PROFORMA FOR BANK GUARANTEE FOR PAYMENTS TOWARDS PLACEMENT OF ALL  
PURCHASE ORDERS OF MAJOR TAGGED ITEMS.**

**(To be submitted on Rs. 500/-(five hundred) non judicial stamp paper)**

---

Ref.....

Bank Guarantee No.-----

Date.....

To,

M/s Talcher Fertilizers Limited

---

**Dear Sir(s),**

In consideration of the Talcher Fertilizers Limited, hereinafter called the "Owner" which expression shall unless repugnant to the context or meaning thereof include its successors, executors, administrators and assignees, having awarded to M/s..... having its registered office at ..... hereinafter referred as the 'CONTRACTOR', which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assignees, a contract hereinafter referred to as the 'Contract' for related works..... referred to as the 'WORK' on terms and conditions set out, inter-alia in the Owner's Contract / DLOA / FOA No.....dated..... valued at..... (in words & figures) and as the Owner having agreed to make milestone payments (for the performance of the above contract to the CONTRACTOR amounting to.....(in words & figures) against Bank Guarantee to be furnished by the CONTRACTOR.

We..... hereinafter referred to as the BANK which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assignees having our office at..... do hereby undertake to give the irrevocable and unconditional guarantee and do hereby undertake to pay the OWNER on first demand without any demur, reservation, contest, recourse, protest and without reference to the CONTRACTOR any and all monies payable by the CONTRACTOR by reason of any breach by the said CONTRACTOR of any of the terms and conditions of the said Contract to the extent of.....We agree that the guarantee herein contained shall continue to be enforceable till the Owner discharges this guarantee **in writing.**

The OWNER shall have the fullest liberty without affecting in any way the liability of the BANK under this guarantee, from time to time to vary the amount or to extend the time for performance of the works by the CONTRACTOR. The BANK shall not be released from its liability under these presents by any exercise of the Owner of the liberty with reference to the matter aforesaid.

The Owner shall have the fullest liberty, without reference to CONTRACTOR and without affecting this guarantee to postpone for any time or from time to time the exercise of any powers vested in them or of any right which they might have against the CONTRACTOR, and to exercise the same at any time in any manner, and either to enforce or to forebear to enforce any power, covenants contained or implied in the Contract between the OWNER and the CONTRACTOR or any other course or remedy or security available to the OWNER and the BANK shall not be released of its obligations under these presents by any exercise by the OWNER of its liberty with reference to matters aforesaid or other acts of omission or commission on the part of the OWNER or any other law would, but for this provision, have the effect of releasing the BANK.

The right of the OWNER to recover the outstanding sum upto Rs..... from the BANK in the manner aforesaid **is absolute and unequivocal and** will not be affected or suspended by reason of the fact that any dispute or disputes has or have been raised by the CONTRACTOR and/or that any dispute or disputes is or are pending before any officer, tribunal or court **or arbitrator or any other authority/forum** and any demand made by OWNER on the BANK shall be conclusive and binding.

The BANK further undertakes not to revoke this guarantee during its currency without previous consent of the OWNER and further agrees that the guarantee contained shall continue to be enforceable **until it is discharged by TFL in writing.**

The BANK also agrees that the OWNER shall at its option be entitled to enforce this guarantee against the BANK as a principal debtor, in the first instance, notwithstanding any other security or guarantee that OWNER may have in relation to the CONTRACTOR's liabilities towards the said milestone payment .

The amount under the Bank Guarantee is payable forthwith without any delay by Bank upon the written demand raised by TFL. Any dispute arising out of or in relation to the said Bank Guarantee shall be subject to the exclusive jurisdiction of courts at New Delhi.

Therefore, we hereby affirm that we are guarantors and responsible to you on behalf of the Contractor up to a total amount of \_\_\_\_\_(amount of guarantees in words and figures) and we undertake to pay you, upon your first written demand declaring the Contractor to be in default under the contract and without caveat or argument, any sum or sums within the limits of \_\_\_\_\_(amount of guarantee) as aforesaid, without your needing to prove or show grounds or reasons for your demand or the sum specified therein.

Notwithstanding anything contained hereinabove, our liability under this guarantee is restricted to \_\_\_\_\_ and it will remain in force upto and including \_\_\_\_\_ (this date shall be initially 15 months from date of FOA) and shall be extended from time to time for such periods as may be advised by M/s\_\_\_\_\_ on whose behalf this guarantee has been given.

We have power to issue this guarantee in your favour under Memorandum and Articles of Association and the undersigned has full power to do so under the Power of Attorney/ resolution of the Board of Directors dated..... accorded to him by the BANK.

Notwithstanding anything contained herein:  
9.

- a) The Bank's liability under this Guarantee shall not exceed (currency in figures) \_\_\_\_\_ (currency in words only) \_\_\_\_\_
- b) This Guarantee shall remain in force upto \_\_\_\_\_ (this date shall be initially 15 months from date of FOA) and any extension(s) thereof; and
- c) The Bank shall be released and discharged from all liability under this Guarantee unless a written claim or demand is issued to the Bank on or before the midnight of \_\_\_\_\_ (indicate date of expiry of claim period which includes minimum three months from the expiry of this Bank Guarantee) and if extended, the date of expiry of the last extension of this Guarantee. If a claim has been received by us within the said date, all the rights of TFL under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

Dated.....this.....day of.....20 .....

Signed by

(Person duly authorised by Bank)

Place:

WITNESS :

1..... (Signature)  
..... (Printed Name)  
..... (Designation)

2..... (Signature)  
..... (Printed Name)  
..... (Designation)

(Common Seal)

**F-19**

**FORMAT OF LETTER OF NO DEVIATIONS**  
**(ON BIDDER'S LETTERHEAD)**

**(NIT NO : PNMM/PC-183/E-4013/NCB DATED 10.03.2022)**

We \* hereby agree to fully comply with, abide by and accept without variation, deviation or reservation all technical, commercial and other condition whatsoever of the Bidding Documents and all Addenda / Corrigenda / Amendment/ Clarifications issued by OWNER.

We further hereby confirm that the bid is submitted in accordance of Tender Document and contains no deviation and the price bid submitted may be treated to conform to, in all respects, with the terms and conditions of the said tender documents including all Addenda / Corrigenda/ Amendment /Clarifications.

For and on behalf of\* : .....

Stamp & Signature\*\* : .....

Name : .....

Designation : .....

Date : .....

**\*Here fill in the name of bidder.**

**\*\*The Letter of *No Deviation* must be signed by the person (s) authorized to sign as per POA.**



**F-20**  
**POWER OF ATTORNEY (POA)**  
**(To be submitted on the Non-Judicial stamp paper / Company's Letter Head)**

TENDER NO:

Description of work:

Name of Bidder: \_\_\_\_\_

"The undersigned \_\_\_\_\_ (Name of LEGAL PERSON, i.e. CEO/C&MD/Company Secretary/Partners) is lawfully authorized to issue this POA\* on behalf of the company M/s \_\_\_\_\_ (Name of bidder) whose registered address is \_\_\_\_\_ and does hereby appoint Mr./Ms \_\_\_\_\_ (name of authorized person signing the bid document) \_\_\_\_\_ (Designation) of M/s \_\_\_\_\_ (Name of bidder) whose signature appears below to be the true and lawful attorney/(s) and authorize him/her to sign the bid (both physically & digitally on CPP Portal), conduct negotiation, sign contracts and execute all the necessary matter related thereto, in the name and on behalf of the company in connection with the tender no. \_\_\_\_\_.

The signature of the authorized person/(s) herein constitutes unconditional obligations of M/s \_\_\_\_\_ (Name of bidder).

This Power of Attorney (POA) shall remain valid and in full force and effect before we withdraw it in writing (by fax, or mail or post). All the documents signed (within the period of validity of the Power of Attorney) by the authorized person herein shall not be invalid because of such withdrawal.

(\*) In case of a single Bidder, the Power of Attorney shall be issued as per the constitution of the bidder as below.

- a) **In case of Proprietorship:** By Proprietor
- b) **In case of Partnership:** by all Partners or Managing Partner.
- c) **In case of Limited Liability Partnership:** by any bidder's employee authorized in terms of Deed of LLP.
- d) **In case of Public /Limited Company:** POA in favour of authorized employee(s) by Board of Directors through Board Resolution or by the designated officer authorized by Board to do so. Such Board Resolution should be duly countersigned by Company Secretary / MD / CMD / CEO.

SIGNATURE OF THE LEGAL PERSON

\_\_\_\_\_  
(Name of person with Company seal)

SIGNATURE OF THE AUTHORIZED PERSON  
(FOR SIGNING THE BID)

\_\_\_\_\_  
(Signature)  
Name of person: \_\_\_\_\_  
E-mail id: \_\_\_\_\_  
DSC (Digital Signature Certificate) No.: \_\_\_\_\_

**F-21**

**UNDERTAKING REGARDING SUBMISSION OF ELECTRONIC INVOICE (E-INVOICE AS PER  
GST LAWS)**

**(to be submitted on letter head along with documents for release of payment)**

To,  
M/s TALCHER FERTILIZERS LIMITED

---

SUB:

LOA NO:

**Dear Sir,**

We \_\_\_\_\_ (Name of the Supplier/Contractor/Service Provider/ Consultant)  
hereby confirm that E-Invoice provision as per the GST Law is

- (i) Applicable to us [     ]
- (ii) Not Applicable to us [     ]

**(Supplier/Contractor/Service Provider/ Consultant is to tick appropriate option (✓ or X) above).**

In case, same is applicable to us, we confirm that we will submit E-Invoice after complying with all the requirements of GST Laws. If the invoice issued without following this process, such invoice can-not be processed for payment by TFL as no ITC is allowed on such invoices. We also confirm that If input tax credit is not available to TFL for any reason attributable to Supplier/Contractor/Service Provider/ Consultant (both for E-invoicing cases and non-E-invoicing cases), then TFL shall not be obligated or liable to pay or reimburse GST (CGST & SGST/UTGST or IGST) claimed in the invoice(s) and shall be entitled to deduct / setoff / recover such GST amount (CGST & SGST/UTGST or IGST) or Input Tax Credit amount together with penalties and interest, if any, by adjusting against any amounts paid or becomes payable in future to the Supplier/Contractor/Service Provider/ Consultant under this contract or under any other contract.

Place: [Signature of Authorized Signatory of Bidder]

Date: Name:  
Designation:  
Bidder Name:  
Seal:

**Form F-22**

**UNDERTAKING REGARDING SUBMISSION OF CONTRACT PERFORMANCE SECURITY  
(CPS)/ SECURITY DEPOSIT (SD) WITHIN STIPULATED TIME LINE**

**(to be submitted on letter head of bidder)**

To,

M/s Talcher Fertilizers Limited

\_\_\_\_\_

SUB:

TENDER NO:

Dear Sir,

We hereby confirm that we have clearly understood the requirement of Contract Performance Security (CPS) / Security Deposit (SD) specified in the tender document.

We also hereby confirm that in case of award of contract / order, we will submit Contract Performance Security (CPS) / Security Deposit (SD) within 30 days from the date of issuance of Fax of Acceptance.

Place: [Signature of Authorized Signatory of Bidder]

Date: Name:

Designation:

Bidder Name:

Seal:

**F-23**  
**PROFORMA FOR CONTRACT AGREEMENT**  
**(To be executed on non-judicial stamp paper of appropriate value)**

DLOA No. .... dated .....

**TFL's PAN No.** .....

Contract Agreement for the work of ----- of TALCHER FERTILIZERS LIMITED made on ---  
----- between (Name and Address)-----, hereinafter called the "CONTRACTOR" (which term shall unless excluded by or repugnant to the subject or context include its successors and permitted assignees) of the one part and TALCHER FERTILIZERS LIMITED hereinafter called the "EMPLOYER" (which term shall, unless excluded by or repugnant to the subject or context include its successors and assignees) of the other part.

**WHEREAS**

- A. The EMPLOYER being desirous of having provided and executed certain work mentioned, enumerated or referred to in the Tender Documents including Letter Inviting Tender, General Tender Notice, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, Plans, Time Schedule of completion of jobs, Schedule of Rates, Agreed Variations, other documents has called for Tender.
- B. The CONTRACTOR has inspected the SITE and surroundings of WORK specified in the Tender Documents and has satisfied himself by careful examination before submitting his tender as to the nature of the surface, strata, soil, sub-soil and ground, the form and nature of site and local conditions, the quantities, nature and magnitude of the work, the availability of labour and materials necessary for the execution of work, the means of access to SITE, the supply of power and water thereto and the accommodation he may require and has made local and independent enquiries and obtained complete information as to the matters and thing referred to, or implied in the tender documents or having any connection therewith and has considered the nature and extent of all probable and possible situations, delays, hindrances or interferences to or with the execution and completion of the work to be carried out under the CONTRACT, and has examined and considered all other matters, conditions and things and probable and possible contingencies, and generally all matters incidental thereto and ancillary thereof affecting the execution and completion of the WORK and which might have influenced him in making his tender.
- C. The Tender Documents including the Notice Letter Inviting Tender, General Conditions of Contract, Special Conditions of Contract, Schedule of Rates, General Obligations, SPECIFICATIONS, DRAWINGS, PLANS, Time Schedule for completion of Jobs, Letter of Acceptance of Tender and any statement of agreed variations with its enclosures copies of which are hereto annexed form part of this CONTRACT though separately set out herein and are included in the expression "CONTRACT" wherever herein used.

**AND WHEREAS**

The EMPLOYER accepted the Tender of the CONTRACTOR for the provision and the execution of the said WORK at the rates stated in the schedule of quantities of the work and finally approved by EMPLOYER (hereinafter called the "Schedule of Rates") upon the terms and subject to the conditions of CONTRACT.

**NOW THIS AGREEMENT WITNESSETH AND IT IS HEREBY AGREED AND DECLARED AS FOLLOWS:-**

1. In consideration of the payment to be made to the CONTRACTOR for the WORK to be executed by him, the CONTRACTOR hereby covenants with EMPLOYER that the CONTRACTOR shall and will duly provide, execute and complete the said work and shall do and perform all other acts and things in the CONTRACT mentioned or described or which are to be implied there from or may be reasonably necessary for the completion of the said WORK and at the said times and in the manner and subject to the terms and conditions or stipulations mentioned in the contract.
2. In consideration of the due provision execution and completion of the said WORK, EMPLOYER does hereby agree with the CONTRACTOR that the EMPLOYER will pay to the CONTRACTOR the respective amounts for the WORK actually done by him and approved by the EMPLOYER at the Schedule of Rates and such other sum payable to the CONTRACTOR under provision of CONTRACT, such payment to be made at such time in such manner as provided for in the CONTRACT.

A N D

3. In consideration of the due provision, execution and completion of the said WORK the CONTRACTOR does hereby agree to pay such sums as may be due to the EMPLOYER for the services rendered by the EMPLOYER to the CONTRACTOR, such as power supply, water supply and others as set for in the said CONTRACT and such other sums as may become payable to the EMPLOYER towards the controlled items of consumable materials or towards loss, damage to the EMPLOYER'S equipment, materials construction plant and machinery, such payments to be made at such time and in such manner as is provided in the CONTRACT.

It is specifically and distinctly understood and agreed between the EMPLOYER and the CONTRACTOR that the CONTRACTOR shall have no right, title or interest in the SITE made available by the EMPLOYER for execution of the works or in the building, structures or work executed on the said SITE by the CONTRACTOR or in the goods, articles, materials etc., brought on the said SITE (unless the same specifically belongs to the CONTRACTOR) and the CONTRACTOR shall not have or deemed to have any lien whatsoever charge for unpaid bills will not be entitled to assume or retain possession or control of the SITE or structures and the EMPLOYER shall have an absolute and unfettered right to take full possession of SITE and to remove the CONTRACTOR, their servants, agents and materials belonging to the CONTRACTOR and lying on the SITE.

The CONTRACTOR shall be allowed to enter upon the SITE for execution of the WORK only as a licensee simpliciter and shall not have any claim, right, title or interest in the SITE or the structures erected thereon and the EMPLOYER shall be entitled to terminate such license at any time without assigning any reason.

The materials including sand, gravel, stone, loose, earth, rock etc., dug up or excavated from the said SITE shall, unless otherwise expressly agreed under this CONTRACT, exclusively belong to the EMPLOYER and the CONTRACTOR shall have no right to claim over the same and such excavation and materials should be disposed off on account of the EMPLOYER according to the instruction in writing issued from time to time by the ENGINEER-IN-CHARGE.

In Witness whereof the parties have executed these presents in the day and the year first above written.

Signed and Delivered for and on behalf of EMPLOYER

TALCHER FERTILIZERS LIMITED

Signed and Delivered for and on behalf of the CONTRACTOR.

NAME OF CONTRACTOR

\_\_\_\_\_

Date : \_\_\_\_\_

Place: \_\_\_\_\_

**IN PRESENCE OF TWO WITNESSES**

1. \_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date : \_\_\_\_\_

Place: \_\_\_\_\_

1. \_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**NO CLAIM CERTIFICATE  
(TO BE SUBMITTED BEFORE RELEASE OF CPS/SECURITY DEPOSIT)**

*[On the Letter-head of Supplier/Vendor]*

We, \_\_\_\_\_, a company incorporated under the laws of India/ a Consortium between \*\_\_\_ and \*\_\_\_ (*name of Consortium partners to be inserted*)/ a Partnership Firm consisting of \*\_\_\_ and \*\_\_\_ (*name of Partners to be inserted*)/ a Sole Proprietorship (as the case may be), having its registered office at \_\_\_\_\_ and carrying on business under the name and style M/s. \_\_\_\_\_ were awarded the contract by TFL. in reference to Tender No. \_\_\_\_\_ dated \_\_\_\_\_ (“Order/Contract”).

After completion of the above-said items/job under the Order/Contract, we have scrutinized all our claims, contentions, disputes, issues and we hereby confirm that after adjusting all payments received by us against our R.A. Bills and final bill, we have no claims, dues, issues and contentions from TFL.

We further absolve TFL. from all liabilities present or future arising directly or indirectly out of the Contract.

There is no economic duress or any other compulsion on us for submission of this no claim certificate.

Signature with Seal of Supplier/Vendor

Dated:



PROJECTS & DEVELOPMENT INDIA LIMITED

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.

Page 1 of 65



## GENERAL CONDITIONS OF CONTRACT





## TABLE OF CONTENTS

<b>Sl.No.</b>	<b>Description</b>
(i)	<b>TABLE OF CONTENTS</b>
(II)	<b>SUBMISSION OF TENDER</b>
<b>SECTION-I (DEFINITIONS)</b>	
1.0	Definition of Terms
<b>SECTION-II (GENERAL INFORMATIONS)</b>	
2.0	General Information
2.1	(a) Location of Site
	(b) Access by Road
2.2	Scope of Work
2.3	Water Supply
2.4	Power Supply
2.5	Land for Contractor's field office, Godown and Workshop
2.6	Land for Residential Accommodation
<b>SECTION-III (GENERAL INSTRUCTIONS TO TENDERERS)</b>	
3.0	Submission of Tender
4.0	Documents
4.1	General
4.2	All pages to be initialed
4.3	Rates to be in figures and words
4.4	Corrections and Erasures
4.5	Signature of Tenderer
4.6	Witness
4.7	Details of Experience
4.8	Liability of Government of India
5.0	Transfer of Tender Documents
6.0	Earnest Money
7.0	Validity
8.0	Addenda/Corrigenda
9.0	Right of Employer to Accept or Reject Tender
10.0	Time Schedule
11.0	Tenderer's Responsibility
12.0	Retired Government or Company Officers
13.0	Signing of the Contract
14.0	Field Management & Controlling/Coordinating Authority
15.0	Note to Schedule of Rates
16.0	16.1 Policy for Tenders under consideration
	16.2 Zero Deviation
17.0	Award of Contract
18.0	Clarification of Tender Document
19.0	Local Conditions



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 3 of 65

20.0 Abnormal Rates

**SECTION-IV (GENERAL OBLIGATIONS)**

- 21.1 Priority of Contract Documents
- 21.2 Headings & Marginal Notes
- 21.3 Singular and Plural
- 21.4 Interpretation
- 22.0 Special Conditions of Contract
- 23.0 Contractor to obtain his own information
- 24.0 Contract Performance Security
- 25.0 Time of Performance
- 25.1 Time for Mobilization
- 25.2 Time Schedule of Construction
- 26.0 Force Majeure
- 26.1 Conditions for Force Majeure
- 26.2 Outbreak of War
- 27.0 Price Reduction Schedule
- 27.3 Bonus for Early Completion
- 28.0 Rights of Employer to forfeit Contract Performance Security
- 29.0 Failure by the Contractor to comply with the provisions of the contract
- 30.0 Contractor remains liable to pay compensation if action not taken under Clause 29.0
- 31.0 Change in Constitution
- 32.0 -A Termination of Contract for Death
- 32.0-B Termination of Contract for Liquidation, Bankruptcy etc.
- 32.0-C Termination of Contract for Non-Performance and subsequently putting the Contractor on Holiday
- 33.0 Members of the Employer not individually liable
- 34.0 Employer not bound by personal representations
- 35.0 Contractor's office at site
- 36.0 Contractor's subordinate staff and their conduct
- 37.0 Sub letting of Works
- i) Sub contracts for Temporary works etc.
- ii) List of sub-contractors to be supplied
- iii) Contractor's liability not limited by Sub-Contractors
- iv) Employer may terminate sub contracts
- v) No remedy for action taken under this clause
- 38.0 Power of Entry
- 39.0 Contractor's responsibility with Mechanical, Electrical, Intercommunication System, Air Conditioning Contractors and other agencies
- 40.0 Other Agencies at site
- 41.0 Notices
- 41.1 To the Contractor
- 41.2 To the Employer
- 42.0 Rights of various Interests
- 43.0 Patents and Royalties
- 44.0 Liens



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 4 of 65

45.0	Delays by Employer or his authorized agents
46.0	Payments if Contract is terminated
47.0	No waiver of Rights
48.0	Certificate not to affect Right of Employer and Liability of Contractor
49.0	Languages & Measures
50.0	Transfer of Title
51.0	Release of Information
52.0	Brand Names
53.0	Completion of Contract
54.0	Spares

**SECTION-V (PERFORMANCE OF WORK)**

55.0	Execution of Work
56.0	Co-ordination and Inspection of work
57.0	Work in Monsoon & Dewatering
58.0	Work on Sundays & Holidays
59.0	General Conditions for construction & Erection Work
60.0	Alterations in specification, Design & Extra Work
61.0	Drawings to be supplied by the Employer
62.0	Drawings to be supplied by the Contractor
63.0	Setting out works
64.0	Responsibility for Levels and Alignment
65.0	Materials to be supplied by contractor
66.0	Stores supplied by Employer
67.0	Conditions for issue of material
68.0	Materials Procured with assistance of Employer/Return of surplus
69.0	Materials obtained from dismantling
70.0	Articles of Value found
71.0	Discrepancies between instructions
72.0	Action where no specification is issued
73.0	Inspection of Works
74.0	Tests for Quality of Works
75.0	Samples for approval
76.0	Action and Compensation in case of bad work
77.0	Suspension of Work
78.0	Employer may do part of work
79.0	Possession prior to completion
80.0	Twelve months period of liability from the date of issue of completion certificate
80.3	Limitation of Liability
81.0	Care of Works
81.1	Defects prior to taking over
81.2	Defects after taking over
82.0	Guarantee/Transfer of Guarantee
83.0	Training of Employer's personnel
84.0	Replacement of Defective parts & materials
85.0	Indemnity
86.0	Construction Aids, Equipments, Tools & Tackles

**SECTION-VI (CERTIFICATES AND PAYMENTS)**



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 5 of 65

87.0	Schedule of Rates and Payments
	i) Contractor's Remuneration
	ii) Schedule of Rates to be inclusive
	iii) Schedule of Rates to cover construction equipment, materials, labour etc.
	iv) Schedule of Rates to cover Royalties, Rents and claims.
	v) Schedule of Rates to cover taxes & duties
	vi) Schedule of Rates to cover risks of delay
	vii) Schedule of Rates cannot be altered
88.0	Procedure for Measurement and billing of works in progress
88.1	Billing Procedure
88.2	Secured Advance on materials
88.3	Dispute in mode of measurement
88.4	Rounding of Amounts
89.0	Lumpsum in Tender
90.0	Running Account Payments to be regarded as advances
91.0	Notices of Claims for Additional Payments
92.0	Payment of Contractor's bills
93.0	Receipt for Payment
94.0	Completion Certificate
94.1	Application for Completion Certificate
94.2	Completion Certificate
94.3	Completion Certificate Documents
95.0	Final Decision & Final Certificate
96.0	Certificate and Payments No evidence of completion
97.0	Deduction from Contract Price

**SECTION-VII (TAXES AND INSURANCE)**

98.0	Taxes, Duties, Octroi etc.
99.0	Sales Tax/Turnover Tax
100.0	Statutory Variations
101.0	Insurance
101.1	General
	i) Employees State Insurance Act
	ii) Workmen Compensation and Employee's Liability Insurance
	iii) Accident or injury to workmen
	iv) Transit Insurance
	v) Automobile
	vi) General Liability
	vii) Any other Insurance required under law or regulations by Employer
102.0	Damage to Property or to any Person or any Third Party

**SECTION-VIII (LABOUR LAWS)**

103.0	Labour laws
104.0	Implementation of Apprentices Act 1961
105.0	Contractor to indemnify the Employer
106.0	Health and Sanitary Arrangement for worker



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**



Page 6 of 65

**SECTION-IX (APPLICABLE LAWS AND SETTLEMENT OF DISPUTES)**

107.0	Arbitration
108.0	Jurisdiction

**SECTION-X (SAFETY CODES)**

109.0	General
110.0	Safety Regulations
111.0	First Aid and Industrial Injuries
112.0	General Rules
113.0	Contractor's barricades
114.0	Scaffolding
115.0	Excavation and Trenching
116.0	Demolition/General Safety
117.0	Care in Handling Inflammable Gas
118.0	Temporary Combustible Structures
119.0	Precautions Against Fire
120.0	Explosives
121.0	Mines Act
122.0	Preservation of Places
123.0	Outbreak of Infectious diseases
124.0	Use of intoxicants

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>	PC-183/ E/ 4023/ S-IV	0	
		DOC. NO.	REV.	
		Page 7 of 65		

**GENERAL CONDITIONS OF CONTRACT**

## General Conditions of Contract

### Section- I. Definitions

**1. Definition of Terms:**

- 1.1 In this CONTRACT (as here-in-after defined) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise required.
- 1.1.1 The OWNER/EMPLOYER/COMPANY/TFL means Talcher Fertilizers Ltd. (a joint venture of four major Public Sector Units – M/s GAIL (India) Limited, M/s Rastriya Chemicals & Fertilizers Ltd., M/s Coal India Ltd. and M/s Fertilizers Corporation of India Ltd.) and having its Registered office at Plot 2/H, Kalpana Area, BJB Nagar, Khurda, Bhubaneswar-751 014 and includes its successors and assigns.
- 1.1.2 The "CONTRACTOR" means the person or the persons, firm or Company or corporation whose tender has been accepted by the EMPLOYER and includes the CONTRACTOR's legal Representatives his successors and permitted assigns.
- 1.1.3 The ENGINEER/ENGINEER-IN-CHARGE" shall mean the person designated from time to time by the TFL and shall include those who are expressly authorized by him to act for and on his behalf for operation of this CONTRACT.
- 1.1.4 The "WORK" shall mean and include all items and things to be supplied/ done and services and activities to be performed by the CONTRACTOR in pursuant to and in accordance with CONTRACT or part thereof as the case may be and shall include all extra, additional, altered or substituted works as required for purpose of the CONTRACT.
- 1.1.5 The "PERMANENT WORK" means and includes works which will be incorporated in and form a part of the work to be handed over to the EMPLOYER by the CONTRACTOR on completion of the CONTRACT.
- 1.1.6 "CONSTRUCTION EQUIPMENT" means all appliances/equipment and things whatsoever nature for the use in or for the execution, completion, operation, or maintenance of the work or temporary works (as hereinafter defined) but does not include materials or other things intended to form or to be incorporated into the WORK, or camping facilities.
- 1.1.7 "CONTRACT DOCUMENTS" means collectively the Tender Documents, Designs, Drawings, Specification, Schedule of Quantities and Rates, Letter of Acceptance and agreed variations if any, and such other documents constituting the tender and acceptance thereof.
- 1.1.8 CONSULTANT: means Projects & Development India Ltd. (PDIL) who are the consulting engineer to the Employer for this project and having registered office at PDIL Bhawan, A-14, Sector 1, Noida - 201301 (U.P.)
- 1.1.9 The "SUB-CONTRACTOR" means any person or firm or Company (other than the CONTRACTOR) to whom any part of the work has been entrusted by the CONTRACTOR, with the written consent of the ENGINEER-IN-CHARGE, and the legal representatives, successors and permitted assigns of such person, firm or company.
- 1.1.10 The "CONTRACT" shall mean the Agreement between the EMPLOYER



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 8 of 65

and the CONTRACTOR for the execution of the works including therein all contract documents.

- 1.1.11 The "SPECIFICATION" shall mean all directions the various technical specifications, provisions attached and referred to the Tender Documents which pertain to the method and manner of performing the work or works to the quantities and qualities of the work or works and the materials to be furnished under the CONTRACT for the work or works, as may be amplified or modified by the TFL or ENGINEER-IN-CHARGE during the performance of CONTRACT in order to provide the unforeseen conditions or in the best interests of the work or works. It shall also include the latest edition of relevant Standard Specifications including all addenda/corrigenda published before entering into CONTRACT.
- 1.1.12 The "DRAWINGS" shall include maps, plans and tracings or prints or sketches thereof with any modifications approved in writing by the ENGINEER-IN-CHARGE and such other drawing as may, from time to time, be furnished or approved in writing by the ENGINEER-IN-CHARGE.
- 1.1.13 The "TENDER" means the proposal along with supporting documents submitted by the CONTRACTOR for consideration by the EMPLOYER.
- 1.1.14 The "CHANGE ORDER" means an order given in writing by the ENGINEER-IN-CHARGE to effect additions to or deletion from and alteration in the works.
- 1.1.15 The "COMPLETION CERTIFICATE" shall mean the certificate to be issued by the ENGINEER-IN-CHARGE when the works have been completed entirely in accordance with CONTRACT DOCUMENT to his satisfaction.
- 1.1.16 The "FINAL CERTIFICATE" in relation to a work means the certificate regarding the satisfactory compliance of various provision of the CONTRACT by the CONTRACTOR issued by the ENGINEER-IN-CHARGE/EMPLOYER after the period of liability is over.
- 1.1.17 "DEFECT LIABILITY PERIOD" in relation to a work means the specified period from the date of COMPLETION CERTIFICATE upto the date of issue of FINAL CERTIFICATE during which the CONTRACTOR stands responsible for rectifying all defects that may appear in the works executed by the CONTRACTOR in pursuance of the CONTRACT and includes warranties against Manufacturing/Fabrication/ Erection/Construction defects covering all materials plants, equipment, components, and the like supplied by the CONTRACTOR, works executed against workmanship defects.
- 1.1.18 The "APPOINTING AUTHORITY" for the purpose of arbitration shall be the CHAIRMAN and MANAGING DIRECTOR or any other person so designated by the EMPLOYER.
- 1.1.19 "TEMPORARY WORKS" shall mean all temporary works of every kind required in or about the execution, completion or maintenance of works.
- 1.1.20 "PLANS" shall mean all maps, sketches and layouts as are incorporated in the CONTRACT in order to define broadly the scope and specifications of the work or works, and all reproductions thereof.
- 1.1.21 "SITE" shall mean the lands and other places on, under, in or through which the permanent works are to be carried out and any other lands or places provided by the EMPLOYER for the purpose of the CONTRACT.
- 1.1.22 "NOTICE IN WRITING OR WRITTEN NOTICE" shall mean a notice in written, typed or printed characters sent (unless delivered personally or otherwise proved to



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

**GENERAL CONDITIONS OF CONTRACT**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



Page 9 of 65

have been received by the addressee) by registered post to the latest known private or business address or registered office of the addressee and shall be deemed to have been received in the ordinary course of post it would have been delivered.

- 1.1.23 "APPROVED" shall mean approved in writing including subsequent written confirmation of previous verbal approval and "APPROVAL" means approval in writing including as aforesaid.
- 1.1.24 "LETTER OF INTENT/FAX OF INTENT" shall mean intimation by a Fax/Letter to Tenderer(s) that the tender has been accepted in accordance with the provisions contained in the letter.
- 1.1.25 "DAY" means a day of 24 hours from midnight to midnight irrespective of the number of hours worked in that day.
- 1.1.26 "WORKING DAY" means any day which is not declared to be holiday or rest day by the EMPLOYER.
- 1.1.27 "WEEK" means a period of any consecutive seven days.
- 1.1.28 "METRIC SYSTEM" - All technical documents regarding the construction of works are given in the metric system and all work in the project should be carried out according to the metric system. All documents concerning the work shall also be maintained in the metric system.
- 1.1.29 "VALUE OF CONTRACT" or "TOTAL CONTRACT PRICE" shall mean the sum accepted or the sum calculated in accordance with the prices accepted in tender and/or the CONTRACT rates as payable to the CONTRACTOR for the entire execution and full completion of the work, including change order.
- 1.1.30 "LANGUAGE FOR DRAWINGS AND INSTRUCTION" All the drawings, titles, notes, instruction, dimensions, etc. shall be in English Language.
- 1.1.31 "MOBILIZATION" shall mean establishment of sufficiently adequate infrastructure by the CONTRACTOR at "SITE" comprising of construction equipments, aids, tools tackles including setting of site offices with facilities such as power, water, communication etc. establishing manpower organization comprising of Resident Engineers, Supervising personnel and an adequate strength of skilled, semi-skilled and un-skilled workers, who with the so established infrastructure shall be in a position to commence execution of work at site(s), in accordance with the agreed Time Schedule of Completion of Work. "MOBILISATION" shall be considered to have been achieved, if the CONTRACTOR is able to establish infrastructure as per Time Schedule, where so warranted in accordance with agreed schedule of work implementation to the satisfaction of ENGINEER-IN-CHARGE/ EMPLOYER.
- 1.1.32 "COMMISSIONING" shall mean pressing into service of the system including the plant(s), equipment(s), vessel(s), pipeline, machinery(ies), or any other section or sub-section of installation(s) pertaining to the work of the CONTRACTOR after successful testing and trial runs of the same.
- "COMMISSIONING" can be either for a completed system or a part of system of a combination of systems or sub-systems and can be performed in any sequence as desired by EMPLOYER and in a manner established to be made suited according to availability of pre-requisites. Any such readjustments made by EMPLOYER in performance of "COMMISSIONING" activity will not be construed to be violating CONTRACT provisions and CONTRACTOR shall be deemed to have provided for the same.





**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 10 of 65

**Section-II General Information**

**2. General Information**

2.1 a) Location of Site: The proposed location of Project site is defined in the Special Conditions of Contract.

b) Access by Road: CONTRACTOR, if necessary, shall build other temporary access roads to the actual site of construction for his own work at his own cost. The CONTRACTOR shall be required to permit the use of the roads so constructed by him for vehicles of any other parties who may be engaged on the project site. The CONTRACTOR shall also facilitate the construction of the permanent roads should the construction there of start while he is engaged on this work. He shall make allowance in his tender for any inconvenience he anticipates on such account.

Non-availability of access roads, railway siding and railway wagons for the use of the CONTRACTOR shall in no case condone any delay in the execution of WORK nor be the cause for any claim for compensation against the EMPLOYER.

2.2 Scope of Work: The scope of WORK is defined in the Technical Part of the tender document. The CONTRACTOR shall provide all necessary materials, equipment, labour etc. for the execution and maintenance of the WORK till completion unless otherwise mentioned in the Tender Document.

2.3 Water Supply: Contractor will have to make his own arrangements for supply of water to his labour camps and for works. All pumping installations, pipe net work and distribution system will have to be carried out by the Contractor at his own risk and cost.

Alternatively the Employer at his discretion may endeavour to provide water to the Contractor at the Employer's source of supply provided the Contractor makes his own arrangement for the water meter which shall be in custody of the Employer and other pipe net works from source of supply and such distribution pipe network shall have prior approval of the Engineer-in-Charge so as not to interfere with the layout and progress of the other construction works. In such case, the rate for water shall be deducted from the running account bills.

However, the Employer does not guarantee the supply of water and this does not relieve the Contractor of his responsibility in making his own arrangement and for the timely completion of the various works as stipulated.

2.4 Power Supply:

2.4.1 Subject to availability, EMPLOYER will supply power at 400/440 V at only one point at the nearest sub-station, from where the CONTRACTOR will make his own arrangement for temporary distribution. The point of supply will not be more than 500 m away from the CONTRACTOR'S premises. All the works will be done as per the applicable regulations and passed by the ENGINEER-IN-CHARGE. The temporary line will be removed forthwith after the completion of work or if there is any hindrance caused to the other works due to the alignment of these lines, the CONTRACTOR will re-route or remove the temporary lines at his own cost. The CONTRACTOR at his cost will also provide suitable electric meters, fuses, switches, etc. for purposes of payment to the EMPLOYER which should be in the custody and control of the EMPLOYER. The cost of power supply shall be payable to the EMPLOYER every month for Construction Works power which would be deducted from the running account bills. The EMPLOYER shall not, however, guarantee the supply of electricity nor have any liability in respect thereof. No claim for compensation for any failure or



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 11 of 65

short supply of electricity will be admissible.

- 2.4.2 It shall be the responsibility of the CONTRACTOR to provide and maintain the complete installation on the load side of the supply with due regard to safety requirement at site. All cabling, equipment, installations etc. shall comply in all respects with the latest statutory requirements and safety provisions i.e., as per the Central/State Electricity Acts and Rules etc. The CONTRACTOR will ensure that his equipment and Electrical Wiring etc., are installed, modified, maintained by a licensed Electrician/Supervisor. A test certificate is to be produced to the ENGINEER-IN-CHARGE for his approval, before power is made available.
- 2.4.3 At all times, IEA regulations shall be followed failing which the EMPLOYER has a right to disconnect the power supply without any reference to the CONTRACTOR. No claim shall be entertained for such disconnection by the ENGINEER-IN-CHARGE. Power supply will be reconnected only after production of fresh certificate from authorized electrical supervisors.
- 2.4.4 The EMPLOYER is not liable for any loss or damage to the CONTRACTOR's equipment as a result of variation in voltage or frequency or interruption in power supply or other loss to the CONTRACTOR arising therefrom.
- 2.4.5 The CONTRACTOR shall ensure that the Electrical equipment installed by him are such that average power factors does not fall below 0.90 at his premises. In case power factor falls below 0.90 in any month, he will reimburse to the EMPLOYER at the penal rate determined by the EMPLOYER for all units consumed during the month.
- 2.4.6 The power supply required for CONTRACTOR's colony near the plant site will be determined by the EMPLOYER and shall be as per State Electricity Board's Rules and other statutory provisions applicable for such installations from time to time. In case of power supply to CONTRACTOR's colony, the power will be made available at a single point and the CONTRACTOR shall make his own arrangement at his own cost for distribution to the occupants of the colony as per Electricity Rules and Acts. The site and colony shall be sufficiently illuminated to avoid accidents.
- 2.4.7 The CONTRACTOR will have to provide and install his own lights and power meters which will be governed as per Central/State Government Electricity Rules. The meters shall be sealed by the EMPLOYER.
- 2.4.8 In case of damage of any of the EMPLOYER's equipment on account of fault, intentional or unintentional on the part of the CONTRACTOR, the EMPLOYER reserves the right to recover the cost of such damage from the CONTRACTOR's bill. Cost of HRC Fuses replaced at the EMPLOYER's terminals due to any fault in the CONTRACTOR's installation shall be to CONTRACTOR's account at the rates decided by the ENGINEER-IN-CHARGE.
- 2.4.9 Only motors upto 3 HP will be allowed to be started direct on line. For motors above 3 HP and upto 100 HP a suitable Starting device approved by the ENGINEER- IN-CHARGE shall be provided by the CONTRACTOR. For motors above 100 HP slipring induction motors with suitable starting devices as approved by the ENGINEER- IN-CHARGE shall be provided by the CONTRACTOR.
- 2.4.10 The CONTRACTOR shall ensure at his cost that all electrical lines and equipment and all installations are approved by the State Electricity Inspector before power can be supplied to the EMPLOYER.
- 2.4.11 The total requirement of power shall be indicated by the tenderer alongwith his tender.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 12 of 65

- 2.5 Land for Contractor's Field Office, Godown and Workshop: The EMPLOYER will, at his own discretion and convenience and for the duration of the execution of the work make available near the site, land for construction of CONTRACTOR's Temporary Field Office, godowns workshops and assembly yard required for the execution of the CONTRACT. The CONTRACTOR shall at his own cost construct all these temporary buildings and provide suitable water supply and sanitary arrangement and get the same approved by the ENGINEER-IN-CHARGE.

On completion of the works undertaken by the CONTRACTOR, he shall remove all temporary works erected by him and have the SITE cleaned as directed by ENGINEER-IN-CHARGE. If the CONTRACTOR shall fail to comply with these requirements, the ENGINEER-IN-CHARGE may at he expenses of the CONTRACTOR remove such surplus, and rubbish materials and dispose off the same as he deems fit and get the site cleared as aforesaid; and CONTRACTOR shall forthwith pay the amount of all expenses so incurred and shall have no claim in respect of any such surplus materials disposed off as aforesaid. But the EMPLOYER reserves the right to ask the CONTRACTOR any time during the pendency of the CONTRACT to vacate the land by giving 7 days notice on security reasons or on national interest or otherwise. Rent may be charged for the land so occupied from contractor by the Employer.

The CONTRACTOR shall put up temporary structures as required by them for their office, fabrication shop and construction stores only in the area allocated to them on the project site by the EMPLOYER or his authorized representative. No tea stalls/canteens should be put up or allowed to be put up by any CONTRACTOR in the allotted land or complex area without written permission of the EMPLOYER.

No unauthorized buildings, constructions or structures should be put up by the CONTRACTOR anywhere on the project site.

For uninterrupted fabrication work, the CONTRACTOR shall put up temporary covered structures at his cost within Area in the location allocated to them in the project site by the EMPLOYER or his authorized representative.

No person except for authorized watchman shall be allowed to stay in the plant area/CONTRACTOR's area after completion of the day's job without prior written permission from ENGINEER-IN-CHARGE.

- 2.6 Land for Residential Accommodation:-:No Land shall be made available for residential accommodation for staff and labour of CONTRACTOR.

**Section-III. General Instructions to Tenderers**

**3. Submission of Tender:**

- 3.1 TENDER must be submitted without making any additions, alterations, and as per details given in other clauses hereunder. The requisite details shall be filled in by the TENDERER at space provided under "Submission of Tender" at the beginning of GCC of Tender Document. The rate shall be filled only in the schedule given in this Tender Document.
- 3.2 Addenda/ Corrigenda to this Tender Document, if issued, must be signed, submitted along with the Tender Document. the tenderer should write clearly the revised quantities in Schedule of Rates of Tender Document and should price the WORK based on revised quantities when amendments of quantities are issued in addenda.
- 3.3 Covering letter along with its enclosures accompanying the Tender Document and all further correspondence shall be submitted in duplicate.
- 3.4 Tenderers are advised to submit quotations based strictly on the terms and conditions and specifications contained in the Tender Documents and not to stipulate any deviations.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 13 of 65

3.5 ~~Tenders should always be placed in double sealed covers, super scribing ["QUOTATION DO NOT OPEN" Tender for \_\_\_\_\_ Project of Talcher Fertilizers Ltd. due for opening on \_\_\_\_\_]. The Full Name, Address and Telegraphic Address, Fax No. of the Tenderers shall be written on the bottom left hand corner of the sealed cover.~~

**4. Documents:**

**4.1 General:**

The tenders as submitted, will consist of the following:

- i) Complete set of Tender Documents (Original) as sold duly filled in and signed by the tenderer as prescribed in different clauses of the Tender Documents.
  - ii) Earnest money in the manner specified in Clause 6 hereof.
  - iii) Power of Attorney or a true copy thereof duly attested by a Gazetted Officer in case an authorized representative has signed the tender, as required by Clause 14 hereof.
  - iv) Information regarding tenderers in the proforma enclosed.
  - v) Details of work of similar type and magnitude carried out by the Tenderer in the proforma provided in the tender document.
  - vi) Organization chart giving details of field management at site, the tenderer proposes to have for this job.
  - vii) Details of construction plant and equipments available with the tenderer for using in this work.
  - viii) Solvency Certificate from Scheduled Bank to prove the financial ability to carry out the work tendered for.
  - ix) Latest Balance Sheet and Profit & Loss Account duly audited.
  - x) Details of present commitment as per proforma enclosed to tender.
  - xi) Data required regarding SUB-CONTRACTOR(s)/ Supplier/ Manufacturers and other technical information the tenderer wish to furnish.
  - xii) Provident fund registration certificate
  - xiii) List showing all enclosures to tender.
- 4.2 All pages are to be Initiated: All signatures in Tender Documents shall be dated, as well as, all the pages of all sections of Tender Documents shall be initialed at the lower right hand corner and signed wherever required in the tender papers by the TENDERER or by a person holding power of attorney authorizing him to sign on behalf of the tenderer before submission of tender.
- 4.3 Rates to be in Figures and Words: The tender should quote in English both in figures as well as in words the rates and amounts tendered by him in the Schedule of Rates of Tender submitted by the CONTRACTOR for each item and in such a way that interpolation is not possible. The amount for each item should be worked out and entered and requisite total given of all items, both in figures and in words. The tendered amount for the work shall be entered in the tender and duly signed by the Tenderer.

If some discrepancies are found between the RATES in FIGURES and WORDS or the AMOUNT shown in the tender, the following procedure shall be followed:



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 14 of 65

- a) When there is difference between the rates in figures and words, the rate which corresponds to the amount worked out by the tenderer shall be taken as correct.
- b) When the rate quoted by the tenderer in figures and words tally but the amount is incorrect the rate quoted by the tenderer shall be taken as correct.
- c) When it is not possible to ascertain the correct rate by either of above methods, the rate quoted in words shall be taken as correct.

4.4 Corrections and Erasures: All correction(s) and alteration(s) in the entries of tender paper shall be signed in full by the TENDERER with date. No erasure or over writing is permissible.

4.5 Signature of Tenderer:

4.5.1 The TENDERER shall contain the name, residence and place of business of person or persons making the tender and shall be signed by the TENDERER with his usual signature. Partnership firms shall furnish the full names of all partners in the tender. It should be signed in the partnership's name by all the partners or by duly authorized representatives followed by the name and designation of the person signing. Tender by a corporation shall be signed by an authorized representative, and a Power of Attorney in that behalf shall accompany the tender. A copy of the constitution of the firm with names of all partners shall be furnished.

4.5.2 When a tenderer signs a tender in a language other than English, the total amount tendered should, in addition, be written in the same language. The signature should be attested by at least one witness.

4.6 Witness: Witness and sureties shall be persons of status and property and their names, occupation and address shall be stated below their signature.

4.7 Details of Experience: The tenderer should furnish, along with his tender, details of previous experience in having successfully completed in the recent past works of this nature, together with the names of Employers, location of sites and value of contract, date of commencement and completion of work, delays if any, reasons of delay and other details along with documentary evidence(s).

4.8 Liability of Government of India: It is expressly understood and agreed by and between Bidder or/Contractor and M/s Talcher Fertilizers Ltd., and that M/s Talcher Fertilizers Ltd., is entering into this agreement solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed that the Government of India is not a party to this agreement and has no liabilities, obligations or rights hereunder. It is expressly understood and agreed that M/s Talcher Fertilizers Ltd. is an independent legal entity with power and authority to enter into contracts solely on its own behalf under the applicable Laws of India and general principles of Contract Law. The Bidder/Contractor expressly agrees, acknowledges and understands that M/s Talcher Fertilizers Ltd. is not an agent, representative or delegate of the Government of India. It is further understood and agreed that the Government of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the contract. Accordingly, Bidder/Contractor hereby expressly waives, releases and foregoes any and all actions or claims, including cross claims, impleader claims or counter claims against the Government of India arising out of this contract and covenants not to sue to Government of India as to any manner, claim, cause of action or thing whatsoever arising of or under this agreement.

**5. Transfer of Tender Documents:**

5.1 Transfer of Tender Documents purchased by one intending tenderer to another is not permissible.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.



REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 15 of 65

- 6. Earnest Money:**  
(Clause not applicable for this Tender)
- 6.1 The bidder must pay Earnest Money as given in the letter /notice inviting tenders and attach the official receipt with the tender failing which the tender is liable to be rejected and representatives of such tenderers will not be allowed to attend the tender opening. Earnest Money can be paid in Demand Drafts or Bank Guarantee or Banker's Cheque or Letter of Credit from any Indian scheduled bank or a branch of an International bank situated in India and registered with Reserve Bank of India as scheduled foreign bank. However, other than the Nationalized Indian Banks, the banks whose BGs are furnished, must be commercial banks having net worth in excess of Rs. 100 crores and a declaration to this effect should be made by such commercial bank either in the bank guarantee itself or separately on a letter head.
- The bid guarantee shall be submitted in the prescribed format.
- Note: The Bank Guarantee so furnished by the tenderer shall be in the proforma prescribed by the EMPLOYER. No interest shall be paid by the EMPLOYER on the Earnest Money deposited by the tenderer. The Bank Guarantee furnished in lieu of Earnest Money shall be kept valid for a period of "SIX MONTHS" from the date of opening of tender.(TWO MONTHS beyond the bid due date).
- The Earnest Money deposited by successful tenderer shall be forfeited if the Contractor fails to furnish the requisite Contract Performance Security as per clause 24 hereof and /or fails to start work within a period of 15 days or fails to execute the AGREEMENT within 15 days of the receipt by him of the Notification of Acceptance of Tender.
- Note: The Earnest Money of the unsuccessful bidder will be returned by EMPLOYER/CONSULTANT, directly to the tenderer(s), within a reasonable period of time but not later than 30 days after the expiration of the period of bid validity prescribed by EMPLOYER.
- 7 Validity:**
- 7.1 Tender submitted by tenderers shall remain valid for acceptance for a period of "4 MONTHS" from the date of opening of the tender. The tenderers shall not be entitled during the said period of 4 months, without the consent in writing of the EMPLOYER, to revoke or cancel his tender or to vary the tender given or any term thereof. In case of tender revoking or canceling his tender or varying any term in regard thereof without the consent of EMPLOYER in writing, the EMPLOYER shall forfeit Earnest Money paid by him alongwith tender.
- 8 Addenda/Corrigenda**
- 8.1 Addenda/ Corrigenda to the Tender Documents will be issued in duplicate prior to the date of opening of the tenders to clarify documents or to reflect modification in design or CONTRACT terms.
- 8.2 Each addenda/ corrigendum issued will be issued in duplicate to each person or organization to whom set of Tender Documents has been issued. Recipient will retain tenderer's copy of each Addendum/ Corrigendum and attach original copy duly signed along with his offer. All Addenda/ Corrigenda issued shall become part of Tender Documents.
- 9 Right of Employer to Accept or Reject Tender:**
- 9.1 The right to accept the tender will rest with the EMPLOYER. The EMPLOYER, however, does not bind himself to accept the lowest tender, and reserves to itself the authority to reject any or all the tenders received without assigning any reason whatsoever. At the option of the Employer, the work for which the tender had been invited, may be awarded to one Contractor or split between more than one bidders, in which case the award will be made for only that part of the work, in respect of which the bid has been accepted. The quoted rates should hold good for such eventualities.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>	PC-183/ E/ 4023/ S-IV	0	
		DOC. NO.	REV.	
		Page 16 of 65		
<b>GENERAL CONDITIONS OF CONTRACT</b>				

Tenders in which any of the particulars and prescribed information are missing or are incomplete in any respect and/or the prescribed conditions are not fulfilled are liable to be rejected. The Tender containing uncalled for remarks or any additional conditions are liable to be rejected.

Canvassing in connection with tenders is strictly prohibited and tenders submitted by the Tenderers who resort to canvassing will be liable to rejection.

**10 Time Schedule**

- 10.1 The WORK shall be executed strictly as per the TIME SCHEDULE specified in TENDER/ CONTRACT Document. The period of construction given in Time Schedule includes the time required for mobilization as well as testing, rectifications if any, retesting and completion in all respects to the entire satisfaction of the ENGINEER-IN- CHARGE.
- 10.2 A joint program of execution of the WORK will be prepared by the ENGINEER-IN-CHARGE and CONTRACTOR based on priority requirement of this project. This program will take into account the time of completion mentioned in 10.1 above and the time allowed for the priority works by the ENGINEER-IN-CHARGE.
- 10.3 Monthly/ Weekly construction program will; be drawn up by the ENGINEER-IN-CHARGE jointly with the CONTRACTOR, based on availability of work fronts and the joint construction program as per 10.2 above. The CONTRACTOR shall scrupulously adhere to these targets/ programs by deploying adequate personnel, construction tools and tackles and he shall also supply himself all materials of his scope of supply in good time to achieve the targets/program. In all matters concerning the extent of targets set out in the weekly and monthly programs and the degree of achievements the decision of the ENGINEER-IN-CHARGE will be final and binding on the CONTRACTOR.

**11 Tenderer's Responsibility**

- 11.1 The intending tenderers shall be deemed to have visited the SITE and familiarized submitting the tender. Non-familiarity with the site conditions will not be considered a reason either for extra claims or for not carrying out the works in strict conformity with the DRAWINGS and SPECIFICATIONS or for any delay in performance.

**12 Retired Government or Company Officers**



- 12.1 No Engineer of Gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the States/ Central Government or of the EMPLOYER is allowed to work as a CONTRACTOR for a period of two years after his retirement from Government Service, or from the employment of the EMPLOYER without the previous permission of the EMPLOYER. The CONTRACT, if awarded, is liable to be cancelled if either the CONTRACTOR or any of his employees is found at any time to be such a person, who has not obtained the permission of the State/ Central Government or of the EMPLOYER as aforesaid before submission of tender, or engagement in the CONTRACTOR'S service as the case may be.

**13 Signing of the Contract:**

- 13.1 The successful tenderer shall be required to execute an AGREEMENT in the proforma attached with TENDER DOCUMENT within 15 days of the receipt by him of the Notification of Acceptance of Tender. In the event of failure on the part of the successful tenderer to sign the AGREEMENT within the above stipulated period, the Earnest Money or his initial deposit will be forfeited and the acceptance of the tender shall be considered as cancelled.

**14 Field Management & Controlling/Coordinating Authority:**

- 14.1 The field management will be the responsibility of the ENGINEER-IN-CHARGE, who will be nominated by the EMPLOYER. The ENGINEER-IN-CHARGE may also authorize his representatives to assist in performing his duties and functions.
- 14.2 The ENGINEER-IN-CHARGE shall coordinate the works of various agencies engaged at site to ensure minimum disruption of work carried out by different

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>		PC-183/ E/ 4023/ S-IV	0	
	<b>GENERAL CONDITIONS OF CONTRACT</b>		DOC. NO.	REV.	
			Page 17 of 65		

agencies. It shall be the responsibility of the CONTRACTOR to plan and execute the work strictly in accordance with site instructions to avoid hindrance to the work being executed by other agencies.

- 15 Note to Schedule of Rates:**
- 15.1 The Schedule of Rates should be read in conjunction with all the other sections of the tender.
- 15.2 The tenderer shall be deemed to have studied the DRAWINGS, SPECIFICATIONS and details of work to be done within TIME SCHEDULE and to have acquainted himself of the condition prevailing at site.
- 15.3 Rates must be filled in the Schedule of Rates of original Tender Documents. If quoted in separate typed sheets no variation in item description or specification shall be accepted. Any exceptions taken by the tenderer to the Schedule of Rates shall be brought out in the terms and conditions of the offer.
- 15.4 The quantities shown against the various items are only approximate. Any increase or decrease in the quantities shall not form the basis of alteration of the rates quoted and accepted.
- 15.5 The EMPLOYER reserves the right to interpolate the rates for such items of work falling between similar items of lower and higher magnitude.
- 16 Policy for Tenders Under Consideration:**
- 16.1 Only Those Tenders which are complete in all respects and are strictly in accordance with the Terms and Conditions and Technical Specifications of Tender Document, shall be considered for evaluation. Such Tenders shall be deemed to be under consideration immediately after opening of Tender and until such time an official intimation of acceptance/ rejection of Tender is made by TFL to the Bidder.
- 16.2 Zero Deviation: Bidders to note that this is a ZERO DEVIATION TENDER. TFL will appreciate submission of offer based on the terms and conditions in the enclosed General Conditions of Contract (GCC), Special Conditions of Contract (SCC), Instructions to Bidders (ITB), Scope of Work, technical specifications etc. to avoid wastage of time and money in seeking clarifications on technical/commercial aspects of the offer. Bidder may note that no technical and commercial clarifications will be sought for after the receipt of the bids. In case of any deviation/ nonconformity observed in the bid, it will be liable for rejection.
- 17 Award of Contract:**
- 17.1 The Acceptance of Tender will be intimated to the successful Tenderer by TFL either by Telex/ Telegram/ Fax or by Letter or like means-defined as LETTER OF ACCEPTANCE OF TENDER.
- 17.2 TFL will be the sole judge in the matter of award of CONTRACT and the decision of TFL shall be final and binding.
- 18 Clarification of Tender Document:**
- 18.1 The Tender is required to carefully examine the Technical Specifications, Conditions of Contract, Drawings and other details relating to WORK and given in Tender Document and fully inform himself as to all conditions and matters which may in any way affect the WORK or the cost thereof. In case the Tenderer is in doubt about the completeness or correctness of any of the contents of the Tender Documents he should request in writing for an interpretation/ clarification to TFL in triplicate. TFL will then issue interpretation/ clarification to Tenderer in writing. Such clarifications and or interpretations shall form part of the Specifications and Documents and shall accompany the tender which shall be submitted by tenderer within time and date as specified in invitations to tender.
- 18.2 Verbal clarification and information given by TFL or its employee(s) or its representatives shall not in any way be binding on TFL.





**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 18 of 65

**19 Local Conditions:**

19.1 It will be imperative on each tenderer to inform himself of all local conditions and factors which may have any effect on the execution of WORK covered under the Tender Document. In their own interest, the tenderer are requested to familiarize themselves with the Indian Income Tax Act 1961, Indian Companies Act 1956, Indian Customs Act 1962 and other related Acts and Laws and Regulations of India with their latest amendments, as applicable TFL shall not entertain any requests for clarifications from the tenderer regarding such local conditions.

19.2 It must be understood and agreed that such factors have properly been investigated and considered while submitting the tender. No claim for financial or any other adjustments to VALUE OF CONTRACT, on lack of clarity of such factors shall be entertained.

**20 Abnormal Rates:**

20.1 The tenderer is expected to quote rate for each item after careful analysis of cost involved for the performance of the completed item considering all specifications and Conditions of Contract. This will avoid loss of profit or gain in case of curtailment or change of specification for any item. In case it is noticed that the rates quoted by the tenderer for any item are unusually high or unusually low, it will be sufficient cause for the rejection of the tender unless the EMPLOYER is convinced about the reasonableness after scrutiny of the analysis for such rate(s) to be furnished by the tenderer (on demand).

**Section-IV. General Obligations**

**21 Priority of Contract Documents**

21.1 Except if and the extent otherwise provided by the Contract, the provisions of the General Conditions of Contract and Special Conditions shall prevail over those of any other documents forming part of the CONTRACT. Several documents forming the CONTRACT are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the ENGINEER-IN-CHARGE who shall thereupon issue to the Contractor instructions thereon and in such event, unless otherwise provided in the Contract, the priority of the documents forming the Contract shall be as follows :



- 1) The Contract Agreement ;
- 2) The Letter of Acceptance;
- 3) The Instructions to Bidders (ITB);
- 4) Special Conditions of Contract (SCC);
- 5) General Conditions of Contract (GCC)
- 6) Any other document forming part of the Contract.

Works shown in the DRAWING but not mentioned in the SPECIFICATIONS OR described in the SPECIFICATIONS without being shown in the DRAWINGS shall nevertheless be deemed to be included in the same manner as if they had been specifically shown upon the DRAWINGS and described in the SPECIFICATIONS.

21.2 Headings and Marginal Notes: All headings and marginal notes to the clauses of these General Conditions of Contract or to the SPECIFICATIONS or to any other Tender Document are solely for the purpose of giving a concise indication and not a summary of the contents thereof, and they shall never be deemed to be part thereof or be used in the interpretation or construction thereof the CONTRACT.

21.3 Singular and Plural: In CONTRACT DOCUMENTS unless otherwise stated specifically, the singular shall include the plural and vice versa wherever the context so requires.

21.4 Interpretation: Words implying 'Persons' shall include relevant 'Corporate Companies / Registered Associations/ Body of Individuals/ Firm of Partnership' as the case may be.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>	PC-183/ E/ 4023/ S-IV	0	
		DOC. NO.	REV.	
		Page 19 of 65		
<b>GENERAL CONDITIONS OF CONTRACT</b>				

**22 Special Conditions of Contract:**

- 22.1 Special Conditions of Contract shall be read in conjunction with the General Conditions of Contract, specification of Work, Drawings and any other documents forming part of this CONTRACT wherever the context so requires.
- 22.2 Notwithstanding the sub-division of the documents into these separate sections and volumes every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the CONTRACT so far as it may be practicable to do so.
- 22.3 Where any portion of the General Condition of Contract is repugnant to or at variance with any provisions of the Special Conditions of Contract, unless a different intention appears the provisions of the Special Conditions of Contract shall be deemed to over-ride the provisions of the General Conditions of Contract and shall to the extent of such repugnancy, or variations, prevail.
- 22.4 Wherever it is mentioned in the specifications that the CONTRACTOR shall perform certain WORK or provide certain facilities, it is understood that the CONTRACTOR shall do so at his cost and the VALUE OF CONTRACT shall be deemed to have included cost of such performance and provisions, so mentioned.
- 22.5 The materials, design and workmanship shall satisfy the relevant INDIAN STANDARDS, the JOB SPECIFICATIONS contained herein and CODES referred to. Where the job specification stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied.

**23 Contractor to obtain his own Information:**

- 23.1 The CONTRACTOR in fixing his rate shall for all purpose whatsoever reason may be, deemed to have himself independently obtained all necessary information for the purpose of preparing his tender and his tender as accepted shall be deemed to have taken into account all contingencies as may arise due to such information or lack of same. The correctness of the details, given in the Tender Document to help the CONTRACTOR to make up the tender is not guaranteed.

The CONTRACTOR shall be deemed to have examined the CONTRACT DOCUMENTS, to have generally obtained his own information in all matters whatsoever that might affect the carrying out of the works at the schedules rates and to have satisfied himself to the sufficiency of his tender. Any error in description of quantity or omission there from shall not vitiate the CONTRACT or release the CONTRACTOR from executing the work comprised in the CONTRACT according to DRAWINGS and SPECIFICATIONS at the scheduled rates. He is deemed to have known the scope, nature and magnitude of the WORKS and the requirements of materials and labour involved etc., and as to what all works he has to complete in accordance with the CONTRACT documents whatever be the defects, omissions or errors that may be found in the DOCUMENTS. The CONTRACTOR shall be deemed to have visited surroundings, to have satisfied himself to the nature of all existing structures, if any, and also as to the nature and the conditions of the Railways, Roads, Bridges and Culverts, means of transport and communication, whether by land, water or air, and as to possible interruptions thereto and the access and egress from the site, to have made enquiries, examined and satisfied himself as to the sites for obtaining sand, stones, bricks and other materials, the sites for disposal of surplus materials, the available accommodation as to whatever required, depots and such other buildings as may be necessary for executing and completing the works, to have made local independent enquiries as to the sub-soil, subsoil water and variations thereof, storms, prevailing winds, climatic conditions and all other similar matters effecting these works. He is deemed to have acquainted himself as to his liability of payment of Government Taxes, Customs duty and other charges, levies etc.

Any neglect or omission or failure on the part of the CONTRACTOR in obtaining



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 20 of 65

necessary and reliable information upon the foregoing or any other matters affecting the CONTRACT shall not relieve him from any risks or liabilities or the entire responsibility from completion of the works at the scheduled rates and times in strict accordance with the CONTRACT.

It is, therefore, expected that should the CONTRACTOR have any doubt as to the meaning of any portion of the CONTRACT DOCUMENT he shall set forth the particulars thereof in writing to EMPLOYER in duplicate, before submission of tender. The EMPLOYER may provide such clarification as may be necessary in writing to CONTRACT, such clarifications as provided by EMPLOYER shall form part of CONTRACT DOCUMENTS.

No verbal agreement or inference from conversation with any effect or employee of the EMPLOYER either before, during or after the execution of the CONTRACT agreement shall in any way affect or modify and of the terms or obligations herein contained.

Any change in layout due to site conditions or technological requirement shall be binding on the CONTRACTOR and no extra claim on this account shall be entertained.

**24 Contract Performance  
Security:**



24.1 The CONTRACTOR shall furnish to the EMPLOYER, within 30 days from the date of notification of award, a security in the sum of 10% of the accepted value of the tender or the actual value of work to be done whichever is applicable due to any additional work or any other reasons, in the form of a Bank draft/Banker's cheque or Bank Guarantee or irrevocable Letter of credit (as per proforma enclosed) as Contract Performance Security with the EMPLOYER which will be refunded after the expiry of DEFECTS LIABILITY PERIOD.

24.2 CONTRACTOR can furnish the Contract Performance Security in the form of Demand Draft or through a Bank Guarantee or through an irrevocable Letter of Credit from any Indian scheduled bank or a branch of an International bank situated in India and registered with Reserve Bank of India as scheduled foreign bank. However, other than the Nationalized Indian Banks, the banks whose BGs are furnished, must be commercial banks having net worth in excess of Rs. 100 crores and a declaration to this effect should be made by such commercial bank either in the bank guarantee itself or separately on a letter head.

The bank guarantee or the Letter of Credit shall be submitted in the prescribed format.

24.3 If the CONTRACTOR/SUB-CONTRACTOR or their employees or the CONTRACTOR's agents and representatives shall damage, break, deface or destroy any property belonging to the EMPLOYER or others during the execution of the CONTRACT, the same shall be made good by the CONTRACTOR at his own expenses and in default thereof, the ENGINEER-IN-CHARGE may cause the same to be made good by other agencies and recover expenses from the CONTRACTOR (for which the certificate of the ENGINEER- IN-CHARGE shall be final).

24.4 All compensation or other sums of money payable by the CONTRACTOR to the EMPLOYER under terms of this CONTRACT may be deducted from or paid by the encashment or sale of a sufficient part of his Contract Performance Security or from any sums which may be due or may become due to the CONTRACTOR by the EMPLOYER of any account whatsoever and in the event of his Contract Performance Security being reduced by reasons of any such deductions or sale of aforesaid, the CONTRACTOR shall within ten days thereafter make good in cash, bank drafts as aforesaid any sum or sums which may have been deducted from or realized by sale of his Contract Performance Security, or any part thereof. No interest shall be payable by the EMPLOYER for sum deposited as Contract

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>	PC-183/ E/ 4023/ S-IV	0	
		DOC. NO.	REV.	
		Page 21 of 65		
<b>GENERAL CONDITIONS OF CONTRACT</b>				

Performance Security.

- 24.5 Failure of the successful bidder to comply with the requirements of this Clause shall constitute sufficient grounds for the annulment of the award and the forfeiture of bid security.

**25 Time of Performance:**

25.1 Time for Mobilization

The work covered by this CONTRACT shall be commenced within fifteen (15) days, the date of letter/Fax of Intent and be completed in stages on or before the dates as mentioned in the TIME SCHEDULE OF COMPLETION OF WORK. The CONTRACTOR should bear in mind that time is the essence of this agreement. Request for revision of construction time after tenders are opened will not receive consideration. The above period of fifteen (15) days is included within the overall COMPLETION SCHEDULE, not over and above the completion time to any additional work or any other reasons.

25.2 Time Schedule of Construction:

25.2.1 The general Time Schedule of construction is given in the TENDER DOCUMENT. CONTRACTOR should prepare a detailed monthly or weekly construction program jointly with the ENGINEER-IN-CHARGE within 15 days of receipt of LETTER/FAX OF INTENT or ACCEPTANCE OF TENDER. The WORK shall be executed strictly as per the Time Schedule given in the CONTRACT DOCUMENT. The period of construction given includes the time required for mobilization testing, rectifications, if any, retesting and completion in all respects in accordance with CONTRACT DOCUMENT to the entire satisfaction of the ENGINEER-IN-CHARGE.

25.2.2 The CONTRACTOR shall submit a detailed PERT network within the time frame agreed above consisting of adequate number of activities covering various key phases of the WORK such as design, procurement, manufacturing, shipment and field erection activities within fifteen (15) days from the date of LETTER/FAX OF INTENT. This network shall also indicate the interface facilities to be provided by the EMPLOYER and the dates by which such facilities are needed.

25.2.3 CONTRACTOR shall discuss the network so submitted with the EMPLOYER and the agreed network which may be in the form as submitted with the EMPLOYER or in revised form in line with the outcome of discussions shall form part of the CONTRACT, to be signed within fifteen (15) days from the date of LETTER OF ACCEPTANCE OF TENDER. During the performance of the CONTRACT, if in the opinion of the EMPLOYER proper progress is not maintained suitable changes shall be made in the CONTRACTOR's operation to ensure proper progress.

The above PERT network shall be reviewed periodically and reports shall be submitted by the CONTRACTOR as directed by EMPLOYER.

**26 Force Majeure:**

26.1 CONDITIONS FOR FORCE MAJEURES

In the event of either party being rendered unable by Force Majeure to perform any obligations required to be performed by them under the CONTRACT the relative obligation of the party affected by such Force Majeures shall upon notification to the other party be suspended for the period during which Force Majeures event lasts. The cost and loss sustained by the either party shall be borne by the respective parties.

The term "Force Majeures" as employed herein shall mean acts of God, earthquake, war (declared or undeclared), revolts, riots, fires, floods, rebellions, explosions, hurricane, sabotage, civil commotions and acts and regulations of respective Government of the two parties, namely the EMPLOYER and the



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 22 of 65

**CONTRACTOR.**

Upon the occurrence of such cause(s) and upon its termination, the party alleging that it has been rendered unable as aforesaid thereby, shall notify the other party in writing immediately but not later than 72 (Seventy-two) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of its claim.

Time for performance of the relative obligation suspended by the Force Majeures shall then stand extended by the period for which such cause lasts.

If deliveries of bought out items and/or works to be executed by the CONTRACTOR are suspended by Force Majeure conditions lasting for more than 2 (two) months the EMPLOYER shall have the option to terminate the CONTRACT or re-negotiate the contract provisions.

**26.2 OUTBREAK OF WAR**

26.2.1 If during the currency of the CONTRACT there shall be an out-break of war whether declared or not, in that part of the World which whether financially or otherwise materially affect the execution of the WORK the CONTRACTOR shall unless and until the CONTRACT is terminated under the provisions in this clause continue to use his best Endeavour to complete the execution of the WORK, provided always that the EMPLOYER shall be entitled, at any time after such out-break of war to terminate or re-negotiate the CONTRACT by giving notice in writing to the CONTRACTOR and upon such notice being given the CONTRACT shall, save as to the rights of the parties under this clause and to the operation of the clauses entitled settlement of Disputes and Arbitration hereof, be terminated but without prejudice to the right of either party in respect of any antecedent breach thereof.

26.2.2 If the CONTRACT shall be terminated under the provisions of the above clause, the CONTRACTOR shall with all reasonable diligence remove from the SITE all the CONTRACTOR's equipment and shall give similar facilities to his SUB-CONTRACTORS to do so.

**27 Price reduction schedule:**

27.1 Time is the essence of the CONTRACT. In case the CONTRACTOR fails to complete the WORK within the stipulated period, then, unless such failure is due to Force Majeure as defined in Clause 26 here above or due to EMPLOYER's defaults, the Total Contract price shall be reduced by ½ % of the total Contract Price per complete week of delay or part thereof subject to a maximum of 5 % of the Total Contract Price, by way of reduction in price for delay and not as penalty. The said amount will be recovered from amount due to the Contractor/ Contractor's Contract Performance Security payable on demand.

The decision of the OWNER in regard to applicability of Price Reduction Schedule shall be final and binding on the CONTRACTOR.

27.2 All sums payable under this clause is the reduction in price due to delay in completion period at the above agreed rate.

**27.3 BONUS FOR EARLY COMPLETION**

**Bonus For Early Completion  
27.3 (\*)**

**(Clause not applicable for this  
Tender)**

If the Contractor achieves completion of Works in all respect prior to the time schedule stipulated in the SCC, the Employer shall pay to the Contractor the relevant sum, if mentioned specifically in SCC, as bonus for early completion. The bonus for early completion, if provided specifically in SCC, shall be payable to the maximum ceiling of 2 ½ % of the total contract price.

(\*) Partial earlier completion may not always produce net benefits to the Employer,



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 23 of 65

for example where utilization of the completed Works requires (a) the fulfillment of all parts of the Contract (e.g. the training of personnel); or (b) the completion of all Sections (e.g. in pipeline laying, where early completion of the laying of pipeline would not be useful if the compressor is still under installation); or (c) certain seasonal effects to take place (e.g. onset of the rainy season, for impounding a reservoir); or (d) other circumstances. Also a more rapid drawdown of budgeted funds may be required. All such factors should be considered prior to the inclusion of a bonus clause in the Contract.

**28 Rights of the employer to  
forfeit contract performance  
security:**

28.1 Whenever any claim against the CONTRACTOR for the payment of a sum of money arises out or under the CONTRACT, the EMPLOYER shall be entitled to recover such sum by appropriating in part or whole the Contract Performance Security of the CONTRACTOR. In the event of the security being insufficient or if no security has been taken from the CONTRACTOR, then the balance or the total sum recoverable, as the case may be shall be deducted from any sum then due or which at any time thereafter may become due to the CONTRACTOR. The CONTRACTOR shall pay to the EMPLOYER on demand any balance remaining due.

28.2 In .case of forfeiture of Contract Performance Security/ Security Deposit, the forfeited amount will be considered inclusive of tax and tax invoice will be issued by TFL. The forfeiture amount will be subject to final decision of TFL based on other terms and conditions of order/ contract.

**29 Failure by the contractor to  
comply with the provisions  
of the contract:**

29.1 If the CONTRACTOR refuses or fails to execute the WORK or any separate part thereof with such diligence as will ensure its completion within the time specified in the CONTRACT or extension thereof or fails to perform any of his obligation under the CONTRACT or in any manner commits a breach of any of the provisions of the CONTRACT it shall be open to the EMPLOYER at its option by written notice to the CONTRACTOR:

a) TO DETERMINE THE CONTRACT in which event the CONTRACT shall stand terminated and shall cease to be in force and effect on and from the date appointed by the EMPLOYER on that behalf, whereupon the CONTRACTOR shall stop forthwith any of the CONTRACTOR's work then in progress, except such WORK as the EMPLOYER may, in writing, require to be done to safeguard any property or WORK, or installations from damage, and the EMPLOYER, for its part, may take over the work remaining unfinished by the CONTRACTOR and complete the same through a fresh contractor or by other means, at the risk and cost of the CONTRACTOR, and any of his sureties if any, shall be liable to the EMPLOYER for any excess cost occasioned by such work having to be so taken over and completed by the EMPLOYER over and above the cost at the rates specified in the schedule of quantities and rate/prices.

b) WITHOUT DETERMINING THE CONTRACT to take over the work of the CONTRACTOR or any part thereof and complete the same through a fresh contractor or by other means at the risk and cost of the CONTRACTOR. The CONTRACTOR and any of his sureties are liable to the EMPLOYER for any excess cost over and above the cost at the rates specified in the Schedule of Quantities/ rates, occasioned by such works having been taken over and completed by the EMPLOYER.

29.2 In such events of Clause 29.1(a) or (b) above.

a) The whole or part of the Contract Performance Security furnished by the CONTRACTOR is liable to be forfeited without prejudice to the right of the EMPLOYER to recover from the



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 24 of 65

CONTRACTOR the excess cost referred to in the sub-clause aforesaid, the EMPLOYER shall also have the right of taking possession and utilizing in completing the works or any part thereof, such as materials equipment and plants available at work site belonging to the CONTRACTOR as may be necessary and the CONTRACTOR shall not be entitled for any compensation for use or damage to such materials, equipment and plant.

b) The amount that may have become due to the CONTRACTOR on account of work already executed by him shall not be payable to him until after the expiry of Six (6) calendar months reckoned from the date of termination of CONTRACT or from the taking over of the WORK or part thereof by the EMPLOYER as the case may be, during which period the responsibility for faulty materials or workmanship in respect of such work shall, under the CONTRACT, rest exclusively with the CONTRACTOR. This amount shall be subject to deduction of any amounts due from the CONTRACT to the EMPLOYER under the terms of the CONTRACT authorized or required to be reserved or retained by the EMPLOYER.

29.3 Before determining the CONTRACT as per Clause 29.1(a) or (b) provided in the judgment of the EMPLOYER, the default or defaults committed by the CONTRACTOR is/are curable and can be cured by the CONTRACTOR if an opportunity given to him, then the EMPLOYER may issue Notice in writing calling the CONTRACTOR to cure the default within such time specified in the Notice.

29.4 The EMPLOYER shall also have the right to proceed or take action as per 29.1(a) or (b) above, in the event that the CONTRACTOR becomes bankrupt, insolvent, compounds with his creditors, assigns the CONTRACT in favour of his creditors or any other person or persons, or being a company or a corporation goes into voluntary liquidation, provided that in the said events it shall not be necessary for the EMPLOYER to give any prior notice to the CONTRACTOR.

29.5 Termination of the CONTRACT as provided for in sub- clause 29.1(a) above shall not prejudice or affect their rights of the EMPLOYER which may have accrued upto the date of such termination.

**30 Contractor remains liable to pay compensation if action not taken under clause 29:**

30.1 In any case in which any of the powers conferred upon the EMPLOYER BY CLAUSE 29.0 thereof shall have become exercisable and the same had not been exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in .the event of any further case of default by the CONTRACTOR for which by any clause or clauses hereof he is declared liable to pay compensation amounting to the whole of his Contract Performance Security, and the liability of the CONTRACTOR for past and future compensation shall remain unaffected. In the event of the EMPLOYER putting in force the power under above sub-clause (a), (b) or (c) vested in him under the preceding clause he may, if he so desired, take possession of all or any tools, and plants, materials and stores in or upon the works or the site thereof belonging to the CONTRACTOR or procured by him and intended to be used for the execution of the WORK or any part thereof paying or allowing for the same in account at the CONTRACT rates or in case of these not being applicable at current market rates to be certified by the ENGINEER-IN-CHARGE whose certificate thereof shall be final, otherwise the ENGINEER-IN- CHARGE may give notice in writing to the CONTRACTOR or his clerk of the works, foreman or other authorized agent, requiring him to remove such tools, plant, materials or stores from the premises (within a time to be specified in such notice), and in the event of the CONTRACTOR failing to comply with any such requisition, the ENGINEER-IN-CHARGE may remove them at the CONTRACTOR's expense or sell them by auction or private sale on account of the CONTRACTOR and at his risk in all respects without any further



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 25 of 65

notice as to the date, time or place of sale and the certificate of the ENGINEER-IN-CHARGE as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the CONTRACTOR.

- 31 Change in constitution:** 31.1 Where the CONTRACTOR is a partnership firm, the prior approval of the EMPLOYER shall be obtained in writing, before any change is made in the constitution of the firm. Where the CONTRACTOR is an individual or a Hindu undivided family business concern, such approval as aforesaid shall, likewise be obtained before such CONTRACTOR enters into any agreement with other parties, where under, the reconstituted firm would have the right to carry out the work hereby undertaken by the CONTRACTOR. In either case if prior approval as aforesaid is not obtained, the CONTRACT shall be deemed to have been allotted in contravention of clause 37 hereof and the same action may be taken and the same consequence shall ensue as provided in the said clause.
- 32 Termination of contract** 32(A) **TERMINATION OF CONTRACT FOR DEATH:**  
If the CONTRACTOR is an individual or a proprietary concern and the individual or the proprietor dies or if the CONTRACTOR is a partnership concern and one of the partner dies then unless, the EMPLOYER is satisfied that the legal representative of the individual or the proprietary concern or the surviving partners are capable of carrying out and completing CONTRACT, he (the EMPLOYER) is entitled to cancel the CONTRACT for the uncompleted part without being in any way liable for any compensation payment to the estate of the deceased CONTRACTOR and/or to the surviving partners of the CONTRACTOR'S firm on account of the cancellation of CONTRACT. The decision of the EMPLOYER in such assessment shall be final and binding on the parties. In the event of such cancellation, the EMPLOYER shall not hold the estate of the deceased CONTRACTOR and/or the surviving partners of the CONTRACTOR'S firm liable for any damages for non-completion of CONTRACT.
- 32(B) **TERMINATION OF CONTRACT IN CASE OF LIQUIDATION / BANKRUPTCY ETC.**  
If the Contractor shall dissolve or become bankrupt or insolvent or cause or suffer any receiver to be appointed of his business or any assets thereof compound with his Creditors, or being a corporation commence to be wound up, not being a member's voluntary winding up for the purpose of amalgamation or reconstruction, or carry on its business under a Receiver for the benefits of its Creditors any of them, EMPLOYER shall be at liberty :-  
To terminate the contract forthwith upon coming to know of the happening of any such event as aforesaid by notice in writing to the Contractor or to give the Receiver or liquidator or other person, the option of carrying out the contract subject to his providing a guarantee up to an amount to be agreed upon by EMPLOYER for due and faithful performance of the contract.
- 32 (C) In case of termination of CONTRACT herein set forth (under clause 29.0) except under conditions of Force Majeure and termination after expiry of contract, the CONTRACTOR shall be put under holiday [i.e. neither any enquiry will be issued to the party by Talcher Fertilizers Ltd. against any type of tender nor their offer will be considered by TFL against any ongoing tender (s) where contract between TFL and that particular CONTRACTOR (as a bidder) has not been finalized] for three years from the date of termination by Talcher Fertilizers Ltd. to such CONTRACTOR.
- 33 Members of the employer not individually liable :** 33.1 No Director, or official or employee of the EMPLOYER/ CONSULTANT shall in any way be personally bound or liable for the acts or obligations of the





**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 26 of 65

EMPLOYER under the CONTRACT or answerable for any default or omission in the observance or performance of any of the acts, matters or things which are herein contained.

**34 Employer not bound by personal representations:**

34.1 The CONTRACTOR shall not be entitled to any increase on the scheduled rates or any other right or claim whatsoever by reason of any representation, explanation statement or alleged representation, promise or guarantees given or alleged to have been given to him by any person.

**35 Contractor's office at site:**

35.1 The CONTRACTOR shall provide and maintain an office at the site for the accommodation of his agent and staff and such office shall be open at all reasonable hours to receive instructions, notice or other communications. The CONTRACTOR at all time shall maintain a site instruction book and compliance of these shall be communicated to the ENGINEER-IN CHARGE from time to time and the whole document to be preserved and handed over after completion of works.

**36 Contractor's subordinate staff and their conduct**

36.1 The CONTRACTOR, on or after award of the WORK shall name and depute a qualified engineer having sufficient experience in carrying out work of similar nature, to whom the equipments, materials, if any, shall be issued and instructions for works given. The CONTRACTOR shall also provide to the satisfaction of the ENGINEER-IN-CHARGE sufficient and qualified staff to superintend the execution of the WORK, competent sub-agents, foremen and leading hands including those specially qualified by previous experience to supervise the types of works comprised in the CONTRACT in such manner as will ensure work of the best quality, expeditious working. Whenever in the opinion of the ENGINEER-IN- CHARGE additional properly qualified supervisory staff is considered necessary, they shall be employed by the CONTRACTOR without additional charge on accounts thereof. The CONTRACTOR shall ensure to the satisfaction of the ENGINEER-IN-CHARGE that SUB-CONTRACTORS, if any, shall provide competent and efficient supervision, over the work entrusted to them.

36.2 If and whenever any of the CONTRACTOR's or SUB- CONTRACTOR'S agents, sub-agents, assistants, foremen, or other employees shall in the opinion of ENGINEER-IN- CHARGE be guilty of any misconduct or be incompetent or insufficiently qualified or negligent in the performance of their duties of that in the opinion of the EMPLOYER or the ENGINEER-IN-CHARGE, it is undesirable for administrative or any other reason for such person or persons to be employed in the works, the CONTRACTOR, is so directed by the ENGINEER-IN-CHARGE, shall at once remove such person or persons from employment thereon. Any person or persons so removed from the works shall not again be employed in connection with the WORKS without the written permission of the ENGINEER-IN- CHARGE. Any person so removed from the WORK shall be immediately re-placed at the expense of the CONTRACTOR by a qualified and competent substitute. Should the CONTRACTOR be requested to repatriate any person removed from the works he shall do so and shall bear all costs in connection herewith.

36.3 The CONTRACTOR shall be responsible for the proper behavior of all the staff, foremen, workmen, and others, and shall exercise a proper degree of control over them and in particular and without prejudice to the said generality, the CONTRACTOR shall be bound to prohibit and prevent any employees from trespassing or acting in any way detrimental or prejudicial to the interest of the community or of the properties or occupiers of land and properties in the neighborhood and in the event of such employee so trespassing, the CONTRACTOR shall be responsible therefore and relieve the EMPLOYER of all consequent claims or actions for damages or injury or any other grounds



whatsoever. The decision of the ENGINEER-IN-CHARGE upon any matter arising under this clause shall be final. The CONTRACTOR shall be liable for any liability to EMPLOYER on account of deployment of CONTRACTOR's staff etc. or incidental or arising out of the execution of CONTRACT.

The CONTRACTOR shall be liable for all acts or omissions on the part of his staff, Foremen and Workmen and others in his employment, including misfeasance or negligence of whatever kind in the course of their work or during their employment, which are connected directly or indirectly with the CONTRACT.

36.4 If and when required by the EMPLOYER and CONTRACTOR's personnel entering upon the EMPLOYER's premises shall be properly identified by badges of a type acceptable to the EMPLOYER which must be worn at all times on EMPLOYER's premises. CONTRACTOR may be required to obtain daily entry passes for his staff/employees from EMPLOYER to work within operating areas. These being safety requirements, no relaxations on this account shall be given to CONTRACTOR.

**37 Sub-letting of works:**

37.1 No part of the CONTRACT nor any share or interest therein shall in any manner or degree be transferred, assigned or sublet by the CONTRACTOR directly or indirectly to any person, firm or corporation whatsoever without the consent in writing, of the ENGINEER/ EMPLOYER except as provided for in the succeeding sub-clause.

i) **SUB-CONTRACTS FOR TEMPORARY WORKS ETC.:**

The EMPLOYER may give written consent to Sub- contract for the execution of any part of the WORK at the site, being entered in to by CONTRACTOR provided each individual Sub- contract is submitted to the ENGINEER-IN-CHARGE before being entered into and is approved by him.

ii) **LIST OF SUB-CONTRACTORS TO BE SUPPLIED:**

At the commencement of every month the CONTRACTOR shall furnish to the ENGINEER-IN- CHARGE list of all SUB-CONTRACTORS or other persons or firms engaged by the CONTRACTOR and working at the SITE during the previous month with particulars of the general nature of the Subcontract or works done by them.

iii) **CONTRACTOR'S LIABILITY NOT LIMITED BY SUB-CONTRACTORS:**

Notwithstanding any sub-letting with such approval as aforesaid and notwithstanding that the ENGINEER-IN-CHARGE shall have received copies of any Subcontracts, the contractor shall be and shall remain solely responsible for the quality, proper and expeditious execution of the Contract in all respects as if such sub-letting or Subcontracting had not taken place, and as if such work had been done directly by the CONTRACTOR. The CONTRACTOR shall bear all responsibility for any act or omission on the part of sub-contractors in regard to work to be performed under the CONTRACT.

iv) **EMPLOYER MAY TERMINATE SUB-CONTRACTS:**

If any SUB-CONTRACTOR engaged upon the works at the site



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 28 of 65

executes any works which in the opinion of the ENGINEER-IN-CHARGE is not in accordance with the CONTRACT documents, the EMPLOYER may by written notice to the CONTRACTOR request him to terminate such subcontract and the CONTRACTOR upon the receipt of such notice shall terminate such Subcontract and dismiss the SUB-CONTRACTOR(S) and the later shall forthwith leave the works, failing which the EMPLOYER shall have the right to remove such SUB- CONTRACTOR(S) from the site.

v) **NO REMEDY FOR ACTION TAKEN UNDER THIS CLAUSE:**



No action taken by the EMPLOYER under the clause shall relieve the CONTRACTOR of any of his liabilities under the CONTRACT or give rise to any right or compensation, extension of time or otherwise failing which the EMPLOYER shall have the right to remove such SUB-CONTRACTOR(S) from the site.

**38 Power of entry:**

38.1 If the CONTRACTOR shall not commence the WORK in the manner previously described in the CONTRACT documents or if he shall at any time in the opinion of the ENGINEER-IN-CHARGE.

- i) fail to carry out the WORK in conformity with the CONTRACT documents, or
- ii) fail to carry out the WORK in accordance with the Time Schedule, or
- iii) substantially suspend work or the WORK for a period of fourteen days without authority from the ENGINEER-IN-CHARGE, or
- iv) fail to carry out and execute the WORK to the satisfaction of the ENGINEER-IN-CHARGE, or
- v) fail to supply sufficient or suitable construction plant, temporary works, labour, materials or things, or
- vi) Commit, suffer, or permit any other breach of any of the provisions of the CONTRACT on his part to be performed or observed or persist in any of the above mentioned breaches of the CONTRACT for fourteen days, after notice in writing shall have been given to the CONTRACTOR by the ENGINEER-IN-CHARGE requiring such breach to be remedied, or
- vii) if the CONTRACTOR shall abandon the WORK or
- viii) If the CONTRACTOR during the continuance of the CONTRACT shall become bankrupt, make any arrangement or composition with his creditors, or permit any execution to be levied or go into liquidation whether compulsory or voluntary not being merely a voluntary liquidation for the purpose of amalgamation or reconstruction

then in any such case, the EMPLOYER shall have the power to enter upon the WORK and take possession thereof and of the materials, temporary WORK, construction plant, and stock thereon, and to revoke the CONTRACTOR's license to use the same, and to complete the WORK by his agents, other CONTRACTORS or workmen or to relate the same upon any terms and to such

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>		PC-183/ E/ 4023/ S-IV	0	
	<b>GENERAL CONDITIONS OF CONTRACT</b>		DOC. NO.	REV.	
			Page 29 of 65		

other person, firm or corporation as the EMPLOYER in his absolute discretion may think proper to employ and for the purpose aforesaid to use or authorize the use of any materials, temporary work, CONSTRUCTION PLANT, and stock as aforesaid, without making payment or allowance to the CONTRACTOR for the said materials other than such as may be certified in writing by the ENGINEER-IN-CHARGE to be reasonable, and without making any payment or allowance to the CONTRACTOR for the use of the temporary said works, construction plant and stock or being liable for any loss or damage thereto, and if the EMPLOYER shall by reason of his taking possession of the WORK or of the WORK being completed by other CONTRACTOR (due account being taken of any such extra work or works which may or be omitted) then the amount of such excess as certified by the ENGINEER-IN-CHARGE shall be deducted from any money which may be due for work done by the CONTRACTOR under the CONTRACT and not paid for. Any deficiency shall forthwith be made good and paid to the EMPLOYER by the CONTRACTOR and the EMPLOYER shall have power to sell in such manner and for such price as he may think fit all or any of the construction plant, materials etc. constructed by or belonging to and to recoup and retain the said deficiency or any part thereof out of proceeds of the sale.

- 39 Contractor's responsibility with the mechanical, electrical, intercommunication system, air-conditioning contractors and other agencies:** 39.1 Without repugnance of any other condition, it shall be the responsibility of the CONTRACTOR executing the work of civil construction, to work in close cooperation and coordinate the WORK with the Mechanical, Electrical, Air-conditioning and Intercommunication Contractor's and other agencies or their authorized representatives, in providing the necessary grooves, recesses, cuts and opening etc., in wall, slabs beams and columns etc. and making good the same to the desired finish as per specification, for the placement of electrical, intercommunication cables, conduits, air-conditioning inlets and outlets grills and other equipments etc. where required. For the above said requirements in the false ceiling and other partitions, the CONTRACTOR before starting-up the work shall in consultation with the Electrical, Mechanical, Intercommunication, Air-conditioning contractor and other agencies prepare and put-up a joint scheme, showing the necessary openings, grooves, recesses, cuts, the methods of fixing required for the WORK of the aforesaid, and the finishes therein, to the ENGINEER-IN-CHARGE and get the approval. The CONTRACTOR before finally submitting the scheme to the ENGINEER-IN-CHARGE, shall have the written agreement of the other agencies. The ENGINEER- IN-CHARGE, before communicating his approval to the scheme, with any required modification, shall get the final agreement of all the agencies, which shall be binding. No claim shall be entertained on account of the above.
- The CONTRACTOR shall confirm in all respects with provision of any statutory regulations, ordinances or byelaws of any local or duly constituted authorities or public bodies which may be applicable from time to time to the WORK or any temporary works. The CONTRACTOR shall keep the EMPLOYER indemnified against all penalties and liabilities of every kind, arising out of non- adherence to such stains, ordinances, laws, rules, regulations, etc.
- 40 Other agencies at site:** 40.1 The CONTRACTOR shall have to execute the WORK in such place and conditions where other agencies will also be engaged for other works such as site grading, filling, and leveling, electrical and mechanical engineering works, etc. No claim shall be entertained due to WORK being executed in the above circumstances.
- 41 Notice:** 41.1 TO THE CONTRACTOR:
- Any notice hereunder may be served on the CONTRACTOR or his duly authorized representative at the job site or may be served by registered mail direct to the address furnished by the CONTRACTOR. Proof of issue of any such notice could be conclusive of the CONTRACTOR having been duly informed of all



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 30 of 65

contents therein.

41.2 TO THE EMPLOYER:

Any notice to be given to the EMPLOYER under the terms of the CONTRACTOR shall be served by sending the same by Registered mail to or delivering the same at the respective site offices of M/s Talcher Fertilizers Ltd. addressed to the HEAD/SITE-IN-CHARGE.

**42 Right of various interests:**

- i) The EMPLOYER reserves the right to distribute the work between more than one agency(ies). The CONTRACTOR shall cooperate and afford other agency(ies) reasonable opportunity for access to the WORK for the carriage and storage of materials and execution of their works.
- ii) Wherever the work being done by any department of the EMPLOYER or by other agency(ies) employed by the EMPLOYER is contingent upon WORK covered by this CONTRACT, the respective rights of the various interests involved shall be determined by the ENGINEER-IN-CHARGE to secure the completion of the various portions of the work in general harmony.

**43 Patents and royalties:**

43.1 The CONTRACTOR, if licensed under any patent covering equipment, machinery, materials or compositions of matter to be used or supplied or methods and process to be practiced or employed in the performance of this CONTRACT, agrees to pay all royalties and license fees which may be due with respect thereto. If any equipment, machinery, materials, composition of matters, be used or supplied or methods and processes to be practiced or employed in the performance of this CONTRACT, is covered by a patent under which the CONTRACTOR is not licensed then the CONTRACTOR before supplying or using the equipment, machinery materials, composition method or processes shall obtain such licenses and pay such royalties and license fees as may be necessary for performance of this CONTRACT. In the event the CONTRACTOR fails to pay any such royalty or obtain any such license, any suit for infringement of such patents which is brought against the CONTRACTOR or the EMPLOYER as a result such failure will be defended by the CONTRACTOR at his own expense and the CONTRACTOR will pay any damages and costs awarded in such suit. The CONTRACTOR shall promptly notify the EMPLOYER if the CONTRACTOR has acquired the knowledge of any plant under which a suit for infringement could be reasonably brought because of the use by the EMPLOYER of any equipment, machinery, materials, process, methods to be supplied hereunder. The CONTRACTOR agrees to and does hereby grant to EMPLOYER, together with the right to extend the same to any of the subsidiaries of the EMPLOYER as irrevocable, royalty free license to use in any country, any invention made by the CONTRACTOR or his employee in or as result of the performance of the WORK under the CONTRACT.

43.2 All charges on account of royalty, toilage, rent, octroi terminal or sales tax and/ or other duties or any other levy on materials obtained for the work or temporary work or part thereof (excluding materials provided by the EMPLOYER) shall be borne by the CONTRACTOR.

43.3 The CONTRACTOR shall not sell or otherwise dispose of or remove except for the purpose of this CONTRACT, the sand, stone, clay, ballast, earth, rock or other substances, or materials obtained from any excavation made for the purpose of the WORK or any building or produce upon the site at the time of delivery of the possession thereof, but all such substances, materials, buildings and produce shall be the property of the EMPLOYER provided that the CONTRACTOR may with the permission of the ENGINEER-IN-CHARGE, use the same for the purpose of the work by payment of cost of the same at such a rate as may be determined by



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 31 of 65

the ENGINEER-IN- CHARGE.

43.4 The EMPLOYER shall indemnify and save harmless the CONTRACTOR from any loss on account of claims against CONTRACTOR for the contributory infringement of patent rights arising out and based upon the claim that the use of the EMPLOYER of the process included in the design prepared by the EMPLOYER and used in the operation of the plant infringes on any patent right. With respect to any subcontract entered into by CONTRACTOR pursuant to the provisions of the relevant clause hereof, the CONTRACTOR shall obtain from the SUB-CONTRACTOR an undertaking to provide the EMPLOYER with the same patent protection that CONTRACTOR is required to provide under the provisions of this clause.

**44 Liens:**

44.1 If, at any time there should be evidence or any lien or claim for which the EMPLOYER might have become liable and which is chargeable to the CONTRACTOR, the EMPLOYER shall have the right to retain out of any payment then due or thereafter to become due an amount sufficient to completely indemnify the EMPLOYER against such lien or claim and if such lien or claim be valid, the EMPLOYER may pay and discharge the same and deduct the amount so paid from any money which may be or may become due and payable to the CONTRACTOR. If any lien or claim remain unsettled after all payments are made, the CONTRACTOR shall refund or pay to the EMPLOYER all money that the latter may be compelled to pay in discharging such lien or claim including all costs and reasonable expenses. EMPLOYER reserves the right to do the same.

44.2 The EMPLOYER shall have lien on all materials, equipments including those brought by the CONTRACTOR for the purpose of erection, testing and commissioning of the WORK.

44.3 The final payment shall not become due until the CONTRACTOR delivers to the ENGINEER-IN-CHARGE a complete release or waiver of all liens arising or which may arise out of his agreement or receipt in full or certification by the CONTRACTOR in a form approved by ENGINEER-IN-CHARGE that all invoices for labour, materials, services have been paid in lien thereof and if required by the ENGINEER-IN-CHARGE in any case an affidavit that so far as the CONTRACTOR has knowledge or information the releases and receipts include all the labour and material for which a lien could be filled.

44.4 CONTRACTOR will indemnify and hold the EMPLOYER harmless, for a period of two years after the issue of FINAL CERTIFICATE, from all liens and other encumbrances against the EMPLOYER on account of debts or claims alleged to be due from the CONTRACTOR or his SUB-CONTRACTOR to any person including SUB- CONTRACTOR and on behalf of EMPLOYER will defend at his own expense, any claim or litigation brought against the EMPLOYER or the CONTRACTOR in connection therewith. CONTRACTOR shall defend or contest at his own expense any fresh claim or litigation by any person including his SUB-CONTRACTOR, till its satisfactory settlement even after the expiry of two years from the date of issue of FINAL CERTIFICATE.

**45 Delays by employer or his authorized agents:**

45.1 In case the CONTRACTOR's performance is delayed due to any act or omission on the part of the EMPLOYER or his authorized agents, then the CONTRACTOR shall be given due extension of time for the completion of the WORK, to the extent such omission on the part of the EMPLOYER has caused delay in the CONTRACTOR's performance of his WORK.

45.2 No adjustment in CONTRACT PRICE shall be allowed for reasons of such delays and extensions granted except as provided in TENDER DOCUMENT, where the EMPLOYER reserves the right to seek indulgence of CONTRACTOR to maintain the agreed Time Schedule of Completion.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.





**GENERAL CONDITIONS OF CONTRACT**

Page 32 of 65

In such an event the CONTRACTOR shall be obliged for working by CONTRACTOR's personnel for additional time beyond stipulated working hours as also Sundays and Holidays and achieve the completion date/interim targets.

- 46 Payment if the contract is terminated:**
- 46.1 If the CONTRACT shall be terminated as per Tender pursuant to Clause no. 29 of GCC, the CONTRACTOR shall be paid by the EMPLOYER in so far as such amounts or items shall not have already been covered by payments of amounts made to the CONTRACTOR for the WORK executed and accepted by ENGINEER-IN-CHARGE prior to the date of termination at the rates and prices provided for in the CONTRACT and in addition to the following:
- a) The amount payable in respect of any preliminary items, so far as the Work or service comprised therein has been carried out or performed and an appropriate portion as certified by ENGINEER-IN-CHARGE of any such items or service comprised in which has been partially carried out or performed.
- b) Any other expenses which the CONTRACTOR has expended for performing the WORK under the CONTRACT subject to being duly recommended by ENGINEER-IN-CHARGE and approved by EMPLOYER for payment, based on documentary evidence of his having incurred such expenses.
- 46.2 The CONTRACTOR will be further required to transfer the title and provide the following in the manner and as directed by the EMPLOYER.
- a) Any and all completed works.
- b) Such partially completed WORK including drawings, information's and CONTRACT rights as the CONTRACTOR has specially performed, produced or acquired for the performance of the CONTRACTOR.
- 47 No waiver of rights:**
- 47.1 Neither the inspection by the EMPLOYER or any of their officials, employees, or agents nor any order by the EMPLOYER for payment of money or any payment for or acceptance of the whole or any part of the Work by the EMPLOYER nor any extension of time, nor any possession taken by EMPLOYER shall operate as a waiver of any provision of the CONTRACT, or of any power herein reserved to the EMPLOYER, or any right to damages herein provided, nor shall any waiver of any breach in the CONTRACT be held to be a waiver of any other subsequent breach.
- 48 Certificate not to affect right of employer and liability of contractor:**
- 48.1 No interim payment certificate(s) issued by the Engineer-in-Charge of the EMPLOYER, nor any sum paid on account by the EMPLOYER, nor any extension of time for execution of the work granted by EMPLOYER shall affect or prejudice the rights of the Employer against the CONTRACTOR or relieve the CONTRACTOR of his obligations for the due performance of the CONTRACT, or be interpreted as approval of the WORK done or of the equipment supplied and no certificate shall create liability for the EMPLOYER to pay for alterations, amendments, variations or additional works not ordered, in writing, by EMPLOYER or discharge the liability of the CONTRACTOR for the payment of damages whether due, ascertained, or certified or not or any sum against the payment of which he is bound to indemnify the EMPLOYER.
- 49 Language and measures:**
- 49.1 All documents pertaining to the CONTRACT including Specifications, Schedules, Notices, Correspondence, operating and maintenance Instructions, DRAWINGS, or any other writing shall be written in English language. The Metric System of measurement shall be used in the CONTRACT unless otherwise specified.



	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>	PC-183/ E/ 4023/ S-IV	0	
		DOC. NO.	REV.	
		Page 33 of 65		
<b>GENERAL CONDITIONS OF CONTRACT</b>				

- 50 Transfer of title:**
- 50.1 The title of Ownership of supplies furnished by the CONTRACTOR shall not pass on to the EMPLOYER for all Supplies till the same are finally accepted by the EMPLOYER after the successful completion of PERFORMANCE TEST and GUARANTEE TEST and issue of FINAL CERTIFICATE.
- 50.2 However, the EMPLOYER shall have the lien on all such works performed as soon as any advance or progressive payment is made by the EMPLOYER to the CONTRACTOR and the CONTRACTOR shall not subject these works for use other than those intended under this CONTRACT.
- 51 Release of information:**
- 51.1 The CONTRACTOR shall not communicate or use in advertising, publicity, sales releases or in any other medium, photographs, or other reproduction of the Work under this CONTRACT or description of the site dimensions, quantity, quality or other information, concerning the Work unless prior written permission has been obtained from the EMPLOYER.
- 52 Brand names:**
- 52.1 The specific reference in the SPECIFICATIONS and documents to any material by trade name, make or catalogue number shall be construed as establishing standard or quality and performance and not as limited competition. However, TENDERER may offer other similar equipments provided it meets the specified standard design and performance requirements.
- 53 Completion of contract:**
- 53.1 Unless otherwise terminated under the provisions of any other relevant clause, this CONTRACT shall be deemed to have been completed at the expiration of the PERIOD OF LIABILITY as provided for under the CONTRACT.
- 54 Spares:**
- 54.1 The CONTRACTOR shall furnish to the EMPLOYER all spares required for COMMISSIONING of the plants, recommendatory and/or mandatory spares, which are required essential by the manufacturer/supplier. The same shall be delivered at SITE, 3(Three) months before COMMISSIONING.
- Also the CONTRACTOR should furnish the manufacturing drawings for fast wearing spares.
- 54.2 The CONTRACTOR guarantees the EMPLOYER that before the manufacturers of the equipments, plants and machineries go out of production of spare parts for the equipment furnished and erected by him, he shall give at least twelve (12) months' advance notice to the EMPLOYER, so that the latter may order his requirement of spares in one lot, if he so desires.

#### SECTION-V Performance of Work

- 55 Execution of work:**
- 55.1 All the Works shall be executed in strict conformity with the provisions of the CONTRACT Documents and with such explanatory detailed drawings, specification and instructions as may be furnished from time to time to the CONTRACTOR by the ENGINEER-IN-CHARGE whether mentioned in the CONTRACT or not. The CONTRACTOR shall be responsible for ensuring that works throughout are executed in the most substantial, proper and workmanlike manner with the quality of material and workmanship in strict accordance with the SPECIFICATIONS and to the entire satisfaction of the ENGINEER-IN-CHARGE. The CONTRACTOR shall provide all necessary materials equipment labour etc. for execution and maintenance of WORK till completion unless otherwise mentioned in the CONTRACT.
- 56 Co-ordination and inspection of work:**
- 56.1 The coordination and inspection of the day-to-day work under the CONTRACT shall be the responsibility of the ENGINEER-IN-CHARGE. The written instruction regarding any particular job will normally be passed by the ENGINEER-IN-CHARGE or his authorized representative. A work order book



	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>	PC-183/ E/ 4023/ S-IV	0	
		DOC. NO.	REV.	
		Page 34 of 65		
<b>GENERAL CONDITIONS OF CONTRACT</b>				

will be maintained by the CONTRACTOR for each sector in which the aforesaid written instructions will be entered. These will be signed by the CONTRACTOR or his authorized representative by way of acknowledgement within 12 hours.

- |           |   |      |   |
|-----------|---|------|---|
| <b>57</b> | <b>Work in monsoon and dewatering:</b>                        | 57.1 | Unless otherwise specified elsewhere in the tender, the execution of the WORK may entail working in the monsoon also. The CONTRACTOR must maintain a minimum labour force as may be required for the job and plan and execute the construction and erection according to the prescribed schedule. No extra rate will be considered for such work in monsoon.  |
|           |   | 57.2 | During monsoon and other period, it shall be the responsibility of the CONTRACTOR to keep the construction work site free from water at his own cost.   |
| <b>58</b> | <b>Work on sundays and holidays:</b>                          | 58.1 | For carrying out Work on Sundays, and Holidays, the CONTRACTOR will approach the ENGINEER-IN-CHARGE or his representative at least two days in advance and obtain permission in writing. The CONTRACTOR shall observe all labour laws and other statutory rules and regulations in force. In case of any violations of such laws, rules and regulations, consequence if any, including the cost thereto shall be exclusively borne by the CONTRACTOR and the EMPLOYER shall have no liability whatsoever on this account.   |
| <b>59</b> | <b>General conditions for construction and erection work:</b> | 59.1 | The working time at the site of work is 48 hours per week. Overtime work is permitted in cases of need and the EMPLOYER will not compensate the same. Shift working at 2 or 3 shifts per day will become necessary and the CONTRACTOR should take this aspect into consideration for formulating his rates for quotation. No extra claims will be entertained by the EMPLOYER on this account. For carrying out work beyond working hours the CONTRACTOR will approach the ENGINEER-IN-CHARGE or his authorized representative and obtain his prior written permission.   |
|           |   | 59.2 | The CONTRACTOR must arrange for the placement of workers in such a way that the delayed completion of the WORK or any part thereof for any reason whatsoever will not affect their proper employment. The EMPLOYER will not entertain any claim for idle time payment whatsoever.   |
|           |   | 59.3 | The CONTRACTOR shall submit to the EMPLOYER/ ENGINEER-IN-CHARGE reports at regular intervals regarding the state and progress of WORK. The details and proforma of the report will mutually be agreed after the award of CONTRACT. The CONTRACTOR shall provide display boards showing progress and labour strengths at worksite, as directed by the ENGINEER-IN-CHARGE.  |
| <b>60</b> | <b>Alterations in specifications, design and extra works:</b> | 60.1 | The WORK covered under this CONTRACT having to be executed by the CONTRACTOR on a lumpsum firm price/item rate quoted by him, the EMPLOYER will not accept any proposals for changes in VALUE OF CONTRACT or extension in time on account of any such changes which may arise to the CONTRACTOR's scope of WORK as a result of detailed Engineering and thereafter during the execution of WORK. The only exception to this will be a case where the EMPLOYER requests in writing to the CONTRACTOR to upgrade the SPECIFICATIONS or the size of any major pieces of equipments, plant or machinery beyond what is normally required to meet the scope of WORK as defined in the CONTRACT DOCUMENT. |
|           |   |      | In such cases, a change order will be initialled by the CONTRACTOR at the appropriate time for the EMPLOYER's prior approval giving the full back-up data for their review and for final settlement of any impact on price within 30 (thirty) days thereafter.  |
|           |   | 60.2 | The ENGINEER-IN-CHARGE shall have to make any alterations in, omission  |



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 35 of 65

from, additions to or substitutions for, the Schedule of Rates, the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the WORK and the CONTRACTOR shall be bound to carry out the such altered/ extra/ new items of WORK in accordance with any instructions which may be given to him in writing signed by the ENGINEER-IN- CHARGE, and such alterations, omissions, additions or substitutions shall not invalidate the CONTRACT and any altered, additional or substituted work which the CONTRACTOR may be directed to do in the manner above specified as part of the WORK shall be carried out by the CONTRACTOR on the same conditions in all respects on which he agreed to do the main WORK. The time of completion of WORK may be extended for the part of the particular job at the discretion of the ENGINEER-IN- CHARGE, for only such alterations, additions or substitutions of the WORK, as he may consider as just and reasonable. The rates for such additional, altered or substituted WORK under this clause shall be worked out in accordance with the following provisions:-

**I. For Item Rate Contract**

- a) If the rates for the additional, altered or substituted WORK are specified in the CONTRACT for the WORK, the CONTRACTOR is bound to carry on the additional, altered or substituted WORK at the same rates as are specified in the CONTRACT.
- b) If the rates for the additional, altered or substituted WORK are not specifically provided in the CONTRACT for the WORK, the rates will be derived from the rates for similar class of WORK as are specified in the CONTRACT for the WORK. The opinion of the ENGINEER-IN- CHARGE, as to whether or not the rates can be reasonably so derived from the items in this CONTRACT will be final and binding on the CONTRACTOR.
- c) If the rates for the altered, additional or substituted WORK cannot be determined in the manner specified in sub-clause(s) (a) and (b) above, then the CONTRACTOR shall, within 7 days of the date of receipt of order to carry out the WORK, inform the ENGINEER-IN-CHARGE of the rates which it is his intention to charge for such class of WORK, supported by analysis of the rate or rates claimed, and the ENGINEER-IN-CHARGE shall determine the rate or rates on the basis of the prevailing market rates, labour cost at schedule of labour rates plus 10% to cover contractor's supervision, overheads and profit and pay the CONTRACTOR accordingly. The opinion of the ENGINEER- IN-CHARGE as to current market rates of materials and the quantum of labour involved per unit of measurement will be final and binding on the CONTRACTOR.
- d) Where the item of work will be executed through nominated specialist agency as approved by the ENGINEER-IN-CHARGE, then the actual amount paid to such nominated agency supported by documentary evidence and as certified by ENGINEER-IN-CHARGE shall be considered plus 10% (ten percent) to cover all contingencies, overhead, profits to arrive at the rates.
- e) Provisions contained in the Sub-clause (a) & (d) above shall, however, not apply for the following:-



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 36 of 65

Where the value of additions of new items together with the value of alterations, additions/ deletions or substitutions does not exceed by or is not less than plus/minus ()25% of the VALUE OF CONTRACT. The item rates in the Schedule of Rates shall hold good for all such variations between the above mentioned limits, irrespective of any increase/decrease of quantities in the individual items of Schedule of Rates.

Where the value of addition of new items together with the value of alterations, additions/ deletions or substitutions reduces more than 25% of the contract value but is within the following limits the tenderer shall be paid compensation for decrease in the value of work, as follows:

S.No.	Range of Variation	Percentage compensation for decrease in the value of work in the respective range.
a)	Beyond (+) 25% upto & inclusive of (+) 50%	No increase and/ or decrease shall be applicable for the Schedule of Rates (The rates quoted for this increase shall be valid).
b)	Beyond (-) 25% upto & inclusive of (-) 50%	For reduction beyond 25% contractor shall be compensated by an amount equivalent to 10% of the reduction in value of the contract as awarded. For example if the actual contract value is 70% of awarded value then compensation shall be 10% of (75-70) i.e. 0.5% of awarded contract value.

**II. For Lumpsum Contracts**

CONTRACTOR shall, within 7 days of the date of receipt of order to carry out the WORK, inform the ENGINEER-IN- CHARGE of the rates which it is his intention to charge for such class of WORK, supported by analysis of the rate or rates claimed, and the ENGINEER-IN-CHARGE shall determine the rate or rates on the basis of the prevailing market rates, labour cost at schedule of labour rates plus 10% to cover contractor's supervision, overheads and profit and pay the CONTRACTOR accordingly. The opinion of the ENGINEER-IN-CHARGE as to current market rates of materials and the quantum of labour involved per unit of measurement will be final and binding on the CONTRACTOR.

**61 Drawings to be supplied by the employer**

- 61.1 The drawings attached with tender are only for the general guidance to the CONTRACTOR to enable him to visualize the type of work contemplated and scope of work involved. The CONTRACTOR will be deemed to have studied the DRAWINGS and formed an idea about the WORK involved.
- 61.2 Detailed working drawings on the basis of which actual execution of the WORK is to proceed, will be furnished from time to time during the progress of the work. The CONTRACTOR shall be deemed to have gone through the DRAWINGS supplied to him thoroughly and carefully and in conjunction with all other connected drawings and bring to the notice of the ENGINEER-IN-CHARGE discrepancies, if any, therein before actually carrying out the Work.
- 61.3 Copies of all detailed working drawings relating to the WORK shall be kept at the CONTRACTOR's office on the site and shall be made available to the



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 37 of 65

ENGINEER-IN- CHARGE at any time during the CONTRACT. The drawings and other documents issued by the EMPLOYER shall be returned to the EMPLOYER on completion of the WORK.

**62 Drawings to be supplied by the contractor:**

62.1 The drawings/date which are to be furnished by the CONTRACTOR are enumerated in the special conditions of contract, and shall be furnished within the specified time.

62.2 Where approval/review of drawings before manufacture/ construction/fabrication has been specified, it shall be CONTRACTOR's responsibility to have these drawings prepared as per the directions of ENGINEER-IN-CHARGE and got approved before proceeding with manufacture/construction/fabrication as the case may be. Any change that may have become necessary in these drawings during the execution of the work shall have to be carried out by the CONTRACTOR to the satisfaction of ENGINEER-IN-CHARGE at no extra cost. All final drawings shall bear the certification stamp as indicated below duly signed by both the CONTRACTOR and ENGINEER-IN-CHARGE.

"Certified true for \_\_\_\_\_ (Name of Work)

Agreement No. \_\_\_\_\_

Signed: \_\_\_\_\_  
(CONTRACTOR)

\_\_\_\_\_  
(ENGINEER-IN-CHARGE)

62.3 The DRAWINGS submitted by the CONTRACTOR shall be reviewed by the ENGINEER-IN-CHARGE as far as practicable within 3 (Three) weeks and shall be modified by the CONTRACTOR, if any modifications and/or corrections are required by the ENGINEER-IN-CHARGE. The CONTRACTOR shall incorporate such modifications and/or corrections and submit the final drawings for approval. Any delays arising out of failure by the CONTRACTOR to rectify the drawing in good time shall not alter the Contract Completion Time.

62.4 As built drawings showing all corrections, adjustments etc. shall be furnished by the CONTRACTOR in six copies and one transparent for record purposed to the EMPLOYER.

**63 Setting out works:**

63.1 The ENGINEER-IN-CHARGE shall furnish the CONTRACTOR with only the four corners of the Works site and a level bench mark and the CONTRACTOR shall set out the Works and shall provide an efficient staff for the purpose and shall be solely responsible for the accuracy of such setting out.

63.2 The CONTRACTOR shall provide, fix and be responsible for the maintenance of all stakes, templates, level marks, profiles and other similar things and shall take all necessary precautions to prevent their removal or disturbance and shall be responsible for the consequence of such removal or disturbance should the same take place and for their efficient and timely reinstatement. The CONTRACTOR shall also be responsible for the maintenance of all existing survey marks, boundary marks, distance marks and center line marks, either existing or supplied and fixed by the CONTRACTOR. The work shall be set out to the satisfaction of the ENGINEER-IN-CHARGE. The approval there of joining with the CONTRACTOR by the ENGINEER- IN-CHARGE in setting out the work, shall not relieve the CONTRACTOR of any of his responsibility.

63.3 Before beginning the Works, the CONTRACTOR shall at his own cost, provide all necessary reference and level posts, pegs, bamboos, flags, ranging rods, strings and other materials for proper layout of the works in accordance with the schemes for bearing marks acceptable to the ENGINEER-IN-CHARGE. The center, longitudinal or face lines and cross lines shall be marked by means of small masonry pillars. Each pillar shall have distinct mark at the centre to enable



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 38 of 65

theodolite to be set over it. No work shall be started until all these points are checked and approved by the ENGINEER-IN-CHARGE in writing but such approval shall not relieve the CONTRACTOR of any of his responsibilities. The CONTRACTOR shall also provide all labour, material and other facilities, as necessary, for the proper checking of layout and inspection of the points during construction.

- 63.4 Pillars bearing geodetic marks located at the sites of units of WORKS under construction should be protected and fenced by the CONTRACTOR.
- 63.5 On completion of WORK, the CONTRACTOR must submit the geodetic documents according to which the WORK was carried out.
- 64 Responsibility for level and alignment:**
- 64.1 The CONTRACTOR shall be entirely and exclusively responsible for the horizontal and vertical alignment, the levels and correctness of every part of the WORK and shall rectify effectively any errors or imperfections therein, such rectifications shall be carried out by the CONTRACTOR, at his own cost, when instructions are issued to that effect by the ENGINEER- IN-CHARGE.
- 65 Materials to be supplied by contractor:**
- 65.1 The CONTRACTOR shall procure and provide within the VALUE OF CONTRACT the whole of the materials required for the construction including steels, cement and other building materials, tools, tackles, construction plant and equipment for the completion and maintenance of the WORK except the materials which will be issued by the EMPLOYER and shall make his own arrangement for procuring such materials and for the transport thereof. The EMPLOYER may give necessary recommendation to the respective authority if so desired by the CONTRACTOR but assumes no further responsibility of any nature. The EMPLOYER will insist on the procurement of materials which bear ISI stamp and/or which are supplied by reputed suppliers.
- 65.2 The CONTRACTOR shall properly store all materials either issued to him or brought by him to the SITE to prevent damages due to rain, wind, direct exposure to sun, etc. as also from theft, pilferage, etc. for proper and speedy execution of his works. The CONTRACTOR shall maintain sufficient stocks of all materials required by him.
- 65.3 No material shall be dispatched from the CONTRACTOR's stores before obtaining the approval in writing of the ENGINEER-IN-CHARGE.
- 66 Stores supplied by the employer:**
- (Clause not applicable for this Tender)
- 66.1 If the SPECIFICATION of the WORK provides for the use of any material of special description to be supplied from the EMPLOYER's stores or it is required that the CONTRACTOR shall use certain stores to be provided by the ENGINEER-IN-CHARGE, such materials and stores, and price to be charged there for as hereinafter mentioned being so far as practicable for the convenience of the CONTRACTOR, but not so as in any way to control the meaning or effect of the CONTRACT, the CONTRACTOR shall be bound to purchase and shall be supplied such materials and stores as are from time to time required to be used by him for the purpose of the CONTRACT only. The sums due from the CONTRACTOR for the value of materials supplied by the EMPLOYER will be recovered from the running account bill on the basis of the actual consumption of materials in the works covered and for which the running account bill has been prepared. After the completion of the WORK, however, the CONTRACTOR has to account for the full quantity of materials supplied to him as per relevant clauses in this document.
- 66.2 The value of the stores/materials as may be supplied to the CONTRACTOR by the EMPLOYER will be debited to the CONTRACTOR's account at the rates shown in the schedule of materials and if they are not entered in the schedule, they will be debited at cost price, which for the purpose of the CONTRACT shall include the cost of carriage and all other expenses whatsoever such as normal



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 39 of 65

storage supervision charges which shall have been incurred in obtaining the same at the EMPLOYER's stores. All materials so supplied to the CONTRACTOR shall remain the absolute property of the EMPLOYER and shall not be removed on any account from the SITE of the WORK, and shall be at all times open for inspection to the ENGINEER-IN-CHARGE. Any such materials remaining unused at the time of the completion or termination of the CONTRACT shall be returned to the EMPLOYER's stores or at a place as directed by the ENGINEER-IN-CHARGE in perfectly good condition at CONTRACTOR's cost.

**67 Conditions for issue of materials:**

**(Clause not applicable for this Tender)**

- 67.1 i) Materials specified as to be issued by the EMPLOYER will be supplied to the CONTRACTOR by the EMPLOYER from his stores. It shall be responsibility of the CONTRACTOR to take delivery of the materials and arrange for its loading, transport and unloading at the SITE of WORK at his own cost. The materials shall be issued between the working hours and as per the rules of the EMPLOYER as framed from time to time.
- ii) The CONTRACTOR shall bear all incidental charges for the storage and safe custody of materials at site after these have been issued to him.
- iii) Materials specified as to be issued by the EMPLOYER shall be issued in standard sizes as obtained from the manufacturers.
- iv) The CONTRACTOR shall construct suitable Godowns at the SITE of WORK for storing the materials safe against damage by rain, dampness, fire, theft etc. He shall also employ necessary watch and ward establishment for the purpose.
- v) It shall be duty of the CONTRACTOR to inspect the materials supplied to him at the time of taking delivery and satisfy himself that they are in good condition. After the materials have been delivered by the EMPLOYER, it shall be the responsibility of the CONTRACTOR to keep them in good condition and if the materials are damaged or lost, at any time, they shall be repaired and/or replaced by him at his own cost according to the instructions of the ENGINEER-IN-CHARGE.
- vi) The EMPLOYER shall not be liable for delay in supply or non-supply of any materials which the EMPLOYER has undertaken to supply where such failure or delay is due to natural calamities, act of enemies, transport and procurement difficulties and any circumstances beyond the control of the EMPLOYER. In no case, the CONTRACTOR shall be entitled to claim any compensation or loss suffered by him on this account.
- vii) It shall be responsibility of the CONTRACTOR to arrange in time all materials required for the WORK other than those to be supplied by the EMPLOYER. If, however, in the opinion of the ENGINEER-IN-CHARGE the execution of the WORK is likely to be delayed due to the CONTRACTOR's inability to make arrangements for supply of materials which normally he has to arrange for, the ENGINEER-IN-CHARGE shall have the right at his own discretion to issue such materials, if available with the EMPLOYER or procure the materials from the market or as elsewhere and the CONTRACTOR will be bound to take such materials at the rates decided by the ENGINEER-IN-CHARGE. This, however, does not in any way absolve the CONTRACTOR from responsibility of making arrangements for the supply of such materials in part or in full, should such a situation occur nor shall this constitute a reason for the delay in the execution of the WORK.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 40 of 65

- viii) None of the materials supplied to the CONTRACTOR will be utilized by the CONTRACTOR for manufacturing item which can be obtained as supplied from standard manufacturer in finished form.
- ix) The CONTRACTOR shall, if desired by the ENGINEER-IN-CHARGE, be required to execute an Indemnity Bond in the prescribed form for safe custody and accounting of all materials issued by the EMPLOYER.
- x) The CONTRACTOR shall furnish to the ENGINEER-IN-CHARGE sufficiently in advance a statement showing his requirement of the quantities of the materials to be supplied by the EMPLOYER and the time when the same will be required by him for the works, so as to enable the ENGINEER-IN-CHARGE to make necessary arrangements for procurement and supply of the material.
- xi) Account of the materials issued by the EMPLOYER shall be maintained by CONTRACTOR indicating the daily receipt, consumption and balance in hand. This account shall be maintained in a manner prescribed by the ENGINEER-IN-CHARGE along with all connected papers viz. requisitions, issues, etc., and shall be always available for inspection in the CONTRACTOR's office at SITE.
- xii) The CONTRACTOR should see that only the required quantities of materials are got issued. The CONTRACTOR shall not be entitled to cartage and incidental charges for returning the surplus materials, if any, to the stores wherefrom they were issued or to the place as directed by the ENGINEER-IN-CHARGE.
- xiii) Materials/ Equipment(s) supplied by EMPLOYER shall not be utilized for any purpose(s) than issued for.
- 68 Material procured with assistance of employer/ return of surplus:** 68.1 Notwithstanding anything contained to the contrary in any or all the clauses of this CONTRACT where any materials for the execution of the CONTRACT are procured with the assistance of the EMPLOYER either by issue from EMPLOYER's stock or purchases made under order or permits or licenses issued by Government, the CONTRACTOR shall hold the said materials as trustee for the EMPLOYER and use such materials economically and solely for the purpose of the CONTRACT and not dispose them off without the permission of the EMPLOYER and return, if required by the ENGINEER-IN-CHARGE, shall determine having due regard to the condition of the materials. The price allowed to the CONTRACTOR, however, shall not exceed the amount charged to him excluding the storage charges, if any. The decision of the ENGINEER-IN-CHARGE shall be final and conclusive in such matters. In the event of breach of the aforesaid condition, the CONTRACTOR shall, in terms of the licenses or permits and/or criminal breach of trust, be liable to compensate the EMPLOYER at double rate or any higher rate, in the event of those materials at that time having higher rate or not being available in the market, then any other rate to be determined by the ENGINEER-IN-CHARGE and his decision shall be final and conclusive.
- (Clause not applicable for this Tender)
- 69 Materials obtained from dismantling:** 69.1 If the CONTRACTOR in the course of execution of the WORK is called upon to dismantle any part for reasons other than those stipulated in Clauses 74 and 77 hereunder, the materials obtained in the WORK of dismantling etc., will be considered as the EMPLOYER's property and will be disposed off to the best advantage of the EMPLOYER.
- 70 Articles of value found:** 70.1 All gold, silver and other minerals of any description and all precious stones, coins, treasure relics, antiquities and other similar things which shall be found in, under or upon the SITE, shall be the property of the EMPLOYER and the



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 41 of 65

CONTRACTOR shall duly preserve the same to the satisfaction of the ENGINEER-IN-CHARGE and shall from time to time deliver the same to such person or persons indicated by the EMPLOYER.

**71 Discrepancies between instructions:**

71.1

Should any discrepancy occur between the various instructions furnished to the CONTRACTOR, his agent or staff or any doubt arises as to the meaning of any such instructions or should there be any misunderstanding between the CONTRACTOR's staff and the ENGINEER-IN-CHARGE's staff, the CONTRACTOR shall refer the matter immediately in writing to the ENGINEER-IN-CHARGE whose decision thereon shall be final and conclusive and no claim for losses alleged to have been caused by such discrepancies between instructions, doubts, or misunderstanding shall in any event be admissible.

**72 Action where no specification is issued:**

72.1

In case of any class of WORK for which there is no SPECIFICATION supplied by the EMPLOYER as mentioned in the Tender Documents such WORK shall be carried out in accordance with Indian Standard Specifications and if the Indian Standard Specifications do not cover the same, the WORK should be carried out as per standard Engineering Practice subject to the approval of the ENGINEER-IN-CHARGE.

**73 Inspection of works:**

73.1

The ENGINEER-IN-CHARGE will have full power and authority to inspect the WORK at any time wherever in progress either on the SITE or at the CONTRACTOR's premises/workshops wherever situated, premises/ workshops of any person, firm or corporation where WORK in connection with the CONTRACT may be in hand or where materials are being or are to be supplied, and the CONTRACTOR shall afford or procure for the ENGINEER-IN-CHARGE every facility and assistance to carry out such inspection. The CONTRACTOR shall, at all time during the usual working hours and at all other time at which reasonable notice of the intention of the ENGINEER-IN-CHARGE or his representative to visit the WORK shall have been given to the CONTRACTOR, either himself be present or receive orders and instructions, or have a responsible agent duly accredited in writing, present for the purpose. Orders given to the CONTRACTOR's agent shall be considered to have the same force as if they had been given to the CONTRACTOR himself. The CONTRACTOR shall give not less than seven days notice in writing to the ENGINEER-IN-CHARGE before covering up or otherwise placing beyond reach of inspection and measurement of any work in order that the same may be inspected and measured. In the event of breach of above the same shall be uncovered at CONTRACTOR's expense for carrying out such measurement or inspection.

73.2

No material shall be dispatched from the CONTRACTOR's stores before obtaining the approval in writing of the Engineer-in-Charge.

The CONTRACTOR is to provide at all time during the progress of the WORK and the maintenance period, proper means of access with ladders, gangways etc. and the necessary attendance to move and adopt as directed for inspection or measurements of the WORK by the ENGINEER-IN-CHARGE.

73.3

The CONTRACTOR shall make available to the ENGINEER-IN-CHARGE free of cost all necessary instruments and assistance in checking or setting out of WORK and in the checking of any WORK made by the CONTRACTOR for the purpose of setting out and taking measurements of WORK.

**74 Tests for quality of work:**

74.1

All workmanship shall be of the respective kinds described in the CONTRACT DOCUMENTS and in accordance with the instructions of the ENGINEER-IN-CHARGE and shall be subjected from time to time to such test at CONTRACTOR's cost as the ENGINEER-IN-CHARGE may direct at the place of manufacture or fabrication or on the site or at all or any such places. The CONTRACTOR shall provide assistance, instruments, labour and materials as are





**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 42 of 65

normally required for examining, measuring and testing any workmanship as may be selected and required by the ENGINEER-IN-CHARGE.

- 74.2 All the tests that will be necessary in connection with the execution of the WORK as decided by the ENGINEER- IN-CHARGE shall be carried out at the field testing laboratory of the EMPLOYER by paying the charges as decided by the EMPLOYER from time to time. In case of non- availability of testing facility with the EMPLOYER, the required test shall be carried out at the cost of CONTRACTOR at Government or any other testing laboratory as directed by ENGINEER-IN-CHARGE.
- 74.3 If any tests are required to be carried out in conjunction with the WORK or materials or workmanship not supplied by the CONTRACTOR, such tests shall be carried out by the CONTRACTOR as per instructions of ENGINEER-IN-CHARGE and cost of such tests shall be reimbursed by the EMPLOYER.
- 75 Samples for approval:** 75.1 The CONTRACTOR shall furnish to the ENGINEER-IN-CHARGE for approval, when requested or if required by the specifications, adequate samples of all materials and finished to be used in the WORK. Such samples shall be submitted before the WORK is commenced and in ample time to permit tests and examinations thereof. All materials furnished and finishes applied in actual WORK shall be fully equal to the approved samples.
- 76 Action and compensation in case of bad work:** 76.1 If it shall appear to the ENGINEER-IN-CHARGE that any work has been executed with unsound, imperfect or unskilled workmanship, or with materials of any inferior description, or that any materials or articles provided by the CONTRACTOR for the execution of the WORK are unsound, or of a quality inferior to that contracted for, or otherwise not in accordance with the CONTRACT, the CONTRACTOR shall on demand in writing from the ENGINEER-IN-CHARGE or his authorized representative specifying the WORK, materials or articles complained of notwithstanding that the same may have been inadvertently passed, certified and paid for, forthwith rectify or remove and reconstruct the WORK so specified and provide other proper and suitable materials or articles at his own cost and in the event of failure to do so within the period specified by the ENGINEER-IN-CHARGE in his demand aforesaid, the CONTRACTOR shall be liable to pay compensation at the rate of 1% (One percent) of the estimated cost of the whole WORK, for every week limited to a maximum of 10% (ten percent) of the value of the whole WORK, while his failure to do so shall continue and in the case of any such failure the ENGINEER-IN-CHARGE may on expiry of notice period rectify or remove and re-execute the WORK or remove and replaced with others, the materials or articles complained of to as the case may be at the risk and expense in all respects of the CONTRACTOR. The decision of the Engineering-in-charge as to any question arising under this clause shall be final and conclusive.
- 77 Suspension of works:** 77.1 i) Subject to the provisions of sub-para (ii) of this clause, the CONTRACTOR shall, if ordered in writing by the ENGINEER-IN-CHARGE, or his representative, temporarily suspend the WORKS or any part thereof for such written order, proceed with the WORK therein ordered to be suspended until, he shall have received a written order to proceed therewith. The CONTRACTOR shall not be entitled to claim compensation for any loss or damage sustained by him by reason of temporary suspension of the WORKS aforesaid. An extension of time for completion, corresponding with the delay caused by any such suspension of the WORKS as aforesaid will be granted to the CONTRACTOR should he apply for the same provided that the suspension was not consequent to any default or failure on the part of the CONTRACTOR.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 43 of 65

- ii) In case of suspensions of entire WORK, ordered in writing by ENGINEER-IN-CHARGE, for a period of more than two months, the CONTRACTOR shall have the option to terminate the CONTRACT.
- 78 Employer may do part of work:** 78.1 Upon failure of the CONTRACTOR to comply with any instructions given in accordance with the provisions of this CONTRACT the EMPLOYER has the alternative right, instead of assuming charge of entire WORK, to place additional labour force, tools, equipments and materials on such parts of the WORK, as the EMPLOYER may designate or also engage another CONTRACTOR to carry out the WORK. In such cases, the EMPLOYER shall deduct from the amount which otherwise might become due to the CONTRACTOR, the cost of such work and material with ten percent (10%) added to cover all departmental charges and should the total amount thereof exceed the amount due to the CONTRACTOR, the CONTRACTOR shall pay the difference to the EMPLOYER.
- 79 Possession prior to completion:** 79.1 The ENGINEER-IN-CHARGE shall have the right to take possession of or use any completed or partially completed WORK or part of the WORK. Such possession or use shall not be deemed to be an acceptance of any work completed in accordance with the CONTRACT agreement. If such prior possession or use by the ENGINEER-IN-CHARGE delays the progress of WORK, equitable adjustment in the time of completion will be made and the CONTRACT agreement shall be deemed to be modified accordingly.
- 80 (Defects liability period) twelve months period of liability from the date of issue of completion certificate:** 80.1 The CONTRACTOR shall guarantee the installation/WORK for a period of 12 months from the date of completion of WORK as certified by the ENGINEER-IN-CHARGE which is indicated in the Completion Certificate. Any damage or defect that may arise or lie undiscovered at the time of issue of Completion Certificate, connected in any way with the equipment or materials supplied by him or in the workmanship, shall be rectified or replaced by the CONTRACTOR at his own expense as deemed necessary by the ENGINEER-IN-CHARGE or in default, the ENGINEER-IN-CHARGE may carry out such works by other work and deduct actual cost incurred towards labour, supervision and materials consumables or otherwise plus 100% towards overheads (of which the certificate of ENGINEER-IN-CHARGE shall be final) from any sums that may then be or at any time thereafter, become due to the CONTRACTOR or from his Contract Performance Security, or the proceeds of sale thereof or a sufficient part on thereof.
- 80.2 If the CONTRACTOR feels that any variation in WORK or in quality of materials or proportions would be beneficial or necessary to fulfil the guarantees called for, he shall bring this to the notice of the ENGINEER-IN-CHARGE in writing.
- If during the period of liability any portion of the WORK/equipment, is found defective and is rectified/ replaced, the period of liability for such equipment/ portion of WORK shall be operative from the date such rectification/ replacement are carried out and Contract Performance Guarantee shall be furnished separately for the extended period of liability for that portion of WORK/ equipment only. Notwithstanding the above provisions the supplier's, guarantees/warranties for the replaced equipment shall also be passed on to the EMPLOYER.
- 80.3 LIMITATION OF LIABILITY
- Notwithstanding anything contrary contained herein, the aggregate total liability of CONTRACTOR under the Agreement or otherwise shall be limited to 100% of Agreement / Contract Value. However, neither party shall be liable to the other party for any indirect and consequential damages, loss of profits or loss of production.
- 81 Care of works:** 81.0 From the commencement to completion of the WORK, the CONTRACTOR shall



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 44 of 65

take full responsibility for the care for all works including all temporary works and in case any damages, loss or injury shall happen to the WORK or to any part thereof or to any temporary works from any cause whatsoever, shall at his own cost repair and make good the same so that at completion the WORK shall be in good order and in conformity in every respects with the requirement of the CONTRACT and the ENGINEER-IN-CHARGE's instructions.

**81.1 DEFECTS PRIOR TO TAKING OVER:**

If at any time, before the WORK is taken over, the ENGINEER-IN-CHARGE shall:

- a) Decide that any works done or materials used by the CONTRACTOR or by any SUB-CONTRACTOR is defective or not in accordance with the CONTRACT, or that the works or any portion thereof are defective, or do not fulfill the requirements of CONTRACT (all such matters being hereinafter, called 'Defects' in this clause), and
- b) As soon as reasonably practicable, gives to the CONTRACTOR notice in writing of the said decision, specifying particulars of the defects alleged to exist or to have occurred, then the CONTRACTOR shall at his own expenses and with all speed make good the defects so specified.

In case CONTRACTOR shall fail to do so, the EMPLOYER may take, at the cost of the CONTRACTOR, such steps as may in all circumstances, be reasonable to make good such defects. The expenditure so incurred by the EMPLOYER will be recovered from the amount due to the CONTRACTOR. The decision of the ENGINEER-IN-CHARGE with regard to the amount to be recovered from the CONTRACTOR will be final and binding on the CONTRACTOR. As soon as the WORK has been completed in accordance with the CONTRACT (except in minor respects that do not affect their use for the purpose for which they are intended and except for maintenance there of provided in clause 80.1 of General Conditions of Contract) and have passed the tests on completion, the ENGINEER-IN-CHARGE shall issue a certificate (hereinafter called Completion Certificate) in which he shall certify the date on which the WORK have been so completed and have passed the said tests and the EMPLOYER shall be deemed to have taken over the WORK on the date so certified. If the WORK has been divided into various groups in the CONTRACT, the EMPLOYER shall be entitled to take over any group or groups before the other or others and there upon the ENGINEER-IN-CHARGE shall issue a Completion Certificate which will, however, be for such group or groups so taken over only. In such an event if the group /section/ part so taken over is related, to the integrated system of the work, not withstanding date of grant of Completion Certificate for group/ section/ part. The period of liability in respect of such group/ section/ part shall extend 12 (twelve) months from the date of completion of WORK.

**81.2 DEFECTS AFTER TAKING OVER:**

In order that the CONTRACTOR could obtain a COMPLETION CERTIFICATE he shall make good, with all possible speed, any defect arising from the defective materials supplied by the CONTRACTOR or workmanship or any act or omission of the CONTRACT or that may have been noticed or developed, after the works or groups of the works has been taken over, the period allowed for carrying out such WORK will be normally one month. If any defect be not remedied within a reasonable time, the EMPLOYER may proceed to do the WORK at CONTRACTOR's risk and expense and deduct from the final bill such amount as may be decided by the EMPLOYER.

If by reason of any default on the part of the CONTRACTOR a COMPLETION CERTIFICATE has not been issued in respect of any portion of the WORK within



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 45 of 65

one month after the date fixed by the CONTRACT for the completion of the WORK, the EMPLOYER shall be at liberty to use the WORK or any portion thereof in respect of which a completion certificate has not been issued, provided that the WORK or the portion thereof so used as aforesaid shall be afforded reasonable opportunity for completing these works for the issue of Completion Certificate.

- 82 Guarantee/transfer of guarantee:** 82.1 For works like water-proofing, acid and alkali resisting materials, pre-construction soil treatment against termite or any other specialized works etc. the CONTRACTOR shall invariably engage SUB-CONTRACTORS who are specialists in the field and firms of repute and such a SUB-CONTRACTOR shall furnish guarantees for their workmanship to the EMPLOYER, through the CONTRACTOR. In case such a SUB-CONTRACTOR/ firm is not prepared to furnish a guarantee to the EMPLOYER, the CONTRACTOR shall give that guarantee to the EMPLOYER directly.
- 83 Training of employer's personnel:** 83.1 The CONTRACTOR undertakes to provide training to Engineering personnel selected and sent by the EMPLOYER at the works of the CONTRACTOR without any cost to the EMPLOYER. The period and the nature of training for the individual personnel shall be agreed upon mutually between the CONTRACTOR and the EMPLOYER. These engineering personnel shall be given special training at the shops, where the equipment will be manufactured and/ or in their collaborator's works and where possible, in any other plant where equipment manufactured by the CONTRACTOR or his collaborators is under installation or test to enable those personnel to become familiar with the equipment being furnished by the CONTRACTOR. EMPLOYER shall bear only the to and fro fare of the said engineering personnel.
- 84 Replacement of defective parts and materials:** 84.1 If during the progress of the WORK, EMPLOYER shall decide and inform in writing to the CONTRACTOR, that the CONTRACTOR has manufactured any plant or part of the plant unsound or imperfect or has furnished plant inferior to the quality specified, the CONTRACTOR on receiving details of such defects or deficiencies shall at his own expenses within 7 (seven) days of his receiving the notice, or otherwise within such time as may be reasonably necessary for making it good, proceed to alter, re-construct or remove such work and furnish fresh equipments up to the standards of the specifications. In case the CONTRACTOR fails to do so, EMPLOYER may on giving the CONTRACTOR 7 (seven) day's notice in writing of his intentions to do so, proceed to remove the portion of the WORK so complained of and at the cost of CONTRACTOR's, perform all such works or furnish all such equipments provided that nothing in the clause shall be deemed to deprive the EMPLOYER of or affect any rights under the CONTRACT, the EMPLOYER may otherwise have in respect of such defects and deficiencies.
- 84.2 The CONTRACTOR's full and extreme liability under this clause shall be satisfied by the payments to the EMPLOYER of the extra cost, of such replacements procured including erection/installation as provided for in the CONTRACT; such extra cost being the ascertained difference between the price paid by the EMPLOYER for such replacements and the CONTRACT price portion for such defective plants and repayments of any sum paid by the EMPLOYER to the CONTRACTOR in respect of such defective plant. Should the EMPLOYER not so replace the defective plant the CONTRACTOR's extreme liability under this clause shall be limited to the repayment of all such sums paid by the EMPLOYER under the CONTRACT for such defective plant.
- 85 Indemnity** 85.1 If any action is brought before a Court, Tribunal or any other Authority against the Employer or an officer or agent of the EMPLOYER, for the failure, omission or neglect on the part of the CONTRACTOR to perform any acts, matters, covenants or things under the CONTRACT, or damage or injury caused by the



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 46 of 65

alleged omission or negligence on the part of the CONTRACTOR, his agents, representatives or his SUB- CONTRACTOR's, or in connection with any claim based on lawful demands of SUB-CONTRACTOR's workmen suppliers or employees, the CONTRACTOR, shall in such cases indemnify and keep the EMPLOYER and/or their representatives harmless from all losses, damages, expenses or decrees arising out of such action.

**86 Construction aids,  
equipments, tools & tackles:**

86.1

CONTRACTOR shall be solely responsible for making available for executing the WORK, all requisite CONSTRUCTION EQUIPMENTS, Special Aids, Barges, Cranes and the like, all Tools, Tackles and Testing Equipment and Appliances, including imports of such equipment etc. as required. In case of import of the same the rates applicable for levying of Custom Duty on such Equipment, Tools, & Tackles and the duty drawback applicable thereon shall be ascertained by the CONTRACTOR from the concerned authorities of Government of India. It shall be clearly understood that EMPLOYER shall not in any way be responsible for arranging to obtain Custom Clearance and/or payment of any duties and/or duty draw backs etc. for such equipments so imported by the CONTRACTOR and the CONTRACTOR shall be fully responsible for all taxes, duties and documentation with regard to the same. Tenderer in his own interest may contact, for any clarifications in the matter, concerned agencies/Dept./Ministries of Govt. of India. All clarifications so obtained and interpretations thereof shall be solely the responsibility of the CONTRACTOR.

**SECTION-VI Certificates and Payments**

**87 Schedule of rates and  
payments:**

87.1

**i) CONTRACTOR'S REMUNERATION:**

The price to be paid by the EMPLOYER to CONTRACTOR for the whole of the WORK to be done and for the performance of all the obligations undertaken by the CONTRACTOR under the CONTRACT DOCUMENTS shall be ascertained by the application of the respective Schedule of Rates (the inclusive nature of which is more particularly defined by way of application but not of limitation, with the succeeding sub-clause of this clause) and payment to be made accordingly for the WORK actually executed and approved by the ENGINEER-IN-CHARGE. The sum so ascertained shall (excepting only as and to the extent expressly provided herein) constitute the sole and inclusive remuneration of the CONTRACTOR under the CONTRACT and no further or other payment whatsoever shall be or become due or payable to the CONTRACTOR under the CONTRACT.

**ii) SCHEDULE OF RATES TO BE INCLUSIVE:**

The prices/rates quoted by the CONTRACTOR shall remain firm till the issue of FINAL CERTIFICATE and shall not be subject to escalation. Schedule of Rates shall be deemed to include and cover all costs, expenses and liabilities of every description and all risks of every kind to be taken in executing, completing and handing over the WORK to the EMPLOYER by the CONTRACTOR. The CONTRACTOR shall be deemed to have known the nature, scope, magnitude and the extent of the WORK and materials required though the CONTRACT DOCUMENT may not fully and precisely furnish them. Tenderer's shall make such provision in the Schedule of Rates as he may consider necessary to cover the cost of such items of WORK and materials as may be reasonable and necessary to complete the WORK. The opinion of the ENGINEER-IN-CHARGE as to the items of WORK which are necessary and reasonable for COMPLETION OF WORK shall be final and binding on the CONTRACTOR, although the same may not be shown on or described specifically in CONTRACT DOCUMENTS.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

**GENERAL CONDITIONS OF CONTRACT**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



Page 47 of 65

Generality of this present provision shall not be deemed to cut down or limit in any way because in certain cases it may and in other cases it may not be expressly stated that the CONTRACTOR shall do or perform a work or supply articles or perform services at his own cost or without addition of payment or without extra charge or words to the same effect or that it may be stated or not stated that the same are included in and covered by the Schedule of Rates.

iii) SCHEDULE OF RATES TO COVER CONSTRUCTION EQUIPMENTS, MATERIALS, LABOUR ETC.:

Without in any way limiting the provisions of the preceding sub-clause the Schedule of Rates shall be deemed to include and cover the cost of all construction equipment, temporary WORK (except as provided for herein), pumps, materials, labour, insurance, fuel, consumables, stores and appliances to be supplied by the CONTRACTOR and all other matters in connection with each item in the Schedule of Rates and the execution of the WORK or any portion thereof finished, complete in every respect and maintained as shown or described in the CONTRACT DOCUMENTS or as may be ordered in writing during the continuance of the CONTRACT.

iv) SCHEDULE OF RATES TO COVER ROYALTIES, RENTS AND CLAIMS:

The Schedule of Rates (i.e., VALUE OF CONTRACT) shall be deemed to include and cover the cost of all royalties and fees for the articles and processes, protected by letters, patent or otherwise incorporated in or used in connection with the WORK, also all royalties, rents and other payments in connection with obtaining materials of whatsoever kind for the WORK and shall include an indemnity to the EMPLOYER which the CONTRACTOR hereby gives against all actions, proceedings, claims, damages, costs and expenses arising from the incorporation in or use on the WORK of any such articles, processes or materials, octroi or other municipal or local Board Charges, if levied on materials, equipment or machineries to be brought to site for use on WORK shall be borne by the CONTRACTOR.

v) SCHEDULE OF RATES TO COVER TAXES AND DUTIES:

No exemption or reduction of Customs Duties, Excise Duties, Sales Tax, Sales Tax on works Contract quay or any port dues, transport charges, stamp duties or Central or State Government or local Body or Municipal Taxes or duties, taxes or charges (from or of any other body), whatsoever, will be granted or obtained, all of which expenses shall be deemed to be included in and covered by the Schedule or Rates. The CONTRACTOR shall also obtain and pay for all permits or other privileges necessary to complete the WORK.

vi) SCHEDULE OF RATES TO COVER RISKS OF DELAY:

The Schedule of Rates shall be deemed to include and cover the risk of all possibilities of delay and interference with the CONTRACTOR's conduct of WORK which occur from any causes including orders of the EMPLOYER in the exercise of his power and on account of extension of time granted due to various reasons and for all other possible or probable causes of delay.

vii) SCHEDULE OF RATES CANNOT BE ALTERED:



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 48 of 65

For WORK under unit rate basis, no alteration will be allowed in the Schedule of Rates by reason of works or any part of them being modified, altered, extended, diminished or committed. The Schedule of Rates are fully inclusive of rates which have been fixed by the CONTRACTOR and agreed to by the EMPLOYER and cannot be altered.

For lumpsum CONTRACTS, the payment will be made according to the WORK actually carried out, for which purpose an item wise, or work wise Schedule of Rates shall be furnished, suitable for evaluating the value of WORK done and preparing running account bill.

Payment for any additional work which is not covered in the Schedule of Rates, shall only be released on issuance of change order.

**88 Procedure for measurement and billing of work in progress:**

**88.1 BILLING PROCEDURE:**

Following procedures shall be adopted for billing of works executed by the CONTRACTOR.

88.1.1 All measurements shall be recorded in sixuplicate on standard measurement sheets supplied by EMPLOYER and submitted to EMPLOYER/CONSULTANT for scrutiny and passing.

88.1.2 EMPLOYER/CONSULTANT shall scrutinize and check the measurements recorded on the sheets and shall certify correctness of the same on the measurement sheets.

88.1.3 ENGINEER-IN-CHARGE shall pass the bills after carrying out the comprehensive checks in accordance with the terms and conditions of the CONTRACTS, within 7 days of submission of the bills, complete in all respects and send the same to the Employer to effect payment to the CONTRACTOR.

88.1.4 TFL shall make all Endeavour to make payments of undisputed amount of the bills submitted based on the joint measurements within 15 (Fifteen) days from the date of certification by the Engineer-in-Charge.

88.1.5 Measurements shall be recorded as per the methods of measurement spelt out in EMPLOYER/CONSULTANT SPECIFICATIONS / CONTRACT DOCUMENT. EMPLOYER/CONSULTANT shall be fully responsible for checking the measurements quantitatively and qualitatively as recorded in the Measurement Books/ Bills.



88.1.6 While preparing the final bills overall measurements will not be taken again. Only volume of work executed since the last measured bill along with summary of final measurements will be considered for the final bill. However, a detailed check shall be made as to missing measurements and in case there are any missing items or measurements the same shall be recorded.

**88.2 SECURED ADVANCE ON MATERIAL:**

Unless otherwise provided elsewhere in the tender, no 'Secured Advance' on security of materials brought to site for execution of contracted items(s) shall be paid to the Contractor whatsoever.

**88.3 DISPUTE IN MODE OF MEASUREMENT:**

In case of any dispute as to the mode of measurement not covered by the CONTRACT to be adopted for any item of WORK, mode of measurement as per

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>	PC-183/ E/ 4023/ S-IV	0	
		DOC. NO.	REV.	
		Page 49 of 65		
<b>GENERAL CONDITIONS OF CONTRACT</b>				

latest Indian Standard Specifications shall be followed.

88.4 ROUNDING OF AMOUNTS:

In calculating the amount of each item due to the CONTRACTOR in every certificate prepared for payment, sum of less than 50 paise shall be omitted and the total amount on each certificate shall be rounded off to the nearest rupees, i.e., sum of less than 50 paise shall be omitted and sums of 50 paise and more upto one rupee shall be reckoned as one rupee.

- 89 Lumpsum in tender:** 89.1 The payment against any Lumpsum item shall be made only on completion of that item as per the provision of the CONTRACT after certification by ENGINEER-IN-CHARGE.
- 90 Running account payments to be regarded as advance:** 90.1 All running account payments shall be regarded as payment by way of advance against the final payment only and not as payments for WORK actually done and completed and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected or be considered as an admission of the due performance of the CONTRACT, or any part thereof, in this respect, or of the accruing of any claim by the CONTRACTOR, nor shall it conclude, determine or affect in any way the powers of the EMPLOYER under these conditions or any of them as to the final settlement and adjustment of the accounts or otherwise, or in any other way vary or affect the CONTRACT. The final bill shall be submitted by the CONTRACTOR within one month of the date of physical completion of the WORK, otherwise, the ENGINEER-IN-CHARGE's certificate of the measurement and of total amount payable for the WORK accordingly shall be final and binding on all parties
- 91 Notice of claims for additional payments:** 91.1 Should the CONTRACTOR consider that he is entitled to any extra payment for any extra/additional WORKS or MATERIAL change in original SPECIFICATIONS carried out by him in respect of WORK he shall forthwith give notice in writing to the ENGINEER-IN-CHARGE that he claims extra payment. Such notice shall be given to the ENGINEER-IN-CHARGE upon which CONTRACTOR bases such claims and such notice shall contain full particulars of the nature of such claim with full details of amount claimed. Irrespective of any provision in the CONTRACT to the contrary, the CONTRACTOR must intimate his intention to lodge claim on the EMPLOYER within 10 (ten) days of the commencement of happening of the event and quantify the claim within 30 (thirty) days, failing which the CONTRACTOR will lose his right to claim any compensation/reimbursement/damages etc. or refer the matter to arbitration. Failure on the part of CONTRACTOR to put forward any claim without the necessary particulars as above within the time above specified shall be an absolute waiver thereof. No omission by EMPLOYER to reject any such claim and no delay in dealing therewith shall be waiver by EMPLOYER of any of this rights in respect thereof.
- 91.2 ENGINEER-IN-CHARGE shall review such claims within a reasonably period of time and cause to discharge these in a manner considered appropriate after due deliberations thereon. However, CONTRACTOR shall be obliged to carry on with the WORK during the period in which his claims are under consideration by the EMPLOYER, irrespective of the outcome of such claims, where additional payments for WORKS considered extra are justifiable in accordance with the CONTRACT provisions, EMPLOYER shall arrange to release the same in the same manner as for normal WORK payments. Such of the extra works so admitted by EMPLOYER shall be governed by all the terms, conditions, stipulations and specifications as are applicable for the CONTRACT. The rates for extra works shall generally be the unit rates provided for in the CONTRACT. In the event unit rates for extra works so executed are not available as per





**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 50 of 65

CONTRACT, payments may either be released on day work basis for which daily/hourly rates for workmen and hourly rates for equipment rental shall apply, or on the unit rate for WORK executed shall be derived by interpolation/extrapolation of unit rates already existing in the CONTRACT. In all the matters pertaining to applicability of rate and admittance of otherwise of an extra work claim of CONTRACTOR the decision of ENGINEER-IN-CHARGE shall be final and binding.

**92 Payment of contractor's bill:**

- 92.1 No payment shall be made for works estimated to cost less than Rs.10,000/- till the whole of the work shall have been completed and a certificate of completion given. But in case of works estimated to cost more than Rs.10,000/-, that CONTRACTOR on submitting the bill thereof be entitled to receive a monthly payment proportionate to the part thereof approved and passed by the ENGINEER-IN-CHARGE, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the CONTRACTOR. This payment will be made after making necessary corrections/deductions as stipulated elsewhere in the CONTRACT DOCUMENT for materials, Contract Performance Security, taxes etc.
- 92.2 Payment due to the CONTRACTOR shall be made by the EMPLOYER by Account Payee cheque forwarding the same to registered office or the notified office of the CONTRACTOR. In no case will EMPLOYER be responsible if the cheque is mislaid or misappropriated by unauthorized person/persons. In all cases, the CONTRACTOR shall present his bill duly pre-receipted on proper revenue stamp payment shall be made in Indian Currency.
- 92.3 In general payment of final bill shall be made to CONTRACTOR within 60 days of the submission of bill on joint measurements, after completion of all the obligations under the CONTRACT.

**93 Receipt for payment:**

- 93.1 Receipt for payment made on account of work when executed by a firm, must be signed by a person holding due power of attorney in this respect on behalf of the CONTRACTOR, except when the CONTRACTOR's are described in their tender as a limited company in which case the receipts must be signed in the name of the company by one of its principal officers or by some other person having authority to give effectual receipt for the company.

**94 Completion certificate:**

- 94.1 APPLICATION FOR COMPLETION CERTIFICATE:
- When the CONTRACTOR fulfils his obligation under Clause 81.1 he shall be eligible to apply for COMPLETION CERTIFICATE.
- The ENGINEER-IN-CHARGE shall normally issue to the CONTRACTOR the COMPLETION CERTIFICATE within one month after receiving any application therefore from the CONTRACTOR after verifying from the completion documents and satisfying himself that the WORK has been completed in accordance with and as set out in the construction and erection drawings, and the CONTRACT DOCUMENTS.
- The CONTRACTOR, after obtaining the COMPLETION CERTIFICATE, is eligible to present the final bill for the WORK executed by him under the terms of CONTRACT.
- 94.2 COMPLETION CERTIFICATE:
- Within one month of the completion of the WORK in all respects, the CONTRACTOR shall be furnished with a certificate by the ENGINEER-IN-CHARGE of such completion, but no certificate shall be given nor shall the WORK be deemed to have been executed until all scaffolding, surplus materials and rubbish is cleared off the SITE completely nor until the



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 51 of 65

WORK shall have been measured by the ENGINEER-IN-CHARGE whose measurement shall be binding and conclusive. The WORKS will not be considered as complete and taken over by the EMPLOYER, until all the temporary works, labour and staff colonies are cleared to the satisfaction of the ENGINEER-IN-CHARGE.

If the CONTRACTOR fails to comply with the requirements of this clause on or before the date fixed for the completion of the WORK, the ENGINEER-IN-CHARGE may at the expense of the CONTRACTOR remove such scaffolding, surplus materials and rubbish and dispose off the same as he thinks fit and clean off such dirt as aforesaid, and the CONTRACTOR shall forthwith pay the amount of all expenses so incurred and shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

**94.3 COMPLETION CERTIFICATE DOCUMENTS:**

For the purpose of Clause 94.0 the following documents will be deemed to form the completion documents:

- i) The technical documents according to which the WORK was carried out.
- ii) Six (6) sets of construction drawings showing therein the modification and correction made during the course of execution and signed by the ENGINEER-IN-CHARGE.
- iii) COMPLETION CERTIFICATE for 'embedded' and 'covered' up work.
- iv) Certificates of final levels as set out for various works.
- v) Certificates of tests performed for various WORKS.
- vi) Material appropriation, Statement for the materials issued by the EMPLOYER for the WORK and list of surplus materials returned to the EMPLOYER's store duly supported by necessary documents.

**95 Final decision and final certificate:**

95.1 Upon expiry of the period of liability and subject to the ENGINEER-IN-CHARGE being satisfied that the WORKS have been duly maintained by the CONTRACTOR during monsoon or such period as hereinbefore provided in Clause 80 & 81 and that the CONTRACTOR has in all respect duly made-up any subsidence and performed all his obligations under the CONTRACT, the ENGINEER-IN-CHARGE shall (without prejudice to the rights of the EMPLOYER to retain the provisions of relevant Clause hereof) otherwise give a certificate herein referred to as the FINAL CERTIFICATE to that effect and the CONTRACTOR shall not be considered to have fulfilled the whole of his obligations under CONTRACT until FINAL CERTIFICATE shall have been given by the ENGINEER-IN-CHARGE notwithstanding any previous entry upon the WORK and taking possession, working or using of the same or any part thereof by the EMPLOYER.

**96 Certificate and payments on evidence of completion:**

96.1 Except the FINAL CERTIFICATE, no other certificates or payments against a certificate or on general account shall be taken to be an admission by the EMPLOYER of the due performance of the CONTRACT or any part thereof or of occupancy or validity of any claim by the CONTRACTOR.

**97 Deductions from the contract price:**

97.1 All costs, damages or expenses which EMPLOYER may have paid or incurred, which under the provisions of the CONTRACT, the CONTRACTOR is liable/will



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 52 of 65

be liable, will be claimed by the EMPLOYER. All such claims shall be billed by the EMPLOYER to the CONTRACTOR regularly as and when they fall due. Such claims shall be paid by the CONTRACTOR within 15 (fifteen) days of the receipt of the corresponding bills and if not paid by the CONTRACTOR within the said period, the EMPLOYER may, then, deduct the amount from any moneys due i.e., Contract Performance Security or becoming due to the CONTRACTOR under the CONTRACT or may be recovered by actions of law or otherwise, if the CONTRACTOR fails to satisfy the EMPLOYER of such claims.

**SECTION-VII Taxes and Insurance**

**98 Taxes, Duties, Octroi etc:**

98.1

The CONTRACTOR agrees to and does hereby accept full and exclusive liability for the payment of any and all Taxes, Duties, including Excise duty, octroi etc. now or hereafter imposed, increased, modified, all the sales taxes, duties, octrois etc. now in force and hereafter increased, imposed or modified, from time to time in respect of WORKS and materials and all contributions and taxes for unemployment compensation, insurance and old age pensions or annuities now or hereafter imposed by any Central or State Government authorities which are imposed with respect to or covered by the wages, salaries, or other compensations paid to the persons employed by the CONTRACTOR and the CONTRACTOR shall be responsible for the compliance of all SUB-CONTRACTORS, with all applicable Central, State, Municipal and local law and regulation and requirement of any Central, State or local Government agency or authority. CONTRACTOR further agrees to defend, indemnify and hold EMPLOYER harmless from any liability or penalty which may be imposed by the Central, State or Local authorities by reason or any violation by CONTRACTOR or SUB-CONTRACTOR of such laws, suits or proceedings that may be brought against the EMPLOYER arising under, growing out of, or by reason of the work provided for by this CONTRACT, by third parties, or by Central or State Government authority or any administrative sub-division thereof.

Tax deductions will be made as per the rules and regulations in force in accordance with acts prevailing from time to time.

**99 Sales tax/turnover tax:**

99.1

Tenderer should quote all inclusive prices including the liability of Sales Tax/Turnover Tax whether on the works contract as a whole or in respect of bought out components used by the CONTRACTOR in execution of the CONTRACT. EMPLOYER shall not be responsible for any such liability of the CONTRACTOR in respect of this CONTRACT.

**100 Statutory variations**

100.1

Tenderer should quote prices inclusive of excise-duty and sales tax applicable on finished product. Any statutory variations in Excise Duty and sales tax on finished product during the contractual completion period, shall be to the Employer's account for which the Contractor will furnish documentary evidence(s) in support of their claims to TFL. However, any increase in the rate of these taxes and duties (E.D. and S.T.) beyond the contractual completion period shall be to Contractor's account and any decrease shall be passed on to TFL.

**101 Insurance:**

101.1

GENERAL

CONTRACTOR shall at his own expense arrange secure and maintain insurance with reputable insurance companies to the satisfaction of the EMPLOYER as follows:

CONTRACTOR at his cost shall arrange, secure and maintain insurance as may be necessary and to its full value for all such amounts to protect the WORKS in progress from time to time and the interest of EMPLOYER against all risks as detailed herein. The form and the limit of such insurance, as defined here in together with the under works thereof in each case should be as acceptable to the



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 53 of 65

EMPLOYER. However, irrespective of work acceptance the responsibility to maintain adequate insurance coverage at all times during the period of CONTRACT shall be that of CONTRACTOR alone. CONTRACTOR's failure in this regard shall not relieve him of any of his responsibilities and obligations under CONTRACT.

Any loss or damage to the equipment, during ocean transportation, port/custom clearance, inland and port handling, inland transportation, storage, erection and commissioning till such time the WORK is taken over by EMPLOYER, shall be to the account of CONTRACTOR. CONTRACTOR shall be responsible for preferring of all claims and make good for the damage or loss by way of repairs and/or replacement of the parts of the Work damaged or lost. CONTRACTOR shall provide the EMPLOYER with a copy of all insurance policies and documents taken out by him in pursuance of the CONTRACT. Such copies of document shall be submitted to the EMPLOYER immediately upon the CONTRACTOR having taken such insurance coverage. CONTRACTOR shall also inform the EMPLOYER at least 60(Sixty) days in advance regarding the expiry cancellation and/or changes in any of such documents and ensure revalidation/renewal etc., as may be necessary well in time.

Statutory clearances, if any, in respect of foreign supply required for the purpose of replacement of equipment lost in transit and/or during erection, shall be made available by the EMPLOYER. CONTRACTOR shall, however, be responsible for obtaining requisite licenses, port clearances and other formalities relating to such import. The risks that are to be covered under the insurance shall include, but not be limited to the loss or damage in handling, transit, theft, pilferage, riot, civil commotion, weather conditions, accidents of all kinds, fire, war risk (during ocean transportation only) etc. The scope of such insurance shall cover the entire value of supplies of equipments, plants and materials to be imported from time to time.

All costs on account of insurance liabilities covered under CONTRACT will be to CONTRACTOR's account and will be included in VALUE OF CONTRACT. However, the EMPLOYER may from time to time, during the currency of the CONTRACT, ask the CONTRACTOR in writing to limit the insurance coverage risk and in such a case, the parties to the CONTRACT will agree for a mutual settlement, for reduction in VALUE OF CONTRACT to the extent of reduced premium amounts.

CONTRACTOR as far as possible shall cover insurance with Indian Insurance Companies, including marine Insurance during ocean transportation.

i) EMPLOYEES STATE INSURANCE ACT:

The CONTRACTOR agrees to and does hereby accept full and exclusive liability for the compliance with all obligations imposed by the Employee State Insurance Act 1948 and the CONTRACTOR further agrees to defend, indemnify and hold EMPLOYER harmless for any liability or penalty which may be imposed by the Central, State or Local authority by reason of any asserted violation by CONTRACTOR or SUB-CONTRACTOR of the Employees' State Insurance Act, 1948, and also from all claims, suits or proceeding that may be brought against the EMPLOYER arising under, growing out of or by reasons of the work provided for by this CONTRACTOR, by third parties or by Central or State Government authority or any political sub- division thereof.

The CONTRACTOR agrees to fill in with the Employee's State Insurance Corporation, the Declaration Forms, and all forms which may be required in respect of the CONTRACTOR's or SUB-CONTRACTOR's employees, who are employed in the WORK provided for or those covered by ESI from time to time under the



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 54 of 65

Agreement. The CONTRACTOR shall deduct and secure the agreement of the SUB- CONTRACTOR to deduct the employee's contribution as per the first schedule of the Employee's State Insurance Act from wages and affix the Employees Contribution Card at wages payment intervals. The CONTRACTOR shall remit and secure the agreement of SUB-CONTRACTOR to remit to the State Bank of India, Employee's State Insurance Corporation Account, the Employee's contribution as required by the Act. The CONTRACTOR agrees to maintain all cards and Records as required under the Act in respect of employees and payments and the CONTRACTOR shall secure the agreement of the SUB- CONTRACTOR to maintain such records. Any expenses incurred for the contributions, making contributions or maintaining records shall be to the CONTRACTOR's or SUB-CONTRACTOR's account.

The EMPLOYER shall retain such sum as may be necessary from the total VALUE OF CONTRACT until the CONTRACTOR shall furnish satisfactory proof that all contributions as required by the Employees State Insurance Act, 1948, have been paid. This will be pending on the CONTRACTOR when the ESI Act is extended to the place of work.

ii) WORKMEN COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE:

Insurance shall be effected for all the CONTRACTOR's employees engaged in the performance of this CONTRACT. If any of the work is sublet, the CONTRACTOR shall require the SUB-CONTRACTOR to provide workman's Compensation and employer's liability insurance for the later's employees if such employees are not covered under the CONTRACTOR's Insurance.

iii) ACCIDENT OR INJURY TO WORKMEN:

The EMPLOYER shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workman or other person in the Employment of the CONTRACTOR or any SUB-CONTRACTOR save and except an accident or injury resulting from any act or default of the EMPLOYER, his agents or servants and the CONTRACTOR shall indemnify and keep indemnified the EMPLOYER against all such damages and compensation (save and except and aforesaid) and against all claims, demands, proceeding, costs, charges and expenses, whatsoever in respect or in relation thereto.

iv) TRANSIT INSURANCE

In respect of all items to be transported by the CONTRACTOR to the SITE of WORK, the cost of transit insurance should be borne by the CONTRACTOR and the quoted price shall be inclusive of this cost.

v) COMPREHENSIVE AUTOMOBILE INSURANCE

This insurance shall be in such a form as to protect the Contractor against all claims for injuries, disability, disease and death to members of public including EMPLOYER's men and damage to the property of others arising from the use of motor vehicles during on or off the 'site' operations, irrespective of the Employership of such vehicles.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 55 of 65

VI) COMPREHENSIVE GENERAL LIABILITY INSURANCE

- a) This insurance shall protect the Contractor against all claims arising from injuries, disabilities, disease or death of member of public or damage to property of others due to any act or omission on the part of the Contractor, his agents, his employees, his representatives and Sub-Contractor's or from riots, strikes and civil commotion.
- b) Contractor shall take suitable Group Personal Accident Insurance Cover for taking care of injury, damage or any other risks in respect of his Engineers and other Supervisory staff who are not covered under Employees State Insurance Act.
- c) The policy shall cover third party liability. The third party (liability shall cover the loss/ disablement of human life (person not belonging to the Contractor) and also cover the risk of damage to others materials/ equipment/ properties during construction, erection and commissioning at site. The value of third party liability for compensation for loss of human life or partial/full disablement shall be of required statutory value but not less than Rs. 2 lakhs per death, Rs. 1.5 lakhs per full disablement and Rs. 1 lakh per partial disablement and shall nevertheless cover such compensation as may be awarded by Court by Law in India and cover for damage to others equipment/ property as approved by the Purchaser. However, third party risk shall be maximum to Rs. 10(ten) lakhs to death.
- d) The Contractor shall also arrange suitable insurance to cover damage, loss, accidents, risks etc., in respect of all his plant, equipments and machinery, erection tools & tackles and all other temporary attachments brought by him at site to execute the work.
- e) The Contractor shall take out insurance policy in the joint name of EMPLOYER and Contractor from one or more nationalized insurance company from any branch office at Project site.
- f) Any such insurance requirements as are hereby established as the minimum policies and coverage which Contractor must secure and keep in force must be complied with, Contractor shall at all times be free to obtain additional or increased coverage at Contractor's sole expenses.

vii) ANY OTHER INSURANCE REQUIRED UNDER LAW OR REGULATIONS OR BY EMPLOYER:

CONTRACTOR shall also carry and maintain any and all other insurance(s) which he may be required under any law or regulation from time to time without any extra cost to EMPLOYER. He shall also carry and maintain any other insurance which may be required by the EMPLOYER.

**102 Damage to Property or to  
any Person or any Third  
Party**

102.1 i)

CONTRACTOR shall be responsible for making good to the satisfaction of the EMPLOYER any loss or any damage to structures and properties belonging to the EMPLOYER or being executed or procured or being procured by the EMPLOYER or of other agencies within in the premises of all the work of the EMPLOYER, if such loss



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 56 of 65

or damage is due to fault and/or the negligence or willful acts or omission of the CONTRACTOR, his employees, agents, representatives or SUB-CONTRACTORS.

- ii) The CONTRACTOR shall take sufficient care in moving his plants, equipments and materials from one place to another so that they do not cause any damage to any person or to the property of the EMPLOYER or any third party including overhead and underground cables and in the event of any damage resulting to the property of the EMPLOYER or of a third party during the movement of the aforesaid plant, equipment or materials the cost of such damages including eventual loss of production, operation or services in any plant or establishment as estimated by the EMPLOYER or ascertained or demanded by the third party shall be borne by the CONTRACTOR. Third party liability risk shall be Rupees One lakh for single accident and limited to Rupees Ten lakhs.
- iii) The CONTRACTOR shall indemnify and keep the EMPLOYER harmless of all claims for damages to property other than EMPLOYER's property arising under or by reason of this agreement, if such claims result from the fault and/or negligence or willful acts or omission of the CONTRACTOR, his employees, agents, representative of SUB-CONTRACTOR.

**SECTION-VIII Labour Laws**

**103 Labour laws:**

- 103.1 i) No labour below the age of 18 (eighteen) years shall be employed on the WORK.
- ii) The CONTRACTOR shall not pay less than what is provided under law to labourers engaged by him on the WORK.
- iii) The CONTRACTOR shall at his expense comply with all labour laws and keep the EMPLOYER indemnified in respect thereof.
- iv) The CONTRACTOR shall pay equal wages for men and women in accordance with applicable labour laws.
- v) If the CONTRACTOR is covered under the Contract labour (Regulation and Abolition) Act, he shall obtain a licence from licensing authority (i.e. office of the labour commissioner) by payment of necessary prescribed fee and the deposit, if any, before starting the WORK under the CONTRACT. Such fee/deposit shall be borne by the CONTRACTOR.
- vi) The CONTRACTOR shall employ labour in sufficient numbers either directly or through SUB- CONTRACTOR's to maintain the required rate of progress and of quality to ensure workmanship of the degree specified in the CONTRACT and to the satisfaction of the ENGINEER-IN-CHARGE.
- vii) The CONTRACTOR shall furnish to the ENGINEER-IN- CHARGE the distribution return of the number and description, by trades of the work people employed on the works. The CONTRACTOR shall also submit on the 4th and 19th of every month to the ENGINEER-IN-CHARGE a true statement showing in respect of the second half of the preceding month and the first half of the current month (1) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 57 of 65

and injury caused by them and (2) the number of female workers who have been allowed Maternity Benefit as provided in the Maternity Benefit Act 1961 on Rules made there under and the amount paid to them.

- viii) The CONTRACTOR shall comply with the provisions of the payment of Wage Act 1936, Employee Provident Fund Act 1952, Minimum Wages Act 1948. Employers Liability Act 1938. Workmen's Compensation Act 1923, Industrial Disputes Act 1947, the Maternity Benefit Act 1961 and Contract Labour Regulation and Abolition Act 1970, Employment of Children Act 1938 or any modifications thereof or any other law relating thereto and rules made there under from time to time.
- ix) The ENGINEER-IN-CHARGE shall on a report having been made by an Inspecting Officer as defined in Contract Labour (Regulation and Abolition) Act 1970 have the power to deduct from the money due to the CONTRACTOR any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the Conditions of the Contract for the benefit of workers, non-payment of wages or of deductions made from his or their wages which are not justified by the terms of the Contract or non-observance of the said regulations.
- x) The CONTRACTOR shall indemnify the EMPLOYER against any payments to be made under and for the observance of the provisions of the aforesaid Acts without prejudice to his right to obtain indemnity from his SUB-CONTRACTOR's. In the event of the CONTRACTOR committing a default or breach of any of the provisions of the aforesaid Acts as amended from time to time, of furnishing any information or submitting or filling and Form/ Register/ Slip under the provisions of these Acts which is materially incorrect then on the report of the inspecting Officers, the CONTRACTOR shall without prejudice to any other liability pay to the EMPLOYER a sum not exceeding Rs.50.00 as Liquidated Damages for every default, breach or furnishing, making, submitting, filling materially incorrect statement as may be fixed by the ENGINEER-IN- CHARGE and in the event of the CONTRACTOR's default continuing in this respect, the Liquidated Damages may be enhanced to Rs.50.00 per day for each day of default subject to a maximum of one percent of the estimated cost of the WORK put to tender. The ENGINEER-IN-CHARGE shall deduct such amount from bills or Contract Performance Security of the CONTRACTOR and credit the same to the Welfare Fund constitute under these acts. The decision of the ENGINEER-IN-CHARGE in this respect shall be final and binding.

**104 Implementation of  
apprentices act, 1961:**

104.1

The CONTRACTOR shall comply with the provisions of the Apprentices Act, 1961 and the Rules and Orders issued there under from time to time. If he fails to do so, his failure will be a breach of the CONTRACT and the ENGINEER-IN-CHARGE may, at his discretion, cancel the CONTRACT. The CONTRACTOR shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions, of the Act.

**105 Contractor to indemnify the  
employer:**

105.1 i)

The CONTRACTOR shall indemnify the EMPLOYER and every member, office and employee of the EMPLOYER, also the ENGINEER-IN-CHARGE and his staff against all actions, proceedings, claims, demands, costs and expenses whatsoever arising out of or in connection with the matters referred to in Clause 102.0 and





**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 58 of 65

elsewhere and all actions, proceedings, claims, demands, costs and expenses which may be made against the EMPLOYER for or in respect of or arising out of any failure by the CONTRACTOR in the performance of his obligations under the CONTRACT DOCUMENT. The EMPLOYER shall not be liable for or in respect of or arising out of any failure by the CONTRACTOR in the performance of his obligations under the CONTRACT DOCUMENT. The EMPLOYER shall not be liable for or in respect of any demand or compensation payable by law in respect or in consequence of any accident or injury to any workmen or other person. In the employment of the CONTRACTOR or his SUB-CONTRACTOR the CONTRACTOR shall indemnify and keep indemnified the EMPLOYER against all such damages and compensations and against all claims, damages, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

ii) **PAYMENT OF CLAIMS AND DAMAGES:**

Should the EMPLOYER have to pay any money in respect of such claims or demands as aforesaid the amount so paid and the costs incurred by the EMPLOYER shall be charged to and paid by the CONTRACTOR and the CONTRACTOR shall not be at liberty to dispute or question the right of the EMPLOYER to make such payments notwithstanding the same, may have been made without the consent or authority or in law or otherwise to the contrary.

iii) In every case in which by virtue of the provisions of Section 12, Sub-section (i) of workmen's compensation Act, 1923 or other applicable provision of Workmen Compensation Act or any other Act, the EMPLOYER is obliged to pay compensation to a workman employed by the CONTRACTOR in execution of the WORK, the EMPLOYER will recover from the CONTRACTOR the amount of the compensation so paid, and without prejudice to the rights of EMPLOYER under Section 12, Sub-section (2) of the said act, EMPLOYER shall be at liberty to recover such amount or any part thereof by deducting it from the Contract Performance Security or from any sum due to the CONTRACTOR whether under this CONTRACT or otherwise. The EMPLOYER shall not be bound to contest any claim made under Section 12, Sub-section (i) of the said act, except on the written request of the CONTRACTOR and upon his giving to the EMPLOYER full security for all costs for which the EMPLOYER might become liable in consequence of contesting such claim.

**106 Health and sanitary arrangements for workers:**

106.1 In respect of all labour directly or indirectly employed in the WORKS for the performance of the CONTRACTOR's part of this agreement, the CONTRACTOR shall comply with or cause to be complied with all the rules and regulations of the local sanitary and other authorities or as framed by the EMPLOYER from time to time for the protection of health and sanitary arrangements for all workers.

106.2 The CONTRACTOR shall provide in the labour colony all amenities such as electricity, water and other sanitary and health arrangements. The CONTRACTOR shall also provide necessary surface transportation to the place of work and back to the colony for their personnel accommodated in the labour colony.

**SECTION-IX Applicable Laws and Settlement of Disputes**

**107 Arbitration:**

107.1 Unless otherwise specified, the matters where decision of the Engineer-in-Charge is deemed to be final and binding as provided in the Agreement and the



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 59 of 65

issues/disputes which cannot be mutually resolved within a reasonable time, all disputes shall be referred to arbitration by Sole Arbitrator.

The Employer [Talcher Fertilizers Ltd.] shall suggest a panel of three independent and distinguished persons to the bidder/contractor/supplier/buyer (as the case may be) to select any one among them to act as the Sole Arbitrator.

In the event of failure of the other parties to select the Sole Arbitrator within 30 days from the receipt of the communication suggesting the panel of arbitrators, the right of selection of the sole arbitrator by the other party shall stand forfeited and the EMPLOYER (TFL) shall have discretion to proceed with the appointment of the Sole Arbitrator. The decision of Employer on the appointment of the sole arbitrator shall be final and binding on the parties.

The award of sole arbitrator shall be final and binding on the parties and unless directed/awarded otherwise by the sole arbitrator, the cost of arbitration proceedings shall be shared equally by the parties. The Arbitration proceedings shall be in English language and venue shall be New Delhi, India.

Subject to the above, the provisions of (Indian) Arbitration & Conciliation ACT 1996 and the Rules framed there under shall be applicable. All matter relating to this contract are subject to the exclusive jurisdiction of the court situated in the state of Delhi.

Bidders/suppliers/contractors may please note that the Arbitration & Conciliation Act 1996 was enacted by the Indian Parliament and is based on United Nations Commission on International Trade Law (UNCITRAL model law), which were prepared after extensive consultation with Arbitral Institutions and centers of International Commercial Arbitration. The United Nations General Assembly vide resolution 31/98 adopted the UNCITRAL Arbitration rules on 15 December 1976.

107.2 FOR THE SETTLEMENT OF DISPUTES BETWEEN GOVERNMENT DEPARTMENT AND ANOTHER AND ONE GOVERNMENT DEPARTMENT AND PUBLIC ENTERPRISE AND ONE PUBLIC ENTERPRISE AND ANOTHER THE ARBITRATION SHALL BE AS FOLLOWS:

"In the event of any dispute or difference between the parties hereto, such dispute or difference shall be resolved amicably by mutual consultation or through the good offices of empowered agencies of the Government. If such resolution is not possible, then, the unresolved dispute or difference shall be referred to arbitration of an arbitrator to be nominated by Secretary, Department of Legal Affairs ("Law Secretary") in terms of the Office Memorandum No.55/3/1/75-CF, dated the 19th December 1975 issued by the Cabinet Secretariat (Department of Cabinet Affairs), as modified from time to time. The Arbitration Act 1940 (10 of 1940) shall not be applicable to the arbitration under this clause. The award of the Arbitrator shall be binding upon parties to the dispute. Provided, however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to Law Secretary whose decision shall bind the parties finally and conclusively.

**108 Jurisdiction:**

The CONTRACT shall be governed by and constructed according to the laws in force in INDIA. The CONTRACTOR hereby submits to the jurisdiction of the Courts situated at DELHI for the purposes of disputes, actions and proceedings arising out of the CONTRACT, the courts at DELHI only will have the jurisdiction to hear and decide such disputed, actions and proceedings.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 60 of 65

**SECTION-X Safety Codes**

- 109 General:** 109.1 CONTRACTOR shall adhere to safe construction practice and guard against hazardous, and unsafe working conditions and shall comply with EMPLOYER's safety rules as set forth herein. Prior to start of construction, CONTRACTOR will be furnished copies of EMPLOYER's "Safety Code" for information and guidance, if it has been prepared.
- 110 Safety regulations:** 110.1 i) In respect of all labour, directly employed in the WORK for the performance of CONTRACTOR's part of this agreement, the CONTRACTOR shall at his own expense arrange for all the safety provisions as per safety codes of C.P.W.D., Indian Standards Institution. The Electricity Act, The Mines Act and such other acts as applicable.
- ii) The CONTRACTOR shall observe and abide by all fire and safety regulations of the EMPLOYER. Before starting construction work CONTRACTOR shall consult with EMPLOYER's safety Engineers or ENGINEER- IN-CHARGE and must make good to the satisfaction of the EMPLOYER any loss or damage due to fire to any portion of the work done or to be done under this agreement or to any of the EMPLOYER's existing property.
- 111 First aid and industrial injuries:** 111.0 i) CONTRACTOR shall maintain first aid facilities for its employees and those of its SUB-CONTRACTOR.
- ii) CONTRACTOR shall make outside arrangements for ambulance service and for the treatment of industrial injuries. Names of those providing these services shall be furnished to EMPLOYER prior to start of construction and their telephone numbers shall be prominently posted in CONTRACTOR's field office.
- iii) All critical industrial injuries shall be reported promptly to EMPLOYER, and a copy of CONTRACTOR's report covering each personal injury requiring the attention of a physician shall be furnished to the EMPLOYER.
- 112 General rules:** 112.0 Smoking within the battery area, tank farm or dock limits is strictly prohibited. Violators of the no smoking rules shall be discharged immediately.
- 113 Contractor's barricades:.** 113.0 i) CONTRACTOR shall erect and maintain barricades required in connection with his operation to guard or protect:-
- a) Excavations
- b) Hoisting Areas.
- c) Areas adjudged hazardous by CONTRACTOR's or EMPLOYER's inspectors.
- d) EMPLOYER's existing property subject to damage by CONTRACTOR's Operations.
- e) Rail Road unloading spots.
- ii) CONTRACTOR's employees and those of his SUB-CONTRACTOR's shall become acquainted with EMPLOYER's barricading practice and shall respect the provisions thereof.



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 61 of 65

iii) Barricades and hazardous areas adjacent to, but not located in normal routes of travel shall be marked by red flasher lanterns at nights.

**114 Scaffolding:**

114.1 i)

Suitable scaffolding should be provided for workmen for all works that cannot safely be done from the ground or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra Mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying material as well, suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal and 4 vertical).

ii)

Scaffolding or staging more than 4 metres above the ground or floor, swing suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise retarded at least one metre high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

iii)

Working platform, gangway and stairway should be so constructed that they should not sag unduly or unequally and if the height of platform of the gangway or the stairway is more than 4 metres above the ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as in ii) above.

iv)

Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum heights shall be 1 metre.

v)

Safe-means of access shall be provided to all working platforms and other working places, every ladder shall be securely fixed. No portable single ladder shall be over 9 metres in length while the width between side rails in rung ladder shall in no case be less than 30 cms for ladder upto and including 3 metres in length. For longer ladder this width should be increased 5mm for each additional foot of length. Uniform steps spacing shall not exceed 30 cms. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed to cause danger or inconvenience to any person or public. The CONTRACTOR shall also provide all necessary fencing and lights to protect the workers and staff from accidents, and shall be bound to bear the expenses of defense of every suit, action or other proceeding of law that may be brought by any person for injury sustained owing to neglect of the above precautions and pay any damages and costs which may be awarded in any such suit or action or proceeding to any such person or which may with the consent of the CONTRACTOR be paid to compromise any claim by any such person.

**115 Excavation and trenching:**

115.1

All trenches 1.2 metres or more in depth, shall at all times be supplied with at least one ladder for each 50 metres length or fraction thereof.

Ladder shall be extended from bottom of the trenches to atleast 1 metre above the surface of the ground. The sides of the trenches which are 1.5M in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides to collapse. The excavated materials shall not be placed within 1.5 metres of the edge of the trench or half of the trench width whichever is more. Cutting shall be done from top to bottom. Under no circumstances



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 62 of 65

undermining or under-cutting shall be done.

**116 Demolition/general safety:**

116.1

- i) Before any demolition work is commenced and also during the progress of the demolition work
  - a) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
  - b) No electric cable or apparatus which is liable to be a source of danger shall remain electrically charged.
  - c) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.
- ii) All necessary personal safety equipment as considered adequate by the ENGINEER-IN-CHARGE, should be kept available for the use of the persons employed on the SITE and maintained in condition suitable for immediate use, and the CONTRACTOR shall take adequate steps to ensure proper use of equipment by those concerned.
  - a) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective gloves.
  - b) Those engaged in white washing and mixing or stacking or cement bags or any material which are injurious to the eyes be provided with protective goggles.
  - c) Those engaged in welding and cutting works shall be provided with protective face & eye shield, hand gloves, etc.
  - d) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
  - e) When workers are employed in sewers and manholes, which are in use, the CONTRACTOR shall ensure that the manhole covers are opened and are ventilated atleast for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or board to prevent accident to the public.
  - f) The CONTRACTOR shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 years are employed on the work of lead painting, the following precautions should be taken.
    - 1) No paint containing lead or lead product shall be used except in the form of paste or readymade paint.
    - 2) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.
    - 3) Overalls shall be supplied by the CONTRACTOR to



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 63 of 65

the workmen and adequate facilities shall be provided to enable the working painters to wash them during and on cessation of work.

- iii) When the work is done near any place where there is risk of drowning, all necessary safety equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.
- iv) Use of hoisting machines and tackles including their attachments, anchorage and supports shall conform to the following standards or conditions:
- a) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defect and shall be kept in good working order.
- b) Every rope used in hoisting or lowering materials or as means of suspension shall be of durable quality and adequate strength and free from patent defects.
- c) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding, winch or give signals to the operator.
- d) In case of every hoisting machine and of every chain ring hook, shackle, swivel, and pulley block used in hoisting or lowering or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gears referred to above shall be plainly marked with the safe working load of the conditions under which it is applicable and the same shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond safe working load except for the purpose of testing.
- e) In case of departmental machine, the safe working load shall be notified by the ENGINEER- IN-CHARGE. As regards CONTRACTOR's machines, the CONTRACTOR shall notify the safe working load of the machine to the ENGINEER-IN-CHARGE whenever he brings any machinery to SITE of WORK and get it verified by the Engineer concerned.
- v) Motors, gears, transmission lines, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as to reduce to minimum the accidental descent of the load, adequate precautions should be taken to reduce the minimum risk of any part or parts of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves, and boots as may be necessary should be provided. The workers shall not wear any rings, watches and carry keys or other materials which are good conductors of electricity.
- vi) All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe conditions and no scaffolds, ladder or



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 64 of 65

equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

- vii) These safety provisions should be brought to the notice of all concerned by displaying on a notice board at a prominent place at the work-spot. The person responsible for compliance of the safety code shall be named therein by the CONTRACTOR.
- viii) To ensure effective enforcement of the rules and regulations relating to safety precautions, the arrangements made by the CONTRACTOR shall be open to inspection by the Welfare Officer, ENGINEER-IN-CHARGE or safety Engineer of the Administration or their representatives.
- ix) Notwithstanding the above clauses there is nothing in these to exempt the CONTRACTOR for the operations of any other Act or rules in force in the Republic of India. The work throughout including any temporary works shall be carried out in such a manner as not to interfere in any way whatsoever with the traffic on any roads or footpath at the site or in the vicinity thereto or any existing works whether the property of the Administration or of a third party.

In addition to the above, the CONTRACTOR shall abide by the safety code provision as per C.P.W.D. Safety code and Indian Standard Safety Code from time to time.

- 117 Care in handling inflammable gas:** 117.1 The CONTRACTOR has to ensure all precautionary measures and exercise utmost care in handling the inflammable gas cylinder/inflammable liquids/paints etc. as required under the law and/or as advised by the fire Authorities of the EMPLOYER
- 118 Temporary combustible structures:** 118.1 Temporary combustible structures will not be built near or around work site.
- 119 Precautions against fire:** 119.1 The CONTRACTOR will have to provide Fire Extinguishers, Fire Buckets and drums at worksite as recommended by ENGINEER-IN-CHARGE. They will have to ensure all precautionary measures and exercise utmost care in handling the inflammable gas cylinders/ inflammable liquid/ paints etc. as advised by ENGINEER-IN-CHARGE. Temporary combustible structures will not be built near or around the work-site.
- 120 Explosives:** 120.1 Explosives shall not be stored or used on the WORK or on the SITE by the CONTRACTOR without the permission of the ENGINEER-IN-CHARGE in writing and then only in the manner and to the extent to which such permission is given. When explosives are required for the WORK they will be stored in a special magazine to be provided at the cost of the CONTRACTOR in accordance with the Explosives Rules. The CONTRACTOR shall obtain the necessary licence for the storage and the use of explosives and all operations in which or for which explosives are employed shall be at sole risk and responsibility of the CONTRACTOR and the CONTRACTOR shall indemnify the EMPLOYER against any loss or damage resulting directly or indirectly therefrom.
- 121 Mines act:** 121.1 SAFETY CODE: The CONTRACTOR shall at his own expense arrange for the safety provisions as required by the ENGINEER-IN-CHARGE in respect of all labour directly employed for performance of the WORKS and shall provide all facilities in connection therewith. In case the CONTRACTOR fails to make arrangements and provides necessary facilities as aforesaid, the ENGINEER-IN-



**CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT  
TALCHER FERTILISER LIMITED, ODISHA**

PC-183/ E/ 4023/ S-IV

0

DOC. NO.

REV.



**GENERAL CONDITIONS OF CONTRACT**

Page 65 of 65

CHARGE shall be entitled to do so and recover the costs thereof from the CONTRACTOR.

121.2 Failure to comply with Safety Code or the provisions relating to report on accidents and to grant of maternity benefits to female workers shall make the CONTRACTOR liable to pay Company Liquidated Damages an amount not exceeding Rs.50/- for each default or materially incorrect statement. The decision of the ENGINEER-IN-CHARGE in such matters based on reports from the Inspecting Officer or from representatives of ENGINEER-IN-CHARGE shall be final and binding and deductions for recovery of such Liquidated Damages may be made from any amount payable to the CONTRACTOR from all the provisions of the Mines Act, 1952 or any statutory modifications or re-enactment thereof the time being in force and any Rules and Regulations made there under in respect of all the persons employed by him under this CONTRACT and shall indemnify the EMPLOYER from and against any claim under the Mines Act or the rules and regulations framed there under by or on behalf of any persons employed by him or otherwise.

**122 Preservation of place:**

122.1 The CONTRACTOR shall take requisite precautions and use his best endeavors to prevent any riotous or unlawful behavior by or amongst his worker and others employed or the works and for the preservation of peace and protection of the inhabitants and security of property in the neighborhood of the WORK. In the event of the EMPLOYER requiring the maintenance of a Special Police Force at or in the vicinity of the site during the tenure of works, the expenses thereof shall be borne by the CONTRACTOR and if paid by the EMPLOYER shall be recoverable from the CONTRACTOR.

**123 Outbreak of infectious diseases:**

123.1 The CONTRACTOR shall remove from his camp such labour and their facilities who refuse protective inoculation and vaccination when called upon to do so by the ENGINEER-IN-CHARGE's representative. Should Cholera, Plague or other infectious diseases break out the CONTRACTOR shall burn the huts, beddings, clothes and other belongings or used by the infected parties and promptly erect new huts on healthy sites as required by the ENGINEER-IN-CHARGE failing which within the time specified in the Engineer's requisition, the work may be done by the EMPLOYER and the cost thereof recovered from the CONTRACTOR.

**124 Use of intoxicants:**

124.1 The unauthorized sale of spirits or other intoxicants, beverages upon the work in any of the buildings, encampments or tenements owned, occupied by or within the control of the CONTRACTOR or any of his employee is forbidden and the CONTRACTOR shall exercise his influence and authority to the utmost extent to secure strict compliance with this condition.

In addition to the above, the CONTRACTOR shall abide by the safety code provision as per C.P.W.D. safety code and Indian Standard Code framed from time to time.



	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/S-V	0	
		DOC. NO.	REV.	
		Page 1 of 39		

## SECTION-V

### SPECIAL CONDITIONS OF CONTRACT

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 2 of 39		

## TABLE OF CONTENTS

- 1.0 INTRODUCTION
- 2.0 LOCATION OF THE PROJECT SITE
- 3.0 GENERAL
- 4.0 GENERAL PROVISION WITH REGARD TO MATERIALS
- 5.0 OWNER'S OBLIGATIONS
- 6.0 POWER & WATER FOR CONSTRUCTION AND OTHER PURPOSES
- 7.0 RATES
- 8.0 SPECIFICATIONS
- 9.0 GATE PASSES
- 10.0 TIME SCHEDULE
- 11.0 ISSUE OF WORKING DRAWINGS
- 12.0 SERVING OF NOTICES
- 13.0 NOTHING EXTRA FOR ADVERSE SUB-SOIL CONDITION
- 14.0 CONTRACTOR'S RESPONSIBILITY FOR THE MANNER OF EXECUTION OF WORK
- 15.0 NO WORK SHALL BE UNDERTAKEN WITHOUT APPROVED WORKING DRAWINGS
- 16.0 CONTRACTOR SHALL KEEP FOUNDATION PITS/TRENCHES DRY
- 17.0 NOTHING EXTRA FOR INTRICATE CONCRETE SHUTTERING OR REINFORCEMENT WORK
- 18.0 NOTHING EXTRA FOR REBATING ETC
- 19.0 CONSTRUCTION JOINTS
- 20.0 SUBMISSION OF BILL
- 21.0 CLAIMS BY THE CONTRACTOR
- 22.0 PROVISION FOR MULTIFARIOUS CHECKING OF WORK
- 23.0 DEFECT LIABILITY PERIOD
- 24.0 CLEARING, FILLING AND LEVELING OF SITE
- 25.0 CONTRACTOR TO COMPLY ALL LAWS
- 26.0 CONTRACTOR TO USE THE MATERIALS ONLY AFTER THE APPROVAL OF OWNER
- 27.0 COMPLIANCE OF ENTIRE PROVISIONS IS OBLIGATORY TO CONTRACTOR
- 28.0 DELIVERY AND DOCUMENTS
- 29.0 WEATHER CONDITIONS
- 30.0 INSTRUCTIONS, DIRECTIONS AND CORRESPONDENCE
- 31.0 QUALITY ASSURANCE / QUALITY CONTROL
- 32.0 HEALTH SAFETY AND ENVIRONMENT (HSE) MANAGEMENT
- 33.0 SUSPENSION OF WORKS
- 34.0 INCOMING MATERIAL REPORT/ INSPECTION
- 35.0 THIRD PARTY INSPECTION
- 36.0 SECURITIES OF MATERIALS / EQUIPMENTS
- 37.0 CONTRACTOR'S PERSONNEL AT SITE
- 38.0 SETTING OUT THE WORKS
- 39.0 COMPLIANCE WITH LABOUR/ INDUSTRIAL LAWS
- 40.0 TERMS OF PAYMENT

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 3 of 39		

- 41.0 DISPATCH, TRANSPORTATION/SHIPPING
  - 42.0 WORK CONTRACT SERVICES
  - 43.0 CONSTRUCTION EQUIPMENT, TOOLS AND TACKLES DEPLOYMENT
  - 44.0 STATUTORY VARIATION IN TAXES
  - 45.0 STATUTORY APPROVALS
  - 46.0 SUB-CONTRACTOR/VENDOR AND MANUFACTURER WARRANTIES
  - 47.0 CONTRACTOR's LIABILITY FOR APPROVED SUB CONTRACTOR
-

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 4 of 39		

## 1.0 INTRODUCTION:

- 1.1. Talcher Fertilizers Ltd. (TFL), hereinafter also referred to as "OWNER", A joint venture company of four major Public Sector Units – M/s. Gas Authority India Limited (GAIL), M/s. Rastriya Chemicals & Fertilizers Ltd. (RCF), M/s. Coal India Ltd. (CIL) and M/s. Fertilizers Corporation of India Ltd. (FCIL) has decided to build a world class Coal based fertilizer complex. The fertilizer complex is to be built at **Talcher, Angul District, Odisha (India)** and will consist of Coal Gasification Plant, Ammonia Plant and Urea Plant, along with Offsite and Utility Plants. Talcher Fertilizers Ltd. intend to invite quotations from eligible Contractors for Construction of 2 x 33kV overhead line for providing power supply to intake well at TFL Pump House from TFL-OPTCL 220/33 kV LILO substation AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA
- 1.2 Projects & Development India Ltd. (PDIL) has been retained as Consultant for providing Engineering Consultancy Services and Project Management Services for the aforesaid project.
- 1.3 **Brief Scope of Work:** The scope of work covers Supply, Transportation, Insurance, Delivery at site, Unloading, handling, Store, installation (including civil works), obtaining all necessary statutory approvals, testing, demonstration for acceptance, commissioning, and documentation of 33kV Double Circuit Overhead Line and UG Cable (road and railway crossing) from 220/33kV Switching Substation to 33/415V Distribution substation for LT power at TFL pump house.

## 2.0 LOCATION OF THE PROJECT SITE

A brief description of infrastructure at Talcher Fertilizer Plant Site is furnished below:

- The proposed project will be located within the premises of existing closed coal based Ammonia-Urea complex of FCI Ltd. Talcher Unit.
- The total land area of the site is 904.53 acres out of which lease hold land from Government of Odisha is 894.207 acres and land purchased from private parties is 10.33 acres.
- The area is not falling under coal bearing zone up to a depth of 200-250 meter.
- Talcher site is located at Vikrampur in Angul district of Odisha on the Cuttack-Sambalpur National Highway NH-42. NH-42 is passing at about 8 km from the site. The nearest railway station is Talcher at about 7 km from the site. Nearest air port Bhubaneswar is 150 km, 3 hours journey by road/ rail. Nearest sea port is Paradeep, 200 km by rail/road from the site. Talcher is situated at 21° 10" N Latitude and 82° 5" E Longitude.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 5 of 39		

### 3.0 GENERAL

- 3.1 Special Conditions of Contract shall be read in Conjunction with the General conditions of Contract, specification of work, Drawings and any other documents forming part of this Contract wherever the context so requires.
- 3.2 Notwithstanding the sub-division of the documents into these separate sections and volumes, every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the Contract so far as it may be practicable to do so.
- 3.3 Where any portion of the General Condition of Contract is repugnant to or at variance with any provisions of the Special Conditions of Contract, unless a different intention appears, the provisions of the Special Conditions of Contract shall be deemed to override the provisions of the General Conditions of Contract and shall to the extent of such repugnancy, or variations, prevail.
- 3.4 Wherever it is mentioned in the specifications that the Contractor shall perform certain work or provide certain facilities, it is understood that the Contractor shall do so at his cost and the value of contract shall be deemed to have included cost of such performance and provisions, so mentioned.
- 3.5 The materials, design, and workmanship shall satisfy the relevant Indian Standards and CPWD specifications, the Job Specifications contained herein and Codes referred to. Where the job specification stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied.
- 3.6 It will be the Contractor's responsibility to bring to the notice of Engineer-in-Charge any irreconcilable conflict in the contract documents before starting the work (s) or making the supply with reference which the conflict exists.
- 3.7 In the absence of any Specifications covering any material, design of work (s) the same shall be performed / supplies / executed in accordance with Standard Engineering Practice as per the instructions / directions of the Engineer-in-Charge, which will be binding on the Contractor.
- 3.8 'Codes' shall mean the following including the latest amendments and/or replacements, if any:
- i) Indian Electricity Act, 2003 and Rules and Regulations made thereunder.
  - ii) Indian Factory Act, 1948 and Rules and Regulations made thereunder.
  - iii) Indian Explosives Act, 1884 and Rules and Regulations made thereunder.
  - iv) Indian Petroleum Act, 1934 and Rules and Regulations made thereunder.
  - v) A.S.M.E. Test Codes.
  - vi) A.I.E.E. Test Codes
  - vii) American Society of Materials Testing Codes.
  - viii) Standards of the Bureau of Indian Standards (BIS).
  - ix) Other Internationally approved standards and/or rules and regulations touching the subject matter of the Contract.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 6 of 39		

x) OPWD Code with its latest amendments.

- 3.9 All the spares for the equipment under the contract will strictly conform to the specification and documents and will be identical to the corresponding main equipment / components supplied under the contract and shall be fully interchangeable.

All the mandatory spares covered under the contract shall be supplied along with the main equipment and the delivery would be completed by the respective dates for the various categories of equipment as per the agreed Work Completion Schedule.


#### 4.0 GENERAL PROVISION WITH REGARD TO MATERIALS

4.1 The CONTRACTOR shall, within the scope of work, undertake the following activities and responsibilities with respect to and in addition and without prejudice to the activities and responsibilities under Clause 4.1 and associated clauses there under in respect of materials:

- i) The CONTRACTOR shall in taking delivery, ensure compliance of any condition for delivery applicable to deliveries from the concerned authority or carrier, and shall be exclusively responsible to pay and bear any detention, demurrage or penalty or other charges payable by virtue of any delay or failure by the CONTRACTOR in lifting the materials or in observing any of the conditions aforesaid, and shall keep the OWNER indemnified from and against all consequences there of
- ii) The CONTRACTOR shall maintain a day-to-day account of all materials indicating the daily receipt(s), consumption(s) and balance of each material and category thereof. Such account shall be in the format, if any, prescribed by the ENGINEER-IN-CHARGE and shall be supported by all documents necessary to verify the correctness of the entries in the account. Such account shall be maintained at the CONTRACTOR MANAGER's office and site(s) and shall be open for inspection and verification (by verification of documents in support of the entry as also by feasible verification of the stock) at all times by the ENGINEER-IN-CHARGE with authority at all times without obstruction to enter into or upon any godown or other place(s) or premise(s) where the materials or any part of them are lying or stored and to inspect the same himself and or through his representative(s).
- iii) All materials shall be taken delivery of, held, stored and utilised by the CONTRACTOR as Trustee of the OWNER, and delivery of the material to the CONTRACTOR shall constitute an entrustment thereof to the CONTRACTOR, with the intent that any utilization, application or disposal thereof by the CONTRACTOR otherwise than for permanent incorporation in the contractual works in terms of the contract shall constitute a breach of trust by the CONTRACTOR.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 7 of 39		

- iv) The CONTRACTOR shall at all times be exclusively responsible for any and all losses, damages, deterioration, misuse, wastage, theft, or other application or misapplication or disposal of the materials or any of them contrary to the provisions hereof and shall keep the OWNER indemnified from and against the same and shall forthwith at its own cost and expenses replace any such material, lost, damaged, deteriorated, misused, wasted, stolen, applied, misapplied and/or disposed as aforesaid with other material of equivalent quality and quantity delivered to site at the CONTRACTOR's risks and costs in all respects.
- v) The CONTRACTOR shall take out, at his own cost and keep in force at all times, during transit, handling, storage, and erection upto completion in all respect of the work, policy (ies) with Insurance Company (ies) approved by the OWNER for the full replacement value of the materials at site against the risks specified in the CONTRACT. Such policies shall be in the joint names of the OWNER and the CONTRACTOR, with exclusive right in the OWNER to receive all monies due in respect of such policy (ies) and with right in the OWNER (but without obligation to do so) to take out and pay the premia for any such policy (ies) and deduct the premia and any other costs and expense in this behalf from the monies for the time being due or in future becoming due to the CONTRACTOR. In case of Insurance claim, the GST leviable on the transfer of the claim money from OWNER to CONTRACTOR shall be over and above the GST cap indicated in the CONTRACT and shall be borne by OWNER.
- vi) If the CONTRACTOR shall default in replacing at the job SITE, without any additional cost to the OWNER, any material lost, damaged, deteriorated, misused, wasted, short, stolen, misapplied or disposed of within the provisions hereof above, the CONTRACTOR shall be liable to pay to the OWNER the cost of such materials.
- a) Notwithstanding anything herein provided, the CONTRACTOR shall be and remain solely and exclusively liable to repair, restore or replace, as the case may be, the materials damaged or destroyed as a result of any act or omission, notwithstanding the existence or otherwise of any policy(ies) of insurance aforesaid, with the intent that any policy(ies) of insurance aforesaid taken out by the CONTRACTOR or by the OWNER, on default by the CONTRACTOR, shall not anyway absolve the CONTRACTOR from his full liability up to and until issue of the Preliminary Acceptance Certificate as provided for herein in respect of the works, the work(s) and all materials incorporated therein shall be and remain at the risks of the CONTRACTOR in all respects, including (but not limited to) accident, lightning, earth-quake, fire, storm, flood, tempest, riot, civil commotion and/or war or otherwise with respect to the materials, but shall constitute merely an additional security and not a substitution of liability.
- b) It shall be the exclusive responsibility of the CONTRACTOR to lodge and pursue any or all claims in respect of the insurance aforesaid.
- c) The CONTRACTOR shall, as a condition to the certification of any Running Account Bill, satisfy the OWNER/ Engineer-In-Charge of the existence of one or more policy(ies) of insurance, covering the materials as specified herein. The policy(ies) of insurance aforesaid shall cover all insurable risks, including but not limited to, any loss or damage

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 8 of 39		

commencing from the supplier's ware house in handling, transit, storage and during erection, theft, pilferage, riot, civil commotion, force majeure (including earth quake, flood, storm, cyclone, tidal wave, lightening and other adverse weather conditions), accidents of kinds, fire, war risks and explosion.

- vii) If the CONTRACTOR shall default in replacing at the job site, free of any cost to the OWNER, any material lost, damaged, deteriorated, misused, wasted, short, stolen, misapplied or disposed of within the provisions hereof above, the CONTRACTOR shall be liable to pay to the OWNER the cost of such materials.

#### 4.2 **SUPPLY OF MATERIALS**

4.2.1 The CONTRACTOR shall supply the materials required to be supplied within the Contractor's scope of supply for incorporation in the permanent works in accordance with and to meet the requirements in quality, quantity and other particulars of the descriptions, specifications, plans, drawings, designs and other documents applicable thereto, and the CONTRACTOR shall be deemed to have undertaken that all materials selected, procured and supplied by the CONTRACTOR within the scope of supply shall be of the best quality and workmanship and shall be capable of producing the designed desired results and to perform the designed and desired functions to meet the contractual requirements in all respects for the project.

4.2.2 The CONTRACTOR shall undertake and complete the supply of materials within the scope of supply to meet the scheduled progress and requirements of the WORK within the scope of work.

4.2.3 All materials shall be deemed to have been accepted only when the material is received at the project SITE and accepted by the ENGINEER-IN-CHARGE. Such acceptance shall however be subject to the terms and conditions of CONTRACT, including the right of rejection and/or replacement as elsewhere herein specified.

4.2.4 Without prejudice to any other terms of the contract, it is clarified that the mere agreement, acceptance or prescription of a Delivery or other Schedule containing an extended time of commencement or completion in respect of the entire delivery(ies) or any of them shall not anyway constitute an extension of time in a terms of the CONTRACT so as to bind the OWNER or relieve the CONTRACTOR of all or any of his liabilities under CONTRACT, nor shall constitute a promise on behalf of the OWNER or a waiver by the OWNER of any of its rights in terms of the contract relative to the performance of the CONTRACT within the time specified or otherwise, but shall be deemed only (at the most) to be a guidance to the CONTRACTOR for better organising his work on a recognition that the CONTRACTOR has failed to organise his supplies and/or make the same within the time specified in the Delivery Schedule.

4.2.5 If the CONTRACTOR fails to supply the materials in accordance with the dates in this behalf specified in the Delivery Schedule which has an impact on the critical path of the schedule, the CONTRACTOR shall provide the OWNER with a suitable plan to recover the delay, but without prejudice to any other rights, discount or remedy available to the OWNER in respect of such delay or failure.

#### 4.2.6 **MAKE OF MATERIALS**

- i) All equipment and materials to be supplied under this CONTRACT shall be from approved vendors as indicated in the Bidding Document or as otherwise approved by the ENGINEER-IN-CHARGE / OWNER.



	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 9 of 39		

- ii) Where the makes of materials are not indicated in the Bidding document, the CONTRACTOR shall furnish details of proposed makes and supplies and supply the same after obtaining the OWNER's/ ENGINEER-IN-CHARGE's approval.

## 5.0 OWNER'S OBLIGATIONS:

The OWNER'S obligations are limited to the following:

- Handing over the substation site .
- Approval of Construction drawings supplied by the Contractor.
- Payment to the contractor for performance of work under the contract as per the terms and conditions specified therein.
- A piece of land for setting up temporary office, Godown, etc., if available.

## 6.0 POWER & WATER FOR CONSTRUCTION AND OTHER PURPOSES

Availability of water & power at site is very limited. Contractor shall have to make his own arrangements for Construction work.

## 7.0 RATES

- OWNER shall pay to contractor the total rates quoted by them for the due and faithful performance of contractor's obligation under the contract. The rates quoted by the contractor in SOR shall remain fixed and firm and not subject to any escalation unless and otherwise specified in the tender.
- The rates shall be deemed to allow for all minor extras and constructional details which are not specifically shown on drawings or given in the specifications but are essential in the opinion of the Owner/ Consultant to the execution of work to conform to good workmanship and sound engineering practice. The Owner / Consultant reserve the right to make any minor changes during the execution without any extra payment.
- The Owner / Consultant decision to classify any item 'minor changes', 'minor extras' and 'constructional details' shall be final conclusive and binding on the Contractor.
- Rates quoted shall include for payment of royalties for obtaining earth, morrum, sand, aggregates, stones, etc. Nothing extra shall be paid to the Contractor on this account.
- Contractor shall be responsible for making all necessary approach roads to the sites of execution for taking his rigs, cranes & equipments. No extra claim in this regard shall be entertained.
- Schedule of rates submitted by the Tenderer shall be the true copy of the schedule of rates enclosed with the tender documents

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 10 of 39		

7.7 The quantities and items of work given in the Schedule of Rates are tentative and approximate. The OWNER reserves the right to order variation of work during the currency of the contract of its original contract value within the stipulated variation as per clause no. 60.2 of GCC.

The contractor shall not be entitled to any **increase** whatsoever **on the SOR rates** on account of any variation in the quantities and/or omission/addition of items **vis-à-vis the quantities mentioned** in the “Schedule of Rates (**Section VII**)” as long as the contract value finally determined on the basis of the certified final quantities and the contract item rates is within the stipulated variation as per clause no. 60.2 of GCC.

## 8.0 SPECIFICATIONS

8.1 If specification for an item of work is not covered by CPWD/ BIS specifications or Technical Specifications, the same shall be decided by the Owner/ Consultant and shall be binding on the Contractor.

8.2 The Owner/ Consultant shall have the right to cause the Contractor to purchase and use such materials of particular make or from a particular source which may in his opinion be necessary for proper and reasonable compliance with the specifications and execution of work.

8.3 (a) As and when required by the Owner/ Consultant, the Contractor shall provide all facilities at site or at manufacture’s works or in approved laboratory for testing of materials and/or workmanship. All the expenditure in respect of this shall be borne by the Contractor. The Contractor shall, when required to do so by the Owner/Consultant, confirm that the materials have been tested in accordance with requirements of the specifications.

(b) Neither the omission by the Owner/ Consultant to test the materials nor the production of manufacturer(s) certificate, etc. shall affect the right of the Owner/Consultant to reject, after delivery, the materials found not in accordance with the specifications.

## 9.0 GATE PASSES

All tools, plant and materials shall be brought by the Contractor to the works site through a covering note to be submitted in 3 copies. One copy of the covering note will be delivered to the security staff and one copy to the Owner/Consultant. The third copy shall be retained by the Contractor. The Contractor shall follow all rules and regulations for entry / exit of their men and materials in/from project site as framed by Owner/Consultant.

## 10.0 TIME SCHEDULE

10.1 Bidder shall be required to complete the WORK under the CONTRACT so as to achieve the GUARANTEED COMPLETION DATE in accordance with the following:

<b>Completion Period/ Completion Schedule</b>	<b>12 (Twelve) months from date of issuance of FOA (Fax of Acceptance)</b>
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Completion date shall be considered as date of issuance of Completion Certificate by TFL after successful Commissioning of the system.

10.2 The basic consideration and essence of the Contract is the strict adherence to the Time schedules for performing the specified works as stipulated in the Contract.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 11 of 39		

10.3 If at any time, the Owner/Consultant is of opinion that the Contractor has fallen behind the approved construction schedule, the Owner/ Consultant may, without any cost to Owner/ Consultant, require the Contractor to take such steps as may be necessary to improve his progress, especially require him to employ overtime operations, increase the number of shifts, work on holidays and Sundays or increase the capacity of his construction plant and equipment and require him to submit evidence demonstrating the manner in which the Contractor proposes to comply with the construction schedule. Failure of the Contractor to comply with the above will be considered a failure to execute the work with due diligence.

#### **10.4 Time schedule network/ bar chart.**

10.4.1 Together with the Work Order/ Contract confirmation, Contractor shall submit to Owner/ Consultant, his time schedule regarding the documentation, supply of materials as well as information about of his Subcontracts to be placed with their parties, including the dates on which Contractor intends to issue such Subcontracts.

10.4.2 The time schedule will be in the form of a network or a bar chart clearly indicating all main or key events regarding documentation, supply of materials, delivery and site fabrication, erection, inspection, testing and completion.

10.4.3 The original issue and subsequent revisions of Contractor's time schedule and or Sub-contractor's time schedules shall be sent to Consultant in two copies (of which one shall be in Soft copy) and two copies to Owner.

10.4.4 The time schedule network/bar chart shall be updated at least every fortnight.

#### **10.5 Progress Trend Chart/ Monthly Report**

10.5.1 Contractor shall report weekly to Owner/ Consultant the progress of the execution of Work Order/ Contract and achievement of targets set out in time bar chart.

10.5.2 The progress will be expressed in percentages shown in the progress trend chart.

10.5.3 The first issue of the progress trend chart will be forwarded together with the time bar chart along with the Work Order confirmation.

10.5.4 The fortnightly reporting will bear the updating of the progress trend chart.

10.5.5 All reports shall be submitted through e-mail. Monthly reports to be also submitted in hard copy.

#### **11.0 ISSUE OF WORKING DRAWINGS**

All Working drawings shall be issued by OWNER/ CONSULTANT's to the CONTRACTOR. Working drawings submitted by the OWNER/ CONSULTANT's progressively during the pendency of the contract, shall be approved/ marked "Good for execution/ construction" by Owner/ Consultant. The Contractor on this account shall not be entitled to put forth any claim whatsoever on account of delay in approval of the drawings to the Owner/ Consultant. Fabrication drawing, if any shall be prepared by the contractor itself and same shall be approved by OWNER/ CONSULTANT's.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 12 of 39		

## 12.0 SERVING OF NOTICES

The Contractor shall furnish to the Owner/ Consultant the name, designation and address of his authorized Agent for the purpose of serving of notice(s) regarding all complaints, communications and references and shall be deemed to have been duly given to the Contractor if delivered to the Contractor or his authorized agent or left at or posted to the address so given and shall be deemed to have reached such address in the ordinary course of post or on the day on which they were so delivered or left. In the case of contract by partnership firm, any change in the constitution of the firm shall be forthwith informed by the Contractor to the Owner/ Consultant.

- All correspondence from the CONTRACTOR to the OWNER shall be as per the correspondence distribution schedule. All communications including technical-commercial clarifications and/ or comments shall be addressed to OWNER/ CONSULTANT and shall always bear reference of DLOA number.
- Correspondence on technical and commercial matters shall be dealt with in separate letters and each copy of the letter shall be complete with all Annexures, if any.
- Any notice to the CONTRACTOR under the terms of the CONTRACT shall be served by registered e-mail/Speed Post, fax or courier.
- Any notice to the OWNER shall be served from the CONTRACTOR's Principal office in the same manner.
- Any written order or instruction of OWNER or his duly authorised representative, communicated to authorised representative of the CONTRACTOR at site office shall be deemed to have been communicated to the CONTRACTOR at his legal address.

## 13.0 NOTHING EXTRA FOR ADVERSE SUB-SOIL CONDITION

There may be variation in nature of sub-soil both horizontally and vertically. The Contractor shall have to take necessary precaution during excavation against any happening like collapsing of sides etc. Any slip or fall in excavation shall have to be cleared by the Contractor at his own cost. In case of excessive heaving, it shall have to be cut and refilled with lean concrete by the Contractor at his own cost. The Contractor shall have to adopt underwater work in case of occurrence of piping/quick conditions without any cost to Owner/Consultant.

## 14.0 CONTRACTOR'S RESPONSIBILITY FOR THE MANNER OF EXECUTION OF WORK

The Contractor shall be responsible for the manner and the method of executing the work. The work shall be subject to the approval of Owner/ Consultant from time to time for purposes of determination of the question whether the work is executed by the Contractor in accordance with the contract.

## 15.0 NO WORK SHALL BE UNDERTAKEN WITHOUT APPROVED WORKING DRAWINGS

No work shall be undertaken at Site by the Contractor until detailed approved working drawings are marked "Good for execution/ construction" by Owner/ Consultant. Any work done without the aforesaid approved working drawing shall be at the Contractor's own risk and costs.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 13 of 39		

## 16.0 CONTRACTOR SHALL KEEP FOUNDATION PITS/TRENCHES DRY

The Contractor, during the pendency of contract, shall keep in dry condition of pits, trenches, which are not yet back filled due to technical reasons, if not shall be Bail-out/Pump-out all accumulation at his own cost for the safety of the structure / element. During pumping, the Contractor shall have to ensure that 'Loss of Ground' does not occur. Other approved methods shall be undertaken by the Contractor to avoid 'Loss of Ground' if occurred, at his own cost.

## 17.0 NOTHING EXTRA FOR INTRICATE CONCRETE SHUTTERING OR REINFORCEMENT WORK

Nothing extra shall be paid for any intricate concrete, shuttering or reinforcement work for foundations of equipment and machinery and for other foundation/superstructure works or for any delay inherent in concreting in small and thin sections in concrete or RCC works etc.

## 18.0 NOTHING EXTRA FOR REBATING ETC.

Nothing extra shall be paid in concrete/RCC works for all rebating, chamfering, grooving, sinking, trotting weathering, moulding, etc. to accord with the details shown on the working drawings.

## 19.0 CONSTRUCTION JOINTS

19.1 In case of execution of massive concrete elements both in foundation and in superstructure and in some other locations as would be permitted except where specified in the working drawings, the work shall be carried out in one single operation without any break in concreting within time limit that would be specified by the Owner / Consultant without any additional cost to Owner/ Consultant.

19.2 All specified construction joints, either horizontal or vertical, in any element of concrete member shall be provided with shear keys of such dimensions as would be determined by the Owner/Consultant. Before adopting the next operation for the other half of the element these shear keys along with the entire surface of the joint shall be roughened and deepened to above 20 mm by chipping, washing and cleaning thoroughly. The Contractor shall provide cement slurry in sufficient quantity over the cleaned surface for proper bond as per the direction of Owner/Consultant. The Contractor shall not be entitled to any extra/payment; on this account.

## 20.0 SUBMISSION OF BILL

Contractor is to submit the bills and record of measurements in three (3) copies for works executed by him.

### 20.1 FOR R/A BILLS:

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 14 of 39		

Contractor is to submit the bills and record of measurements to EIC complete in all respect for certification by Owner/Consultant in three copies for works executed by him progressively.

## 20.2 MEASUREMENT OF WORKS

In addition to the provisions of relevant Clause of GCC, following shall also apply:

Measurement of work shall be made in the units mentioned in the schedule of rates. The abbreviations used in the schedule of rates are mentioned in Schedule of Rates.

The Engineer-in-Charge shall, except as otherwise stated ascertain and determine by measurement the value of Work done, in accordance with the Contract and as per actual Work done. The Engineer-in-Charge shall, when he requires any part or parts of the Works to be measured, give notices to the Contractor's authorized agent or representative who shall forthwith attend or send a qualified agent to assist the Engineer-in-Charge in making such measurement and shall furnish all particulars required by either of them. Should the Contractor not attend or neglect or omit to send such representative then the measurement made by the Engineer-in-Charge shall be taken to be the correct measurement of the Work. For all measurements, figured dimensions given in the drawings shall be followed. Measurement of all hidden items shall be carried out by the Engineer-in-Charge. The Contractor or his representative who attends may at the time of measurement take such notes and measurements as he may desire.

The measurements for excavations shall be restricted and limited to minimum excavation line as per drawing for payment purposes.

## 20.3 DISPUTE IN MODE OF MEASUREMENT

Where Works have to be measured for any purpose whatsoever, it shall be in accordance with item specifications as per relevant Indian Standards unless otherwise specifically indicated in the Contract Specifications. All measurements will be recorded in metric units only. In case of absence of mode of measurement of any item not covered by both the methods mentioned above, the Engineer-in-Charge's decision shall be final and binding. The required number of bills, registers, bill forms, level/field books, materials/ account registers, testing registers, site order books and any other stationary item pertaining to this contract shall be printed and provided for by the contractor, at his own cost in the format prescribed and approved by the Engineer-in-Charge in writing. The Measurement Sheet will have three copies in different colour pages and will be printed so that proper referring and record of complete measurement is maintained. Original sheet will be retained in the book and will be returned to Owner on completion of Work.

## 20.4 SUBMISSION OF FINAL BILL

The final bill complete in all respect shall be submitted after certified completion of work.

20.4.1 On the basis of the rates provided in the CONTRACT and subsequent Change Order(s)/Amendment(s), if any, the CONTRACTOR shall prepare the Final Bill as per GST norms. Additions claimed on account of CHANGE ORDER(s) shall be separately indicated in the Final Bill with reference to the relative CHANGE ORDERS(s).

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 15 of 39		

20.4.2 The Final Bill shall, in addition to the payment entitlements arrived at according to the provisions of Clause 20.4.1 hereof shall separately state and include therein all claims of the CONTRACTOR, if any, with full particulars of the nature of such claim and grounds on which it is based and the amount claimed.

20.4.3 The Final Bill drawn in accordance with Clause 20.4.1 shall be submitted (together with the COMPLETION CERTIFICATE along with other documents as stipulated at Clause No. 39.8 of SCC, to the ENGINEER-IN-CHARGE for certification, who shall certify the Final Bill, if drawn in accordance with Clause 20.4.1. After certification of the ENGINEER-IN-CHARGE, the Final Bill shall be submitted in quadruplicate (or in such other number of copies as the OWNER may prescribe) to the OWNER for payment.

20.4.4 All monies payable under the CONTRACT for WORKS to be performed and MATERIALS to be supplied up to and including successful completion shall become due and payable to the CONTRACTOR only after submission to the OWNER of the Final Bill prepared in accordance with the provisions of Clause 20.4.1 hereof and associated provisions there under accompanied by the COMPLETION CERTIFICATE in respect of the WORKS.

20.4.5 Payments of the amount(s) due on the Final Bill to the extent certified by the ENGINEER-IN-CHARGE, shall be made within 30 (Thirty) days from the due date as specified in Clause 20.4.4 hereof, subject to the deductions provided in Clause 20.4.5.1.

20.4.5.1 All payments due to the CONTRACTOR on the Final Bill shall be subject to tax deductions and any other deductions provided in the CONTRACT or required to be made under any law, rule or regulation having the force of law for the time being applicable, or elsewhere provided for in the CONTRACT documents.

## 21.0 CLAIMS BY THE CONTRACTOR

21.1 No claim(s) shall on any account be made by the CONTRACTOR after submission of the Final Bill, with the intent that the Final Bill prepared by the CONTRACTOR shall reflect any and all claims whatsoever of the CONTRACTOR against the OWNER arising out of or in connection with the CONTRACT or any supply made or work performed by the CONTRACTOR there under or in relation thereto, and notwithstanding any enabling provision in any law or CONTRACT and notwithstanding any claim that the CONTRACTOR could have with respect thereto, the CONTRACTOR hereby waives and relinquishes any and all such claims not included in the Final Bill and absolves and discharges the OWNER from and against the same, even if in not including the same as aforesaid, the CONTRACTOR shall have acted under a mistake of law or of fact, or shall claim to have acted under economic compulsion or necessity.

21.2 If required by the OWNER, the ENGINEER-IN-CHARGE shall be authorised to require the CONTRACTOR to furnish, and the CONTRACTOR shall, upon the request of the ENGINEER-IN-CHARGE /OWNER, furnish all invoices, vouchers and accounting records as may be deemed necessary by the ENGINEER-IN-CHARGE /OWNER for the purpose of verifying any CONTRACTOR's claim.

## 22.0 PROVISION FOR MULTIFARIOUS CHECKING OF WORK

Before commencement of the actual concreting operation the position and layout of foundations, pedestals, inserts, pockets, recess, reinforcement and form work shall be checked repeatedly by Owner/Consultant. No claim whatsoever shall be entertained on

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 16 of 39		

this account. The level of foundations shall be accurately maintained as shown in the drawings or as directed by the Owner/Consultant. No padding, plastering or chipping shall be allowed for achieving the results.

### 23.0 DEFECT LIABILITY PERIOD

Defect Liability Period shall be 12 months from the date of completion of works in all respects as declared by EIC.

### 24.0 CLEARING, FILLING AND LEVELING OF SITE

The site shown on the layout plan shall be cleared by the Contractor of all obstructions, loose stones, materials, rubbish of all kinds of bushes, trees, grass as well as brush wood. All holes/hollow, whether originally existing or produced by removal of loose stones or brush wood, shall be carefully filled up with earth, well rammed and levelled off as directed by the Owner/ Consultant. The Contractor will not be entitled to any payment in his regard.

### 25.0 CONTRACTOR TO COMPLY ALL LAWS

25.1 The contract shall be governed by the law in force in the Republic of India.

25.2 The Contractor shall comply with all laws etc. The Contractor shall be responsible to secure compliance with the Central and States Laws as well as the Rules, Regulations, by-laws and orders of the legal authorities and statutory bodies which are in force or as may be in force from time to time. He shall give to the Municipal Corporation Committees, police and other relevant authorities all such notices, etc. as may be required by law and obtain all requisite license for temporary constructions, enclosures, etc. and pay all fees, taxes and such other dues or charges which may be leviable on account of any of his operations in executing the works under this contract. Owner/Consultant shall not pay anything extra to the Contractor on this account. The Contractor shall also make good at his own cost, any damage done by him to any adjoining property, during execution of work.

### 26.0 CONTRACTOR TO USE THE MATERIALS ONLY AFTER THE APPROVAL OF OWNER

The Contractor shall use the raw materials only after its successful testing at any NABL accredited lab and subsequent concurrence of the report by the Owner/ Consultant, before incorporation of the same in the works.

### 27.0 COMPLIANCE OF ENTIRE PROVISIONS IS OBLIGATORY TO CONTRACTOR

It shall always prevail, unless otherwise specifically stated, that the entire provisions of the Tender Document have been accepted for compliance by the Contractor without any reservation.

### 28.0 DELIVERY AND DOCUMENTS

Delivery of the Goods shall be made by the Contractor in accordance with the terms specified by the Owner/Consultant in the schedule of requirements in Technical Specifications and the special conditions of Contract.



	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 17 of 39		

## 29.0 WEATHER CONDITIONS

Owner/Consultant may order Contractor to suspend any work which in the opinion of Owner/Consultant may be subject to damage by prevailing weather conditions. No claim whatsoever on this account shall be entertained.

It is presumed that the Contractor has familiarized himself with the weather conditions prevailing in the area therefore in such weather parameters if it appears to the Engineer –in –charge (EIC) that certain weather condition may damage the work or specified quality of the work can be achieved without stoppage of the work, the EIC in such conditions may require the Contractor to stop the work till such time as he thinks fit and appropriate. It is understood by the contractor that no compensation will be admissible on this count.

## 30.0 INSTRUCTIONS, DIRECTIONS AND CORRESPONDENCE

30.1 The work described in Contract is to be executed according to the standards, data sheets, tables, Specifications and Drawings and according to all conditions both general and specific enclosed with the Tender document, unless any or all of them shall have been modified or cancelled in writing as a whole or in part.

- i) All instructions and orders to Contractor shall, except what is herein provided, given by Owner/Consultant.
- ii) All the work shall be carried out under the direction of and to the satisfaction of Owner/Consultant.
- iii) All communications including technical/commercial clarifications and/or comments shall bear reference to the DLOA/ Contract.
- iv) Invoice for payment against DLOA/ Contract shall be addressed to Owner/ Consultant.
- v) The DLOA number shall be shown on all invoices, communications, packing lists, containers and bills of lading etc.

30.2 Correspondence on technical and commercial matters shall be dealt with in separate letters and each copy of the letter shall be complete with all Annexures. Wherever possible, correspondence should be through e-mails.

30.3 Correspondence for expediting any Material Inspection , shall be done directly with CONSULTANT & OWNER.

## 31.0 QUALITY ASSURANCE / QUALITY CONTROL

31.1 After the award of the contract detailed quality assurance programme shall be prepared by the Contractor for the execution of contract for various works which will be mutually discussed and agreed to.

31.2 The Contractor shall establish document and maintain an effective quality assurance system outlined in recognized codes.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 18 of 39		


- 31.3 Quality Assurance System plans/procedures of the Contractor shall be furnished in the form of a QA manual after award of job. This document should cover details of the personnel responsible for the Quality Assurance, plans or procedures to be followed for quality control in respect of Design, Engineering, Procurement, Supply, Installation, Testing and completion in all respect till final acceptance by Owner. The quality assurance system should indicate organizational approach for quality control and quality assurance of the construction activities, at all stages of work at site.
- 31.4 The Owner/ Consultant or their representative shall reserve the right to inspect/ witness, review any or all stages of work at shop/site as deemed necessary for quality assurance.
- 31.5 The Contractor has to ensure the deployment of quality Assurance and Quality Control Engineer(s) depending upon the quantum of work.  
This QA/QC group shall be fully responsible to carry out the work as per standards and all code requirements. In case Engineer-in-charge feels that Contractor's QA/QC Engineer(s) are incompetent or insufficient, Contractor has to deploy other experienced Engineer(s) as per site requirement and to the full satisfaction of Engineer-In-Charge.
- 31.6 In case Contractor fails to follow the instructions of Engineer-in-charge with respect to above clauses, next payment due to him shall not be released unless until he complies with the instructions to the full satisfaction of Engineer-in-charge.
- 31.7 The Contractor shall adhere to the approved quality assurance system

### **32.0 HEALTH SAFETY AND ENVIRONMENT (HSE) MANAGEMENT**

The Contractor, during entire duration of the Contract, shall adhere to HSE requirement as per Specification enclosed in the Bidding Document as per **Annexure - I (Annexure to Special Conditions of Contract)**

### **33.0 SUSPENSION OF WORKS**

- 33.1 The OWNER reserves the right to suspend and reinstate execution of the whole or any part of the WORK without invalidating the provisions of the CONTRACT. Orders for suspension or reinstatement of the WORKS will be issued by the OWNER to the CONTRACTOR in writing. The time for completion of the WORKS will be extended for a period equal to the duration of the suspension along with mutually agreed remobilization period.
- 33.2 If such suspension of WORK by OWNER delays or is likely to delay the progress of WORK or the carrying out of WORK under CONTRACT resulting in additional expenses or increased liability to CONTRACTOR, the OWNER shall pay to the CONTRACTOR all reasonable expenses, mutually agreed between OWNER and CONTRACTOR, arising from suspension of the work by an order in writing of the OWNER provided that such suspensions of work is more than a cumulative period of Sixty days (60) days and provided that such suspension is not due to some fault on the part of the CONTRACTOR or a SUB-CONTRACTOR.
- 33.3 If the OWNER has;
- (i) failed to pay the CONTRACTOR any sum due under the CONTRACT within the period specified in the Contract; or

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 19 of 39		

- (ii) failed to approve invoice or supporting document without just cause within the period specified in the Contract; or
- (iii) committed substantial breach of the Contract:

Then, CONTRACTOR may give a notice requesting OWNER to remedy aforesaid default within 30 days. If OWNER fails to remedy it within the said period, CONTRACTOR may suspend the performance of its obligations under the CONTRACT.

33.4 If the CONTRACTOR's performance of its obligations is suspended under the CONTRACT pursuant to clause 33.3 as above, then the COMPLETION TIME shall be extended and all reasonable additional costs or expenses incurred by the CONTRACTOR and mutually agreed between OWNER and CONTRACTOR, as a result of such suspension shall be paid by the OWNER to the CONTRACTOR provided that such suspension is not due to fault on the part of CONTRACTOR or its SUB CONTRACTOR.

#### 34.0 INCOMING MATERIAL REPORT/ INSPECTION

All material entering the site shall be properly recorded by contractor's representative with detail of challan, bill and quantity.

- a) All equipment shall be inspected and tested as per an agreed Quality Assurance Plan before the same is packed and dispatched from the Contractor's/ Vendor's Works. The Contractor shall carry out tests as specified/ directed by Engineer.
- b) Contractor shall perform all such tests as may be necessary to meet requirements of Local Authorities, Municipal or other statutory laws/ bye-laws in force. No extra shall be paid for these.
- c) The OWNER/ CONSULTANT may, at his sole discretion, carry out inspection at different stages during manufacturing and final testing after manufacturing.
- d) Approvals or passing of any inspection by the OWNER/ CONSULTANT or his authorized representative shall not however, prejudice the right of the OWNER/ CONSULTANT to reject the plan if it does not comply with the specification when erected or give complete satisfaction in service.
- e) All materials and equipment found defective shall be replaced and the whole work again tested to meet the requirements of the specifications, at the cost of the contractor. Contractor has to obtain a performance certificate/approval for the complete layout of piping/equipment erected.

#### 35.0 INSPECTION

35.1 Inspection of equipment/ materials at manufacturer/ supplier works, prior to dispatch shall be carried out by OWNER and/or CONSULTANT unless is explicitly waived off (in writing) by the OWNER and/or CONSULTANT.

35.2 Once the materials are ready for inspection, the materials will be offered for inspection to OWNER through proper channel. The offer of the inspection should contain the following documents and information;

- i) List of materials/equipment

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 20 of 39		

- ii) Quantity to be inspected
- iii) Routine test certificates of the equipment/materials
- iv) Name of the Vendors
- v) Place of inspection with detail address
- vi) Name of contact persons with telephone numbers
- vii) Bill of Materials in case of Tower materials and sub-station structures

### 35.3 Inspection by OPTCL

35.3.1 The inspection of materials/equipment by OPTCL shall be carried out at CONTRACTOR'S cost. The tour cost of OPTCL's inspecting officer will be borne by the CONTRACTOR. The deputation of the inspecting officers of OPTCL for witnessing the acceptance test will be decided & communicated to all concerned after receipt of above mentioned documents & scrutiny thereof.

35.3.2 The inspection will be witnessed by the OPTCL inspecting officer as per OPTCL practice in the presence of the representative of the manufacturer and TFL/CONSULTANT. The inspecting officer will submit the inspection report, test result, minutes of discussion, calibration certificates of the measuring and testing instruments etc. to OPTCL office.

If the test results are acceptable and the observations made by the inspecting officer are complied with, a dispatch instruction will be issued from OPTCL office Materials/equipment procured and received at site, contrary to the procedure enumerated above, shall not be allowed to be used in construction activities involving OPTCL transmission network.

35.3.3 Expenses in respect of OPTCL's representative for witnessing the inspection & testing of the offered equipment/materials at the inspection and testing site.

OPTCL inspecting officer on receipt of offer for inspection from the contractor/supplier, shall proceed to the manufacturer works to witness the Type/Acceptance/Routine test.

35.3.4 The travel expenses under the following heads, in respect of OPTCL's representative for witnessing the inspection & testing of the offered equipment/materials at the inspection and testing site, shall be borne by the contractor.

**a. Hotel Accommodation:**

- Single room accommodation in 4 star hotel for OPTCL inspecting officer, not below the rank of Assistant General Manager (Grade E-6),
- Single room accommodation in 3 star hotel for OPTCL inspecting officer of the rank below Assistant General Manager (Grade E-6).

**N.B.:** It is the responsibility of the contractor to arrange the hotel accommodation matching with their inspection and testing schedule. In case of extended duration of inspection or non-availability of the return ticket, Contractor shall arrange for the extended stay of the inspecting officer in the Hotel accordingly. In case, there is no hotel with prescribed standard in and around the place of inspection, the contractor

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 21 of 39		

shall suggest alternative suitable arrangement at the time of offer for inspection, which is subjected to acceptability of OPTCL inspecting officer.

**b. Journey of the Inspecting Officer:**

To and fro travel expenditure from the Head Quarters of the inspecting officer to the place of inspection/testing shall be borne by the contractor as per the following.

- Journey from the Head Quarters to the nearest Airport by train (1st/Ind A/C) or Taxi (A/C).
- Journey from destination Airport to the place of inspection/testing by train (1st/Ind A/C) or Taxi (A/C).
- For train journey, inspecting officer, not below the rank of Assistant General Manager shall be provided with 1st class AC ticket and inspecting officer below the rank of Assistant General Manager shall be provided with 2nd class AC ticket.

- Booking/cancellation of Air-ticket / Train-ticket is the responsibility of the contractor.
- Moreover, if during the journey there is an unavoidable necessity for intermediate travel by road/ waterway/sea-route, the contractor/supplier shall provide suitable conveyance to the inspecting officer for travel this stretch of journey or bear the cost towards this. Any such possibilities shall be duly intimated to OPTCL at the time of their offer for inspection.

**c. Local Conveyance:** Local journey for the inspecting officer between Hotel and the place of the inspection/testing site, Air-conditioned four wheeler vehicles in good condition shall be provided by the contractor.

**d. Other Important Information:**

- All the above expenses shall be deemed to be included in the bidder's quoted price for that supply item. Bidder shall not be eligible to raise any extra claim in this regard.
- Contractor may assume that only in 40% of the inspection and testing offer cases, OPTCL/TPIA inspecting officer (not below the rank of Assistant General Manager) will witness the inspection and testing.
- In case of inspection and testing of some critical equipment/materials like Power Transformers, CT, PT, Breakers, S/S Automation Equipment and Cable, OPTCL may depute more than one inspecting officer.
- Contractor shall judiciously plan the inspection/testing schedule and place of inspection/testing, so that optimum number of inspection/testing and minimum time shall be required to cover all the equipment/materials of the relevant contract package.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 22 of 39		

- It shall be the responsibility of the Contractor to organize the above tour related matters of OPTCL inspecting officer including the matters related to overseas inspection/testing, if any.
- e. Providing vehicle to the field Engineers for proper supervision of site works:
- For effective monitoring of the site works, the contractor shall submit monthly and weekly program of site work well in advance in prescribed format to OPTCL site engineer.
  - In case of transmission line work, the contractor shall clearly indicate the location no. in the program.
  - Contractor shall provide a four wheeler vehicle in good running condition and suitable for the site use to the field officers of the respective head-quarters to visit different work locations for monitoring the site works as per the program and back to the headquarters after monitoring the work.

Note: The expenses towards above, including cost pertaining to up-keeping cost of the vehicle, i.e. fuel, driver etc., shall be deemed to be included in the bidder's quoted price without any additional financial implication to OPTCL. Bidder shall not be eligible to raise any extra claim in this regard.

35.3.5 The materials shall be inspected by OPTCL or any authorized representative of OPTCL at the Contractor's or its Vendor's manufacturing works. The Contractor shall give the advance notice in writing about the place of Inspection and/or testing atleast 15 days before the schedule date on which the equipment/materials will be ready for Inspection and/or Testing. Routine test certificates are to be submitted along with the offer for inspection.

35.3.6 The OPTCL or his representative shall be entitled at all reasonable times during manufacture / installation to inspect examine and test the equipment/materials at the contractor's/Vendors premises / erection site about workmanship of the materials to be supplied under this contract. The contractor shall provide unhindered clearance, giving full rights to OPTCL to inspect, examine and test as if the equipment/materials were being manufactured in his premises/Vendors Premises. Such inspection/examination and testing shall not relieve the contractor of his obligations under the contract.

35.3.7 The Engineer-In-Charge shall have the right to re-inspect any equipment/materials though previously inspected and approved by him at the Contractor's or its Vendor's works, before and after the same are erected at Site. If by the above inspection, OPTCL rejects any equipment, the Contractor shall make good for such rejections either by replacement or modifications/repairs as may be necessary to the satisfaction of the Engineer-In-Charge, free of cost. Such replacement will also include the replacements or re-execution of such of those works of other Contractors and/or agencies, which might have got damaged or affected by the replacements or re-work done to the

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 23 of 39		

Contractor's/Vendor's work.

The OWNER/ CONSULTANT's Engineer may, at his sole discretion, carry out inspection at different stages during manufacturing and final testing after manufacturing. Testing performed in the presence of the Purchaser's representatives shall not relieve the supplier of their own responsibilities and guarantees and any other contractual obligations.

### 36.0 SECURITIES OF MATERIALS / EQUIPMENTS

Contractor shall be solely responsible for the security of the material at site and TFL/ Consultant shall not be responsible for any loss/theft of the materials.

- a) Materials required for the works, whether brought by the Contractor shall be stored by the Contractor only at places approved by the Engineer-in-Charge, as storage and safe custody of material shall be responsibility of the Contractor.
- b) TFL,'s officials concerned with the Contract shall be entitled at any time to inspect and examine any materials intended to be used in or on the works, either on the site or at factory or workshop or other place(s) where such materials are assembled, fabricated, manufactured or at any place(s) where these are lying or from which these are being obtained and the Contractor shall give such facilities as may be required for such inspection and examination.
- c) The contractor shall be the OWNER of all bought out items and materials and shall be responsible for the safety, security, insurance and care and custody of all the materials lying at site. TFL will have lien on all the items including those brought by the contractor for the purpose of Erection, testing, and commissioning of the work. For all Equipments/Materials, the title of Ownership shall pass on to the OWNER at the time of acceptance of entire work.

However, in case of termination of contract the transfer of title shall pass automatically to OWNER.

- d) CONSTRUCTION EQUIPMENT used by the CONTRACTOR and its SUB-CONTRACTORS in connection with the execution of works shall remain the property of CONTRACTOR or its SUB-CONTRACTORS. All duties, levies, taxes etc. payable on account of CONSTRUCTION EQUIPMENT shall be borne by the CONTRACTOR. CONTRACTOR shall indemnify the OWNER on this count.

### 37.0 CONTRACTOR'S PERSONNEL AT SITE:

List of persons employed by Contractor for the subject work mentioning there residential address shall be submitted to TFL. In case of any revision, the same shall be informed to TFL from time-to-time. If required necessary verification from Police / Gram Pradhan shall have to be submitted by the contractor.

The Contractor shall be directly responsible for any/all disputes arising between him and his personnel and keep indemnified against all losses, damage and claims arising thereof.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 24 of 39		

Within the TFL's premises, the Contractor's personnel shall not do any private work other than their normal duties.

The personnel engaged by the Contractor shall be subject to security check by the TFL's security staff while entering/leaving the premises. The contractor & his personnel shall be required to follow the rules and regulations of TFL in force from time-to-time. The contractor may also be required to provide photo passes to the personnel required by him, for security and safety reasons and furnished the details of the same when asked for.

No other person except Contractor's authorized representative shall be allowed to enter TFL premises Contractor shall also not entertain any outsider or extend any service beyond TFL's premises. Entry of Contractor's persons shall be regulated with proper identity/gate pass.

Contractor shall be fully responsible for theft, burglary, fire or any mischievous deeds by his staff and any loss to TFL shall be recovered from the immediate bill of the Contractor.

Contractor shall provide all necessary tools and tackles, equipments, safety belt, wheel burrow, scaffolding, ladders, drilling m/c & safety equipment etc. required to carry out job at his cost and material used by Contractor shall be of standard make and approval of Engineer-In-Charge shall be taken for the same.

TFL also reserves the right to ask the Contractor to remove particular person(s) from site with immediate effect if in the opinion of TFL, his behaviour/ performance is not up to the mark and/or found indulging in unlawful activities, Contractor shall immediately comply with such instructions.

It will be the responsibility of contractor's engineer to ensure that their personnel behave in a proper manners and behaviour and not to undergo the argument with the employees. It will be the responsibility of the Contractor's Engineer to deal with such complaints or co-ordinate with the TFL Engineer.

### **38.0 SETTING OUT THE WORKS**

The CONTRACTOR shall supply dimensioned drawings, levels and other information necessary to set out the works and the Contractor shall set out the works and be responsible for the accuracy of the same. He shall rectify at his own cost and to the satisfaction of the Engineer-in-Charge any error found at any stage which may arise through in accurate setting out. The Contractor shall protect and preserve all bench marks used in setting out the works till end of the Defects Liability Period unless the Engineer-in-Charge direct their earlier removal.

### **39.0 COMPLIANCE WITH LABOUR/ INDUSTRIAL LAWS**

RESPONSIBILITIES OF THE CONTRACTOR AND COMPLIANCE WITH LABOUR/ INDUSTRIAL LAWS:

- a. The contractor shall have his own PF code no. with the RPFC as required under Employee PF & Miscellaneous Provisions Act, 1952 and ESI code No. required under Employee State Insurance Act 1948 before commencement of work.



	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 25 of 39		

- b. The contractors shall periodically submit the challans / receipts / proof for the depositing PF contribution with RPFC and ESIC.
- c. The contractor is required to obtain labour license under the provisions of Contract Labour (R&A) Act, 1970 from the office of ALC (Central), Ministry of Labour, Govt. of India.
- d. The contractor is liable to abide by all necessary licenses / permissions from the concerned authorities as provided under the various labor legislations
- e. The contractor shall discharge obligations as provided under various statutory enactments including the employees Provident Fund and Miscellaneous Provisions Act, 1952, Contract Labour (R&A) Act, 1970, Minimum Wages Act, 1948, Payment of wages act 1936, Workman Compensation Act 1923, Employees' State Insurance Act 1948 and other relevant acts, rules and regulations enforced from time to time.
- f. The contractor shall be solely responsible for the payment of wages and other dues to the personnel, if any, deployed by him latest by 7<sup>th</sup> day of the subsequent month.
- g. The contractor shall be solely responsible and indemnify the TFL against all charges, dues, claim etc. arising out of the disputes relating to the dues and employment of personnel, if any, deployed by him.
- h. The contractor shall indemnify TFL against all losses or damages, if any, caused to it on account of acts of the personnel, if any, deployed by him.
- i. All personnel deployed by the contractor should be on the rolls of the contractor.
- j. The contractor shall ensure regular and effective supervision and control of the personnel, if any, deployed by him and gives suitable direction for undertaking the contractual obligations.
- k. The personnel to be deputed by the contractor shall observe all security, fire and safety rules of TFL while at the site. His Work/Services will be supervised by the supervisors of contractor. Contractor has to strictly adhere to guidance, instruction when required.
- l. Contractor shall provide proper identification cards for his employees to be deputed by him for Work/Services, duly signed by the contractor or authorized person on behalf of contractor. Also the contractor should obtain entry passes from Security Dept. through OPERATION-IN-CHARGE for his employees.
- m. Contractor has to deploy the personnel with no past criminal records. Reformed people, names of such persons should be clearly indicated in case of. Also the contractor has to provide police verification for all the persons deployed by him.
- n. While confirming to any of these conditions, the contractor should ensure that no law of state regarding labour, their welfare, conduct etc, is violated. The contractor shall indemnify TFL for any action brought against him for violation, non-compliance of any act, rules & regulation of centre / state / local statutory authorities.
- o. All existing and amended safety / fire rules of TFL are to be followed at the work site.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 26 of 39		

- p. Contractor shall ensure payment of wages to the personnel employed and meet all statutory obligations of payment as per Minimum Wages act 1948 and payment of wages Act 1936.
- q. Special safety equipment e.g. safety belts, helmets, hand gloves, goggles, safety shoes etc shall be provided to the personnel engaged by the contractor.
- r. Suitable site office space may be provided by TFL if required and available.
- s. In case of accident, injury and death caused to the employee of the contractor while executing the Work under the contract, the contractor shall be solely responsible for payment of adequate compensation, insurance money etc. to the next kith & kin of injured / diseased. Contractor shall indemnify TFL from such liabilities.
- t. The contractor shall also undertake to obtain necessary group insurance coverage covering all risks connected with the job to be undertaken by him under the contract from insurance company and pay the premium accordingly.
- u. The contractor shall not employ or permit to be employed any person suffering from any contagious, loathsome or infectious disease. The contractor shall get examined his employees / persons deployed from a civil govt. doctor.
- v. No employees or person of contractor (including contractor) be allowed to consume alcoholic drinks or any narcotics within the plant premises. If found under the influence of above, the owner / TFL will terminate the contract immediately and may refer the case to police.
- w. The contractor hereby agrees to indemnify owner/ TFL and harmless from all claims, demands, actions, cost and charges etc brought by any court, competent authority/ statutory authorities against owner/ TFL.
- x. All registration and statutory inspection fees, if any, in respect of his work pursuant to this Contract shall be to the account of the Contractor. However, any registration, statutory inspection fees lawfully payable under any statutory laws and its amendments from time to time during erection in respect of the equipment ultimately to be owned by OPTCL, shall be to the account of OPTCL. Should any such inspection or registration need to be re-arranged due to the fault of the Contractor or his Sub Contractor, the additional fees to such inspection and/or registration shall be borne by the Contractor

#### 40.0 TERMS OF PAYMENT

Payment shall be released after submitting valid Tax Invoice. GST no. of Contractor as well as Owner should be mentioned by the Contractor on Invoice.

Following terms of payment shall be applicable:

40.1 **Mobilization Advance:** Not Applicable

40.2 **Running on Account Payment**

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 27 of 39		

Contractor shall raise the invoice for the 100% completed job against the RA bill and payment shall be released as per following manner:

**A) For Civil works**

➤ 95% against the value of actual work done shall be paid against running bills certified by OWNER/CONSULTANT after recovery of following payments:

- a) Value of chargeable materials issued by OWNER/CONSULTANT, if any
- b) Mobilization advances if any.
- c) Statutory deductions like income tax, etc. as applicable.
- d) Any other recovery if becomes due.
- e) Value of Chargeable Service provided by owner/Consultant, if any

Payment shall not be released against 1st R/A bill until submission of following documents by contractor to the indenting department.

1. Contract Performance Security
2. Labour License (as per statutory requirements)
3. EPF Code Registration number
4. Insurance Contractor All Risk (CAR) Policy
5. Workmen compensation policy

➤ Balance 5% (Retention Money) shall be released along with final bill.

**I) 33kV Sub-Transmission Line;**

**For Supply Items**

- 20% upon successful Inspection and Dispatch Clearance.
- 50% upon receipt, storage and physical verification at site.
- 25% on Successful erection / installation of the equipment / material and completion of stringing, testing and commissioning of the Line.
- Balance 5% (Retention Money) shall be released after completion of entire works, covered under the scope of the contract, along with final bill on issuance of 'Taking over Certificate' (TOC) by TFL and handing over to TPCODL.

**For Erection Items;**

- 80% on completion of each of the items of Erection activity
- 15% on Successful erection / installation of the equipment / material and completion of stringing, testing and commissioning of the Line.
- Balance 5% (Retention Money) shall be released after completion of entire works, covered under the scope of the contract, along with final bill on issuance of 'Taking over Certificate' (TOC) by TFL and handing over to TPCODL.

**II) For Items involving both Supply & Erection**

- 65% on receipt and storage at site and on physical verification and furnishing of necessary certificate by Employer's representative.
- 20% on its completion of erection / Installation.
- 10% on its testing and commissioning.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 28 of 39		

- Balance 5% (Retention Money) shall be released along with final bill.

III) **For Lump sum/Lot Items:**

- 70% shall be paid on receipt and acceptance of material / service at site on pro rata basis
- 20% on completion of erection / Installation on pro-rata basis
- 5% on Inspection & testing on pro-rata basis
- Balance 5% (Retention Money) shall be released along with final bill

**Note: If in case of delay in commissioning, by more than 6 months, of the 33kV Feeder, for the reasons not attributable to the Contractor, the payment against successful commissioning of the Line (except Balance 5% that is to be paid along with final bill) shall be released against submission of Performance Bank Guarantee (PBG) of equivalent amount, by the Contractor.**

**Note:** Bidder shall submit the breakup details of LOT items, in case if applicable for this tender, before submission of invoice. The breakup shall be certified by EIC.

40.3 Payment shall be released for supply of materials (wherever applicable) on submission of the following documents:

1. Signed Invoice(s)
2. Delivery Challan
3. Manufacturer's certificate of inspection for shipment in one original and one photocopy / Manufacturer's test certificate (wherever applicable)
4. Inspection Release Note clearly indicating that material has been inspected and accepted as per QAP approved by OWNER, or waiver certificate issued by OWNER (wherever applicable).
5. Railway Receipt/LR (wherever applicable)
6. Insurance Certificate/Intimation
7. Guarantee/ Warranty certificate (wherever applicable)
8. Operation & Maintenance manual (wherever applicable)

**Note :**

- 1) The amount of CGST & SGST or IGST and GST cess, if any will be released when the same will appear in the GSTR-2A of OWNER, in the common portal of GST and supplier has filed the valid return in accordance with the provisions of the GST Act and the rules made there under. If, input tax credit is not available to OWNER for any reason attributable to the bidder, then OWNER shall not be obligatory or liable to pay or reimburse GST claimed in invoice and shall be entitled to deduct /setoff/ recover such GST together with all the penalty and interest if any, against any paid or payable to bidder. Further in this case, OWNER reserves the right to upload the name of such defaulter on the Company website and may also consider for giving Holiday or debarred from participation in future tender.
- 2) Set / Lot / Lumpsum shall be governed as per the requirement of the corresponding item description read in conjunction with relevant provisions of Technical Specifications and

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 29 of 39		

the Billing breakup referred to above shall be issued by the Employer based on Contractor's request, if and as may be required during the currency of the Contract

The bid price for which the quantities are to be estimated by the Bidder shall remain constant unless there is change made in the Scope of Work by Employer. The quantities and unit prices (i) subsequently arrived while approving the Bill of Quantities (BOQ) / Billing breakup of lumpsum quantities/ lot/ Set and/ or (ii) estimated by the bidder shall be for on account payment purpose only. In case additional quantities, over and above the quantities BOQ/billing breakup and /or estimated by the bidder, are required for successful completion of the scope of work as per Technical Specification, the Bidder shall execute additional quantities of these items for which no additional payment shall be made over and above the lumpsum bid price. In case quantities of these items supplied at site are in excess of that required for successful completion of scope of work, such additional quantities shall be the property of the bidders and they shall be allowed to take back the same from the site for which no deduction from the lumpsum bid price shall be made. Further, in case actual requirement of quantities for successful completion of scope of work is less than the quantities identified in the approved BOQ /billing breakup and/or estimated by the bidder, the lumpsum bid price shall remain unchanged and no deduction shall be made from the lumpsum price due to such reduction of quantities

#### 40.4 **PAYING AUTHORITY**

Director (Finance),  
Talcher Fertilizers Ltd.,  
C/o GAIL Training Institute, PARC Building,  
Plot No. 24, Sector – 16A, Film City, NOIDA (U. P.)

40.5 Payment in R.A. bills shall based on quantity of work executed at site (as per the item of work) & verified by Owner/ Consultant as per the Contract. Owner/ Consultant is authorized to allow part rate/ reduced rate for any item as mentioned in Contract. The engineer in charge shall specify the reason for the part rate payment in the R.A. bill. Payment has been made in R.A. bill for any item but later on, if some defect is noticed by the Owner/ Consultant, then Owner/ Consultant shall disallow the payment in successive R.A. bill till rectification of the work has been done.

#### 40.6 **RELEASE OF 1st R/A BILL**

Payment will be released against 1st R/A bill only on submission of following documents by contractor to the EIC/ OWNER:

- i. Contract Performance Security
- ii. Labour License (as per statutory requirements)
- iii. EPF Code Registration number with RPFC/ARPF
- iv. Insurance Contractor All Risk (CAR) Policy
- v. Workmen compensation policy

40.7 Balance 5% (Retention Money) shall be released along with final bill subject to the following:

If the amount recoverable exceeds the amount payable in final bill, the balance amount shall be recovered by the Owner, from the retention money and or performance bank guarantee/any other moneys or bank guarantees available with the owner for any other job being done by the contractor. The contractor shall restore the performance guarantee to the

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 30 of 39		

requisite value to the extent of 10% of contract price in such case where recovery is required to be affected by the encashment of full amount or a part of the performance bank guarantee as soon as the contractor receives such intimation from the owner/ consultant.

- 40.8 The contractor shall raise invoices on fortnightly basis. Bidder shall enclose all documents as per check list issued by CONSULTANT/TFL. However, EIC may authorize payments for bills more frequently i.e. periodicity of less than fortnight, depending on site requirements.

After receipt of complete R.A. Bill as per terms and conditions of the contract and duly certified by Engineer-in-Charge (EIC), on-account payment equivalent to seventy percent (70%) of the net payable certified amount of the R.A. Bill will be released to the Contractor within a period of seven (07) working days from submission of certified bill by EIC to OWNER. The balance amount will be released within a period of 15 days from submission of certified bill by EIC to OWNER.

However, in addition of Running Account Bill, the contractor has to submit the Monthly Progress Report. This report will acts as a mandatory document for submission of the bill. Failing in submission of the report, the invoice will not be processed further for payment

- 40.9 The final bill complete in all respect shall be submitted by the contractor within three (3) months of certified completion of work. The bill should be accompanied along with the following documents.

1. Job completion certificate.
2. No claim certificate on Owner's prescribed proforma.
3. Site clearance certificate.
4. Contract Performance Security duly amended to cover Defect Liability Period.
5. Material reconciliation statement (statement of material issued by Owner or consultant to be got certified from stores dept.).
6. Indemnity certificate towards labour payment and all statutory payments.

No claim shall be entertained after receipt of final bill. Settlement of final bill shall be made subject to settlement of all disputes and furnishing of all required documents/clarifications and grant of extension of time, if any, by Owner's competent authority.

**In case any claim with regard to the wages of any labour employed by Contractor for the subject job is pending/ reported, TFL shall be fully entitled to withhold payment of final bill pending finalisation of such claims.**

#### **41.0 DISPATCH, TRANSPORTATION/SHIPPING**

- 41.1 CONTRACTOR shall be responsible for dispatch of EQUIPMENT by sea/ rail/ road/ air after proper packing and protection. The consignment shall be dispatched after inspection by concerned authority as specified in the Tender document, unless otherwise agreed to in writing however such inspection shall not constitute waiver of the CONTRACTOR's obligations, responsibilities for the EQUIPMENT including care, safety and preservation in any way and manner and the CONTRACTOR's responsibility and obligation in this behalf shall continue till ACCEPTANCE OF ENTIRE WORK.

**The Consignee for all bought-out material shall be CONTRACTOR.**

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 31 of 39		

- 41.2 The Contractor, wherever applicable, shall after proper painting, pack and crate all equipment in such a manner as to protect them from deterioration and damage during rail and road transportation to the site and storage at the site till the time of erection. The Contractor shall be held responsible for all damages due to improper packing and handling.
- i) The Contractor shall notify Employer of the date of each shipment from his works, and the expected date of arrival at the Site for the information of Employer.
  - ii) The Contractor shall also give all shipping information concerning the weight, size and content of each packing including any other information Employer may require.
  - iii) The Contractor shall prepare detailed packing list of all packages and containers, bundles and loose materials forming part of each and every consignment dispatched to Site.
  - iv) The Contractor shall further be responsible for making all necessary arrangements for loading, unloading and other handling right from his works up to the Site and also till the equipment is erected, tested and commissioned. He shall be solely responsible for proper storage and safe custody of all equipment.

### 41.3 EMBOSSING/PUNCHING/CASTING

All equipment and materials supplied /erected under the works of 33kV Feeder shall bear distinct mark by a way of embossing / punching / casting. This should be clearly visible to naked eye. The details of the mark shall be approved by TFL and /or TPCODL during Drawing & GTP Approval.

### 42.0 WORK CONTRACT SERVICES

- 42.1 The award of work shall be on 'Work Contract Service' basis. The contractor shall be responsible for payment of any tax levied on the transfer of property and goods involved with relevant GST act and rules made there under including amendments, if any. The contractor shall be liable to ensure to have registered with the respective tax authorities and to submit self-attested copy of such registration certificate(s) and any taxes/ duties/ levies being charged by the Contractor would be claimed by issuing proper tax invoice/ challan indicating details/ elements of all taxes charged and necessary requirements as prescribed under the respective tax laws and also to mention correct and valid registration number(s) on all tax invoices raised to TFL.
- 42.2 Irrespective of single or separate insurances, the CONTRACTOR shall take the same in the joint name of OWNER and CONTRACTOR, with OWNER as Primary Beneficiary and CONTRACTOR as Joint Beneficiary, to cover all risk including marine cum erection insurance (MCE), workmen compensation / Employees State Insurance (ESI) under ESI Act 1948 for Contractor's personnel, fire risk policy etc. till handing over of PLANT to OWNER duly commissioned and tested. However, for CONTRACTOR's EQUIPMENT, CONTRACTOR can be the sole beneficiary. Further, OWNER shall have the first right over the claim amount for all insurance claims, where owner has made part or full payment to the contractor.
- 42.3 CONTRACTOR shall be fully responsible for pursuing and settling all claims under the underwriters. In the event of accident, injury, damage or loss likely to form a claim under the above insurance policies, CONTRACTOR shall, as quickly as possible submit the insurance claims by underwriters under intimation to OWNER. CONTRACTOR shall also

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 32 of 39		

keep OWNER fully informed about progress of each such case. CONTRACTOR shall undertake immediate repair and replacement of the equipment lost in transit, storage, assembly, erection and COMMISSIONING of PLANT pending settlement of claim thereafter by the underwriters.

- 42.4 The CONTRACTOR at his cost shall arrange, secure and maintain all insurance as may be pertinent to the works and obligatory in terms of law to protect his interest and interest of OWNER in the project, against all perils detailed herein. The Form and the limit of such insurance as defined herein together with the under-writer in each case shall be acceptable to the OWNER and OWNER's acceptance shall not be unreasonably withheld. However, irrespective of such acceptance, the responsibility to maintain adequate insurance coverage at all times including third party liability during the period of contract shall be as of CONTRACTOR alone. The contractor's failure in this regard shall not relieve him of any of his contractual responsibilities and obligations. The insurance covers to be taken by the CONTRACTOR shall be in the joint names of OWNER and the CONTRACTOR. The CONTRACTOR shall, however, be authorized to deal directly with insurance company or companies and shall be responsible in regard to maintenance of all insurance covers.
- 42.5 Any loss or damage to the equipment during handling, transportation, storage, erection, putting the equipment into satisfactory operation and all activities to be performed till the successful completion of trial operation of the plant shall be to the account of the CONTRACTOR. The CONTRACTOR shall be responsible for reference of all claims and make good the damages or loss by way of repairs and/or replacement of the equipment, damaged or lost. The transfer of title shall not in any way relieve the CONTRACTOR of the above responsibility during the period of CONTRACT. The CONTRACTOR shall provide the OWNER with copies of all insurance policies and documents taken out by him in pursuance of the CONTRACT. Such copies of documents shall be submitted to the OWNER immediately after such insurance coverage. However, if Marine cargo insurance or Third party liability Insurance is a part of their global policies; insurer certificate (including the main terms of policy) shall be submitted by CONTRACTOR. The CONTRACTOR shall also inform the OWNER in the writing at least thirty (30) days in advance regarding the expiry/ cancellation and/or change in any of such documents and ensure revalidation, renewal etc. as may be necessary well in time. However adequacy, credibility and maintenance of Insurance policies is the sole responsibility of CONTRACTOR and CONTRACTOR shall keep the OWNER indemnified against any such failure.
- 42.6 If the material/ equipment or any portion thereof is damaged or lost during transit and handling, storage, erection, commissioning at site, the replacements of such material / equipment shall be effected by the CONTRACTOR within a reasonable time to avoid unnecessary delay in the COMMISSIONING of the EQUIPMENT and without waiting for realization of cost of damages from the insurance company, appointed by him for this purpose. This will not alter the schedule of commissioning & guarantee tests in any way.
- 42.7 All works and operations necessary to lift and to remove the material from port, warehouse, railway or other siding, factory or other places of delivery, loading, handling, transporting and unloading and safely stacking, placing or storing the same at approved godowns, yards or other place(s) of storage including lashing or other-wise securing or protecting the same in transit and during and in storage.
- 42.8 The CONTRACTOR shall maintain a day-to-day account of all materials indicating the daily receipt(s), consumption(s) and balance of each material and category thereof. Such



	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 33 of 39		

account shall be in the format, if any, prescribed by the Engineer-in-Charge and shall be supported by all documents necessary to verify the correctness of the entries in the account. Such account shall be maintained at the CONTRACTOR MANAGER's office and site(s) and shall be open for inspection and verification (by verification of documents in support of the entry as also by feasible verification of the stock) at all times by the Engineer-in-Charge with authority at all times without obstruction to enter into or upon any godown or other place(s) or premise(s) where the materials or any part of them are lying or stored and to inspect the same himself and or through his representative(s).

42.9 The CONTRACTOR shall at all times be exclusively responsible for any and all losses, damages, deterioration, misuse, wastage, theft, or other application or misapplication or disposal of the materials or any of them contrary to the provisions hereof and shall keep the OWNER indemnified from and against the same and shall forthwith at its own cost and expenses replace any such material, lost, damaged, deteriorated, misused, wasted, stolen, applied, mis-applied and/or disposed as aforesaid with other material of equivalent quality and quantity delivered to site at the CONTRACTOR's risks and costs in all respects.

42.10 Notwithstanding anything herein provided, the CONTRACTOR shall be and remain solely and exclusively liable to repair, restore or replace, as the case may be, the materials damaged or destroyed as a result of any act or omission, notwithstanding the existence or otherwise of any policy(ies) of insurance aforesaid, with the intent that any policy(ies) of insurance aforesaid taken out by the CONTRACTOR or by the OWNER, on default by the CONTRACTOR, shall not anyway absolve the CONTRACTOR from his full liability up to and until issue of the Completion Certificate as provided for herein in respect of the works, the work(s) and all materials incorporated therein shall be and remain at the risks of the CONTRACTOR in all respects, including (but not limited to) accident, lightning, earth-quake, fire, storm, flood, tempest, riot, civil commotion and/or war or otherwise with respect to the materials, but shall constitute merely an additional security and not a substitution of liability.

42.11 If the CONTRACTOR shall default in replacing at the job site, free of any cost to the OWNER, any material lost, damaged, deteriorated, misused, wasted, short, stolen, misapplied or disposed of within the provisions hereof above, or shall fail to return to the OWNER any surplus material or empties within the provision hereof above, the CONTRACTOR shall be liable to pay to the OWNER the cost of such materials or empties delivered at OWNER's stockpile/ godown.

### 43.0 CONSTRUCTION EQUIPMENT, TOOLS AND TACKLES DEPLOYMENT

i. The details of key construction equipment in good condition, required to be mobilized by the contractor, to complete the work within the schedule is listed below (not limited to only the following) :

Sl. No.	Equipment Description
1	Hydraulic Telescopic Boom Pick & Carry Crane of suitable capacity
2	Hydraulic Excavator
3	Dumper
4	Tractor Trailer

5	Water Tanker
6	Total Station
7	Dumpy level
8	Welding Machine
9	Dewatering Pump
10	Concrete Mixer
11	Electrical tool Kit
12	Breaker
13	Manual/ Electrical Lifting Equipment/ Hoists/ Pullers of suitable capacity
14	Any, other equipments to complete the job

- ii. Contractor to confirm that the above equipments are available with him in good working condition and shall be timely mobilized on this project site. Contractor has the option to hire some these equipment from equipment hiring agencies also, however contractor shall be responsible for all the machinery deployed at site.
- iii. In addition to above, Contractor shall be required to deploy all the machinery/ tools & tackles at site as required for the successful completion of the job/ as directed by the Engineer-in-charge.
- iv. Owner/ consultant reserve the right to physically check & verify the availability of these equipments prior to award of work
- v. Contractor shall replace any defective/ damaged equipment promptly to complete the work without any time & cost implication to the owner/ consultant
- vi. The actual deployment of equipments shall be finalized or approved by Engineer-in-charge.

#### **44.0 STATUTORY VARIATION IN TAXES AND DUTIES**

- 44.1 No variation on account of taxes and duties, statutory or otherwise, (other than due to change in turnover) shall be payable by OWNER to CONTRACTOR, except for GST. Any statutory variation in GST, shall be payable up to COMPLETION PERIOD against documentary evidence. Any reduction in the amount of GST resulting from a reduction in the rate of GST or remission or exemption from GST with respect to Goods and Services provided to the OWNER shall be refundable to the OWNER at actuals within the COMPLETION PERIOD and also during the delayed contractual Project completion, if any. The CONTRACTOR shall submit a copy of the 'Government Notification' to evidence the rate as applicable on the Bid due date and on the date of revision.
- 44.2 Any new taxes, duties, cess, levies notified or imposed after the submission of Price Bid but before COMPLETION PERIOD shall be to OWNER's Account.
- 44.3 In case of delayed completion beyond the COMPLETION PERIOD, even though extension of completion time is allowed by OWNER, for reasons solely attributable to Contractor, all extra costs on account of changes of statutory regulations/ acts, or shall not apply to the Contract price and shall be borne by the CONTRACTOR.

However, any decrease in taxes and duties during the delayed period shall be passed on to the OWNER.

In case the COMPLETION PERIOD is extended for reasons solely attributable to OWNER, then any increase on account of statutory changes in GST until the extended

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 35 of 39		

period shall be borne by OWNER. Further, any new taxes, duties, cess, levies notified or imposed after the submission of Price Bid during such extended COMPLETION PERIOD shall be to OWNER's Account-

- 44.4 Claim for payment of GST (CGST & SGST/UTGST or IGST)/ Statutory variation, should be raised within two [02] months from the date of issue of 'Government Notification' for payment of differential (in %) GST (CGST & SGST/UTGST or IGST), otherwise claim in respect of above shall not be entertained for payment of arrears.


The base date for the purpose of applying statutory variation shall be the Bid Due Date.

**44.5 BOCW (BUILDING AND OTHER CONSTRUCTION WORKS)**

Applicable BOCW shall be included in the quoted TOTAL CONTRACT PRICE. The contractor shall pay the cess under BOCW Act for subject works and submit proof of submission of cess to owner before submitting the next R.A. bill. In case, contractor does not submit the said proof, applicable BOCW shall be deducted at source by the OWNER from the contractor's invoice and deposit the deducted amount to the concerned authority. OWNER does not undertake any further responsibility in this regard.

**45.0 STATUTORY APPROVAL**

- 45.1 Unless otherwise specified in the Bidding Document, it shall be the CONTRACTOR'S sole responsibility to obtain all approvals from any authority required under any statute, rule or regulation of the Central or Odisha State Government for the performance of the contract and / or the contractual work. The application on behalf of Employer for submission to relevant authorities along with copies of required certificates complete in all respects shall be prepared and submitted by the CONTRACTOR well ahead of time so that the actual construction / commissioning of the works is not delayed for want of the approval / inspection by the concerned authorities. The CONTRACTOR shall arrange for the inspection of the works by the authorities and will undertake necessary coordination and liaison required and shall not be entitled to any extension of time for any delay in obtaining such approvals.
- 45.2 Statutory fees, if any, paid for all such inspection and approvals shall be reimbursed at actual to the CONTRACTOR by Employer on production of documentary evidence.
- 45.3 Any deficiency (ies) as pointed out by any such authority shall be rectified by the CONTRACTOR within the scope of relative supply and / or work at no extra cost to Employer. The inspection and acceptance of the work by such authorities shall, however, not absolve the CONTRACTOR from any of its responsibilities under this contract.
- 45.4 Any cost incurred towards payment of official fees for obtaining Right of Way (RoW) clearances for construction of 33kV Line shall be reimbursed in actual on submission of valid payment receipts along with the relevant documents. It may be noted that successful bidder will be responsible to arrange all the requisite clearances including RoW.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 36 of 39		

#### 46.0 SUB-CONTRACTOR/VENDOR AND MANUFACTURER WARRANTIES

- (a) CONTRACTOR shall ensure that all equipment and other items used in connection with the performance of the WORK or incorporated in the PLANT (other than minor items) will be purchased in compliance with CONTRACT Technical Specifications and requirements in order to allow the PLANT to achieve the Guarantee and Warrantee as provided for in the CONTRACT, unless otherwise agreed with OWNER. Any residual warranty from sub-contractor/vendor shall be passed to the OWNER after expiry of DEFECT LIABILITY PERIOD.
- (b) Neither CONTRACTOR nor its SUB-CONTRACTORS/SUB-VENDORS nor any person under the control of either thereof, shall take any action which could release, void, impair or waive any Guarantee or Warranty on EQUIPMENT or services relating to the PROJECT or the WORK. Any residual warranty from sub-contractor/sub-vendor shall be passed to the OWNER after expiry of DEFECT LIABILITY PERIOD.
- (c) Nothing in this clause shall derogate from the obligations of CONTRACTOR to provide the Guarantees and Warranties described in and to comply with the provisions hereinabove.
- (d) CONTRACTOR shall, based on its past professional judgement, enforce all guarantees and warranties provided hereunder to the fullest extent thereof till such time they are transferred to the OWNER pursuant to sub-clause (g) below.
- (e) Upon the expiration or termination of any of the guarantees or warranties provided by CONTRACTOR pursuant to the CONTRACT, the CONTRACTOR shall assign, and hereby assigns, effective as of such date, or otherwise make available, to OWNER all of CONTRACTOR's rights under all such SUBCONTRACTOR's residual Guarantees and warrantee as per 45.0 (a) & (b) (except to the extent CONTRACTOR has thereof provided warranty services to OWNER and is enforcing CONTRACTOR's rights with respect to such services under the applicable guarantee or warranty) and shall deliver to OWNER copies of all contracts providing for such guarantees and warranties.
- (f) CONTRACTOR, in accordance with the CONTRACT, shall require all SUB-CONTRACTORS/ SUB-VENDORS to be covered by the insurance covers specified in the CONTRACT, during the time in which they are engaged in performing WORK.
- (g) CONTRACTOR shall require all SUB-CONTRACTORS/ SUB-VENDORS to release and waive any and all rights of recovery against OWNER including its affiliates, subsidiaries, employees, successors, permitted assigns, insurers and underwriters) and against CONTRACTOR and all other SUB-CONTRACTORS/ VENDORS which the releasing SUB-CONTRACTOR/ VENDOR may otherwise have or acquire, in or from or in any way connected with any loss covered by policies of insurance maintained or required to be maintained pursuant to this the CONTRACT (other than third party liability insurance policies) or because of deductible clauses in or inadequacy of limits of any such policies of insurance. CONTRACTOR shall further require all SUB-CONTRACTORS/VENDORS to include in all policies of insurance maintained by the SUB-CONTRACTORS/ VENDORS clauses providing that each underwriter shall release and waive all of its rights of recovery, under subrogation or otherwise, against OWNER, its promoters, affiliates, subsidiaries, employees, successors, permitted assigns, insurers and underwriters, and against CONTRACTOR and all other SUB-CONTRACTORS/VENDORS.
- (h) OWNER shall not be deemed by virtue of the CONTRACT to have any contractual

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 37 of 39		

obligation to or relationship with any SUB-CONTRACTOR/ VENDOR.

#### 47.0 CONTRACTOR's LIABILITY FOR APPROVED SUB CONTRACTOR :

The review by and approval and consent of OWNER as to the approved SUB-CONTRACTORS list or as to CONTRACTOR entering into any SUB-CONTRACT with any approved SUB-CONTRACTOR or as to any WORK done or supply made or services provided by any such approved SUB-CONTRACTOR/ SUB-VENDOR shall not relieve CONTRACTOR of any of his duties, liabilities or obligations under this CONTRACT, and CONTRACTOR shall be liable hereunder to the same extent as if any such SUB-CONTRACT had not been entered into. Any inspection review or approval by OWNER permitted under this CONTRACT of any portion of the work or of any work in progress by CONTRACTOR or SUB-CONTRACTORS/ SUB-V ENDORS shall not relieve CONTRACTOR of any duties, liabilities or obligations under this CONTRACT.

#### 48.0 FUNCTIONAL GUARANTEES

Bidder shall state the guaranteed technical particulars, performance or efficiency of different equipment/materials with respect to the Technical Specifications. Equipment/Materials offered shall have guaranteed acceptable particulars /performance/efficiency specified in Technical Specification.

#### 49.0 TRIAL OPERATION:

For Trial Operation, the system for a particular package, Sub-Station and Line shall be energized in presence of the representative of OPTCL and same shall be maintained in energized condition for a period of at least twenty-four (24) hours. In case of any defect is observed, then such mutually agreed defect shall be liquidated within a maximum period of one week by the bidder. Thereafter, the system shall be maintained in energized condition.

#### 50.0 PLANNING AND DESIGNING IN PURVIEW OF VULNERABILITY ATLAS OF INDIA

Vulnerability Atlas of India (VAI) is a comprehensive document which provides existing hazard scenario for the entire country and presents the digitized State/UT- wise hazard, maps with respect to earthquakes, winds and floods for district-wise identification of vulnerable areas. It also includes additional digitized maps for thunderstorms, cyclones and landslides. The main purpose of this Atlas is its use for disaster preparedness and mitigation at policy planning and project formulation stage.

This atlas is one of its kind single point source for the various stakeholders including policy makers, administrators, municipal commissioners, urban managers, engineers, architects, planners, public etc. to ascertain proneness of any city/location/site to multi-hazard which includes earthquakes, winds, floods thunderstorms, cyclones and landslides. While project formulation, approvals and implementation of various urban housing, buildings and infrastructures schemes, this Atlas provides necessary information for risk analysis and hazard assessment.

The Vulnerability Atlas of India has been prepared by Building Materials and Technology Promotion Council under Ministry of Housing and Urban Affairs, Government of India and available at their website [www.bmtpc.org](http://www.bmtpc.org).

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 38 of 39		

It is mandatory for the bidders to refer Vulnerability Atlas of India for multi hazard risk assessment and include the relevant hazard proneness specific to project location while planning and designing the project in terms of

- i. Seismic zone (II to V) for earthquakes,
- ii. Wind velocity (Basic Wind Velocity: 55, 50, 47, 44, 39 & 33 m/s)
- iii. Area liable to floods and Probable max, surge height
- iv. Thunderstorms history
- v. Number of cyclonic storms/severe cyclonic storms and max sustained wind specific to coastal region
- vi. Landslides incidences with Annual rainfall normal
- vii. District wise Probable Max Precipitation.

#### **51.0 STANDARD CONDITIONS OF SCC: PART I TO PART III**

The Contractor has to fully comply with all applicable Labour Laws and Regulations passed, modified and notified from time to time by the Central, State and Local Government agencies/authorities. Brief guidelines and Annexures related to labour laws/Acts for Workmen/labour are enclosed as STANDARD CONDITIONS OF SCC: PART I to PART III.

#### **52.0 GUARANTEE/WARRANTY:**

52.1 The Contractor shall guarantee that the equipment/materials will be new, unused and in accordance with the Contract documents and free from defects in material and workmanship for a period of 12 (Twelve) months commencing immediately after the satisfactory commissioning of the entire works under the contract. The Contractor's liability shall be to the extent of repair/replacement of such defective equipment/material either arising from faulty design or defective equipment/materials and/or bad workmanship. Such defective equipment/materials shall be handed over to the Contractor for repair or replacement by a new one, unless otherwise repairable at site. The Contractor shall complete the repair/replacement work within the reasonable time frame intimated by the Engineer-In-Charge.

If any defects are not remedied within the time frame, the Engineer-In-Charge may proceed to do the work at the Contractor's risk and cost but without prejudice to any other rights, which "TALCHER FERTILIZERS LIMITED" may have against the Contractor in respect of such defects.

52.2 If it becomes necessary for the Contractor to replace or renew any defective portions of the works the provision of this clause shall apply to portion of the works so replaced or renewed until the expiry of guarantee period.

52.3 The repaired or new parts will be supplied and erected free of cost by the Contractor. If any repair is carried out on his behalf at the site, the Contractor shall bear the cost of such repairs.

52.4 The cost of any special or general overhaul rendered necessary during the maintenance period due to defects in the equipment or defective work carried out by the Contractor, the same shall be borne by the Contractor.

	<b>CONSTRUCTION OF 2 X 33KV OVERHEAD LINE AT TALCHER FERTILISER LIMITED, ODISHA</b>  <b>SPECIAL CONDITIONS OF CONTRACT</b>	PC-183/ E/ 4023/ S-V	0	
		DOC. NO.	REV.	
		Page 39 of 39		

- 52.5 The acceptance of the equipment or works by the Engineer-In-Charge shall in' no way relieve the Contractor of his obligations under this clause.
- 52.6 In the case of those defective parts, which are-not repairable at site but are essential for the operation of the equipment, the Contractor and the Engineer-In-Charge shall mutually agree to a program of replacement or renewal, which will minimize interruption to the maximum extent in the operation of the equipment.
- 52.7 At the end of the guarantee period, the Contractor's liability ceases except for latent defects.

## STANDARD CONDITIONS OF SCC: PART I

### Compliances under various Labour Laws

The Contractor has to fully comply with all applicable Labour Laws and Regulations passed, modified and notified from time to time by the Central, State and Local Government agencies/authorities. Specific attention of the Contractor is drawn to the following obligations amongst others:

1. **The Minimum Wages Act, 1948, Payment of Wages Act, 1936 and Payment of Bonus Act 1965 or The Code on Wages, 2019 (after it comes into force)**

1.1. **Minimum Wages:**

- a. During the tenure of the contract, the Contractor must ensure the payment of minimum wages, as notified by the Central Government or State Government whichever is higher, as per the provisions of the Minimum Wages Act, 1948 / Code on Wages, 2019 (after it comes into force).
- b. **Wage period and monthly wages:** Wage period shall be monthly and wages for a month shall be calculated by multiplying daily rate of Minimum Wages by 26. The monthly wages include the wages of the weekly days of rest as applicable to the office/establishment of TFL. Deduction in case of any days of absence other than weekly days of rest shall be calculated using the following formula:

**Deduction for absence = days of absence x (monthly wages / number of days in the relevant month)**

However, in case the resource has worked for less than 7 working days in a particular month, the payment of wages is to be made as per the actual number of days worked based on notified wage rate per day.

*Illustration I (05 days per week working pattern):*

Sl. No.	Month	Nos. of days in the month	Nos. of weekly off	Nos. of days absence	Nos. of days present	Daily wage as notified	Monthly wage	Deduction	Wage to paid
1	Feb.	28	8	2	18	603	15678	1119.86	14558.14
2	March	31	10	5	16	603	15678	2528.71	13149.29
3	April	30	8	10	12	603	15678	5226	10452.00
4	May	31	10	-	4	603	2412	0	2412.00



**Illustration II (06 days per week working pattern):**

Sl. No.	Month	Nos. of days in the month	Nos. of weekly off	Nos. of days absence	Nos. of days present	Daily wage as notified	Monthly wage	Deduction	Wage to paid
1	Feb.	28	4	2	22	603	15678	1119.86	14558.14
2	March	31	5	5	21	603	15678	2528.71	13149.29
3	April	30	4	10	16	603	15678	5226	10452.00
4	May	31	5	-	4	603	2412	0	2412.00

**1.2. Payment of Wages:**

The Contractor shall disburse monthly wages **through e-banking / digital mode through cashless transaction only**, and avoid illegitimate deductions and maintain records /returns as prescribed. The Contractor shall be solely responsible for the payment of wages and other dues to the resources, if any, deployed by him latest by 7<sup>th</sup> day of the subsequent month as per the provisions of the Payment of Wages Act, 1936 / as applicable under Code on Wages, 2019 (after it comes into force) in the presence of Engineer In-charge (EIC) or authorized representative of TFL. After disbursement of wages, the representative of the Contractor and EIC/ authorised representative of TFL have to certify the payment of wages to the resources and sign the Wage Register - Form B (under The Ease of Compliance to Maintain Registers under various Labour Laws Rules, 2017) / FORM-I of Code on Wages, 2019 (after it comes into force) with specific seal detailing name/designation/Company.

**1.3. Payment of Bonus:**

Contractor shall ensure payment of bonus as per the provisions of the Payment of Bonus Act, 1965 / Code on Wages, 2019 (after it comes into force). Present minimum rate of payment of Bonus as per the Payment of Bonus Act, 1965 is 8.33% of minimum wages per month or 8.33% of Rs.7,000/- per month whichever is higher. The rate shall be subject to amendments made from time to time to the legislation.

Payment of Bonus / ex-gratia (if Bonus is not applicable) shall be made preferably before Deepawali festival falling after the end of relevant financial year(s) and the balance payment at the time of closure of contract.

The amount towards the payment of bonus/ex-gratia shall be released / reimbursed to the contractor, after submission of proof of payment.

**2. Leaves/ Leave with wages/ Holiday:**

The Contractor shall comply with all the applicable leave Rules including leave with wages in terms of applicable labour legislations i.e. Factories Act, 1948 / Shops & Establishment Act/ Industrial Establishment (national & festival holidays, casual & sick leave) Act, 1965.

The Contractor shall extend the leave with wages and maintain the Register of Leave pertaining to the resource deployed. The payment towards un-availed leave, as per the Factories Act, 1948

/ Shops & Establishment Act, shall be settled with the resource at the time of closure of the contract or separation of resource from the contract by the contractor.

- i. As per the **Factories Act, 1948 (if applicable)**:-Annual Leave with Wages @ 01 day for every 20 days of work performed by him in the previous calendar year becomes due.
- ii. As per the **Shops & Establishment Act (if applicable)** : Privilege Leave not less than 15 days and Sickness/Casual Leave not less than 12 days ( this provision may vary from state to state).
- iii. As per the **Industrial Establishment (national & festival holidays, casual & sick leave) Act, 1965 (if applicable)**: (a) three national holidays of one whole day each on the 26<sup>th</sup> January, 15<sup>th</sup> August and 2<sup>nd</sup> October (b) five other holidays on any of the festivals specified in the - Schedule appended to this Act. (c) Every worker shall in each calendar year, be allowed by the employer 07 casual leave and 14 sick leave in such manner and on such conditions as may be prescribed (This provision may vary from state to state).

### **3. The Employees' Provident Fund & Miscellaneous Provisions Act 1952**

- a) The Contractor shall have independent PF code no. with the RPFC as required under the Employees' PF & Misc. Provisions Act, 1952.
- b) The Contractor has to ensure compliance (as per prevailing rates) and extend benefits under the Employees' Provident Fund Scheme 1952, the Employees' Pension Scheme 1995 & the Employees' Deposit Linked Insurance Scheme, 1976 to the resources deployed by him.
- c) The Contractor is required to submit copies of *separate e-Challans / ECR alongwith proof of payment/receipt* in respect of resources engaged through this contract only, on monthly basis. **Common challans would not be acceptable in TFL.** The Contractor should submit copies of previous months EPF e-Challans / ECR alongwith current month's bill. The TRRN. No. of the ECR would be verified online from EPFO portal by the Engineer-in-charge to confirm the status of payment and names of the resources deployed.
- d) **PF is mandatory irrespective of the number of resources deployed** by the Contractor under this contract. **PF membership and deposit of PF contribution is also mandatory even if the wage payment to the resource is exceeding the prescribed monthly wage ceiling ( i.e. Rs. 15,000/-) under the Employees' PF & Misc. Provisions Act, 1952 and in such case the liability of the Contractor towards PF contribution shall be limited to the prescribed monthly wage ceiling notified from time to time ( i.e. Rs. 15,000/- currently).**
- e) In case, the Contractor deploys any "**International Worker**", the Contractor should also make compliance under para 83 of EPF Scheme, 1952 i.r.o the "International Workers" and must register on the ***International Worker Portal of EPFO.***

### **4. The Employees' State Insurance Act, 1948 (If applicable and as per prevailing rates)**

- a) The Contractor shall have his own ESI code No. allotted by Employees' State Insurance Corporation (ESIC) as required under the Employees' State Insurance Act, 1948.
- b) The Contractor has to arrange **Smart Cards (i.e. ESI Identity Card) /e-Pehchan Card** for the resource(s) engaged by him from the Corporation.

## 5. The Employees' Compensation Act 1923 (wherever applicable)

In case, the work place is out of the notified coverage area under ESIC i.e. ESIC is not implemented in the area **or** in case of excluded employees under ESIC, the Contractor is required to take Employee Compensation / Workmen Compensation Policy from IRDAI approved Insurance Company taking into consideration the **maximum compensation liability** as per provisions of Employees' Compensation Act, 1923. It must be ensured that the contractor/contracting firm should extend coverage to the contract workers through Employee Compensation Policy, to meet the **Compensation Liability** under **Employee's Compensation Act, 1923** along with **Medi-claim Policy** within the overall premium @ 3.25 % of Minimum wages (i.e. employer contribution towards ESI).

## 6. Group Personal Accident Insurance Policy

The Contractor is required to take a Group Personal Accident Insurance Policy with coverage of **Rs. 3 Lakhs** per resource for the entire period of contract covering all resources deployed under the contract.

## 7. The Payment of Gratuity Act, 1972

In case of Death or permanent disablement of a resource during execution of work under the contract, the Contractor has to pay the Gratuity as per the provision under the Payment of Gratuity Act, 1972 to the nominee(s) of the resource as per the details maintained in the duly signed Nomination Form maintained by the Contractor. The proof of disbursement may be submitted to the EIC for claiming reimbursement of amount paid towards death Gratuity from TFL.

## 8. The Contract Labour (R&A) Act, 1970

- a) The Contractor is required to obtain Labour license under the provisions of the Contract Labour (R&A) Act, 1970 from the office of Licensing Officer, Central Labour Authority, Ministry of Labour and Employment, Govt. of India having jurisdiction of the Region.
- b) The Contractor shall discharge obligations as provided under the Contract Labour (R&A) Act, 1970 rules and regulations framed under the same and enforced from time to time.
- c) The Contractor shall ensure regular and effective supervision and control over the resources deployed for which a supervisor / representative of the Contractor should be available at all the times for giving suitable direction for undertaking the Contractual Obligations.
- d) The Contractor is solely responsible for payment of wages to each resource deployed by him and such wages shall be paid before the expiry of such period as may be prescribed.
- e) It shall be the duty of the Contractor to ensure the disbursement of wages to resource(s) through e-banking/digital mode. In case the resource does not have a bank account, the disbursement of wages may be made in cash in the presence of the Engineer-in-charge /

authorized representative of TFL initially and Contractor shall simultaneously arrange for opening the bank account of each contract labour deployed by him.

- f) In case, the Contractor fails to make payment of wages and deposit of PF contribution within the prescribed period or makes short payment of wages / short deposit of PF contribution, then TFL, as Principal Employer, will make payment of wages in full or the unpaid balance due, as the case may be, to the resource(s) deployed by the Contractor and deposit the PF contribution with PF authorities. Such amounts will be recovered from the Contractor either by deduction from any amount payable to the Contractor under any contract or as a debt payable by the Contractor.
9. The contractor is required to comply with all applicable labour laws and regulations including, but not limited to the following:
- a) The Factories Act, 1948 / The Shops & Establishment Act, 1948 (which ever applicable)
  - b) The Maternity Benefit Act, 1961
  - c) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1979 & Building and Other Construction Workers Welfare Cess Act, 1996
  - d) The Inter State Migrant Workmen (RECS) Act 1979 (if applicable)
  - e) Contract Labour (R&A) Act-1970
  - f) Employees' Provident Fund & Misc. Provisions Act- 1952
  - g) Employees' State Insurance Act-1948
  - h) Employees' Compensation Act, 1923
  - i) Payment of Gratuity Act, 1972
  - j) Minimum of Wages Act,1948
  - k) The Payment of Wages Act,1936
  - l) The Payment of Bonus Act,1965

## **STANDARD CONDITIONS OF SCC: PART II**

### **Responsibilities of the Contractor**

1. The Contractor shall be solely responsible and indemnify TFL against all charges, dues, claim etc. arising out of the disputes relating to the dues and employment of resources, if any, deployed by him.
2. The Contractor shall indemnify TFL against all losses or damages, if any, caused to it on account of acts of the resource(s) deployed by him.
3. The Contractor shall indemnify TFL from all claims, demands, actions, cost and charges etc. brought by any court, competent authority / statutory authorities against TFL.
4. The Contractor shall also indemnify TFL for any action brought against him for violation, non-compliance of any act, rules & regulation of center / state / local statutory authorities.
5. All resources deployed by the Contractor are deemed to be on the rolls of the Contractor.
6. **Age:** No resource below the age of **18 years** and above age of **58 years** shall be deployed by the contractor for the execution of the contract.
7. **Appointment/Nomination of supervisor:**  
As a part of the contract, the Contractor is required to appoint/nominate a supervisor (s) who will supervise, control and give directions to the resource(s) for discharging the contractual obligations. Accordingly, the Contractor has to give in writing the name and contact details of the supervisor (s) to the EIC. A copy of the same is also to be sent to HR In-charge and Security In-charge for records.
8. A copy of the Letter of Acceptance (LOA) should be submitted to the Security Department by the Contractor / his representative or supervisor for facilitating the movement of resource(s) including machine & materials involved in the contract.
9. The resources to be deputed/ deployed by the Contractor shall observe all security, fire and safety rules of TFL while at the site/work. All existing and amended safety / fire rules of TFL are to be followed at the work site by the Contractor and his deployed resource(s).
10. **Personal Protective Equipment / Safety Kit and Liveries:** Contractor shall ensure adequate supply of personal protective equipment / Safety Kit and Liveries as mentioned in the Scope of Work to all such resources deployed.
11. In case of accident, injury or death caused to the resource(s) while executing the Work under the contract, the Contractor shall be solely responsible for payment of adequate compensation, insurance money etc. to the next kith & kin of injured / diseased. Contractor shall indemnify TFL from such liabilities.
12. The Contractor shall not deploy any resource suffering from any contagious or infectious disease. The Contractor shall get the deployed resource(s) examined from a civil Govt. Doctor / TFL's Doctor.

13. No resource(s) or representatives of Contractor (including Contractor) are allowed to consume alcoholic drinks or any narcotics within the premises of TFL (including Plant, Office and Residential etc.). If found under the influence of above, the Contractor shall immediately replace that resource(s) with intimation to the EIC.
14. While engaging / deploying the resources, the Contractor is required to make efforts to provide opportunity of employment to resources belonging to **Schedule Caste, Schedule Tribe and Other Backward Class** in order to have a fair representation of these sections of the society.
15. While engaging the resources, the Contractor is required to make efforts to provide an **opportunity to** candidates with experience of **apprentice training in TFL** under the provisions of the Apprentices Act, 1961.
16. The Contractor is required to maintain all Registers and other records in an **office** within the premises of TFL or at a place **within a radius of three kilometers**.
17. Contractor shall provide proper **Employment cards (FORM XII)** for the resource to be deployed by him, duly signed by the Contractor or authorized person on behalf of Contractor.
18. **Gate/ Entry Pass or Authorization:**  
Entry to the premises of TFL is restricted and is subject to appropriate entry authorization in the prescribed format of a Gate Pass or any other entry authorization w.r.t police verification as per instruction of Security department from time to time. Similarly, entry for material/equipment's/ tools/ tackles etc. is restricted & subject to entry authorization by security department.
19. The Contractor shall issue **Identity cards** in his firm's name to the resource deployed.
20. Discipline of the resource(s) during discharge of duties must be regulated by the Contractor himself or by his representative.
21. **Police verification**
  - a) The Contractor (including his sub-Contractors/Petty Contractors etc, if allowed) will undertake police verification in respect of the resource(s) engaged by him in TFL's premises. Such verification will have to be carried out from concerned police station of their permanent place of residence/present place of residence.
  - b) Further, the Contractor is advised not to deploy any resource having past criminal record in the establishment/premises of TFL under this contract awarded to him.
  - c) In the event of violation of above clauses at (a) and (b), the Contractor will be solely responsible for the same.
  - d) If any such resource(s) having criminal record is deployed by the Contractor in the premises of TFL and has come to the notice of TFL at any point of time, the Contractor shall immediately replace that resource(s), failing which that particular resource(s) of the Contractor will not be allowed to enter into the premises of TFL.
22. While confirming to any of these conditions, the Contractor must ensure that all applicable Laws of State regarding labour, their welfare, conduct etc. are complied.

## **STANDARD CONDITIONS OF SCC: PART III**

### **Compliance of Government of India Directives**

#### **1. Pradhan Mantri Suraksha Bima Yojna (PMSBY) and Pradhan Mantri Jeevan Jyoti Bima Yojna (PMJJBY)**

Contractor shall, ensure that all its resources deployed under this contract have obtained additional insurance coverage under the Pradhan Mantri Suraksha Bima Yojana (PMSBY) and Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) through the participating banks and submit the proof of such insurance coverage to the satisfaction of TFL. The cost has been included in the estimate mentioned in SOR and the Contractor shall submit evidence / proof to TFL in this respect. Both the schemes are to be regulated continuously on yearly basis and the same should be renewed on each successive relevant date in subsequent years during the period of the contract.

#### **2. Labour Identification Number (i.e. LIN) Registration (Mandatory)**

The Unified Shram Suvidha Portal, developed by Government of India, facilitates reporting of Inspections & submission of Returns and has also been envisaged as a single point of contact between employer, resources and enforcement agencies bringing in transparency in their day-to-day interactions. For integration of data among various enforcement Agencies, the Contractor, as an inspectable unit, is required to register and obtain Labour Identification Number (i.e. LIN) from Shram Suvidha Portal and submit the same in TFL.

#### **3. Pradhan Mantri Rojgar Protsahan Yojna (PMRPY) – if applicable**

In order to support the Govt. of India's Initiative on Employment Generation, the Contractor must register for Pradhan Mantri Rojgar Protsahan Yojna (PMRPY) Scheme. The Contractor shall inform TFL/Engineer in Charge about the benefit availed, if any, against the scheme for adjustment against the invoice(s) / bill(s).

**Details in support of RA Bill for the Month of \_\_\_\_\_, 20\_\_**

- (1) Name of the Firm/Agency/Contractor \_\_\_\_\_
- (2) Nature of Contract: Job/ Service \_\_\_\_\_
- (3) Period of Contract: From \_\_\_\_\_ to \_\_\_\_\_
  - (a) Extension Period of Contract, if any from \_\_\_\_\_ to \_\_\_\_\_
  - (b) Place where contract workmen are working \_\_\_\_\_
- (4) Postal address of the Contractor: \_\_\_\_\_
- (5) Phone No. of the Contractor: \_\_\_\_\_
- (6) Fax No. and Email of the Contractor: \_\_\_\_\_
- (7) Name and Address of PF office from where EPF Code No. has been allotted: \_\_\_\_\_
- (8) EPF Code No. allotted by PF office: \_\_\_\_\_
- (9) Name and Address of ESIC office from where ESI Code No. has been allotted: \_\_\_\_\_
- (10) ESI Code No. allotted by ESIC office: \_\_\_\_\_
- (11) Labour License No. \_\_\_\_\_ dated \_\_\_\_\_
- (12) Validity period of Labour License from \_\_\_\_\_ to \_\_\_\_\_
- (13) Detail of Resource engaged by the Contractor:

Category	No. of Resources		Prevailing Minimum Wages
	Male	Female	
Unskilled			
Semi-skilled			
Skilled			
Highly skilled			
Total			

- (14) Copy of Wage Register in FORM – B ( to be replaced by FORM-I as per Code on Wages-2019, after it comes into force)
- (15) Details of deposit of contribution towards EPF:
  - a) EPF Challan No. \_\_\_\_\_ Amount \_\_\_\_\_ Date \_\_\_\_\_
- (16) Details of Deposition of contribution towards ESI
  - a) ESI Challan No. \_\_\_\_\_ Amount \_\_\_\_\_ Date \_\_\_\_\_
- (17) Whether any arrangement / agreement has been entered with any resource for extending benefits under Inter-state Migrant Workmen (RE&CS) Act, 1979: \_\_\_\_ (Yes / No)  
If Yes, No. of such Inter-state Migrant Workers: \_\_\_\_\_

SIGNATURE OF CONTRACTOR/AUTHORIZED REPRESENTATIVE

Place:  
Date:



**UNDERTAKING**

**(To be submitted along with un-priced bid)**

I/We hereby undertake that I/We have completely understood the terms & conditions of the Tender including minimum resources required to be deployed and the cost involved thereof in deployment of resources.

I/We further undertake to ensure all compliances of the tender conditions. Any non-compliance may be construed as deficiency in the performance of the contract. If such non-compliance is noticed TFL/owner is at liberty to take action in line with the tender conditions including termination of the contract.

*Signature of Bidder.....*  
*Name of Bidder.....*



## Summary of Insurance Policies

Contractor is required to cover all resources deployed by him with the following insurances / schemes:

Sl. No.	SCHEME	APPLICABILITY	PREMIUM/ CONTRIBUTION	SUM ASSURED/ BENEFITS	REMARKS
1	The Employees' State Insurance Act, 1948	Applicable to all resources of the Contractor (within ESI wage limit) working in notified area.	3.25% of wages by employer 0.75% of wages by employees	Benefits under the Employees' State Insurance Act, 1948.	
2	The Employees' Compensation Act, 1923 (in lieu of ESI – mentioned at Sl. 1)	Applicable to excluded employees under ESI and those who are working in non-notified area to extend similar benefits as available under ESI Act, 1948	Premium to be calculated considering wage limit under EC Act, 1923 (i.e. Rs. 15,000/- p.m currently)	Maximum <b>Compensation Liability</b> under Employee's Compensation Act, 1923 along with a <b>Mediclaim policy</b> within overall premium @ 3.25 % of Minimum wages (i.e. employer contribution towards ESI)	Provides compensation and medical facility to resources.
3	Group personal Accident Insurance	Applicable to all resources of the Contractor	Based on the coverage	Insured value: Rs. 3 Lakh to cover expenses associated with any accident.	Death, permanent disablement, temporary total disability or any other medical expenses related to accident.
4	Pradhan Matri Suraksha Bima Yojana (PMSBY)	Eligibility – age group 18 to 70 years	Rs. 12/- per annum	<b>Accidental</b> death and permanent disability: (i) Permanent total disability – Rs. 2 lakhs. (ii) Permanent partial disability – Rs. 1 Lakh.	
5	Pradhan Mantri Jeevan Jyoti Bima Yojana(PMJJB)	Eligibility – age group 18 to 50 years. (can continue upto 55 years)	Rs. 330/- per annum.	Risk coverage – Rs. 2 Lakhs- in case of <b>death due to any reason</b>	

 <b>PROJECTS &amp; DEVELOPMENT INDIA LIMITED</b>	PC-183 / E / 4017 /S-V	0	
	DOC. NO.	REV.	
	Page 1 of 18		

**ANNEXURE - I**  
**TO**  
**SPECIAL CONDITIONS OF CONTRACT**  
  
**SPECIFICATION**  
**FOR**  
**HEALTH, SAFETY AND**  
**ENVIRONMENT (HSE) MANAGEMENT**



	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>  <b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 2 of 18		

## TABLE OF CONTENTS

1.0	SCOPE.....	3
2.0	REFERENCES.....	3
3.0	REQUIREMENTS OF HEALTH, SAFETY & ENVIRONMENT (HSE) MANAGEMENT SYSTEM TO BE COMPILED BY BIDDERS .....	3
4.0	DETAILS OF HSE MANAGEMENT SYSTEM BY CONTRACTOR.....	7

### ANNEXURES: -

1. ANNEXURE-1 A : RELEVANT I.S. CODES
2. ANNEXURE-1 B : REPORTING FORMATS

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 3 of 18		
<b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>				

## 1.0 SCOPE

This Specification establishes the Health, Safety and Environment (HSE) management requirement to be complied with by the Contractors during construction. Requirements stipulated in this specification shall supplement the requirements of HSE Management given in relevant Act (s)/ legislations. General Conditions of Contract (GCC), Special Conditions of Contract (SCC), and Job Specifications. Where different documents stipulate for different requirements, the most stringent shall be adopted.

## 2.0 REFERENCES

This document should be read in conjunction with following:

- General Conditions of Contract (GCC)
- Special Condition of Contract (SCC)
- Job Specifications
- Relevant IS Codes (Refer Annexure-IA)
- Reporting Formats (Refer Annexure-IB)

## 3.0 REQUIREMENTS OF HEALTH, SAFETY & ENVIRONMENT (HSE) MANAGEMENT SYSTEM TO BE COMPILED BY BIDDERS


### 3.1 MANAGEMENT RESPONSIBILITY

The contractor should have a documented HSE policy to cover commitment of their organization to ensure health, safety and environment aspects in their line of operation.

3.1.2 The HSE management system of the Contractor shall cover the HSE requirements including but not limited to what is specified under Para 1.0 and Para 2.0 above.

3.1.3 Contractor shall be fully responsible for planning and implementing HSE requirements. Contractor as a minimum requirement shall designate/deploy the following to coordinate the above.

No. of workers deployed Upto 250	- Deploy one qualified and experienced safety Engineer/Officer
Above 250 & Upto 500	- One additional safety engineer/officer, as above
Above 500	- One additional safety engineer/officer,



	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 4 of 18		
<b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>				

(For every 500 or less)

for each 200 workers.

Contractor shall indemnify & hold harmless Owner/Consultant & their representatives free from any and all liabilities arising out of non-fulfillment of HSE requirements.

- 3.1.4 The Contractor shall ensure that the Health, Safety and Environment (HSE) requirements are clearly understood & faithfully implemented at all levels at site.
- 3.1.5 The Contractor shall promote and develop consciousness for Health Safety and Environment among all personnel working for the Contractor. Regular awareness programs and fabrication shop/work site meetings shall be arranged on HSE activities to cover hazards involved in various operations during construction.
- 3.1.6 Arrange suitable First-Aid measures such as First Aid Box, trained personnel to First Aid, Standby Ambulance or Vehicle and install fire protection measures such as adequate number of steel buckets with sand and water and adequate extinguishers to the satisfaction of Consultant/Owner.
- 3.1.7 The Contractor shall evolve a comprehensive planned and documented system for implementation and monitoring of the HSE requirements. This shall be submitted to Consultant/Owner for approval. The monitoring for implementation shall be done by regular inspections and compliance to the observations thereof. The Contractor shall get similar HSE requirements implemented at his sub-contractor(s) work site/office. However, compliance of HSE requirements shall be the sole responsibility of Contractor. Any review/approval by Consultant/Owner shall not absolve contractor of his responsibility / liability in relation to all HSE requirements.
- 3.1.8 Non-Conformance on HSE by Contractor (including his Sub-contractors) as brought out during review/audit by Consultant/Owner representative shall be resolved forthwith by Contractor. Compliance report shall be provided to Consultant/Owner.
- 3.1.9 The Contractor shall ensure participation of his Resident Engineer/ Site-in-Charge in the Safety Committee / HSE Committees. Meetings arranged by Consultant/Owner. The compliance of any observations shall be arranged urgently. He shall assist Consultant/Owner to achieve the targets set by them on HSE during the project implementation.
- 3.1.10 The Contractor shall adhere consistently to all provisions of HSE requirements. In case of non-compliance or continuous failure in implementation of any of HSE provisions; Consultant/Owner may impose stoppage of work without any Cost & time implication to Owner and/or impose a suitable penalty for noncompliance with a notice of suitable period upto a cumulative limit of 1.0% (one percent) of Contract Value with a ceiling of Rs 10 lakhs. This penalty shall be in addition to all other penalties specified else where in the contract. The decision of imposing stoppage

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 5 of 18		

work, its extent & monetary penalty shall rest with Consultant/Owner & binding on the Contractor.

3.1.11 However **fatal accident** may lead to termination of the Contract. The personnel accidents shall be investigated by a team of Contractor's senior personnel for root cause & recommend corrective and preventive actions. Findings shall be documented and suitable actions taken to avoid recurrences shall be communicated to Consultant/Owner. Owner/Consultant shall have the liberty to independently investigate such occurrences and Contractor shall extend all necessary help and co-operation in this regard.



### 3.2.0 HOUSE KEEPING

3.2.1 Contractor shall ensure that a high degree of house keeping is maintained and shall ensure inter-racial the followings:

- a. All surplus earth and debris are removed/disposed off from the working areas to identified location(s).
- b. Unused / Surplus Cables different places within location(s). Steel items and steel scrap lying scattered at the working areas are removed to identified
- c. All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from work place to indemnified location(s).
- d. Roads shall be kept clear and materials like pipes steel sand, boulders concrete, chips and bricks etc shall not be allowed on the roads to obstruct free movement of men & machineries.
- e. Fabricated steel structural, pipes & piping materials shall be stacked properly for erection.
- f. Water logging on roads shall not be allowed.
- g. No parking of trucks/trolleys, cranes and trailers etc shall be allowed on roads which may obstruct the traffic movement.
- h. Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas.
- i. Trucks carrying sand, earth and pulverized materials etc shall be covered while moving within the plant area.

### 3.3.0 HEALTH, SAFETY AND ENVIRONMENT



3.3.1 The Contractor shall provide safe means of access to any working place including provisions of suitable and sufficient scaffolding at various stages during all operations

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 6 of 18		
<b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>				

of the work for the safety of his workmen, and, Consultant/Owner. Contractor shall ensure deployment of appropriate equipment and appliances for adequate safety and health of the workmen and protection of surrounding areas.

- 3.3.2 The Contractor shall ensure that all their staff and workers including their subcontractor(s) shall wear Safety Helmet and Safety shoes. Contractor shall also ensure, use of safety belt protective goggles, gloves etc. by the personnel as per job requirements. All these gadgets shall conform to relevant IS specifications or equivalent.
- 3.3.3 Contractor shall ensure that a proper Safety Net System shall be used at appropriate locations. The safety net shall be located not more than 30 feet (9.0 meters) below the working surface at site to arrest or to reduce the consequences of a possible fall of persons working at different heights.
- 3.3.4 Contractor shall ensure that flash back arrester shall be used while using Gas Cylinders at site. Cylinders shall be mounted on trolleys.
- 3.3.5 The Contractor shall assign to his workmen tasks commensurate with their qualification experience and state of health for driving of vehicles, handling and erection of materials and equipments. All lifting equipments shall test certified for its capacity before use. Adequate and suitable lighting at every work place and approach there to, shall be provided by the contractor before starting the actual operations at night.
- 3.3.6 Hazardous and/or toxic materials such as solvent coating or thinners shall be stored in appropriate containers.
- 3.3.7 All hazardous materials shall be labeled with the name of materials the hazards associated with its use and necessary precautions to be taken.
- 3.3.8 Contractor shall ensure that during performance of the work, all hazards to the health of personnel have been indemnified, assessed and eliminated.
- 3.3.9 Chemical spills shall be contained & cleaned up immediately to prevent further, contamination.
- 3.3.10 All personnel exposed to physical agents such as ionizing or non-ionizing radiations ultraviolet rays or similar other physical agents shall be provided with adequate shielding or protection commensurate with the type of exposure involved.
- 3.3.11 Where contact or exposure of hazardous materials could exceed limits or could otherwise have harmful affects, appropriate personal protective equipments such as gloves, goggles, aprons chemical resistant clothing and respirator shall be used.
- 3.3.12 Suitable facilities for toilet, drinking water, proper lighting shall be provided at site and labor camps, commensurate with applicable Laws/Legislation.



	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 7 of 18		

3.3.13 Contractor shall ensure storage and utilization methodology of materials that are not detrimental to environment. Where required, Contractor shall ensure that only the environment friendly materials are selected.

3.3.15 All persons deployed at site shall be knowledgeable of and comply with the environment laws, rules & regulations relating to the hazardous materials substances and wastes. Contractor shall not dump release or otherwise discharge or dispose off any such materials without the express authorization of Consultant / Owner.

#### 4.0 DETAILS OF HSE MANAGEMENT SYSTEM BY CONTRACTOR

##### 4.1 On Award of Contract



The Contractor shall prior to start of work submit his Health, Safety and Environment Manual or procedure and HSE Plans for approval by Consultant/Owner. The contractor shall participate in the pre-start meeting with Consultant/Owner to finalize HSE Plans including the following.

- Job procedure to be followed by Contractor for activities covering handling of equipments, Scaffolding, Electric Installation, describing the risks involved, actions to be taken and methodology for monitoring each activity.
- Consultant/Owner review /audit requirements.
- Organization structure along with responsibility and authority records/ reports etc on HSE activities.

##### 4.2 During job execution



4.2.1 Implement approved Health, Safety and Environment management procedure including but not limited to as brought out under Para 3.0. Contractor shall also ensure to:

- Arrange workmen compensation insurance registration under ESI Act third party liability insurance etc, as applicable:
- Arrange all HSE permits before start of activities (as applicable) like hot work, confined space, work at heights, storage of chemicals/explosive materials and its use and implement all precautions mentioned their in.
- Submit timely the completed checklist on HSE activities, Monthly HSE reports, accident reports, and investigation reports etc as per Consultant/Owner requirements. Compliance of instructions on HSE shall be done by contractor and informed urgently to Consultant /Owner.
- Ensure that resident Engineer/Site-In-Charge of the Contractor shall attend all the Safety Committee/HSE meetings arranged by Consultant/Owner. Only in

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>  <b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 8 of 18		

case of his absence from site that a second senior most person shall be nominated by him in advance and communicated to Consultant/Owner.

- Display at site office and work locations caution boards list of hospitals emergency services available.
- Provide posters, banners for safe working to promote safety consciousness.
- Carry out audits/inspection at sub-contractor works as per approved HSE document & submit the reports for Consultant/Owner review.
- Assist in HSE audits by Consultant /Owner and submit compliance reports
- Generate & submit HSE records/report as per HSE Plan.
- Appraise Consultant /Owner on HSE activities at site.

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 9 of 18		

**HEALTH, SAFETY AND  
ENVIRONMENT (HSE) MANAGEMENT**

**ANNEXURE -1A**



**RELEVANT IS - CODES FOR PERSONAL PROTECTION**

IS: 2925 - 1984	Industrial Safety Helmets
IS: 4770 - 1968	Rubber gloves for electrical purposes
IS: 6994 - 1973 (Part-I)	Industrial Safety Gloves (Leather & Conon Gloves)
IS: 1989 - 1986 (Part -I & III)	Leather safety boots and shoes
IS: 3738 - 1975	Rubber knee boots
IS: 5557 - 1969	Industrial and Safety rubber knee boots
IS: 6519 - 1971	Code of practice for selections, care and repair of Safety footwear
IS: 11226 - 1985	Leather Safety footwear having direct moulding sole
IS: 5983 - 1978	Eye protectors
IS: 9167 -1979	Ear protectors
IS: 3521 -1983	Industrial Safety belts and harness

**NOTE:**

For necessary Codes for safety/Environmental requirement, concerned statutory authorities may be consulted.



	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 11 of 18		
<b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>				

## 2.0 MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (1/6)

**PROJECT:**

**CONTRACTOR:**



**DATE:**

**OWNER:**

**INSPECTION BY:**

**NOTE:** Write N.A. where the item is not applicable.



ITEM	Yes	No	Remarks	Action
<b>HOUSEKEEPING</b>				
Waste containers provided and used				
Sanitary facilities adequate and clean				
Passageways and walkways clear				
General neatness of working areas				
Other				
<b>PERSONAL PROTECTIVE EQUIPMENTS</b>				
Goggles, Shields				
Face protection				
Hearing protection				
Safety shoes provided				
Hand protection				
Respiratory mask etc.				
Safety belts				
Other				
<b>EXCAVATION / OPENINGS</b>				
Opening properly covered or barricaded				
Excavation shored				
Excavation barricaded				
Overnight lightening provided				
Other				

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 12 of 18		
<b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>				

### MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (2/6)



ITEM	Yes	No	Remarks	Action
<b>WELDING ,CUTTING</b>				
Gas cylinders chained upright				
Cables and hoses not obstructing				
Screens or shields used				
Flammable materials protected				
Fire extinguisher (s) accessible				
other				
<b>SCAFFOLDING</b>				
Fully decked platforms				
Guard and intermediate rails in place				
Toe boards in place				
Adequate shoring				
Adequate access				
Other				
<b>LADDERS</b>				
Extension side rails 1 m above				
Top of landing				
Properly secured				
Angle $\pm 70^\circ$ from horizontal				
Other				

### MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (Contd. 3/6)

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 13 of 18		
<b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>				

ITEM	Yes	No	Remarks	Action
<b>HOISTS, CRANES AND DERRICKS</b>				
Condition of cables and sheaves OK				
Condition of slings, chains hooks and eyes O.K.				
Inspection and maintenance logs maintained				
Outriggers used				
Sign/l barricades provided				
signals observed and understood				
Qualified operators				
Other				
<b>MACHINERY, TOOLS AND EQUIPMENT</b>				
Proper instruction				
Safety devices				
Proper cords				
Inspection and maintenance				
Other				
<b>VEHICLE AND TRAFFIC</b>				
Rules and regulations observed				
Inspection and maintenance				
Licensed drivers				
Others				



**MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (Contd. 4/6)**

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 14 of 18		
<b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>				

ITEM	Yes	No	Remarks	Action
<b>TEMPORARY FACILITIES</b>				
Emergency instructions posted				
Fire extinguisher provided				
Fire-aid equipment available				
Secured against storm damage				
General neatness				
In accordance with electrical requirements				
Other				
<b>FIRE PREVENTION</b>				
Personnel instructed				
Fire extinguishers checked				
No smoking in prohibited areas.				
Hydrants Clear				
Other				
<b>ELECTRICAL</b>				
Proper wiring				
ELCB's provided				
Ground fault circuit interrupters				
Protection against damage				
Prevention of tripping hazards				
Other				



**MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (Contd. 5/6)**



	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 15 of 18		
<b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>				



ITEM	Yes	No	Remarks	Action
<b>HANDLING AND STORAGE OF MATERIALS</b>				
Properly Stored or stacked				
Passageways clear				
Other				
<b>FLAMMABLE GASES AND LIQUIDS</b>				
Container clearly identified				
Proper storage				
Fire extinguishers nearby				
Other				
<b>WORKING AT HEIGHT</b>				
Erection plan				
Safety nets				
Safety belts and lanyards: chute lines				
Other				
<b>ENVIRONMENT</b>				
Chemical and other Effluents properly disposed				
Cleaning liquid of pipes disposed off properly				
Sea water used for hydro-testing disposed off as per agreed procedure				
Lubricant waste/Engine oils properly disposed				
Waste from Canteen, offices, sanitation etc disposed properly				
Disposal of surplus earth stripping materials Oily rags and combustible materials done properly				
Green belt protection				

**MONTHLY HSE CHECK LIST CUM COMPLIANCE REPORT (Contd. 6/6)**

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>  <b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 16 of 18		

ITEM	Yes	No	Remarks	Action
<b>HEALTH CHECKS</b>				
Hygienic conditions at labour camps O.K.				
Availability of first Aid facilities				
Proper sanitation at site ,office and labour camps				
Arrangement of medical facilities				
Measures for dealing with illness				
Availability of potable drinking water for working and staff				
Provision of crèches for children				

(Signature of Resident Engineer with Seal)

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>  <b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 17 of 18		



3.0 **ACCIDENT CUM FIRE REPORT**

STANDARD TFL FORMAT SHALL BE SUPPLIED AT SITE

4.0 **SUPPLEMENTRY ACCIDENT & INVESTIGATION REPORT**

STANDARD TFL FORMAT SHALL BE SUPPLIED AT SITE

**5.0 MONTHLY HEALTH, SAFETY & ENVIRONMENT (HSE) REPORT**  
(To be submitted by each Contractor)

	<b>GRID CONNECTIVITY TO TFL TO SUPPLY 90 MW POWER AT TALCHER FERTILIZERS LTD., ANGUL, ODISHA</b>	PC-183 / E /4017 /S-V	0	
		DOC. NO.	REV	
		Page 18 of 18		
<b>HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT</b>				

Actual work start Date:  
Project:  
Name of the Contractor:  
Name of work:

For the Month of:  
Report No:  
Status as on:  
Name of safety officer:

ITEM	THIS MONTH	CUMMULATIVE
Total Strength (Staff + Workmen)		
Number of HSE meetings organized at site		
Number of HSE awareness programs conducted at site		
Whether workmen compensation policy taken		
Whether workmen compensation policy is valid		
Whether workmen registered under ESI Act		
No. of fatal accidents		
Number of Loss time accidents(other than fatal)		
Other accidents (Non Loss Time)		
Total No. of Accidents		
Total man-hours worked		
Man-hour loss due to fire and accidents		
Compensation cases raised with Insurance		
Compensation cases resolved and paid to workmen		
Remarks		

Date:

**Safety Officer / Resident Engineer**

(Signature and name)

To:

OWNER..... 1 Copy  
RCM/SITE-IN-Charge (CONSULTANT) 1 Copy

**SECTION-VI**  
**TECHNICAL SPECIFICATION**

## Table of Contents (Technical Specifications)

S. No.	Description	Page No.
1)	Section Project	1 – 10
2)	TS for H-Type Pole	11 – 21
3)	TS for WPB Pole	22 – 33
4)	TS for 33kV V Cross Arm	34 – 43
5)	TS for GI Channel & Angle, GI Top Bracket	44 – 54
6)	TS for HT Stay Set including Clamp	55 – 67
7)	GTP & Drawing for GI Stay Clamp	68 – 69
8)	GTP & Drawing for GI HT Stay Set	70 – 71
9)	GTP for GI Stay Wire	72
10)	GTP & Drawing for GI Earthing Coil	73
11)	GTP & Drawing for Danger Board	74
12)	GTP & Drawing for HT Stay Insulator	75 – 76
13)	GTP & Drawing for 33kV GI Pin Insulator Polymer	77 – 78
14)	TS for GI Earthing Pipe	79 – 87
15)	TS for 33kV Lightning Arrester (10 kA)	88 – 103
16)	TS for 33kV Polymer Disc Insulator (90kN & 120kN)	104 – 117
17)	TS for AAA Conductor	118 – 130
18)	TS for 33kV Outdoor Current Transformer	131 – 145
19)	TS for 33kV Outdoor Potential Transformer	146 – 157
20)	TS for 33kV 200A HG Fuse	158 – 169
21)	TS for 33kV 400A AB Switch	170 – 182
22)	TS for Heat Shrinkable Straight Through Joint & Terminations for 33kV Cable	183 – 205
23)	TS for Centre Rotating, Double Break Type Isolator (33kV – 1250A)	206 – 230
24)	TS for 33kV XLPE Armoured Cable	231 – 252
25)	TS for Accessories of 33kV Insulated Conductor	253 – 270
26)	TS for Earth Enhancement Material	271 – 278
27)	TS for Fuse Wire	279 – 288
28)	TS for GI Flats of Different Sizes	289 – 298
29)	TS for Disc Insulator Hardware Fittings	299 – 309
30)	TS for HDPE Pipe	310 – 318
31)	TS for GI Nut & Bolt	319 – 326
32)	Galvanization Procedure	327
33)	GTP for GI Barbed Wire	328
34)	TS for 33kV XLPE Covered Conductor	329 – 341
35)	Quality Assurance Plan	342 – 425
36)	TPCODL Approved Manufacturer – Distributor List	426 – 441
37)	Bill of Quantities	442 – 445
38)	Reference Drawings	446 – 463
39)	Reference Route Drawing (TPCODL Approved)	464
40)	Reference Route Drawing (Detailed)	465
41)	Soil Testing Report (For Reference)	466 – 489

## Section Project

### I. DETAILED SCOPE OF WORK

**Name of Work:** Construction of 2 x 33kV overhead line for providing Power Supply to intake well at TFL Pump House (located near *Brahimani* River) from TFL-OPTCL's 220/33 kV LILO Substation (proposed at TFL's Plant site)

The scope of work under this project covers, but not limited to, Supply, Transportation, Insurance, Delivery at site, Unloading, handling, Store, installation (including civil works), obtaining all necessary statutory approvals, testing, demonstration for acceptance, commissioning, and documentation of 33kV Double Circuit Overhead Line and UG Cable (road and railway crossing) from 220/33kV Switching Substation to 33kV/415V Distribution substation for LT Power at TFL water pump house.

#### **The Scope covers the following:**

- Preliminary route alignment in respect of the proposed 33KV feeder line has been fixed by the employer subject to alteration of places due to way leave or other unavoidable constraints. It may be noted that the employer is also laying a water pipeline from the Pump House to TFL premises wherein the Right of Use (RoU) of TFL is already being acquired. Bidders are requested to make themselves aware of the complete route prior to Bidding. Notwithstanding the above, the successful agency shall undertake the check survey before execution and shall make all efforts to lay the 33kV feeder within the proposed route. It may also be noted that in case of any deviation from the proposed route, the responsibility of obtaining the Right of Use for the additional land required, lies with the Bidder.
- The responsibilities of acquiring Right of Way (ROW) for the proposed 33kV Line also lies with Bidder at his risk and cost. However, Employer shall make all endeavors to facilitate process of securing the ROW. Employer shall assist the Bidder for getting clearances from Private/Govt./Statutory bodies. All statutory Charges / Fees towards obtaining ROW clearance (viz. Tree Cutting, Forest Clearance, Road Crossing, Railway Crossing, River Crossing, Nalla Crossing etc.) for the laying / stringing the 33 kV feeder line shall be reimbursed by TFL on production of legitimate, evident and valid Documentary Proof.
- Survey of route, Drawings, Supply of all material, Transportation, Insurance, Delivery at site, Unloading, handling, Store, installation (including civil works), obtaining all necessary statutory approvals, testing, demonstration for acceptance, commissioning, and documentation of 33kV Double circuit overhead lines with 148 Sq.mm AAA Insulated conductor on H-Type Poles (for Single Pole & Double Pole Structures) and WPB Poles (for 4-Pole Structures) and 33kV 1C x 400 Sq. mm. Aluminum XLPE Cable for various Road / Rail / Water Body crossings from 220/33kV Switching Substation to 33kV Distribution substation at TFL water pump house. The total route length is ~11 KM (Refer route drawings in the tender document).
- Bidder at his own cost must check the route survey and confirm the BOQ given in tender document, however the 33KV line route map is attached in the tender document.
- 33KV Line is crossing at the Railway track and roads, the cables shall be laid as per the standard specifications of the concerned utility / TPCODL & the respective Code. It is the responsibility of Bidder to get the required clearances from the concerned utilities i.e., Railways, Roads, waterways etc.
- It shall be the responsibility of the Bidder to fulfill the requirements and code of practice of Odisha Discoms as well as CEIG's safety regulations.

## Section Project

- At every stage, Bidder must take TFL / PDIL / TPCODL approval on materials, drawing and documents. The costs incurred, if any, for taking such approval (s) shall be borne by the Bidder.
- Vendors on TFL holiday list shall not be considered for ordering.
- Bidder shall make an independent assessment of capability of all the vendors for timely deliveries of material / equipment. Any delays in deliveries by vendor(s) shall not be a cause of schedule time and cost implication.
- Reference drawings towards execution of the works viz. Single Pole / Double Pole / Four Pole Structures, Foundation Details, Stay Set, Cable Route Marker, Cable Riser etc. are enclosed with this Tender Document. However, Bidder must draft all the applicable drawings required this tender and get them approved from TFL / PDIL / TPCODL before commencement of the works.
- Any other items not specifically mentioned in the specification, but which are required for installation, testing, commissioning, and satisfactory operation as per the requirement of TFL / PDIL / TPCODL and Indian standards/IE Rules/IE Act and other concerned authority regulations are deemed to be included in the scope of the specification and no deviation in this regard shall be accepted.

### Notes:

- a) HT/EHT LICENSE: HT/EHT license issued by any State Govt. Authority available with the Bidder is sufficient for the purpose of participation in this subject tender. In case the HT/EHT license is not from the ELBO Odisha, Bidder license for execution of works is to be obtained from the Office of the EIC-CUM-PCEI, Odisha. However, the Bidder should furnish the documents as a proof to Employer, that they have applied to the issuing authority for issuing of Bidder License within 30 (thirty) days from the issue of FOA/LOA. In case the Bidder license application is not furnished within 30(thirty) Days from the issue of FOA/LOA, Employer have the right to cancel the LOA.
- b) Successful Bidder must submit the General Technical Particulars (GTP) duly filled in line with the given Technical Specifications, along with all the relevant drawings and allied documents for approval prior to placement of order & commencement of works thereof.
- c) All the material and equipments are to be strictly sourced from the approved vendor list of TPCODL. Original guarantee card should be handed over to TFL / PDIL along with the invoices and other necessary documents.
- d) This is a 'No Deviation' Tender, hence bidders are not allowed to seek or request any deviation w.r.t. the given Technical Specifications. Bidders need to comply with the Given Technical Specifications in toto.
- e) In case of any dispute in the given Technical Specifications of the Tender, decision of TFL / PDIL shall be final and binding to all.
- f) Bidder need not submit any technical document, even if mentioned in the Technical Specifications, along with their Bid. If in case Bidder submits any such documents along with their Bid the same shall not be evaluated or considered during Bid evaluation process. However, successful bidder must submit all the relevant GTP, drawings and documents for approval prior to issuance of Purchase Orders to the respective manufacturers / fabricators.

## II. GENERAL TECHNICAL REQUIREMENT FOR OVERHEAD LINE: 33KV DOUBLE CIRCUIT OVERHEAD LINE

**IE Rules:** The Bidder shall be well acquainted with the I.E Rules 1956 as numbered from time to time and with the Indian Telegraph Act 1889 so that the necessary provisions therein may be followed.



## Section Project

**Survey of the route:** The tentative route map of the line and Pole location to be erected is furnished by TFL (refer pole schedule/route layout drawing). The successful Bidder is required to carry out the check survey of the line route and fix up the location considering span of 40 Meters and mark the location and submit a detailed route map to TFL / PDIL / TPCODL for approval.

During check surveying by the Bidder, conspicuous variations in the change and physical features to those indicated in the route map and as actually existing are noticed, deviations must be brought to the notice of TFL / PDIL.

The routing shall be shortest distance. The routing shall be decided such that required safety clearance are maintained and finalized in consultation with TFL / PDIL's site officials.

The routing shall be in such a way that all necessary clearances are met as per relevant standards. The Bidder shall obtain necessary government approvals as necessary. The Bidder shall take all line clearances as per procedure in due course of work. On completion of over headline installation, competent personnel shall carry out a general inspection.

**Way leaves and tree cutting:** The Bidder shall be responsible to get clearances from concerned authorities for tree cuttings etc. The Bidder shall arrange for tree cuttings or tree branches cutting also. The widths of tree clearances to be adopted for the lines of various voltages are outlined here under. All growth within 6.096m (20ft) from the centerline of support and all trees which may fall and foul the line are to be suitably removed/cut. The Bidder shall take all possible steps to ensure timely completion of the work and shall be responsible for crop damage compensation etc. and no extra cost shall be accepted by TFL / PDIL in this regard. Sometimes, it may not be possible for TFL / PDIL to arrange right-of-way for excavation of pole pits or erecting the poles of stringing the line. At all such time, the Bidder shall shift his gangs to other areas. The rates quoted shall cover all such contingencies and no extra payments shall be claimed for such contingencies.

### **Minimum clearances**

Shall be as per Indian Electricity Rules and TPCODL guidelines.

### **Ground Clearances for 33kV OH Line.**

Shall be as per Indian Electricity Rules and TPCODL guidelines.

### **Clearance between lines crossing each other.**

Shall be as per Indian Electricity Rules and TPCODL guidelines.

### **Excavation of pole pits, stay pits:**

After the final survey of the line and after making the pole locations with pegs, excavation work must be commenced in accordance with the approved route map. Excavation is generally done by pickaxe, crow V-bars and shovels although sometimes earth augers are used for excavation of the pole pits in very hard or rocky soil or in rock beds. The pits for the supports are excavated in the direction of the line as this will facilitate the erection of support, in addition to giving greater

## Section Project

lateral stability. The depth of the foundation to be excavated for poles shall be in accordance with relevant sketch for the erection of pole or stay or DP etc.

### All soils other than hard rock

**Hard – rock:** Hard rock will be that which requires drilling and blasting by any method. The cost of drilling and blasting is deemed to be included in the per kilometer rate of the line. In certain cases, when the area around the location happens to be an inhabited area consequent to which blasting cannot be resorted to the excavation may have to be dug with or by the process of drilling wedging, hammering, and splitting or by the process of heating and splitting by sudden cooling or by use of rock splitters or by using cold blasting compounds like Acconex etc.

The rate quoted shall take into consideration such contingencies also. Whenever blasting is resorted to the Bidder shall make adequate arrangements of safety precautions. TFL / PDIL will not be responsible for any damages or accidents arising out of the process of blasting. The quoted rates should cover all contingencies during the process of excavation, for any reasons whatsoever no extra claim will be accepted.

### FOUNDATIONS:

#### Classifications of Foundations:

Depending on the type of soils, the subsoil water table, and the presence of surface water, four types of foundation designs will be used for each location classified in the following manner in addition to normal soil. The type of foundation shall be decided by TFL / PDIL and the same shall be final and binding on the Bidder.

- Normal Soil
- Black cotton Soil
- Submerged type
- Rock type

### ERECTION OF SUPPORTS:

After the excavation of pits is completed the supports to be erected may be brought to the pit location. Then the pole may be erected inside the pit. The length of pole that must be planted into the ground shall be 1/6th of total length of the pole or as mentioned in the relevant Technical Specifications. Wooden support may be utilized to facilitate lifting of the pole at the pit locations.

Having lifted the pole, the same should be kept in a vertical position with the help of manila rope of 25mm. dia using the rope as a temporary anchor. As the poles are being erected, say from the pole already erected to the said location where in the pole is being erected the alignment of the poles are to be checked and set right by visual check. The vertically of the poles are to be checked with a spirit level on both transverse and longitudinal directions. Having satisfied that the vertically and alignment are all right, filling of concrete to be done.

In swampy and special locations. However, before earth filling, the poles are to be concreted up to ground level of the pit. After the poles have been set the temporary anchors are to be removed. Coping shall be done as per drawing.

### ANCHORING AND PROVIDING GUYS FOR SUPPORTS:

Guys are to be provided to the supports at the following places

## Section Project

- i. Angle locations.
- ii. Dead end locations.
- iii. Tee- off points.
- iv. Steep gradient locations to avoid uplifting of the poles.

The installations of guy will involve the following works:

- i. Excavation of pit and fixing of stay rod.
- ii. Fastening guy wires to the support.
- iii. Tightening guy wire and fastening to the anchor.

The marking of the guy pit for excavation, the excavation of pits and setting of the anchor rod must be carefully carried out. If stay wire arrangement is not possible in particular location WPB/H pole Structure can be used after getting approval. Number of stay wire shall be generally as per TPCODL/Odisha Discom construction standards. All ferrous materials shall be of hot dip galvanized as per relevant Indian Standards. The ratio of concrete for stay pit shall be as per TS.

Guy-strain insulators are used in the guys so that, in case of any mishap of the live conductor comes in to contact with guy wire and continues to be in contact and of the line does not trip then the bottom portion of the guy wire would have no voltage due to the insulation provided by the guy insulator. The insulator is fixed between the guy wire shall be at the middle. Guy insulator shall conform to the specification as per drawing the minimum failing load of C type insulator shall be as per TS. No guy insulator shall be located less than 3.0 meters from the ground level. The stay rod should be placed in a position such that the angle of inclination of the rod with the vertical face of the pit is 30°/45° as the case may be. The concreting of the stay at the bottom should then be carried out. The back filling and ramming must be well done thereafter and allowed to set for at least 7 days.

The free end of the guy wire is passed through the eye of the anchor rod, bent back parallel to the main portion of the guy and bound after inserting the GI thimble. The GI thimble protects the loop where it bears on the anchor rod. Where the existence of guy wire proves hazardous, it should be protected with suitable asbestos pipe filled with concrete of about 2 Mts, length above the ground level, duly painted with white and black stripes so that it may be visible at night. The turnbuckle is halfway in the working position thus giving the maximum movement for tightening or loosening. Guy insulators are placed to prevent the lower part of the guy from becoming electrically energized when the conductors snap and fall on them or due to leakage. The anchoring and providing guys for supports shall be done as per drawing.

### **FIXING OF CHANNELS AND INSULATORS:**

After the erection of supports and providing guys, the next step would be to mount the channels on the support. All Insulator mounting channels shall be of ISMC. The channel is to be mounted after the support is erected. The lineman should climb the support having requisite tools with him and the channel is then tied to a hand line and pulled up by the ground man, through a pulley till the channel reaches the linemen. The ground man should station himself well to one side so that if any materials drop from the top of the pole, it may not strike him.

All the materials required should be lifted or lowered by means of the handling. In no case, the materials or the tools should be dropped or thrown from the pole top. The fixing of channels shall

## Section Project

be in accordance to spacing detailed in sketch. MS bolts and nuts and spring washers of good quality only shall be used which will have to be procured by the Bidder.

### **BACK CLAMPS:**

The back clamps for fixing of the channels will have to be procured by the Bidder and shall be in accordance with drawing enclosed and the clamp shall be fabricated with MS flat as mentioned in the TS.

### **INSULATORS:**

The pins for insulators shall be fixed in the holes provided in the channels. The insulators shall be mounted in their places over the pins and tightened. In the case of strain or angle supports, where strain fittings are provided for this purpose, one strap of the strain fittings is placed over the channels before placing the bolts in the hole of the channels. The nut of the straps is so tightened that the strap can move freely in horizontal direction, as this is necessary to fix the strain insulator. The insulators shall conform to the following standards.

- |      |                          |                           |
|------|--------------------------|---------------------------|
| i.   | PIN insulators           | -IS 731,BS 137and IEC 383 |
| ii.  | Guy or Strain insulators | -IS 1779 and 5300         |
| iii. | Composite Insulators     | -IEC:61109                |

### **Hardware Fittings:**

The drawings for all hardware shall be submitted by the Bidder to TFL / PDIL for approval prior to commencement of the work.

### **EARTHING:**

#### **PIPE EARTHING:**

At road crossing pole locations, pits are to be excavated. The steel and metal parts are to be earthed by pipe earthing as per the approved drawing and technical specification. Duly filling the pits with finely broken coke having granule sizes not more than 25mm thick, the coke shall be maintained up to a distance of 300mm from the pipe on all sides. The top edges of the pipe shall be at least 200mm below the ground level. The steel strips shall be fixed not less than 300mm deep from the ground level.

#### **POLE EARTHING:**

Pole earthing shall be done with GI coils as per drawing & TS. This arrangement shall be done for all poles. The earth resistance shall be of less than 10 Ohms. If the earth resistance is more than 10 ohms, multiple earthing arrangement shall be done till achieving less than 10 Ohms.

#### **ROAD CROSSINGS:**

Wherever the line crossing the road, the OHL will be converted to underground cable system. 33kV 400sqmm XLPE cable with Outdoor termination through HDPE pipe conduit as per drawing will be laid. Wherever cables are laid for Double circuit. Cable pull pit is provided on both side of the road. For cable specification and erection method refer separate section. Road crossing shall be as per the tender drawing.

#### **EXECUTION OF WORKS RELATING TO POWER LINE CROSSINGS AND RAILWAY CROSSINGS**

Work such as erection of support underneath an existing power line and paving out of conductors and earth wire and stringing the power line crossing span or a railway crossing span, will have to

## Section Project

be done only after receipt of the line clear from TFL / PDIL authorities and approval from the concerned officer, which sometimes may not be match with program of the Bidder. In such cases, the Bidder shall execute such works as and when approvals are received. His rates for line erection and stringing shall take into consideration such contingencies also. Railway track crossing will be through underground method.

### **FINAL CHECKING, TESTING AND COMMISSIONING**

After the completion of the works final patrolling and checking of the line shall be done by the Bidder to ensure that all the foundation works, pole erection and stringing have been done as approved by the Engineer and also to ensure that they are complete in all respects. Bidder shall prepare pole schedules and hand it over to the Engineer. All works shall be thoroughly inspected keeping in view of the following main points.

- i. Sufficient back filled earth is lying over each foundation pit and it is adequately compacted.
- ii. Concreting and coping of poles is in good and finally shaped conditions.
- iii. All the accessories and insulators are strictly as per the drawings and are free from any defects or damages, what so ever.
- iv. All the bolts and nuts should be of MS material.
- v. The stringing of the conductor has been done as per the approved sag and desired clearances are available.
- vi. No damage, minor or major to the conductor, earth wire accessories and insulators strings still unattended are noticed.
- vii. Of all cut points double jumpers shall be provided to each phase. The jumpers provide the cut points are connected rigidly to the tension hardware utilizing all the jointing being provided for the purpose. The Bidder shall submit a report to the above effect to the Engineer.
- viii. Pole schedule with span wise load on the pole, factor of safety obtained, guy wire tension date of casting. Erection stringing etc. are compiled in to a single format and duly checked and certified by site officials. The schedule submitted to TFL / PDIL for record.

### **Traceability:**

Each and every component incorporated shall be traceable to the batch number, manufacturer, test report testing official's name and telephone number and testing witnessed from Bidder's side and TFL / PDIL's official (if witnessed) so that it can be traced back in case of any problem.

In case, it is noticed later that some or any of the above are not fulfilled, the engineer will get such items rectified through other agencies and recover the cost of such works from the bills payable to the Bidder or any other contract executed by him for TFL / PDIL along with necessary overheads.

After final checking, the lines shall be tested for insulation in accordance with tests prescribed by the engineer. All arrangements for such testing or any other test desired by the engineer shall be done by the Bidder and necessary labor, transport and equipment shall be provided by him.

The Bidder shall rectify any defects found out as a result of such tests, forthwith, without any extra charges to TFL / PDIL. In addition to the above the Bidder shall be responsible for testing and ensuring that the total and relative sags of the conductors are within the specified tolerance.

## Section Project

Such tests shall be carried out at selected points along with route as required by the engineer and the Bidder shall provide all necessary equipment and labour to enable the tests to be carried out. After satisfactory tests on the line and an approval by the Engineer the line shall be energized at full operating voltage before handing over.

### **CONSTRUCTIONS MATERIALS:**

#### **Cement:**

The Bidder has to make his own arrangements for the procurement of cement to required specifications for the works subject to the following:

- a) The Bidder shall procure cement to required specifications only from reputed cement factories (main producer) acceptable to TFL / PDIL / TPCODL. The Bidder shall be required to furnish to TFL / PDIL, bill of payment and test certificates issued by the manufacturers to authenticate procurement of quality cement from the approved cement factory. The Bidder shall make his own arrangement for adequate storage of cement.
- b) The Bidder shall procure cement in standard packing of all 50 kg bag from the authorized manufacturers. The Bidder shall make necessary arrangement at his own cost to the satisfaction of TFL / PDIL / TPCODL of actual weightment of random sample from the available stock and shall conform with the specification laid down by the Indian Standard Institution of other standard foreign institutions as the case may be.
- c) Cement shall be got tested for all the tests as directed by TFL / PDIL at least one month in advance before the use of cement bags brought and kept on site godown. The Bidder shall supply cement bags free of cost required for testing. However, the testing charges for cement will be borne by the Bidder. If the tests prove unsatisfactory then the Bidder has to replace such works without any financial implication to TFL / PDIL.
- d) The Bidder should store the cement of 60 days requirement at least one month in advance to ensure the quality of cement so brought to site and shall not remove the same without the written permission of TFL / PDIL. The Bidder shall forthwith remove from the works area any cement that TFL / PDIL may disallow for use on account of failure to meet with required quality and standard.
- e) The Bidder shall further at all times satisfy TFL / PDIL on demand by production of records and books or by submission of returns and other proofs as directed, that the cement is being used as tested and approved by TFL / PDIL for the purpose and the Bidder shall at all times, keep this records up to date enable TFL / PDIL to supply such checks as he may desire.
- f) Cement which has been unduly long in storage with the Bidder or alternatively has deteriorated due to inadequate storage and thus become unfit for use in the works will be rejected by TFL / PDIL and no claim will be entertained. The Bidder shall forthwith remove from the work areas, any cement TFL / PDIL may disallow for use on work and replace it by cement with the relevant Indian Standards.

#### **Steel:**

The Bidder shall procure mild steel reinforcement bars, high yield strength deformed (HYSD) bars, rods and structural steel etc., required for the works only from the main or secondary producers manufacturing steel to the prescribed specifications of Bureau of Indian Standard or equivalent and licensed or affixed ISI or other equivalent certifications marks and acceptable to TFL / PDIL.

## Section Project

Necessary ISI list certificate is to be produced to TFL / PDIL before use on works. The unit weight and dimensions shall be as prescribed in the relevant Indian Standard certification for steel.

### **CONCRETING**

The cement concrete used for the foundations shall be as per the drawing. The sand used for the concrete shall be composed of hard silicon materials and well sieved. It shall be clear and of a sharp angular grit type of and free from earthy or organic matter and deleterious salts.

The aggregate shall be of clean broken hard granite or other stone specified or approved by the engineer. It shall be hard close-grained quality. It shall also be as far as possible cube like, preferably angular but not flaky, perfectly clean and free from the earth organic or other deleterious matter. 38mm aggregate shall be of size as will pass through 38mm square mesh measured in the clear.

The water used for mixing concrete shall be fresh and conform to ISI. It should be clean and free from oil acids and alkali. Saltish or brackish water should not be used. The concrete should be mixed as stiff as the requirements of placing the concrete in the forms or molds with as and the degree to which the concrete resists segregation will permit. Hence, the quantity of water used should not be too much.

Proper forms of molds adequate braced to retain proper shape while concreting should be used. The mold should be made watertight so that cement cram will not come out leaving only sand and jelly consequently forming honeycombing in the concrete.

After concreting to the required height, the top surface should be finished smooth with slight slope towards the outer edge to drain off the rainwater falling on the copings. These copings and muffings should be done after the stringing are completed in respect of tension locations and such other locations as may be decided by the Engineer at site.

In wet locations, the site must be kept completely dewatered both during the placing of the concrete and for 24 Hrs. after completion. There should be no disturbance of concrete by water during this period. No extra rate will be paid for the dewatering. The form of moulds shall not be removed before the lapse of about 24 Hr. after the completion of concreting. After removal of the form moulds, the concreted surface, wherever required shall be repaired with a rich cement and sand mortar in the shortest possible time. If augur is used for making pole pits, ramming shall be done after erection of pole.

### **WORKMANSHIP:**

The Bidder shall be entirely responsible for correct erection of all supports as per the approved drawings and their correct setting and alignment, as approved by the Engineer. If the supports and SP/DP/4P structures after the erection are found to differ from approved route maps and drawings or to be out of alignment, the Bidder shall dismantle and re-erect them correctly at his own cost without extension of time. The supports must be truly vertical and in plumb after erection and no straining will be permitted to bring them to vertical position. Verticality of each support shall be measured by the Bidder and furnished to the engineer.

**SAFETY:** Safety covers the following:

- i. Supply and fixing of enamel painted danger board on all poles.
- ii. Supply and fixing of anti-climbing device on all poles as per specification.

## Section Project

- iii. Supply and fixing of enamel painted phase identification plates at every 10th pole and every cut point.
- iv. Supply and fixing of enamel painted pole identification plates on all poles as per direction of TFL / PDIL engineer.

### **FINAL CHECKING, TESTING AND COMMISSIONING**

After completion of the works, final checking of the line and structures is to be done by the Bidder. All works shall be thoroughly inspected keeping in view the following items.

- i. Sufficient back filled earth is adequately compacted
- ii. Concreting of poles is in good condition
- iii. All the insulators accessories are strictly free from any defect or damages
- iv. On bolts and nuts shall be of MS material

### **DO'S AND DON'TS:**

#### **Do's:**

- i. Use proper equipment for handling aluminum conductor at all items.
- ii. Use kits or similar method for lowering reels or coils from transport or on ground.
- iii. Examine reel before unreeling for presence of nails or any other object which might damage the conductor.
- iv. Rotate the reel or coil while unwinding conductor.
- v. Grip all strands while pulling out the conductor.
- vi. Control the unreeling speed with a suitable braking arrangement.
- vii. Use wooden guards of suitable braking arrangements.
- viii. Use long straight, parallel jaw grip with suitable liners when pulling conductor thus avoiding nicking or kinking of the conductor.
- ix. Use free-running sleeves or blocks with adequate grooves for drawing/ paving conductor.
- x. Use proper sag charts.
- xi. Mark conductors with conductors with crayons or adhesive tape.
- xii. Make all splicing with the proper tools.
- xiii. Use a twisting wrench for twisting the joints.
- xiv. Chromate or graphite conducting oxide- inhibiting grease should be applied before cleaning with brush.

#### **DON'T'S:**

- i. Do not handle conductors without proper tools at any stage.
- ii. Do not pull conductors without ensuring that there are no obstructions on the ground.
- iii. Do not pull out excess quantity of conductor than is required.
- iv. Do not make jumper connections on dirty or weathered conductor. Clean the conductor using sandpaper or a wire brush.
- v. Do not handle aluminum conductors in a rough fashion but handle it with care it deserves.



## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

**1. SCOPE:**

This specification covers the design, manufacture, testing and supply of GI H Type pole structure 13Mtr. and 14 Mtr. Long. Scope also includes transportation & unloading of poles at store / site.

**2. APPLICABLE STANDARDS:**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

IS 2062	Hot Rolled Medium and High Tensile Structural Steel
IS 2629	Recommended Practice for Hot-Dip Galvanizing of Iron and Steel
IS 2633	Methods for testing uniformity of coating of zinc coated articles
IS 4759	Hot-dip zinc coatings on structural steel and other allied products
IS 6745	Method for determination of mass of zinc coating on zinc coated iron and steel articles

**3. CLIMATIC CONDITIONS OF THE INSTALLATION:**

SL.NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.

SL.NO.	CONDITIONS	VALUES
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

TPCODL/TPNODL/TPSODL/ TPWODL service area **has heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph.** The atmosphere is generally laden with mild acid, dust in suspension during the dry months, and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

SL NO	PARTICULAR	UNIT	TPCODL/TPNODL/TPWODL/TPSODL REQUIREMENT	
1	Description of Item		13 MTR H Pole	14 MTR H Pole
2	Type of Steel		MS (HDG)	
3	Make	Name	SAIL/TATA/JINDAL/RINL (Billet/Rerolling Shall not accepted)	
<b>4. For ISMC 200X75 (Make SAIL/TATA/Jindal/RINL)</b>				
i)	No of Segment of H Pole	NO	2 (i.e. Bottom & Top)	
ii)	Length Of ISMC (Bottom)	MM	6984	6992
iii)	Length Of ISMC (Top)	MM	6000	6992
iv)	Section of ISMC (DX BX t)	MM	200X75x6.2	200X75x6.2
v)	Radius (R1 & R2)	MM	11.0 & 3.2	11.0 & 3.2
vi)	Moment of inertia IXX	CM <sup>4</sup>	1830	1830
	IYY	CM <sup>4</sup>	141	141
vii)	Radius of Gyration RXX	CM	8.02	8.02
	RYY	CM	2.22	2.22
viii)	Sectional Area	CM <sup>2</sup>	28.5	28.5
ix)	GI Stiffener for Channels (welded to both the channels along 200 mm side (separated by 300 mm))	MM	150x 75x5.7	150x 75x5.7
x)	GI Base Plate	MM	450 x450 x10	450 x450 x10
xi)	GI Stiffener in Web	MM	150 x 450 x 6	150 x 450 x 6
xii)	GI Stiffener in Flange	MM	150 x 119 x 6	150 x 119 x 6
xiii)	Standard for steel		IS 808:1989	IS 808:1989

SL NO	PARTICULAR	UNIT	TPCODL/TPNODL/TPWODL/TPSODL REQUIREMENT	
xiv)	Grade of Steel Size		E250 A as per Is 2062:2011	E250 As per Is 2062:2011
xv)	Dimension Tolerance	±	As per IS 1852:1985	As per IS 1852:1985
xvi)	Weight Kg/M With ± 2.5% Tolerance	KG	22.3	22.3
<b>Mechanical Properties For Channel (As per Is 2062:2011)</b>				
xvii)	Yield Stress	N/SqMM	250	250
xviii)	Tensile stress	N/SqMM	410	410
xix)	Elongation	%	Min-23	Min-23
xx)	Bend Test (2T)		shall Not Cracked	shall Not Cracked
<b>Chemical Composition For Channel (As per Is 2062:2011)</b>				
xxi)	C	Percent age	Max-0.23	Max-0.23
xxii)	MN	Percent age	Max-1.50	Max-1.50
xxiii)	S	Percent age	Max-0.045	Max-0.045
xxiv)	P	Percent age	Max-0.045	Max-0.045
xxv)	SI	Percent age	Max-0.40	Max-0.40
xxvi)	Carbon Equivalent (Max)	Percent age	Max-0.42	Max-0.42
xxvii)	Mode of Deoxidation		Semi Killed/Killed	Semi Killed/Killed
<b>5.GALVANIZING</b>				
i)	Applicable Galvanizing Standard		IS 2629	IS 2629
ii)	Inspection Galvanizing Standard		IS 4759/6745/2633	IS 4759/6745/2633
iii)	Zinc Coating	Gr/Sq Mtr, Micron	Min 705/100	Min 705/100
iv)	Uniformity	withstood	6 time dip Each Dip 1 Min	6 time dip Each Dip 1 Min

#### 5. GENERAL CONSTRUCTION:

H Pole Structure: The H Pole structures are to be constructed with two parallel run 200x75x6.2 mm G.I. Channels. Both the channels are separated by 300 mm distance (run through the entire length). The bottom channels are further connected with stiffeners (on each side) of size 150x75x5.7mm G.I. Flats welded to both the channels along 200 mm side (separated by 300 mm).

At the bottom, the channels are fixed with a Base Plate of 450 x450 x10 mm along with two nos. of stiffener plate having dimensions, 150x450x6 mm and 150x119x6 mm thickness welded with base plate.

However, in case of any discrepancy between the above data & the relevant IS, the values indicated in the IS shall prevail. All the acceptance Tests / routine tests shall be carried out as per relevant IS. The approved makes are SAIL, JINDAL, RINL & TATA (Billet with re rolling not allowed).

### 5.1 Galvanization:

H Pole shall be hot dip galvanized, are as following:

- a) All galvanizing shall be carried out by the hot dip process, in accordance with Specification IS 2629. However, high tensile steel nuts, bolts and spring washer shall be electro galvanized.
- b) The zinc coating (min 705 gms per sq.mt /min 100Micron 6 Dips) shall be smooth, continuous and uniform. It shall be free from acid spot and shall not scale, blister or be removable by handling or packing.
- c) There shall be no impurities in the zinc or additives to the galvanic bath which could have a detrimental effect on the durability of the zinc coating. Purity of zinc shall be Zn 99.95% or better.
- d) In the event of damage to the galvanizing the method used for repair shall be subject to the approval of the Engineer in Charge or that of his representative. Repair of galvanization at site will not be permitted in any situation.
- e) The threads of all galvanized bolts and screwed rods shall be cleared of spelter by spinning or brushing. A die shall not be used for cleaning the threads unless specifically approved by the Engineer in Charge. All nuts shall be galvanized. The threads of nuts shall be cleaned with a tap and the threads oiled.
- f) Partial immersion of the work shall not be permitted and the galvanizing tank must therefore be sufficiently large to permit galvanizing to be carried out by one immersion.
- g) After galvanizing no drilling or welding shall be performed on the galvanized parts of the equipment excepting that nuts may be threaded after galvanizing. To avoid the formation of white rust galvanized materials shall be stacked during transport and stored in such a manner as to permit adequate ventilation. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization. The galvanized steel shall be subjected to test as per IS-2633.
- h) Quality of Hot Dip Galvanization should comply with IS 2629, ISO 1461 & should be guaranteed for any type of damage due to harsh climatic condition for 5 Years. These poles are to be used in coastal areas of Odisha where climate is hot, humid & saline. These areas are prone to flood & frequent rainfall.

**6. MARKING:**

Following distinct non-erasable embossing is to be made on each H Poles to be supplied to TPCODL/TPNODL/TPWODL/TPSODL under this Tender.

- a) ISI Mark
- b) H Pole 13 Mtr./ 14 Mtr.
- c) E-250 A
- d) Manufacturer Name/ Trade Mark

Engraved Marking (Punching before galvanization)

- a) "TPCODL/TPNODL/TPWODL/TPSODL"
- b) P.O No and Date of Manufacturing

**7. TESTS:**

The bidder shall be required to submit complete set of the following test reports along with the offer: -

**7.1 ACCEPTANCE TESTS**

- i) Chemical Composition
- ii) Mechanical Properties
- iii) Dimension Test & Weight (kg/M) Visual Examination,
- iv) Test in respect of Hot Dip Galvanization i.e. Thickness of zinc coating in microns

**7.2 ROUTINE TESTS**

Same as Acceptance Test

**7.3 TYPE TESTS**

- i) Chemical Composition
- ii) Mechanical Properties
- iii) Test in respect of Hot Dip Galvanization i.e. thickness of zinc coating in microns

**8. TYPE TEST CERTIFICATES:**

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA** as per relevant IS. However, TPCODL/ TPWODL/ TPNODL/ TPSODL. TATA-POWER reserves the right to allow any other NABL accredited/ Govt. lab report under exceptional circumstances after due diligence/ scrutiny by DISCOM. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test

reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/ TPWODL/ TPNODL/ TPSODL.

**9. PRE-DISPATCH INSPECTION:**

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPWODL/TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPNODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPWODL/TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPWODL/TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPWODL/TPSODL
- c) TPCODL/TPNODL/TPWODL/TPSODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

**10. INSPECTION AFTER RECEIPT AT STORE:**

The material received at TPCODL/TPNODL/TPWODL/TPSODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

**11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 54 months from the date of commissioning or 60 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire

satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

Galvanization Guarantee- Quality of Hot Dip Galvanization should be guaranteed for any type of damage due to harsh climatic condition for 5 Years.

**12. PACKING:**

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**13. TENDER SAMPLE:**

Not Applicable

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The bidder shall get the approved drawing and GTP before start of manufacturing activity. The successful bidder will have to submit details of the offered design & components for approval as per specification. CAT-A/CAT-B is mandatory to start manufacturing.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:



- a) Completely filled in Schedule "A" Guaranteed Technical Particulars & Schedule "B" Deviations
- b) Work Experience details
- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.

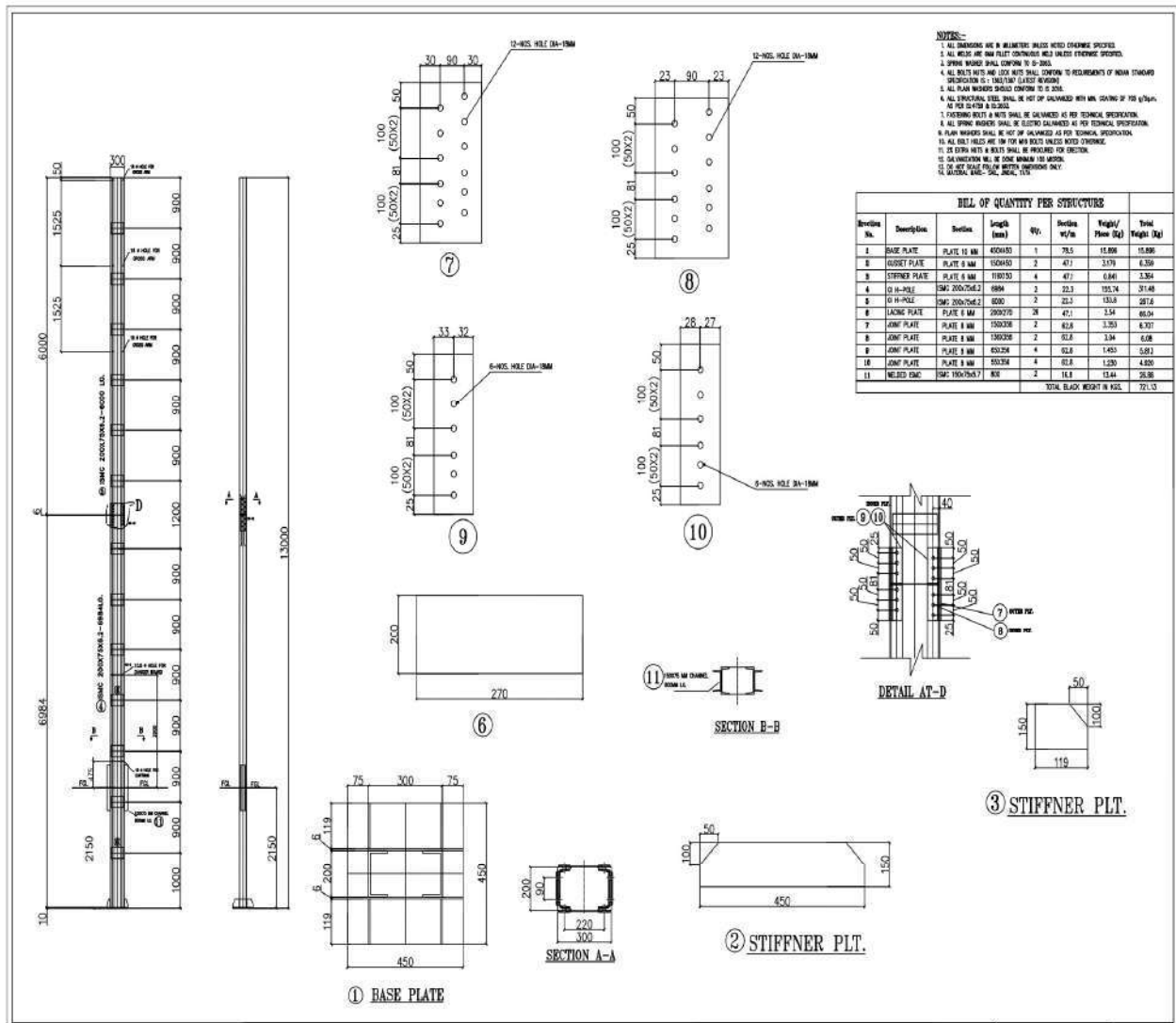


FIG 1:- 13 Mtr. H Pole Drawing

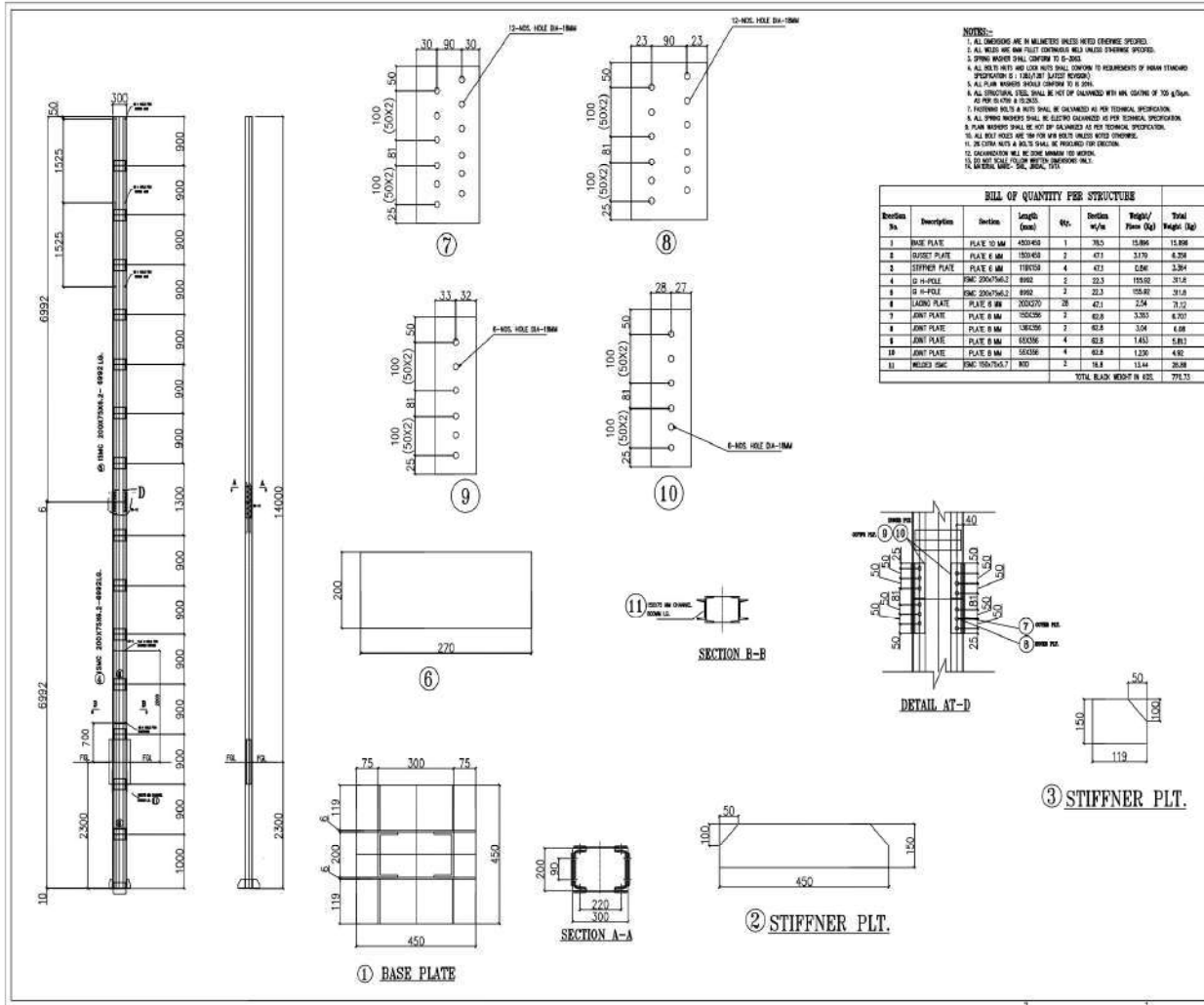


FIG 2:- 14 Mtr. H POLE Drawing

Note:- These are the indicative drawings and for tender purpose only.

19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS:

Bidder to submit completely clause wise compliance of this specification.

**20. SCHEDULE "B" DEVIATIONS:**

**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

Seal of the Company:

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-GEN-4009**

**Specification Name : Technical Specification For WPB Pole (11MTR & 13MTR)**

<b>SANTOSH KUMAR PATRA</b>	<b>SATYA PRASAD NAYAK</b>	<b>SHANTAPRIYA JENA</b>	<b>Ranjan Kumar Sahoo</b>	<b>ANUP JAWASE</b>	<b>VARUN BHATNAGAR</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPWODL	TPCODL	TPNODL	TPSODL	TPWODL	TPWODL
08-02-2023	09-02-2023	14-02-2023	14-02-2023	15-02-2023	17-02-2023

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TPWODL*

**CONTENTS**

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS/REQUIREMENTS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. MINIMUM TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE OF DEVIATIONS

**1. SCOPE:**

This specification covers the design, manufacture, testing and supply of 160mm X 152 mm WPB pole, 11mtr. & 13mtr. long having unit weight of 30.44Kg per meter. Scope also includes transportation & unloading of poles at store / site.

**2. APPLICABLE STANDARDS:**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

IS 12778	Hot Rolled Parallel Flange Steel Sections for Beams, Columns and Bearing Piles - Dimensions and Section Properties
IS 2062	Hot Rolled Medium and High Tensile Structural Steel
IS 12779	Rolling and cutting tolerances for hot rolled parallel flange beam and column sections
IS 2629	Recommended Practice for Hot-Dip Galvanizing of Iron and Steel
IS 2633	Methods for testing uniformity of coating of zinc coated articles
IS 4759	Hot-dip zinc coatings on structural steel and other allied products
IS 6745	Method for determination of mass of zinc coating on zinc coated iron and steel articles

**3. CLIMATIC CONDITIONS OF THE INSTALLATION:**

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Speed	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/ TPNODL/ TPWODL/ TPSODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

Sl. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Length of Joist in mtr.	11mtr / 13mtr
2	Make	SAIL/TATA/ RINL/JINDAL/JSW <b>(Billet with re rolling not allowed)</b>
3	Weight in kg/m with $\pm 2.5\%$ Tolerance	30.44
4	Sectional Area (cm <sup>2</sup> )	38.8
5	Flange slope in deg	90
6	Cutting length tolerance	100 mm (no negative tolerance)
7	Depth(D) of Section (mm) with $\pm 3.0$ mm Tolerance	152
8	Width(B) of Flange (mm) with $\pm 3.0$ mm Tolerance	160
9	Thickness of Flange (Tf) (mm) with $\pm 1.5$ mm Tolerance	9
10	Thickness of Web (Tw) (mm) with $\pm 0.7$ mm Tolerance	6
11	Corner Radius of fillet or root (R) (mm)	15
12	Moment of Inertia	
A	Ixx (cm <sup>4</sup> )	1673
B	Iyy (cm <sup>4</sup> )	615.6
13	Radius of Gyration (cm)	
A	Rxx	6.57
B	Ryy	3.98
14	Modulus of Section Zxx (cm <sup>3</sup> )	
A	Zxx (cm <sup>3</sup> )	220.1
B	Zyy(cm <sup>3</sup> )	76.9
15	GI Base Plate in mm	300 x 300 x 12
16	GI Stiffener Flange in mm	150 x 60 x 6
17	GI Stiffener Web in mm	150 x 100 x 6
18	<b>Mechanical Properties</b>	
a)	Grade	E-350A
b)	Yield stress in Mpa	350 Min
c)	Tensile stress in Mpa	490 min
d)	Lo= (5.65 So) Elongation %	22 min
e)	Bend test	2t (Shall not crack)

Sl. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
<b>19</b>	<b>Chemical properties</b>	
a)	Grade	E 350A
b)	Carbon	0.2 % Max
c)	Manganese	1.55 % max
d)	Sulphur	0.045 % max
e)	Phosphorous	0.045 % max
f)	Silicon	0.45 % max
g)	Carbon equivalent	0.47 % max
h)	De oxidation method	Semi killed or killed
<b>20</b>	Supply condition	Hot rolled
<b>21</b>	Galvanizing standard	IS 2633, IS 2629, IS 4759
<b>22</b>	The zinc coating (Min 705 gms per sq.mt & Min. 100 Micron at every point) shall be smooth, continuous and uniform. It shall be free from acid spot and shall not scale, blister or be removable by handling or packing. Zinc Coating shall withstand for 6 dips in Dip Test process for WPB Pole	Min 705 gms per sq.mt & Min. 100 Micron at every point with 6 Dips
<b>23</b>	Fabrication	1. Hole as per GA drawing provided by TPCODL/TPNODL/TPWODL/TPSODL 2. Arc welding to be used for fabrication / jointing of Base plate & stiffener to the pole
<b>24</b>	Embossing (non-erasable)	ISI Mark, WPB 160, Manufacturer Name/ Trade Mark.
<b>25</b>	Stencil Marking (non-erasable) is made on mid-section of each WPB Poles to be supplied to TPCODL/TPNODL/TPWODL/TPSODL	TPCODL/TPNODL/TPWODL/TPSODL, P.O No and Date of Manufacturing
<b>26</b>	Depth of Plantation Marking (Red Colour)	A strip of 20-30 mm shall be painted with oil paint of red colour, on all over of the pole at a planting depth

## 5. GENERAL CONSTRUCTIONS/REQUIREMENTS:

The Wide Parallel Beam support structures shall be fabricated from mild steel, grade A and in lengths dictated by design parameters. Supplier has to supply Baseplate with dimension 300mm x 300mm x 12mm thickness along with Stiffener 150x60x6 (flange) & 150x100x6 (web). Complete fabrication drawing shall be submitted for approval. Holes should be as per GA drawing provided by TPCODL/TPNODL/TPWODL/TPSODL. Arc welding to be used for fabrication / jointing of Base plate & stiffener to the pole. However, in case of any discrepancy between the above data & the relevant IS, the values indicated in the IS shall prevail. All the acceptance Tests / routine tests shall be carried out as per relevant IS. The approved makes are SAIL, JINDAL, RINL, JSW & TATA (Billet with re rolling not allowed).



### 5.1 Galvanization:

WPB Pole shall be hot dip galvanized, are as following:

- a) All galvanizing shall be carried out by the hot dip process, in accordance with Specification IS 2629. However, high tensile steel nuts, bolts and spring washer shall be electro galvanized.
- b) The zinc coating (Min 705 gms per sq.mt & Min. 100 Micron at every point) shall be smooth, continuous and uniform. It shall be free from acid spot and shall not scale, blister or be removable by handling or packing.
- c) There shall be no impurities in the zinc or additives to the galvanic bath which could have a detrimental effect on the durability of the zinc coating. purity of zinc shall be Zn 99.95% or better.
- d) In the event of damage to the galvanizing the method used for repair shall be subject to the approval of the Engineer in Charge or that of his representative. Repair of galvanization at site will not be permitted in any situation.
- e) The threads of all galvanized bolts and screwed rods shall be cleared of spelter by spinning or brushing. A die shall not be used for cleaning the threads unless specifically approved by the Engineer in Charge. All nuts shall be galvanized. The threads of nuts shall be cleaned with a tap and the threads oiled.
- f) Partial immersion of the work shall not be permitted and the galvanizing tank must therefore be sufficiently large to permit galvanizing to be carried out by one immersion.
- g) After galvanizing no drilling or welding shall be performed on the galvanized parts of the equipment excepting that nuts may be threaded after galvanizing. To avoid the formation of white rust galvanized materials shall be stacked during transport and stored in such a manner as to permit adequate ventilation. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization. The galvanized steel shall be subjected to test as per IS-2633.
- h) Quality of Hot Dip Galvanization should comply with IS 2629, ISO1461 & should be guaranteed for any type of damage due to harsh climatic condition for 5 Years. These poles are to be used in coastal areas of Odisha where climate is hot, humid & saline. These areas are prone to flood & frequent rainfall.

### 6. MARKING:

Following distinct non-erasable embossing is to be made on mid-section of each WPB Poles to be supplied to TPCODL/TPNODL/TPWODL/TPSODL under this Tender.

- a) ISI Mark
- b) WPB 160
- c) E-350 A
- d) Manufacturer Name/ Trade Mark

Stencil Marking (non-erasable) is made on mid-section of each WPB Poles to be supplied to TPCODL/TPNODL/TPWODL/TPSODL.

- a) "TPCODL/TPNODL/TPWODL/TPSODL"
- b) P.O No and Date of Manufacturing
- c) Depth of planting (A strip of 20-30 mm shall be painted with oil paint of red colour, on all over of the pole at a planting depth.)

## 7. TESTS CERTIFICATE:

The bidder shall be required to submit complete set of the following test reports along with the offer:-

### 7.1 ACCEPTANCE TESTS

- i) Chemical Composition
- ii) Mechanical Properties
- iii) Dimension Test & Weight (kg/M) Visual Examination,
- i) Test in respect of Hot Dip Galvanization i.e., (Thickness of zinc coating in microns, Mass of Zinc Coating)

### 7.2 ROUTINE TESTS

Same as Acceptance Test

### 7.3 TYPE TESTS

- ii) Chemical Composition
- iii) Mechanical Properties
- iv) Test in respect of Hot Dip Galvanization i.e., (Thickness of zinc coating in microns, Mass of Zinc Coating)

## 8. TESTS:

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA/Approved Government Labs by Tata Odisha Discoms as per relevant IS. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e., any test report not acceptable, same shall be carried out without any cost implication to TPCODL/TPNODL/TPWODL/TPSODL.

## 9. PRE DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPWODL/TPSODL. Inspection may be made at any stage of manufacture at the option of the TPCODL/TPNODL/TPWODL/TPSODL and the

equipment if found unsatisfactory as to workmanship or material is liable to rejection. Supplier shall grant free access to the places of manufacture to TPCODL/TPNODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPWODL/TPSODL authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.

Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPWODL/TPSODL. Following documents shall be sent along with material

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPWODL/TPSODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings
- f) Delivery Challan
- g) Guarantee / Warrantee card
- h) Other Documents (as applicable).

#### **10. INSPECTION AFTER RECEIPT AT STORES:**

The material received at TPCODL/TPNODL/TPWODL/TPSODL Store/Site will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

#### **11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 54 months from the date of commissioning or 60 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

Galvanization Guarantee- Quality of Hot Dip Galvanization should be guaranteed for any type of damage due to harsh climatic condition for 5 Years.

**12. PACKING:**

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**13. TENDER SAMPLE:**

Not Applicable.

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING ACTIVITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

**17. SPARES, ACCESSORIES AND TOOLS:**

Not applicable.

**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Signed & stamped copy of clause-wise compliance on Technical Specification & Schedule of Deviations.
- b) Work Experience details.

- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.
- e) Signed & stamped copy of pre-bid queries.

**19. GUARANTEED TECHNICAL PARTICULARS:**

Bidder shall have to comply & submit clause wise compliance of this specification.

~~20. SCHEDULE OF DEVIATIONS:~~

~~**(TO BE ENCLOSED WITH TECHNICAL BID)**~~

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>Sl. No.</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

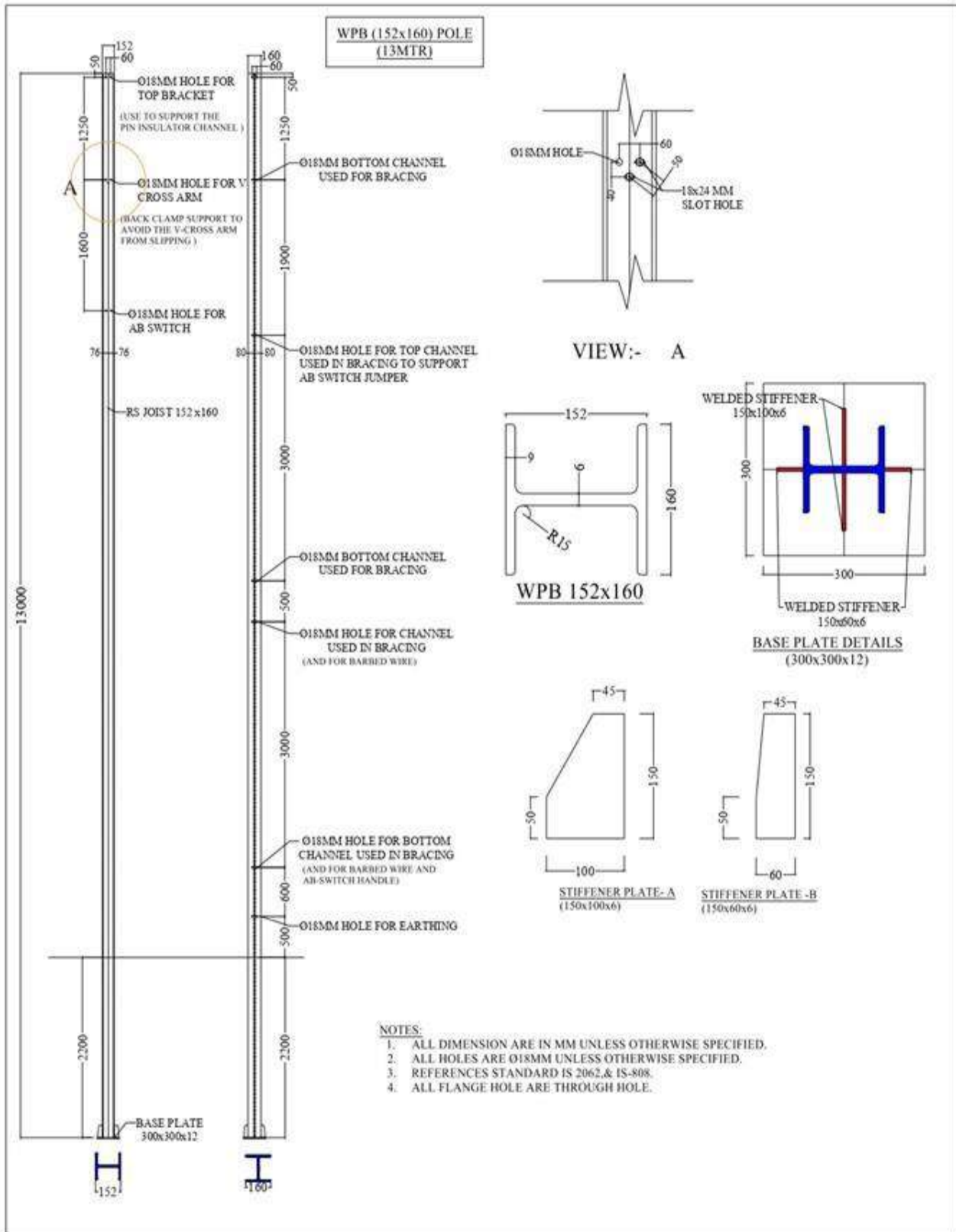
~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

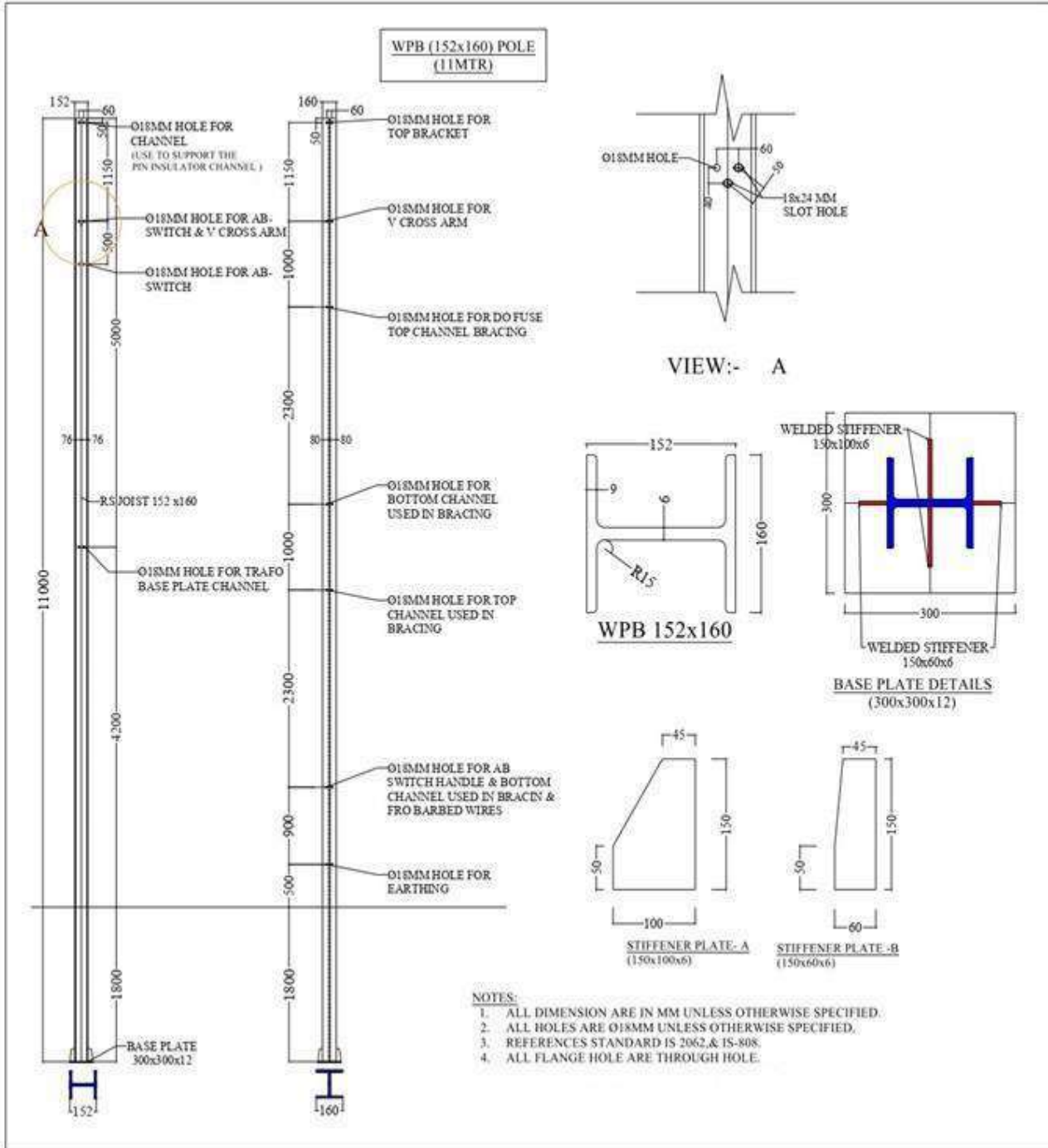
~~Signature~~

~~Designation~~

The shown drawing shall be indicative in nature & will be finalized during detailed engineering:



The shown drawing shall be indicative in nature & will be finalized during detailed engineering:



## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS



**1. SCOPE:**

This specification covers the design, manufacture, testing and supply of 33kV GI V Cross Arm to be used in Structures. Scope also includes transportation & unloading at store / site.

**2. APPLICABLE STANDARDS:**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

IS 2062	Hot Rolled Medium and High Tensile Structural Steel
IS 1852	Rolling and Cutting Tolerances for Hot Rolled Steel products
IS 2633	Methods for testing uniformity of coating of zinc coated articles
IS 4759	Hot-dip zinc coatings on structural steel and other allied products
IS 6745	Method for determination of mass of zinc coating on zinc coated iron and steel articles

**3. CLIMATIC CONDITIONS OF THE INSTALLATION:**

SL.NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.

SL.NO.	CONDITIONS	VALUES
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

TPCODL/TPNODL/TPSODL/ TPWODL service area **has heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph.** The atmosphere is generally laden with mild acid, dust in suspension during the dry months, and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Materials	100X50X5 mm Channel , 65X65X6 mm GI Plate
2	Galvanization process	Hot-Dip Galvanized
3	Relevant Standard	IS: 2062, IS: 2633, IS: 2629, TPCO-OTH-010.
4	Make	SAIL, JINDAL, RINL & TATA (Billet with re rolling not allowed)
5	Weight of Cross Arm	20 KG (Approx.)
6	Grade of Steel	E 250 A
7	Minimum Tensile Strength	410 N/mm <sup>2</sup>
8	Yield Stress	250 N/mm <sup>2</sup>
9	Percentage Elongation (Min.) at Gauge Length	23%
10	Bend Test (Internal Dia)	Min-2t
11	Mass of Zinc Coating	Min 705 gm/m <sup>2</sup>
12	Zinc Coating Thickness	Min 100 micron (6 Dip)
13	Chemical composition	Grade: E 250 A (As per IS: 2062)
14	Tolerance	As per IS 1852 latest amendment

#### 5. GENERAL CONSTRUCTION:

The Chemical composition and Physical properties of the finished material shall be as per the equivalent standards. Chemical Composition and Physical Properties shall conforming to IS: 2062. The approved makes are SAIL, JINDAL, RINL & TATA (Billet with re rolling not allowed).

## 5.1 CHEMICAL COMPOSITION

Chemical composition for 250 A Grade

- a) C - 0.23% Max
- b) Mn - 1.5% Max
- c) S - 0.045% Max
- d) P - 0.045% Max
- e) SI - 0.40% Max
- f) CE (Carbon Equivalent)- 0.42%

## 5.2 Galvanization:

All 33kV V Cross Arms shall be hot dip galvanized, are as following:

- a) All galvanizing shall be carried out by the hot dip process, in accordance with Specification IS 2629.
- b) The zinc coating (Min 705 gms per sq.mt / 100 Micron, 6 Dips) shall be smooth, continuous and uniform. It shall be free from acid spot and shall not scale, blister or be removable by handling or packing.
- c) There shall be no impurities in the zinc or additives to the galvanic bath which could have a detrimental effect on the durability of the zinc coating. Purity of zinc shall be Zn 99.95% or better.
- d) In the event of damage to the galvanizing the method used for repair shall be subject to the approval of the Engineer in Charge or that of his representative. Repair of galvanization at site will not be permitted in any situation.
- e) Partial immersion of the work shall not be permitted and the galvanizing tank must therefore be sufficiently large to permit galvanizing to be carried out by one immersion.
- f) After galvanizing no drilling or welding shall be performed on the galvanized parts. To avoid the formation of white rust galvanized materials shall be stacked during transport and stored in such a manner as to permit adequate ventilation. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization. The galvanized steel shall be subjected to test as per IS-2633.
- g) Quality of Hot Dip Galvanization should comply with IS 2629, ISO 1461 & should be guaranteed for any type of damage due to harsh climatic condition for 5 Years. These V Cross Arms are to be used in coastal areas of Odisha where climate is hot, humid & saline. These areas are prone to flood & frequent rainfall.

**6. MARKING:**

Following distinct non-erasable embossing is to be made on each Channel and Angles to be supplied to TPCODL/TPWODL/TPNODL/TPSODL under this Tender.

- a) Manufacturer Name/ Trade Mark

Engraved Marking (Punching before galvanization)

- a) "TPCODL/TPWODL/TPNODL/TPSODL"  
b) Year of manufacturing  
c) PO Number

**7. TESTS:**

The bidder shall be required to submit complete set of the following test reports along with the offer:

**7.1 ACCEPTANCE TESTS**

- i) Chemical Composition  
ii) Mechanical Properties  
iii) Dimension Test & Weight (kg/M) Visual Examination,  
iv) Test in respect of Hot Dip Galvanization i.e. Thickness of zinc coating in microns

**7.2 ROUTINE TESTS**

Same as Acceptance Test

**7.3 TYPE TESTS**

- i) Chemical Composition  
ii) Mechanical Properties  
iii) Test in respect of Hot Dip Galvanization i.e. thickness of zinc coating in microns

**8. TYPE TEST CERTIFICATES:**

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA/Other Govt. Lab** as per relevant IS. However, TPCODL/ TPWODL/ TPNODL/ TPSODL. TATA-POWER reserves the right to allow any other NABL accredited/ Govt. lab report under exceptional circumstances after due diligence/ scrutiny by DISCOM. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/ TPWODL/ TPNODL/ TPSODL.

**9. PRE-DISPATCH INSPECTION:**

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPWODL/TPNODL/TPSODL. Inspection may be made at any stage of manufacture at

the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPWODL/TPNODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPWODL/TPNODL/TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPWODL/TPNODL/TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPWODL/TPNODL/TPSODL
- c) TPCODL/TPWODL/TPNODL/TPSODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

**10. INSPECTION AFTER RECEIPT AT STORE:**

The material received at TPCODL/TPWODL/TPNODL/TPSODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

**11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

Galvanization Guarantee- Quality of Hot Dip Galvanization should be guaranteed for any type of damage due to harsh climatic condition for 5 Years.

**12. PACKING:**

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**13. TENDER SAMPLE:**

~~The Bidder shall provide 1 no. sample of the product. The product will be accepted only if it meets all specifications as defined in the document.~~

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The bidder shall get the approved drawing and GTP before start of manufacturing activity. The successful bidder will have to submit details of the offered design & components for approval as per specification. CAT-A/CAT-B is mandatory to start manufacturing.

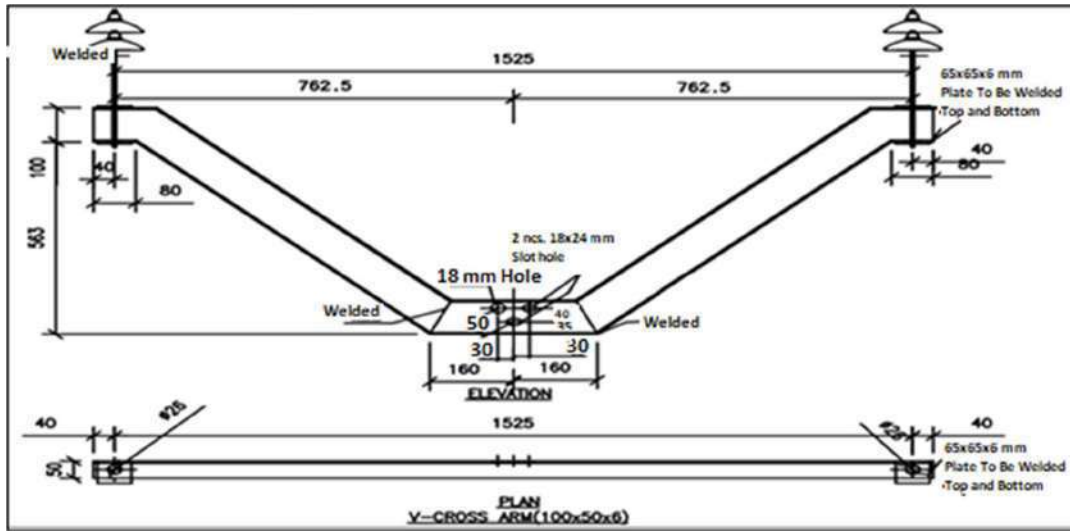
**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

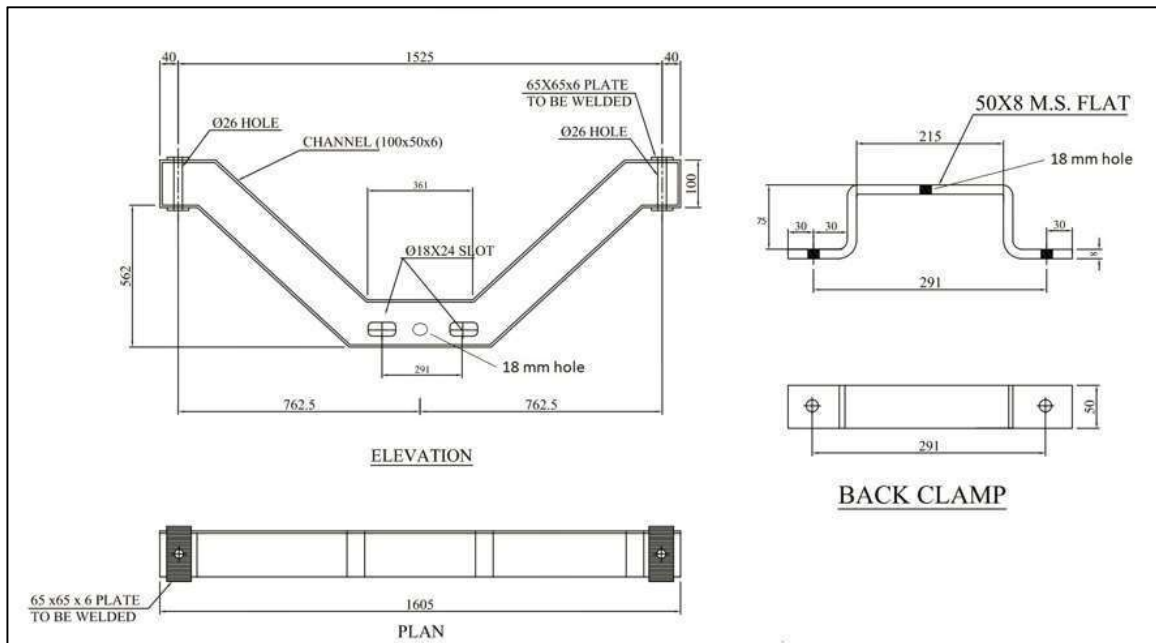
**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

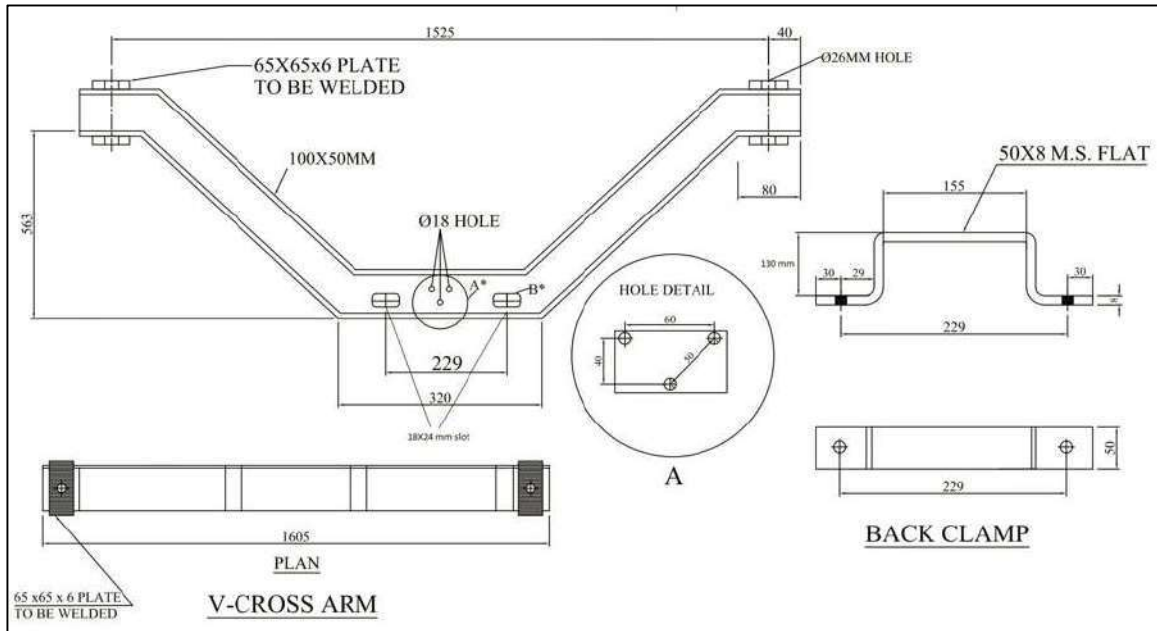
- a) Completely filled-in clause wise compliance of the specification
- b) Schedule "B" Deviations
- c) Work Experience details
- d) Type test certificates.
- e) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.



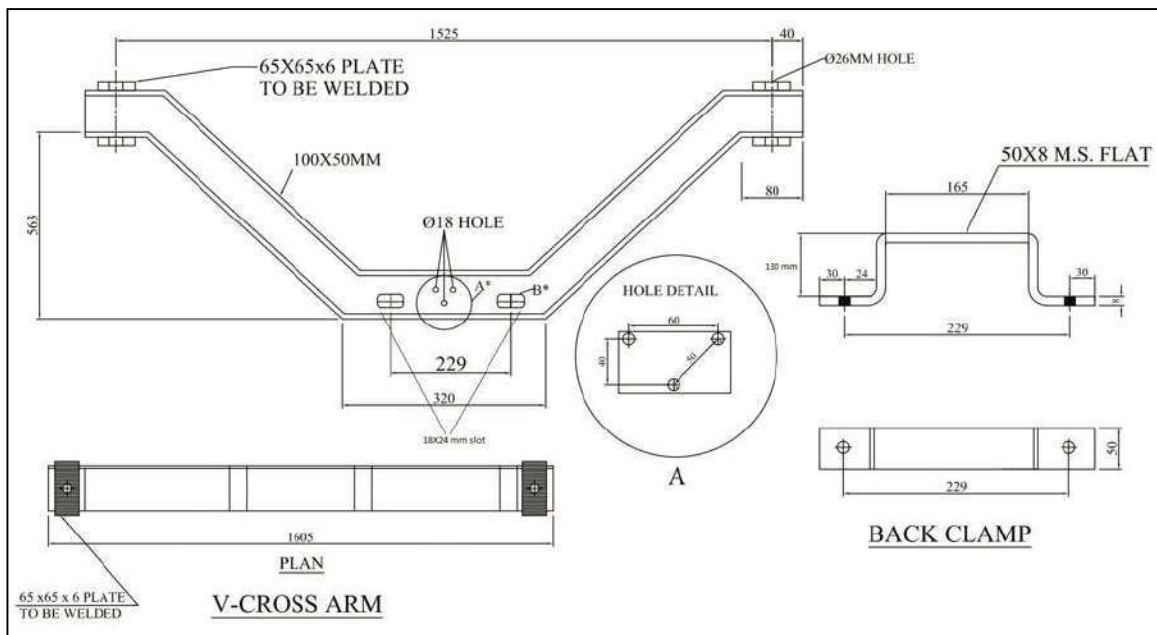
OPTION1:- Arrangement in WPB Pole



OPTION2:- Arrangement in 9 Mtr. PSC Pole



OPTION 3:- Arrangement in RSJ Pole



OPTION 4:- Arrangement in WPB Pole

**Note:- The drawing is for tender purpose only and indicative in nature & will be finalized during detailed engineering**



**19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS:**

Bidder to submit completely clause wise compliance of this specification.

**~~20. SCHEDULE "B" DEVIATIONS:~~**

**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-GEN-4027**

**Specification Name : Technical Specification For GI Channel & Angle, GI Top Bracket**

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
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28-02-2023	03-03-2023	03-03-2023	09-03-2023	18-03-2023	18-03-2023

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## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

**1. SCOPE:**

This specification covers the design, manufacture, testing and supply of GI Structural Items includes Channel, Angles and Top brackets to be used in Structures. Scope also includes transportation & unloading at store / site.

**2. APPLICABLE STANDARDS:**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

IS 2062	Hot Rolled Medium and High Tensile Structural Steel
IS 1852	Rolling and Cutting Tolerances for Hot Rolled Steel products
IS 2633	Methods for testing uniformity of coating of zinc coated articles
IS 4759	Hot-dip zinc coatings on structural steel and other allied products
IS 6745	Method for determination of mass of zinc coating on zinc coated iron and steel articles

**3. CLIMATIC CONDITIONS OF THE INSTALLATION:**

SL. NO.	CONDITIONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W

SL. NO.	CONDITONS	VALUES
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

Environmentally, some of the regions, where the work will take place include coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas. Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere.

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE			
		100X50X5 mm	75X40x4.8 mm	65X65X6 mm	50X50X6 mm
1	Material	Hot-Dip Galvanized Channel	Hot-Dip Galvanized Channel	Hot-Dip Galvanized Angle	Hot-Dip Galvanized Angle
2	Relevant Standard	IS: 2062, IS: 2633, IS: 2629, IS: 4759	IS: 2062, IS: 2633, IS: 2629, IS: 4759	IS: 2062, IS: 2633, IS: 2629, IS: 4759	IS: 2062, IS: 2633, IS: 2629, IS: 4759
3	Make	SAIL, JINDAL, RINL & TATA (Billet with re rolling not allowed)			
4	Grade of Steel	E 250 A	E 250 A	E 250 A	E 250 A
5	Minimum Tensile Strength in Mpa	410	410	410	410
6	Yield Stress in Mpa	250	250	250	250
7	Percentage Elongation (Min.) at Gauge Length	23%	23%	23%	23%

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE			
		100X50X5 mm	75X40x4.8 mm	65X65X6 mm	50X50X6 mm
8	Bend Test (Internal Dia)	Min-2t	Min-2t	Min-2t	Min-2t
9	Mass of Zinc Coating	Min 705 gm/m <sup>2</sup>	Min 705 gm/m <sup>2</sup>	Min 705 gm/m <sup>2</sup>	Min 705 gm/m <sup>2</sup>
10	Zinc Coating Thickness & No of Dips	Min. 100 Micron at every point with 6 Dips	Min. 100 Micron at every point with 6 Dips	Min. 100 Micron at every point with 6 Dips	Min. 100 Micron at every point with 6 Dips
11	Chemical composition	Grade: E 250 A (As per IS: 2062)	Grade: E 250 A (As per IS: 2062)	Grade: E 250 A (As per IS: 2062)	Grade: E 250 A (As per IS: 2062)
12	Standard length of supply For Channel and Angles only	6 Metre Long			
13	Tolerances	As per IS 1852 latest Amendment			

## 5. GENERAL CONSTRUCTION:

The Chemical composition and Physical properties of the finished material shall be as per the equivalent standards. Chemical Composition and Physical Properties shall conforming to IS: 2062. The approved makes are SAIL, JINDAL, RINL & TATA (Billet with re rolling not allowed). Mass of the Channel and Angles are as follows:-

- a) 100x50x5 mm:- 9.56kg/m
- b) 75x40x4.8 mm:- 7.14kg/m
- c) 65x65x6 mm:- 5.8kg/m
- d) 50x50x6 mm:-4.5kg/m

### 5.1 CHEMICAL COMPOSITION

Chemical composition for E 250 A Grade

- a) C - 0.23% Max
- b) Mn - 1.5% Max
- c) S - 0.045% Max
- d) P - 0.045%Max
- e) SI - 0.40% Max
- f) CE (Carbon Equivalent)- 0.42%

## 5.2 Galvanization:

All the channels and angles shall be hot dip galvanized, are as following:

- a) All galvanizing shall be carried out by the hot dip process, in accordance with Specification IS 2629.
- b) The zinc coating (Min 705 gms per sq.mt / Min. 100 Micron at every point with 6 Dips) shall be smooth, continuous and uniform. It shall be free from acid spot and shall not scale, blister or be removable by handling or packing.
- c) There shall be no impurities in the zinc or additives to the galvanic bath which could have a detrimental effect on the durability of the zinc coating. Purity of zinc shall be Zn 99.95% or better.
- d) In the event of damage to the galvanizing the method used for repair shall be subject to the approval of the Engineer in Charge or that of his representative. Repair of galvanization at site will not be permitted in any situation.
- e) Partial immersion of the work shall not be permitted and the galvanizing tank must therefore be sufficiently large to permit galvanizing to be carried out by one immersion.
- f) After galvanizing no drilling or welding shall be performed on the galvanized parts. To avoid the formation of white rust galvanized materials shall be stacked during transport and stored in such a manner as to permit adequate ventilation. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization. The galvanized steel shall be subjected to test as per IS-2633.
- g) Quality of Hot Dip Galvanization should comply with IS 2629, ISO 1461 & should be guaranteed for any type of damage due to harsh climatic condition for 5 Years. These channels and angles are to be used in coastal areas of Odisha where climate is hot, humid & saline. These areas are prone to flood & frequent rainfall.

## 6. MARKING:

Following distinct non-erasable embossing is to be made on each Channel and Angles and top Bracket to be supplied to TPCODL/TPNODL/TPWODL/TPSODL under this Tender.

- a) Manufacturer Name/ Trade Mark
- b) E-250 A

Engraved Marking (Punching before galvanization)

- a) "TPCODL/TPNODL/TPWODL/TPSODL"
- b) Year of manufacturing
- c) PO Number

**7. TESTS:**

The bidder shall be required to submit complete set of the following test reports along with the offer:

**7.1 ACCEPTANCE TESTS**

- i) Chemical Composition
- ii) Mechanical Properties
- iii) Dimension Test & Weight (kg/M) Visual Examination,
- iv) Test in respect of Hot Dip Galvanization i.e. Thickness of zinc coating in microns
- v) Mass of Zinc Test

**7.2 ROUTINE TESTS**

Same as Acceptance Test

**7.3 TYPE TESTS**

- i) Chemical Composition
- ii) Mechanical Properties
- iii) Test in respect of Hot Dip Galvanization i.e. thickness of zinc coating in microns

**8. TYPE TEST CERTIFICATES:**

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA** as per relevant IS. However, TPCODL/ TPWODL/ TPNODL/ TPSODL. TATA-POWER reserves the right to allow any other NABL accredited/ Govt. lab report under exceptional circumstances after due diligence/ scrutiny by DISCOM. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/ TPWODL/ TPNODL/ TPSODL.

**9. PRE-DISPATCH INSPECTION:**

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPWODL/TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPNODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPWODL/TPSODL or its authorized



representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPWODL/TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPWODL/TPSODL
- c) TPCODL/TPNODL/TPWODL/TPSODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

#### **10. INSPECTION AFTER RECEIPT AT STORE:**

The material received at TPCODL/TPNODL/TPWODL/TPSODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

#### **11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 54 months from the date of commissioning or 60 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

Galvanization Guarantee- Quality of Hot Dip Galvanization should be guaranteed for any type of damage due to harsh climatic condition for 5 Years.

#### **12. PACKING:**

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be

taken at site.

**~~13. TENDER SAMPLE:~~**

~~The Bidder shall provide 1 no. sample of the product. The product will be accepted only if it meets all specifications as defined in the document.~~

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

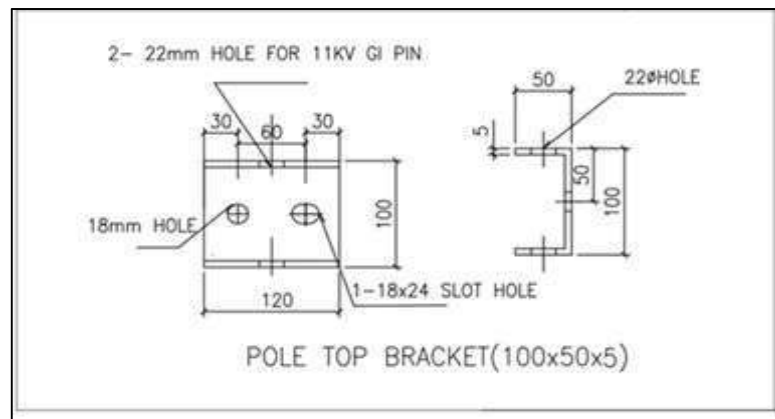
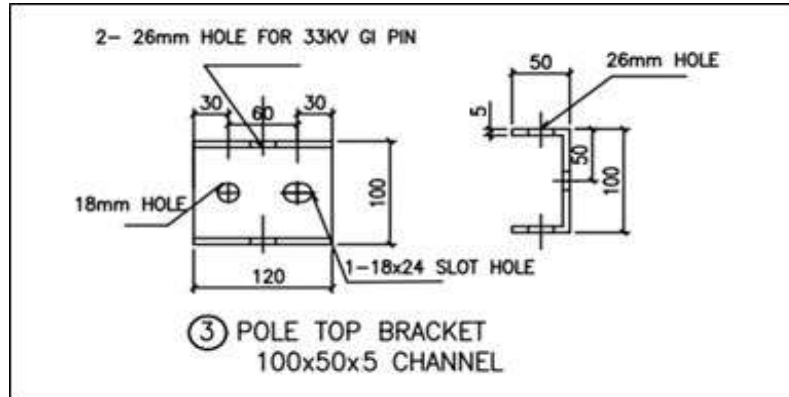
**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars & Schedule "B" Deviations
- b) Work Experience details
- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.

**Specification Name:**

Technical Specification For GI Channel & Angle,  
GI Top Bracket



**Note:-** The Drawing is for Tender Purpose Only.

**19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS:**

SL. NO.	TECHNICAL PARTICULARS	To Be Furnished By The Bidder			
		100X50X5 mm	75X40x4.8 mm	65X65X6 mm	50X50X6 mm
1	Material				
2	Relevant Standard				
4	Make				
5	Grade of Steel				
6	Minimum Tensile Strength in Mpa				
7	Yield Stress in Mpa				
8	Percentage Elongation (Min.) at Gauge Length				
9	Bend Test (Internal Dia)				
10	Mass of Zinc Coating				

SL. NO.	TECHNICAL PARTICULARS	To Be Furnished By The Bidder			
		100X50X5 mm	75X40x4.8 mm	65X65X6 mm	50X50X6 mm
11	Zinc Coating Thickness & No of Dips				
12	Standard length of supply for channel and angles only				
13	Tolerances				

~~20. SCHEDULE "B" DEVIATIONS:~~

~~(TO BE ENCLOSED WITH TECHNICAL BID)~~

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-HV-2024**

**Specification Name : Technical Specification For HT Stay set including Clamp**

<b>SAYANTANI DAS</b>	<b>MILAN MAITY</b>	<b>SANTOSH KUMAR PATRA</b>	<b>Susavan Biswas</b>	<b>KHAJAN BHARDWAJ</b>	<b>POURUSH GARG</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPCODL	TPNODL	TPWODL	TPSODL	TPCODL	TPCODL
16-02-2023	16-02-2023	21-02-2023	21-02-2023	22-02-2023	23-02-2023

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## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

**1. SCOPE:**

This specification covers the technical requirements of design, manufacture, test at manufacturer's works, packing & forwarding, supply and unloading at stores/ site and performance of HT Stay Set.

**2. APPLICABLE STANDARDS:**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

Ref IS	Description
IS 4759	Hot Dip Galvanizing For Fabrication
IS 1852	Tolerance For Raw Material
IS 2062	Manufactured from raw material as per IS 2062 grade E-250 quality 'A'

**3. CLIMATIC CONDITIONS OF THE INSTALLATION:**

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/ TPNODL/ TPSODL/ TPWODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

**4. GENERAL TECHNICAL REQUIREMENTS:**

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Manufacturer Name & Address	To be specified by Bidder
2	Referred IS	IS: 2062, IS: 2633, IS: 2629
3	Dimensions	
<b>4</b>	<b>Anchor Rod (20mm Dia): 1 No.</b>	
a)	Dia of Rod	20mm (+ 5%, - 3%)
b)	Overall length of Anchor rod	1800mm (+ 0.5%)
c)	Inside Dia of Rounded Eye	40mm (+ 3%)
d)	Length of threaded portion	40mm (+ 11%, - 5%)
e)	Size of MS Nut & Bolt, Square MS Washers confirming to IS 1387 (1967) and IS 1363 (1967)	20mm Sq. Washer 50X 50 X 1.6mm (2No.s)
<b>5</b>	<b>Anchor Plate: 1 No.</b>	
a)	Size of the MS Anchor plate	300x300x8 mm
b)	Dia of the hole made at the centre of the plate	22mm
<b>6.</b>	<b>Turn Buckle</b>	
(A)		
(i)	Dia of the eye bolt	20mm (+ 3%, - 2%)
(ii)	Length of the eye bolt	450mm
(iii)	Length of the threaded portion of the bolt	300mm
(vi)	Inner dia of the circular eye made at other end of the bolt.	40mm
(B)	<b>Bow with welded Channel</b>	
(i)	Dia of the MS Rod used for bow	20mm dia
(ii)	Overall length and height of the bow	995mm 450mm
(iii)	Magnitude of the angle in radians by which bow is bended at the top	10 R
(iv)	Length and size of the GI Channel welded at the order end of the bow	200mm & 100x50x5 mm Channel
(v)	Number of holes made in the GI Channel	3
(vi)	Dia of the holes	22mm (3Nos.)
<b>7</b>	<b>Thimble: 1 No.</b>	
a)	Thickness of the MS Sheet used for thimble	1.5mm
b)	Size of thimble	75x22x40mm



SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
8	Minimum strength of the welding provides on various components of Guy/Stay Sets (IS:823/1964)	4900Kg.
9	Average weight of finished stay set	14.523 kg (min) / 15.569 kg (Max)
10	Surface Finish of stay set	Hot Dip Galvanized
11	All Tolerance of the dimensions/weight	± 5%
<b>12</b>	<b>Hot-Dip Galvanized, Flat (50X8) GI Flat for Stay Clamp</b>	
1	Relevant Standard	IS: 2062, IS: 2633, IS: 2629
2	Grade of Steel	E 250 A
3	Minimum Tensile Strength	410 N/mm <sup>2</sup>
4	Yield Stress	250 N/mm <sup>2</sup>
5	Percentage Elongation (Min.) at Gauge Length	23%
6	Bend Test (Internal Dia)	Min-2t
7	Mass of Zinc Coating	705 gm/m <sup>2</sup>
8	Zinc Coating Thickness	100 micron (6 Dip)
9	Chemical composition	Grade: E 250 (As per IS: 2062)
10	Markings/Embossing	TPCODL/ TPNODL/ TPSODL/ TPWODL, Manufacture's trademark.

## 5. GENERAL CONSTRUCTION:

### 5.1 ANCHOR ROD WITH MS CHANNEL

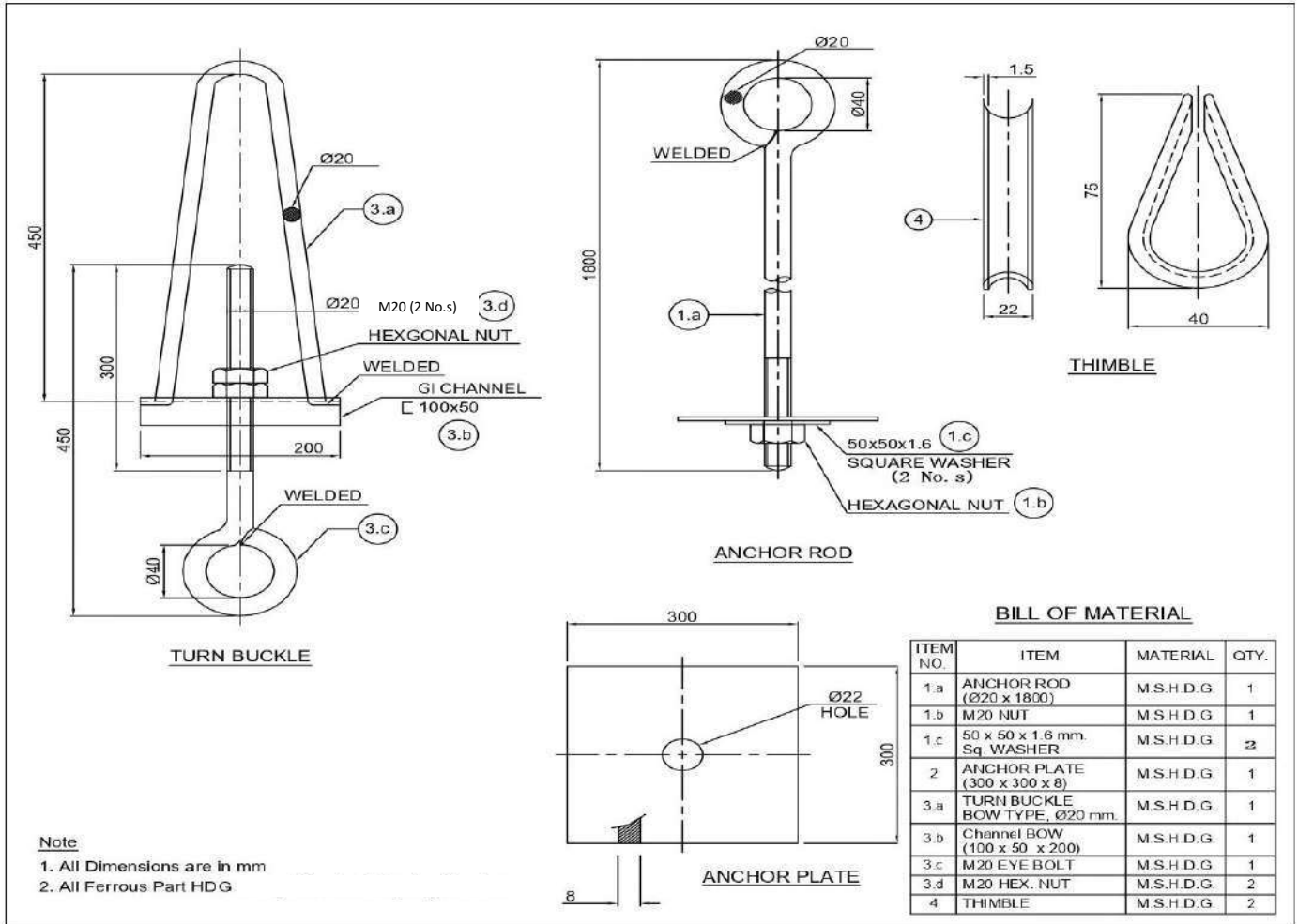
Overall length of rod should be 1800 mm made out of 20 mm diameter MS rod. One end of rod to be made into a round eye having an inner diameter of 40 mm. Other end fitted with MS channel 100 x 50 x 5 mm; 200 mm long. Hot Dip galvanized as per IS 4759-1996.

### 5.2 EYE BOLT

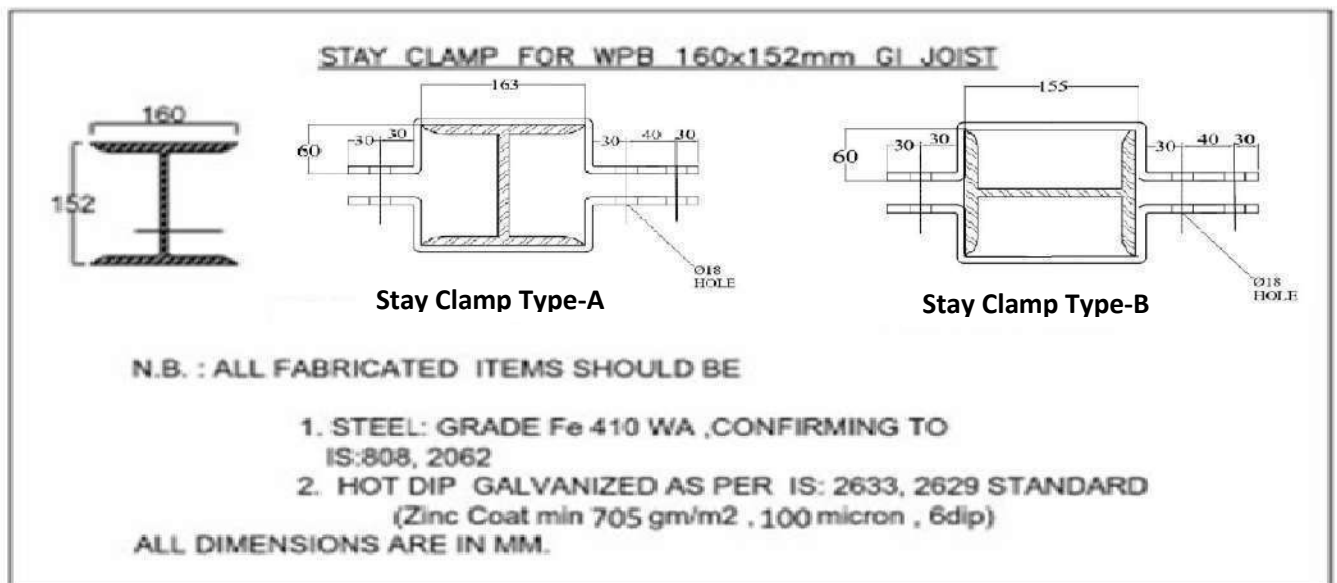
Eye bolt to be made of 20 mm dia MS Rod having an overall length of 450 mm. One end of the rod to be threaded up to 300 mm length. The other end of the rod shall be rounded into a circular eye of 40 mm inner dia with proper and good quality welding. Eye Bolt being a threaded fastener be hot dip galvanized as per relevant IS : 1367 (part 13) – 1983.

## DRAWINGS

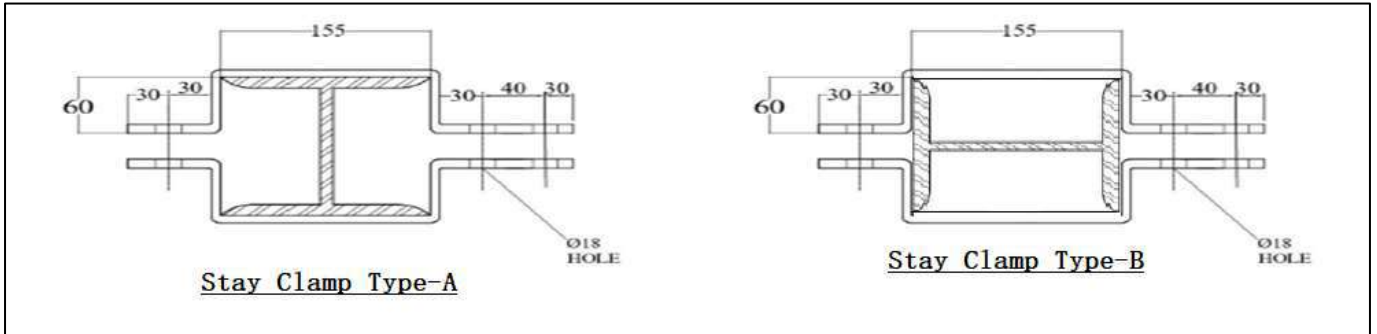
**HT Stay Set :**



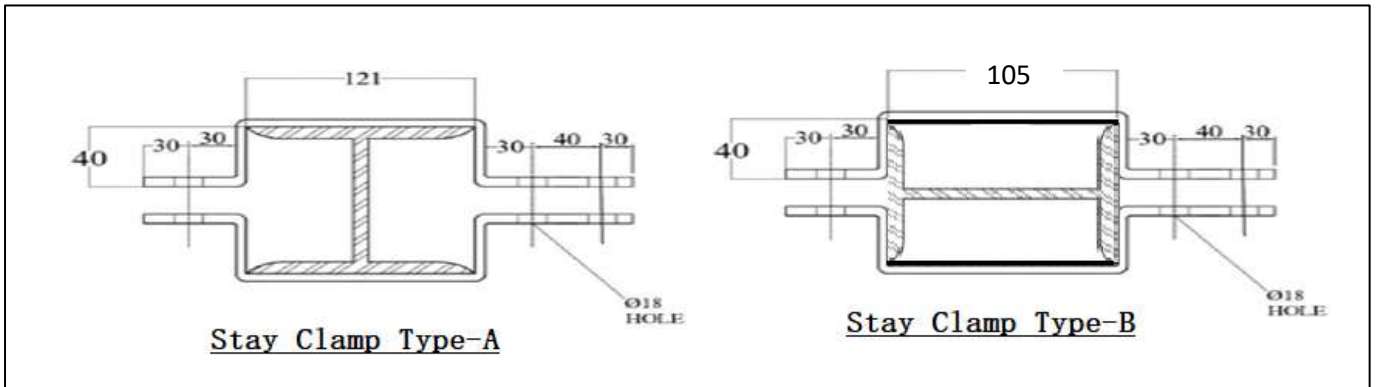
**HT Stay Clamp for WPB Pole (50x8 mm):**



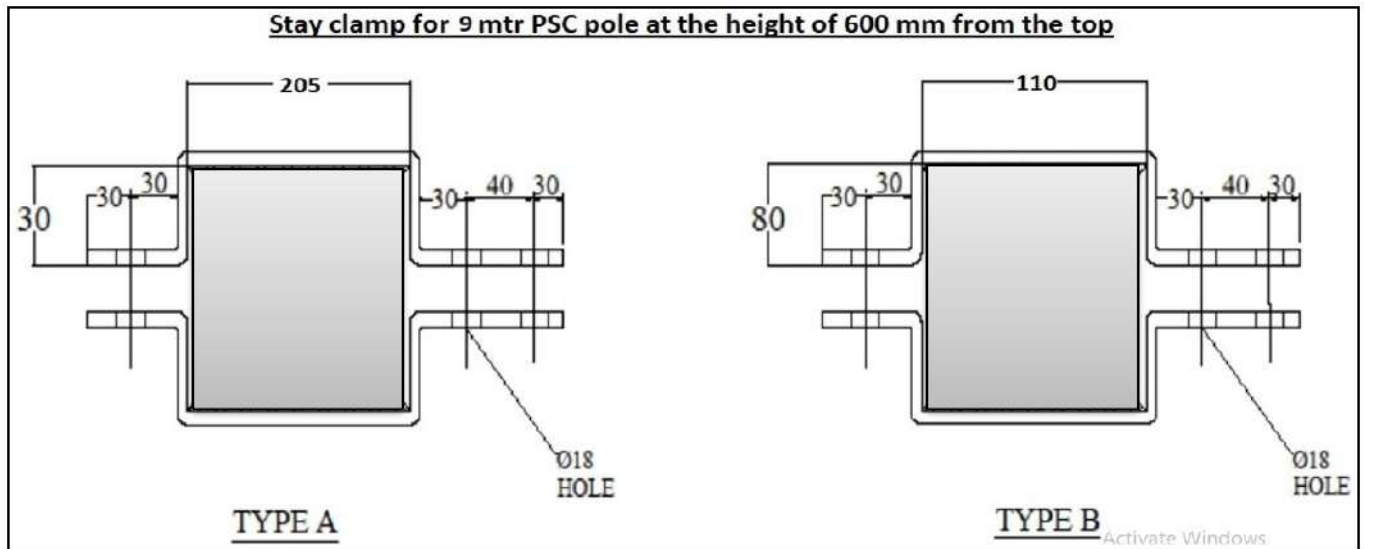
**HT Stay Clamp for 150x150 RSJ Pole (50x8 mm):**

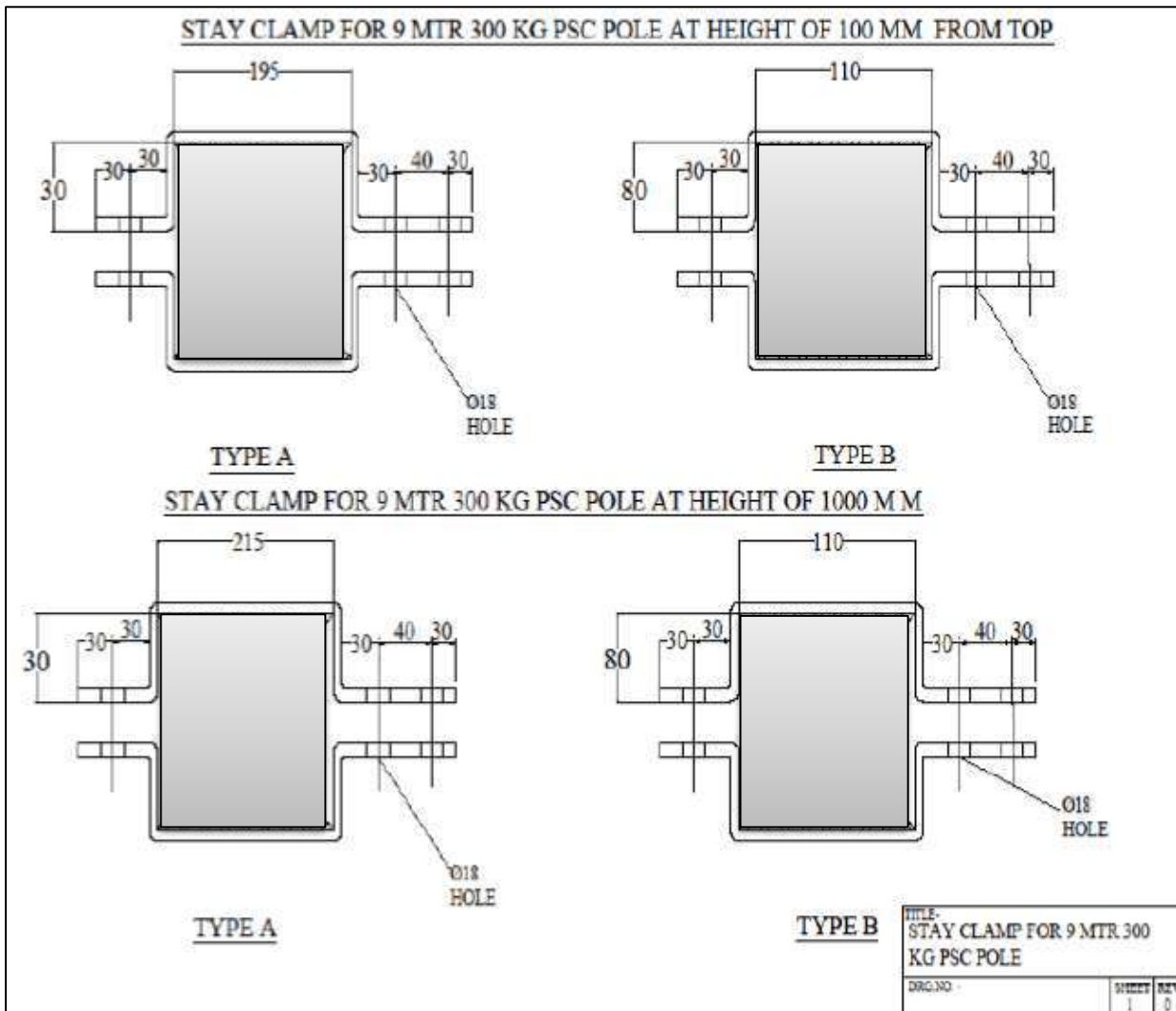


**HT Stay Clamp for 116x100 RSJ Pole (50x8 mm):**



**HT Stay Clamp for 9 mtr PSC Pole (50x8 mm):**





**Specific requirements as per Tender, are to be fulfilled at the time of detailed engineering.**

**6. MARKING:**

Following distinct non-erasable embossing to be made on each HT Stay Set and clamp Supplied to TPCODL/ TPNODL/ TPSODL/ TPWODL under this Tender.

- a) Manufacturer Name/ Trade Mark
- b) Engraved Marking (Punching before galvanization)
- c) "TPCODL/ TPNODL/ TPSODL/ TPWODL"
- d) Year of manufacturing, Country of manufacturing

**7. TESTS:**

The bidder shall be required to submit complete set of the following test reports along with the offer:

**7.1 ACCEPTANCE TESTS**

- i) Visual examination, Verification of dimension and marking test.
- ii) Tensile Strength.
- iii) Galvanization (Uniformity) test.

## 7.2 ROUTINE TESTS

Same as Acceptance Test

## 7.3 TYPE TESTS

- i) Chemical Composition
- ii) Mechanical Properties
- iii) Test in respect of Hot Dip Galvanization i.e. thickness of zinc coating in microns

## 8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI / ERDA / Other Government Labs** as per relevant IS. Type tests should have been conducted in certified during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/ TPNODL/ TPSODL/ TPWODL.

## 9. PRE-DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPCODL/ TPNODL/ TPSODL/ TPWODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/ TPNODL/ TPSODL/ TPWODL's representatives at all times when the work is in progress. Inspection by the TPCODL/ TPNODL/ TPSODL/ TPWODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/ TPNODL/ TPSODL/ TPWODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/ TPNODL/ TPSODL/ TPWODL
- c) TPCODL/ TPNODL/ TPSODL/ TPWODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card

- g) Delivery Challan
- h) Other Documents (as applicable).

#### 10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPCODL/ TPNODL/ TPSODL/ TPWODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

#### 11. GUARANTEE:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

Galvanization Guarantee- Quality of Hot Dip Galvanization should be guaranteed for any type of damage due to harsh climatic condition for 5 Years.

#### 12. PACKING:

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

#### 13. TENDER SAMPLE:

Not Applicable

#### 14. QUALITY CONTROL:

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free

access to the manufacturer's/sub-supplier's works to carry out inspections.

#### 15. TESTING FACILITIES:

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

#### 16. MANUFACTURING FACILITIES:

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

#### 17. SPARES, ACCESSORIES AND TOOLS

Not applicable.

#### 18. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars & Schedule "B" Deviations
- b) Work Experience details
- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.

#### 19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS:

SL. NO.	TECHNICAL PARTICULARS	TO BE FURNISHED BY THE BIDDER
1	Manufacturer Name & Address	
2	Referred IS	
3	Dimensions	
<b>4</b>	<b>Anchor Rod (20mm Dia): 1 No.</b>	
a)	Dia of Rod	
b)	Overall length of Anchor rod	
c)	Inside Dia of Rounded Eye	
d)	Length of threaded portion	
e)	Size of MS Nut & Bolt, Square MS Washers confirming to IS 1387 (1967) and IS 1363 (1967)	
<b>5</b>	<b>Anchor Plate: 1 No.</b>	
a)	Size of the MS Anchor plate	

SL. NO.	TECHNICAL PARTICULARS	TO BE FURNISHED BY THE BIDDER
b)	Dia of the hole made at the centre of the plate	
6. (A)	<b>Turn Buckle</b>	
(i)	Dia of the eye bolt	
(ii)	Length of the eye bolt	
(iii)	Length of the threaded portion of the bolt	
(vi)	Inner dia of the circular eye made at other end of the bolt.	
(B)	<b>Bow with welded Channel</b>	
(i)	Dia of the MS Rod used for bow	
(ii)	Overall length and height of the bow	
(iii)	Magnitude of the angle in radians by which bow is bended at the top	
(iv)	Length and size of the GI channel welded at the order end of the bow	
(v)	Number of holes made in the GI Channel	
(vi)	Dia of the holes	
7	<b>Thimble: 1 No.</b>	
a)	Thickness of the MS Sheet used for thimble	
b)	Size of thimble	
8	Minimum strength of the welding provides on various components of Guy/Stay Sets (IS:823/1964)	
9	Average weight of finished stay set	
10	Surface Finish of stay set	
11	All Tolerance of the dimensions/weight	
12	<b>Hot-Dip Galvanized, Flat (50X8) GI Flat for Stay Clamp</b>	
1	Relevant Standard	
2	Grade of Steel	
3	Minimum Tensile Strength	
4	Yield Stress	
5	Percentage Elongation (Min.) at Gauge Length	
6	Bend Test (Internal Dia)	
7	Mass of Zinc Coating	
8	Zinc Coating Thickness	



SL. NO.	TECHNICAL PARTICULARS	TO BE FURNISHED BY THE BIDDER
9	Chemical composition	
10	Markings/Embossing	

**~~20. SCHEDULE "B" DEVIATIONS:~~**

**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~


<del>SL. No.</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

Signature

Designation

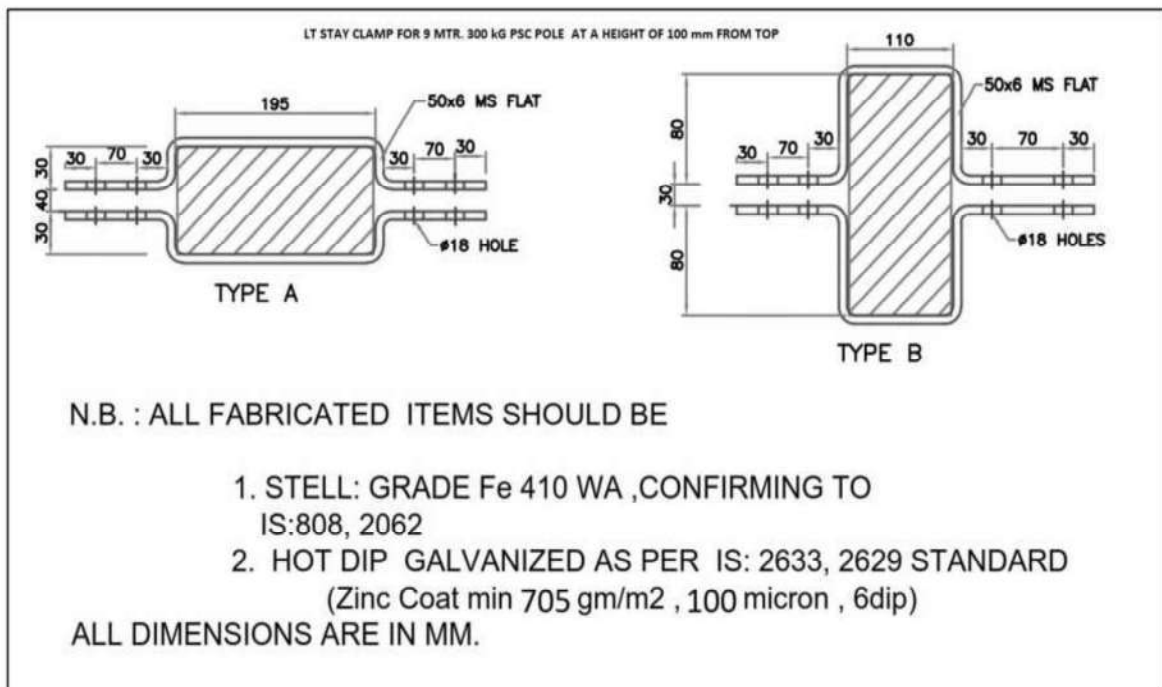
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	TECHNICAL BOOKLET		
Document Title	GENERAL TECHNICAL PARTICULARS AND DRAWINGS		
Document No.	TPCODL-ENGG. -001	Issue Date: 05.07.2021	
Revision No.	00	Page 13 of 191	
Prepared by: Engineering Department	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Praveen Verma

## 7.0 GI STAY CLAMP (FOR LT AND HT)

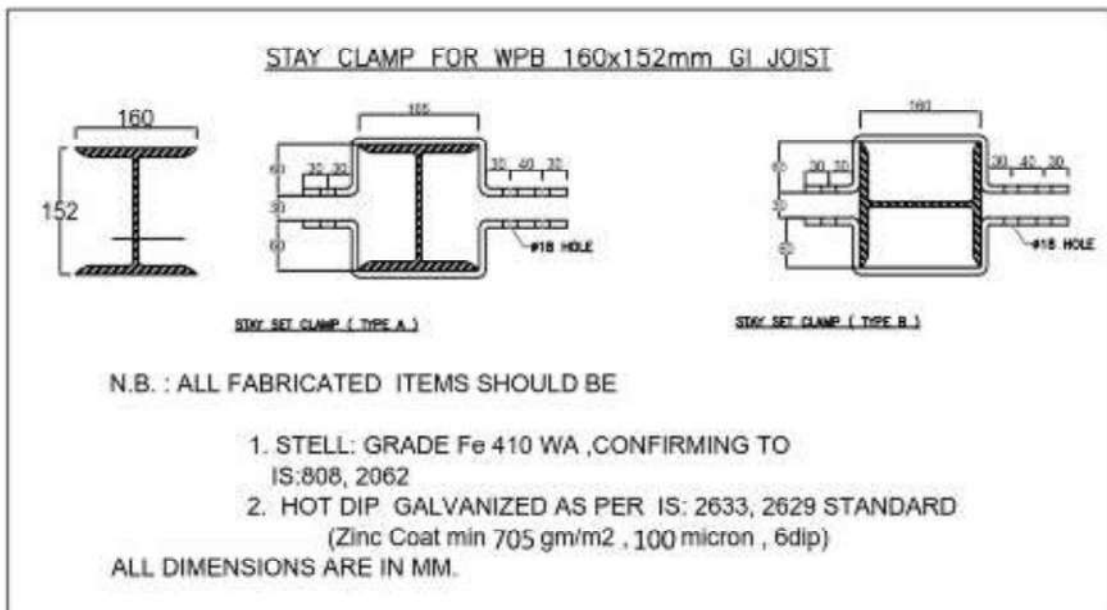
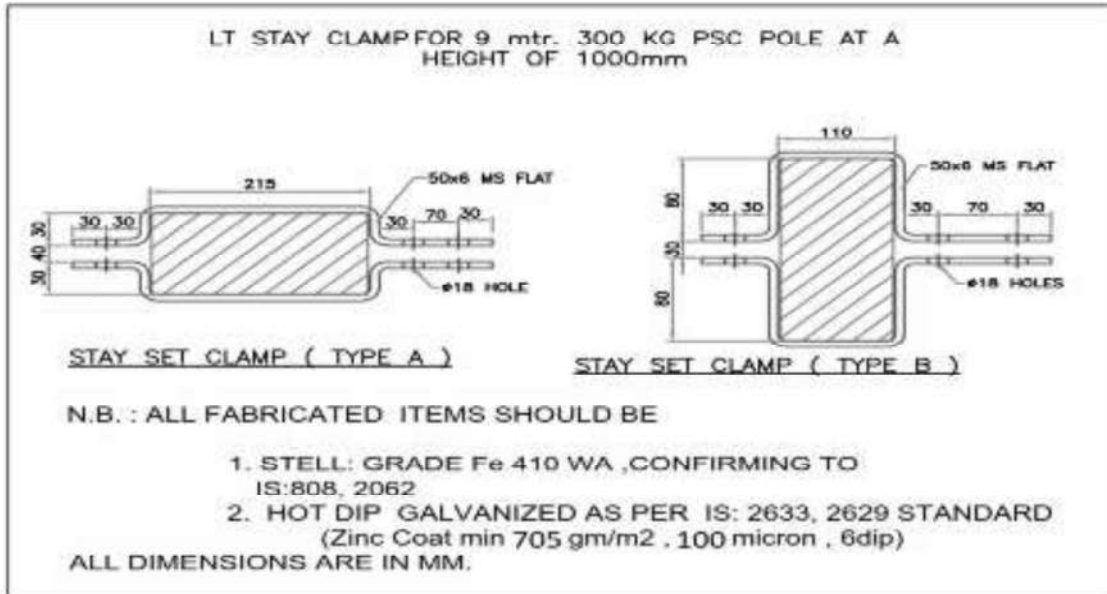
### GENERAL TECHNICAL PARTICULARS


SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Material	Hot-Dip Galvanized, Flat(50X6) GI Flat
2	Relevant Standard	IS: 2062, IS: 2633, IS: 2629, TPCO-OTH-010.
3	Grade of Steel	E 250 A
4	Minimum Tensile Strength	410 N/mm <sup>2</sup>
5	Yield Stress	250 N/mm <sup>2</sup>
6	Percentage Elongation (Min.) at Gauge Length	23%
7	Bend Test (Internal Dia)	Min-2t
8	Mass of Zinc Coating	705 gm/m <sup>2</sup>
9	Zinc Coating Thickness	100-micron, 6 Dip(min)
10	Chemical composition	Grade: E 250 (As per IS: 2062)
11	Markings/Embossing	TPCODL, Manufacture's trademark.

### DRAWINGS



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	<b>TECHNICAL BOOKLET</b>		
<b>Document Title</b>	<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date: 05.07.2021</b>	
<b>Revision No.</b>	00	<b>Page 14 of 191</b>	
<b>Prepared by:</b> Engineering Department	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Praveen Verma



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	TECHNICAL BOOKLET		
Document Title	GENERAL TECHNICAL PARTICULARS AND DRAWINGS		
Document No.	TPCODL-ENGG. -001	Issue Date: 05.07.2021	
Revision No.	00	Page 15 of 191	
Prepared by: Engineering Department	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Praveen Verma

## 8.0 GI HT STAY SET

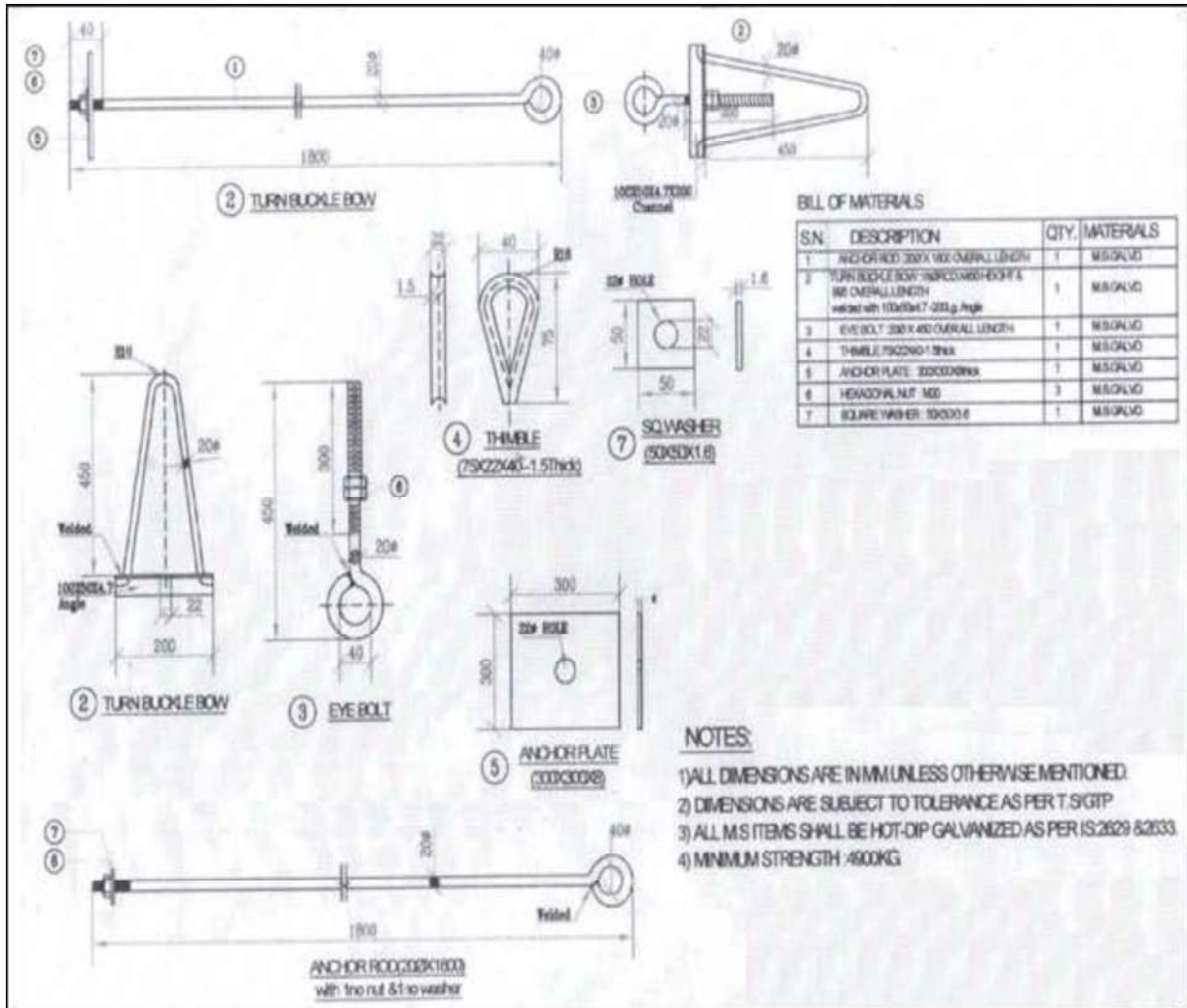
### GENERAL TECHNICAL PARTICULARS


SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Manufacturer Name & Address	To be specified by Bidder
2	Referred IS	IS: 2062, IS: 2633, IS: 2629, TPCO-OTH-010.
3	Dimensions	
<b>4</b>	<b>Anchor Rod (20mm Dia): 1 No.</b>	
a)	Dia of Rod	20mm (+ 5%, - 3%)
b)	Overall length of Anchor rod	1800mm (+ 0.5%)
c)	Inside Dia of Rounded Eye	40mm (+ 3%)
d)	Length of threaded portion	40mm (+ 11%, - 5%)
e)	Size of MS Nut Bolt, Square MS Washers confirming to IS 1387 (1967) and IS 1363 (1967)	20mm Sq. Washer 50X 50X 1.6mm
<b>5</b>	<b>Anchor Plate: 1 No.</b>	
a)	Size of the MS Anchor plate	300x300x8 mm
b)	Dia of the hole made at the centre of the plate	22mm
<b>6.</b>	<b>Turn Buckle</b>	
(i)	Dia of the eye bolt	20mm (+ 3%, - 2%)
(ii)	Length of the eye bolt	450mm
(iii)	Length of the threaded portion of the bolt	300mm
(vi)	Inner dia of the circular eye made at other end of the bolt.	40mm
<b>(B)</b>	<b>Bow with welded angle</b>	
(i)	Dia of the MS Rod used for bow	20mm dia
(ii)	Overall length and height of the bow	995mm 450mm
(iii)	Magnitude of the angle in radians by which bow is bended at the top	10 R
(iv)	Length and size of the GI Angle welded at the order end of the bow	200mm & 100x50x4.8 mm Angle
(v)	Number of holes made in the GI Channel/ angle	3
(vi)	Dia of the holes	22mm (3Nos.)
<b>7</b>	<b>Thimble: 1 No.</b>	

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	<b>TECHNICAL BOOKLET</b>		
<b>Document Title</b>	<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date: 05.07.2021</b>	
<b>Revision No.</b>	00	<b>Page 16 of 191</b>	
<b>Prepared by:</b> Engineering Department	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Praveen Verma

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
a)	Thickness of the MS Sheet used for thimble	1.5mm
b)	Size of thimble	75x22x40mm
8	Minimum strength of the welding provides on various components of Guy/Stay Sets (IS:823/1964)	4900Kg.
9	Average weight of finished stay set	14.523 kg (min) / 15.569 kg (Max)
10	Surface Finish of stay set	Hot Dip Galvanised
11	All Tolerance of the dimensions/weight	± 5%
12	Markings/Embossing	TPCODL, Manufacture's name or trademark, Month & Year of Manufacturing.

### DRAWINGS



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	TECHNICAL BOOKLET		
Document Title	GENERAL TECHNICAL PARTICULARS AND DRAWINGS		
Document No.	TPCODL-ENGG. -001	Issue Date: 05.07.2021	
Revision No.	00	Page 20 of 191	
Prepared by: Engineering Department	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Praveen Verma

## 11.0 7/8 GI STAY WIRE (33kV), 7/10 GI STAY WIRE (11kV) AND 7/12 GI STAY WIRE (LT)

### GENERAL TECHNICAL PARTICULARS

Sl. No	TECHNICAL PARTICULARS	DESIRED VALUE		
		7/8 SWG	7/10 SWG	7/12SWG
1	Nominal Diameter	4.00 mm	3.15 mm	2.5mm
2	Sectional Area in sq. mm	87.92(for stranded wire)	54.52(for stranded wire)	34.35(for stranded wire)
3	Tolerance in diameter	+0.06 mm to -0.03 mm	+0.06 mm to -0.03 mm	+0.06 mm to -0.03 mm
4	Tensile strength	700-1100(N/mm <sup>2</sup> )	700-1100(N/mm <sup>2</sup> )	700-1100(N/mm <sup>2</sup> )
5	Minimum breaking Load (KN)	8.80(for single wire) 54.90(for stranded wire)	5.46(for single wire) 34.52(for stranded wire)	3.44(for single wire) 21.40(for stranded wire)
6	Type of coating Heavy/Medium/Light	Heavy	Heavy	Heavy
7	Variety Hard/Soft	Hard	Hard	Hard
8	Weight of Zn Coating(gm/mtr.2)(After stranding)	260	240	240
9	No of dips the coating is able to withstand at 18±2°C	2x1 Min, 1x1/2 Min	2x1 Min, 1x1/2 Min	2x1 Min, 1x1/2 Min
10	Adhesion Test (wrap test at 1 turn per second coiling while stress not exceeding % nominal tensile strength)			
a)	Min. Complete turn of wrap	10	10	10
b)	Diameter of mandrel on which wrapped	4xNominal Diameter	4xNominal Diameter	4xNominal Diameter
11	Freedom from defects	The wire shall be free from all kinds of surface defects.	The wire shall be free from all kinds of surface defects.	The wire shall be free from all kinds of surface defects.
12	<b>Chemical composition of the MS Wire used shall not exceed</b>			
a)	Sulphur	0.055%	0.055%	0.055%
b)	Phosphorous	0.055%	0.055%	0.055%
c)	Carbon	0.23%	0.23%	0.23%
13	Standard	IS: 2141,4826,6594	IS: 2141,4826,6594	IS: 2141,4826,6594
14	Wt. of Each Coil(Kg)	70-100	70-100	70-100
15	Marking	Coil attached with a metallic tag containing:		
		Manufacturer make or Trade mark, ISI Mark		
		Coil no, Size, TPCODL-marking		
		Mass of coil, Length, Manufacturing month & year		

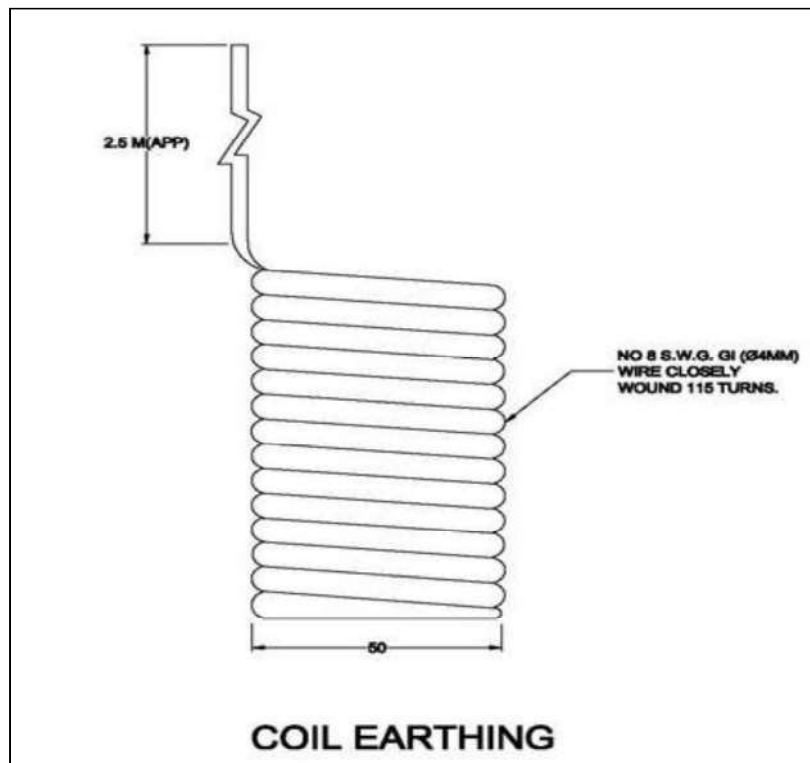
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	<b>TECHNICAL BOOKLET</b>		
<b>Document Title</b>	<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date: 05.07.2021</b>	
<b>Revision No.</b>	00	<b>Page 24 of 191</b>	
<b>Prepared by:</b> Engineering Department	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Praveen Verma

## 15.0 GI EARTHING COIL


### GENERAL TECHNICAL PARTICULARS

SL. NO.	TECHNICAL PARTICULAR	DESIRED VALUE
1	Manufacturer	To be Specified by Bidder
2	Materials of Earthing coil	G.I Wire
3	<b>DIMENSIONS</b>	
a	Wire Diameter	8 SWG (4 mm)
b	Outside Dia of Coil	50 mm
c	Length of Coil	450 mm
d	Free Length of G.I wire of earthing coil	2500 mm
4	<b>No of Turns of coil</b>	115 turns
5	Surface Finish	Galvanised
6	Complete weight of Earthing Set (in Kgs)	1.7 Kg. (Approx.)
7	General Tolerance in Dimensions & Weight	+/- 5 %
8	Reference Standard	IS: 2633, IS: 2629, TPCO-OTH-010.

### DRAWINGS



**Note:** -All Dimensions are in mm unless noted otherwise specified.

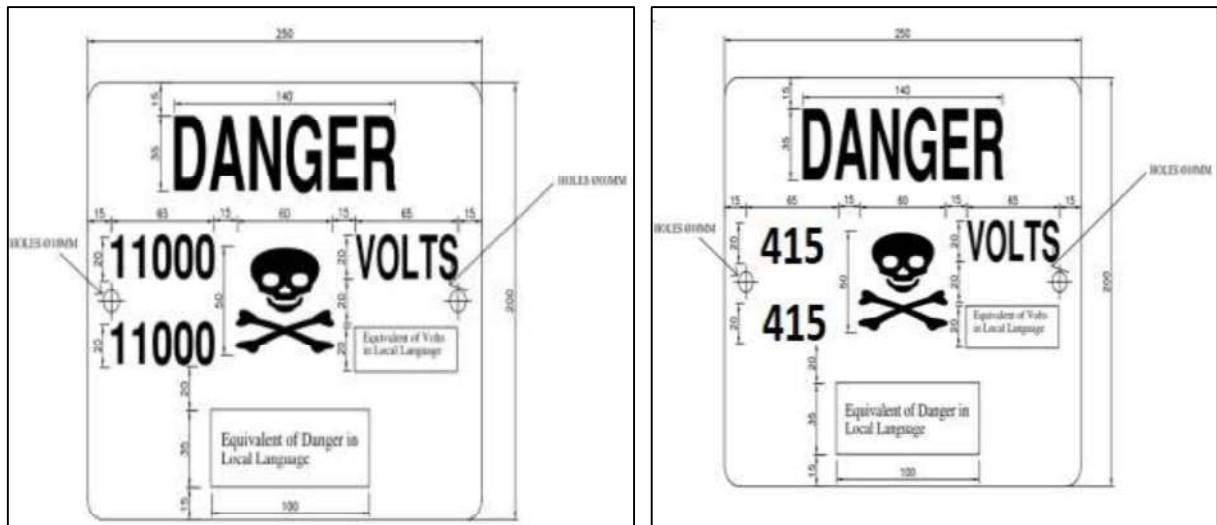
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	TECHNICAL BOOKLET		
Document Title	GENERAL TECHNICAL PARTICULARS AND DRAWINGS		
Document No.	TPCODL-ENGG. -001	Issue Date: 05.07.2021	
Revision No.	00	Page 25 of 191	
Prepared by: Engineering Department	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Praveen Verma

## 16.0 DANGER BOARD

### GENERAL TECHNICAL PARTICULARS


SL. NO.	TECHNICAL PARTICULAR	DESIRED VALUE
1	Size of the danger board	250mm X 200 mm (11kV & LT)
2	Thickness of Sheet	1.6mm
3	Front side of the board	The plate is vitreous enamelled white with letters, figures and the conventional skull and cross-bones in signal red colour.
4	Rear side of the board	Rear Side of the plate is black enamelled
5	Letter Size	As per IS 2551/1982
6	Holes	10 mm dia. holes at suitable place as per sketch for fixing
7	Languages	The language will be Odia and English
8	Marking	TPCODL, Manufacture's name or trademark, Month & Year of Manufacturing.

### DRAWINGS



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	<b>TECHNICAL BOOKLET</b>		
<b>Document Title</b>	<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date: 05.07.2021</b>	
<b>Revision No.</b>	00	<b>Page 32 of 191</b>	
<b>Prepared by:</b> Engineering Department	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Praveen Verma

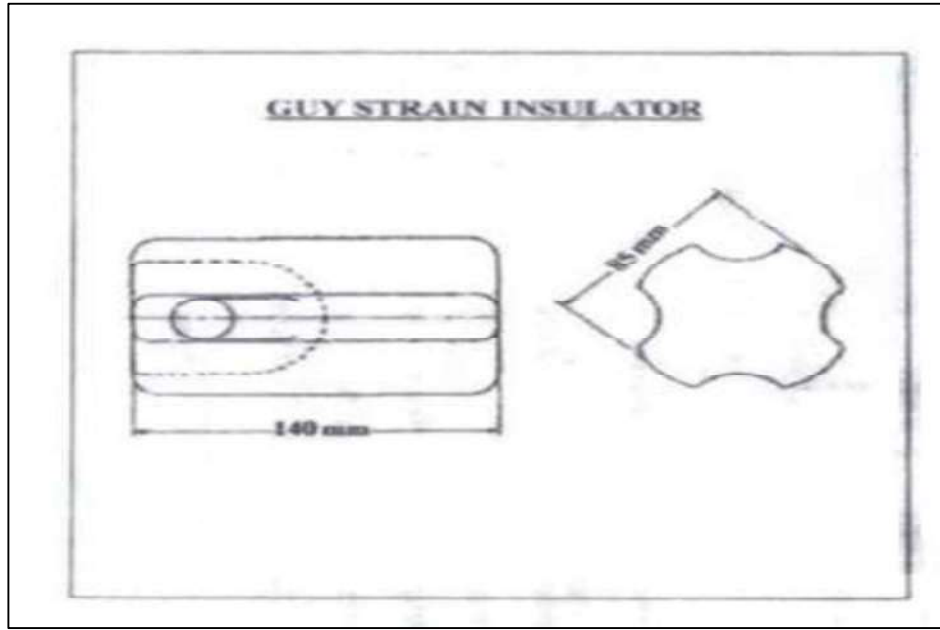
## 21.0 HT STAY INSULATOR

### GENERAL TECHNICAL PARTICULARS


SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Manufacturer's Name	To be specified by Bidder
2	Type of insulator	Type C
3	Standard Specification to which the material shall confirm	As per IS: 5300 - 1969
4	<b>ELECTRICAL CHARACTERISTICS</b>	
(a)	Dry one minute power frequency Flashover voltage	32 kV
(b)	Wet one minute power frequency Flashover voltage	15 kV
(c)	Dry one minute power frequency Withstand voltage	27 kV
(d)	Wet one minute power frequency Withstand voltage	13 kV
5	Minimum Failing Load	88 KN
6	Power Frequency Punctured withstand voltage	1.3 times of Actual Dry Flashover Voltage
7	<b>DIMENSIONS</b>	
(a)	Length	140 mm
(b)	Width	85 mm
(C)	Cable Hole Dia	25 mm
8	Creepage Distance	57 mm
9	Type of Glaze	Brown / Dark Brown
10	Weight per piece	1.1 Kg appx.
11	Markings/Embossing:	TPCODL. Failing Load in KN Manufacture's trademark, Month & Year of manufacturing
12	Packing details	All Insulators shall be in crates or boxes suitable for rough handling. Packing shall be marked with the strength and voltage ratings

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	<b>TECHNICAL BOOKLET</b>		
<b>Document Title</b>	<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date: 05.07.2021</b>	
<b>Revision No.</b>	00	<b>Page 33 of 191</b>	
<b>Prepared by:</b> Engineering Department	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Praveen Verma

**DRAWINGS**



**Note: -All Dimensions are in mm unless noted otherwise specified.**

 TPCODL TP CENTRAL ODISHA DISTRIBUTION LIMITED	TATA POWER CENTRAL ODISHA LIMITED, BHUBANESWAR		
	TECHNICAL BOOKLET		
Document Title	GENERAL TECHNICAL PARTICULARS AND DRAWINGS		
Document No.	TPCODL-ENGG. -001	Issue Date: 05.07.2021	
Revision No.	00	Page 28 of 191	
Prepared by: Engineering Department	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Praveen Verma

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## 19.0 33kV GI PIN 10KN INSULATOR POLYMER AND 11kV GI PIN 5KN INSULATOR POLYMER

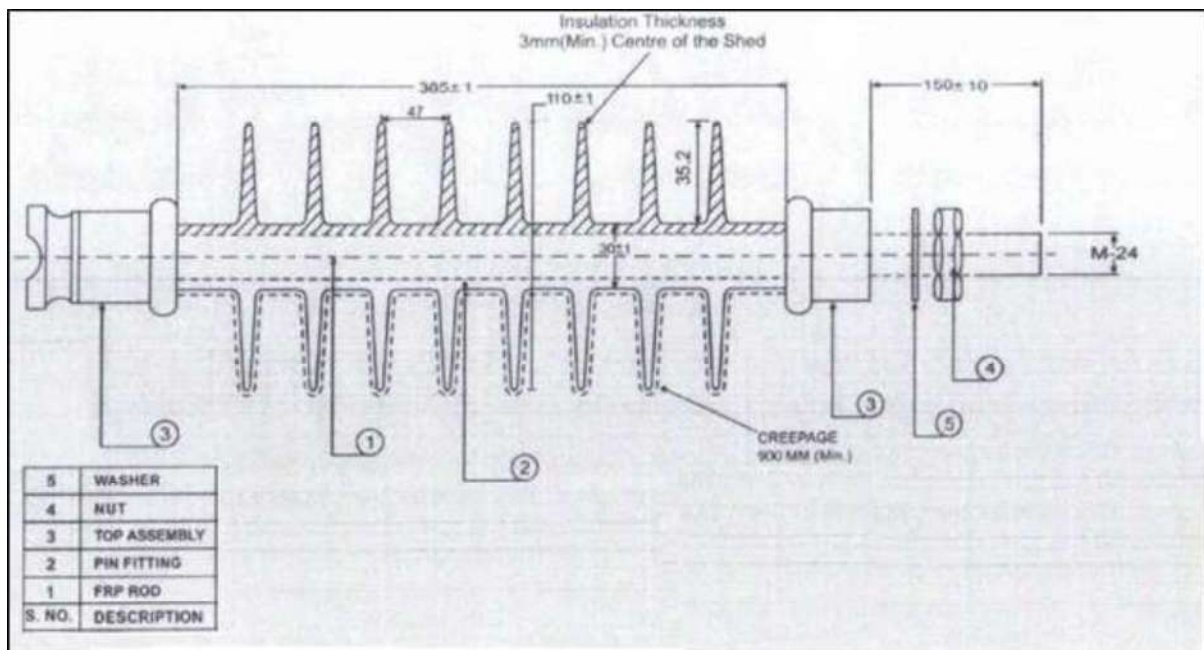
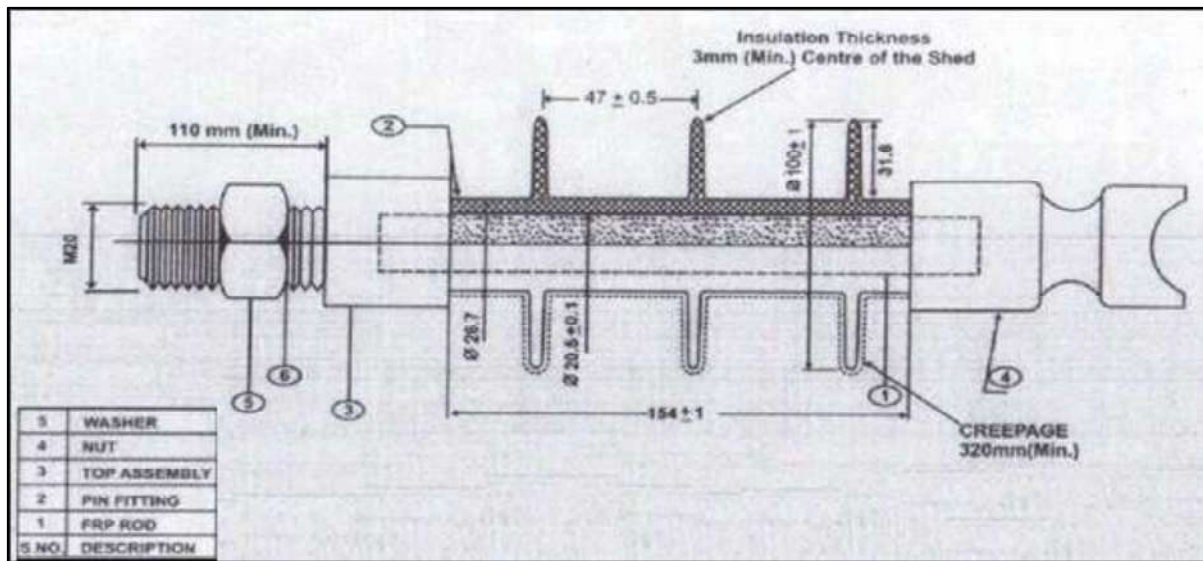
### GENERAL TECHNICAL PARTICULARS

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE	
1	Type of insulator	11 KV Polymeric composite Pin Insulator	33 KV Polymeric composite Pin Insulator
2	Reference Standard	IEC 61109	IEC 61109
3	Material of FRP Rod	Borron free ECR	Borron free ECR
4	Material of sheds	Silicon Rubber	Silicon Rubber
5	Material of Top End Fittings	SGCI /MCI/ FORGED STEEL	SGCI /MCI/ FORGED STEEL
6	Material of Bottom End Fittings	FORGED STEEL	FORGED STEEL
7	Material of sealing compound	RTV Silicon	RTV Silicon
8	Colour of sheds	Grey	Grey
9	Rated system voltage	11 KV	33 KV
10	Highest system voltage	12 KV	36 KV
11	Dry Power Frequency Withstand voltage	60 KV	95 KV
12	Wet Power Frequency Withstand voltage	35 KV	75 KV
13	Dry Power Frequency Flashover Voltage	75 KV	130 KV
14	Wet Power Frequency Flashover Voltage	45 KV	90 KV
15	Dry Lightning Impulse withstand voltage	Positive: 75 KV Negative: 80 KV	Positive: 170 KV Negative: 180 KV
16	Dry Lightning Impulse Flashover voltage	Positive: 95 KV Negative: 100 KV	Positive: 210 KV Negative : 230 KV
17	RIV at 1 MHz when energised at 10 KV / 30 KV (rms) under dry condition	< 50 microvolt	< 70 microvolt
18	Creepage distance (min)	320 mm	900 mm
19	Min Failing load	5 KN	10 KN
20	Dia of FRP Rod	20 mm	24 mm
21	Length of FRP Rod (min)	165 mm	300 mm
22	Dia of weather sheds	100 mm	110 mm
23	Thickness of housing	3 mm	3 mm
24	Dry arc distance(min)	150 mm	300 mm
25	Method of fixing sheds to housing	Injection moulding	Injection moulding
26	Visible Discharge Voltage (PF)	9 KV	27 KV
27	Type of sheds	Aerodynamic	Aerodynamic
28	Dia of bottom end fitting	20 mm	24 mm
29	Thread length of bottom end fitting	110 mm (Min)	130 mm (min)
30	Type of packing	Wooden / Corrugated box	Wooden / Corrugated box
31	No of insulator in each pack	Thirty	Twenty
32	Marking / Embossing	TPCODL, Manufacture's name or trademark,	

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	<b>TECHNICAL BOOKLET</b>		
<b>Document Title</b>	<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date: 05.07.2021</b>	
<b>Revision No.</b>	00	<b>Page 29 of 191</b>	
<b>Prepared by:</b> Engineering Department	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Praveen Verma

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
		Month & Year of Manufacture

### DRAWINGS



**Note: -All Dimensions are in mm unless noted otherwise specified.**

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-GEN-4006**

**Specification Name : GI EARTHING PIPE**

<b>Ranjan Kumar Sahoo</b>	<b>SATYA PRASAD NAYAK</b>	<b>SHANTAPRIYA JENA</b>	<b>JYOTIPRAKASH MOHANTY</b>	<b>Shailendra Kumar Jaiswal</b>	<b>SHIRISH SHARAD DIKAY</b>
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21-12-2022	21-12-2022	22-12-2022	22-12-2022	22-12-2022	22-12-2022

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TPWODL*

## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

**1. SCOPE:**

The specification covers technical requirements of design, Manufacturing, testing, Inspection, supply and transportation of Heavy type GI Earth Pipe Electrode. Scope also includes transportation & unloading at store / site.

**2. APPLICABLE STANDARDS:**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

IS 1239 (Part-1)	Specification of steel tubes, Tubular and other wrought steel fittings
IS 1239 (Part-2)	Specification of steel tubes, Tubular and other steel fittings
IS 10748	Hot- rolled steel strip for Welded Tubes and Pipes
IS: 228	Methods of Chemical analysis for steels
IS: 4759	Specification for Hot Dip Zinc Coating on structural steel and other allied products
IS: 4711	Methods for sampling of steel pipes, tubes, fittings
IS 3043	Code for practice of Earthing

**3. CLIMATIC CONDITIONS OF THE INSTALLATION:**

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/TPNODL/TPSODL/TPWODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

**4. GENERAL TECHNICAL REQUIREMENTS:**

SL. No	TECHNICAL PARTICULAR	DESIRED VALUE		
1	Diameter of earthing Pipe	40 mm dia	50 mm dia	100 mm dia
2	Standard	IS 1239	IS 1239	IS 1239
3	Material	GI Pipe	GI Pipe	GI Pipe
4	Make	JINDAL /TATA	JINDAL /TATA	JINDAL /TATA
5	Class	Heavy	Heavy	Heavy
6	Outdoor diameter	47.9 mm min. to 48.8 mm max.	59.7 mm min. to 60.8 mm max.	113.1 mm min. to 115 mm max.
7	Wall thickness	4 mm	4.5 mm	5.4 mm
8	% of Elongation	20	20	20
9	Tensile strength	320 N/mm <sup>2</sup>	320 N/mm <sup>2</sup>	320 N/mm <sup>2</sup>
10	Length of pipe earthing	3000 mm	3000 mm	3000 mm
11	Dimensions of holes	12 mm	12 mm	12 mm
12	Tolerance on dimensions/weight	+/-5 %	+/-5 %	+/-5 %
13	Galvanizing shall confirm	IS:4736, IS: 2633, IS: 2629	IS:4736, IS: 2633, IS: 2629	IS:4736, IS:2633, IS: 2629
14	Dimension of clamp	50 x 6 GI flat	50 x 6 GI flat	50 x 6 GI flat
15	Weight of Pipe (As per IS 1239 Part-1(2004))	4.37Kg/Mtr.	6.19Kg/Mtr.	14.5Kg/Mtr.
16	Center of Hole	150mm	150mm	150mm

Note: - For design and other parameter refer to the drawing on page No:-7.

**5. GENERAL CONSTRUCTION:**

For welded and seamless plain end steel tubes intended for different use in electricity distribution utility shall comply IS 1239 (Part-1). Plain ends of the tubes are cleanly finished by normal deburring process. For tubes with thickness up to 6 mm, the minimum mass of zinc coating in accordance with IS: 6745, shall be 400g/mm<sup>2</sup>. The Zinc coating on the tube shall be uniform and tested in accordance with IS 4736. The welded tubes shall be manufactured from hot rolled steel strip for welded tubes and pipes confirming to IS 10748. Pipe shall be strictly from approved vendors i.e. TATA/JINDAL. The hot dip galvanization shall be done only after the all fabrication and welding done. Zinc



electroplated/painted material will not be accepted. The nut bolt and washers provided shall be as per the relevant IS. Chemical composition for GI earth pipe are in below:

Carbon: 0.20% (max.)

Manganese: 1.30% (max.)

Phosphorus: 0.04% (max.)

Sulphur: 0.04% (max.)

## 6. MARKING:

The unit shall be appropriately marked as

- a) TPCODL/TPNODL/TPSODL/TPWODL
- b) Manufacture's name or trademark
- c) Year of Manufacturing

## 7. TESTS:

The bidder shall be required to submit complete set of the following test reports along with the offer:-

### 7.1 ACCEPTANCE TESTS

- i) Visual Inspection
- ii) Verification of Dimensions
- iii) Tensile Strength
- iv) Bend Test
- v) Hot Dip galvanizing
- vi) Determination of mass of Zinc coating on Zinc coated iron and steel

### 7.2 ROUTINE TESTS

Same as Acceptance Test

### 7.3 TYPE TESTS

- i) Visual Inspection
- ii) Verification of Dimensions
- iii) Tensile Strength
- iv) Bend Test
- v) Flattening test (dia.>50mm)
- vi) Hot Dip galvanizing
- vii) Determination of mass of Zinc coating on Zinc coated iron and steel

## 8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI / ERDA / Other Government/NABL Accredited Labs** as per relevant IS. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/TPNODL/TPSODL/TPWODL.

## 9. PRE-DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL 's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPSODL/TPWODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL
- c) TPCODL/TPNODL/TPSODL/TPWODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable)

## 10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPCODL/TPNODL/TPSODL/TPWODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

## 11. GUARANTEE:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 18 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

**12. PACKING:**

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**13. TENDER SAMPLE:**

Not Applicable

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

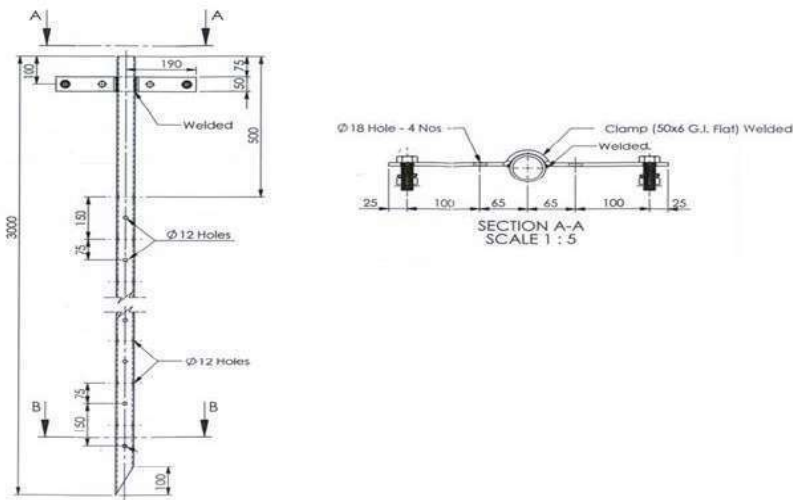
**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule “A” Guaranteed Technical Particulars & Schedule “B” Deviations
- b) Work Experience details
- c) Type test certificates
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing



NOTE: - The drawing is for tender purpose only.

**19. SCHEDULE- “A” GUARANTEED TECHNICAL PARTICULARS:-**

SL. No	TECHNICAL PARTICULAR	TO BE FURNISHED BY THE BIDDER		
1	Diameter of earthing Pipe	40 mm dia	50 mm dia	100 mm dia
2	Standard			
3	Material			
4	Make			
5	Class			
6	Outdoor diameter			
7	Wall thickness			
8	% of Elongation			
9	Tensile strength			
10	Length of pipe earthing			
11	Dimensions of holes			

12	Tolerance on dimensions/weight			
13	Galvanizing shall confirm			
14	Dimension of clamp			

**~~20. SCHEDULE "B" DEVIATIONS:~~**

**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

~~Signature~~

~~Designation~~

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1021**

**Specification Name : Technical Specification for 33KV Lightning Arrester (10 KA)**

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
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TPCODL	TPNODL	TPWODL	TPSODL	TPCODL	TPCODL
21-01-2023	23-02-2023	01-03-2023	04-03-2023	18-03-2023	18-03-2023

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## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING FACILITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. TRAINING
20. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
21. SCHEDULE "B" DEVIATIONS

**1. SCOPE:**

This specification covers the design, manufacture, testing and supply of 33kV, 10kA, Station class-SL, (Station class-II) and 33 KV ,10 KA –SM (class –III), Metal Oxide Gap less Polymeric Lightning Arrester. The specific requirements are covered in the enclosed technical data sheet. Some of the parts that may have not been specifically included, but otherwise form part of the Lightning arrester as per standard practice or necessary for proper operation, will be deemed to be also included in this specification. The successful bidder shall not be eligible for any extra charges for such accessories etc. Scope also includes transportation & unloading at store / site.

**2. APPLICABLE STANDARDS:**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

IEC 60099-4	Specification for surge arrestor without gap for AC System
IS 15086	Specification for Metal Oxide Gap less Lightning arresters for alternating current System
IS 6209	Method of Partial Discharge Measurement
IS 8704 & IS 731	Guide for selection of creepage distance of polymeric housing insulator.
ISO 48	Rubber, vulcanized or thermoplastic -- Determination of hardness (hardness between 10 IRHD and 100 IRHD).
IEC 60721-3-2	Classification of environmental conditions. Classification of groups of environmental parameters and their severities. Transportation
IEC 60071	Insulation co-ordination -- Part 1 definitions, principles and rules; -- Part 2: Application Guide
IEC 60815-1	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions –Part 1: Definitions, information and general principles
IS 2629	Recommended Practice for Hot-Dip Galvanizing of Iron and Steel
IS 2633	Methods for testing uniformity of coating of zinc coated articles
IS 4759	Hot-dip zinc coatings on structural steel and other allied products

**3. CLIMATIC CONDITIONS:**



1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	1500mm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/TPWODL/TPNODL/TPSODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

**4. GENERAL TECHNICAL REQUIREMENTS:**

<b>SL. NO.</b>	<b>TECHNICAL PARTICULARS (Class-SL,Class-II)</b>	<b>DESIRED VALUE</b>
1	Installation	Outdoor
2	Reference standards (Latest Amend.)	IS 15086:Part.4(2017), IEC 60099
3	Arrester Type and Housing	Metal Oxide Gapless Cage type with Polymeric housing
4	Normal System Voltage	33 kV
5	Highest System Voltage	36 kV
6	Rated Frequency	50 Hz
7	Maximum Continuous Operating Voltage (M.C.O.V)	25 kV (rms)
8	Arrester Rating	30 kV (rms)
9	<b>Discharge Current</b>	
a	Nominal Discharge Current	10 kA
b	Switching impulse discharge current	0.5kA

SL. NO.	TECHNICAL PARTICULARS (Class-SL,Class-II)	DESIRED VALUE
10	Short Circuit rating	40 kA
11	<b>Voltage Withstand on Arrester Housing</b>	
a	Standard rated short duration Power Frequency withstand Voltage (Dry/Wet) as per IS:2165	70kV (rms)
b	Standard rated Lightning Impulse withstand Voltage (Peak in kV)	170kV (Peak)
12	Lightning Impulse Protection Level (at 10kA)	115 kV
13	<b>Long Duration Current</b>	
a	Peak Current	400A
b	Virtual duration of Peak T	2000 T (Micro Sec)
14	High Current impulse Operating Duty	100 kA (Peak)
15	Creepage Distance of Arrester Housing	1116 min or 31mm/KV
16	Partial Discharge at 1.05 times M.C.O. V	<10 pc
17	Energy Absorption capacity (KJ/KV)	>=4KJ/KV
18	Repetitive charge transfer withstand (coloumbs),Qrs	>=1.0
19	<b>Temporary over voltage (TOV)</b>	
a	1 sec	51kVp
b	10 sec	49kVp
20	<b>Maximum Lightning Impulse Residual voltage with 8/20 microsecond wave</b>	
a	at 5kA	85kVp
b	at 10kA	90kVp
c	at 20kA	100kVp
21	Maximum switching current impulse residual voltage in kVP at 500 A	73.2 KVP
22	Max. Cantilever Strength	325 kgF
23	Total height of the arrester	To be specified by bidder
24	Total weight of the arrester	To be specified by bidder
25	No. of Metal oxide blocks in arrester	To be specified by bidder
26	Rating of individual ZnO blocks used for assembly	To be specified by bidder
27	Power Losses of the Arrester in watt	To be specified by bidder
28	Type of Mounting	Pedestal
29	Material of Insulating base	UV resistant Fire retardant DMC
30	Insulating Terminal Cap	Polyolefin
31	Material of Nuts and bolts	Stainless Steel

SL. NO.	TECHNICAL PARTICULARS (Class-SM,Class-III)	DESIRED VALUE
1	Installation	Outdoor
2	Reference standards (Latest Amend.)	IS 15086:Part.4(2017), IEC 60099
3	Arrester Type and Housing	Metal Oxide Gapless Cage type and Polymeric housing
4	Normal System Voltage	33 kV
5	Highest System Voltage	36 kV
6	Rated Frequency	50 Hz
7	Maximum Continuous Operating Voltage (M.C.O.V)	25 kV (rms)
8	Arrester Rating	30 kV (rms)
9	<b>Discharge Current</b>	
a	Nominal Discharge Current	10 kA
b	Switching impulse discharge current	1kA
10	<b>Short Circuit rating</b>	40 KA
a	Reduced Short circuit currents	25 kA
b	Low short circuit current with a duration of 1 sec	600±200 kA
c	Prospective symmetrical fault current	40 kA for min 0.2 sec
11	<b>Voltage Withstand on Arrester Housing</b>	
a	Standard rated short duration Power Frequency withstand Voltage (Dry/Wet) as per IS:2165	70kV (rms)
b	Standard rated Lightning Impulse withstand Voltage (Peak in kV)	170kV (Peak)
12	Lightning Impulse Protection Level (at 10kA)	115 kV
13	<b>Long Duration Current</b>	To be provided by bidder
a	Peak Current	To be provided by bidder
b	Virtual duration of Peak T	2400 T (Micro Sec)
14	High Current impulse Operating Duty	100 kA (Peak)
15	Creepage Distance of Arrester Housing	1116 min or 31mm/KV
16	Partial Discharge at 1.05 times M.C.O. V	<10 pc
17	Energy Absorption capacity (KJ/KV)	>=7KJ/KV
18	Repetitive charge transfer withstand (coloumbs),Qrs	1.6 Coloumbs
19	<b>Temporary over voltage (TOV)</b>	
a	1 sec	51kVp
b	10 sec	49kVp
20	<b>Maximum Lightning Impulse Residual voltage with 8/20 microsecond wave</b>	
a	at 5kA	85kVp
b	at 10kA	90kVp

SL. NO.	TECHNICAL PARTICULARS (Class-SM,Class-III)	DESIRED VALUE
c	at 20kA	100kVp
21	<b>Maximum switching current impulse residual voltage in kVP At 500 Amps</b>	73.2KVp
22	Max. Cantilever Strength	325 kgF
23	Total height of the arrester	To be specified by bidder
24	Total weight of the arrester	To be specified by bidder
25	No. of Metal oxide blocks in arrester	To be specified by bidder
26	Rating of individual ZnO blocks used for assembly	To be specified by bidder
27	Power Losses of the Arrester in watt	To be specified by bidder
28	Type of Mounting	Pedestal
29	Material of Insulating base	UV resistant Fire retardant DMC
30	Insulating Terminal Cap	Polyolefin
31	Material of Nuts and bolts	Stainless Steel

## 5. GENERAL CONSTRUCTION:

### 5.1 Assembly:

The surge arresters shall conform in general to IEC-60099-4 ed 3.0

Surge arrester shall be supplied along with the insulating base, terminal connector, insulating terminal cap (Polyolefin) and necessary hardware. The Assembly consists of a stack of Metal Oxide elements arranged in a cage type design. All metal parts shall be of non-rusting and non corroding metal (All ferrous parts shall be Hot Dip Galvanized i.e. HDG). All nuts & bolts shall be with double spring washers. Bolts, screws and pins shall be provided with lock washers. Surge arrester construction shall be suitable to withstand Seismic Loading, Short Circuit Forces and wind load and the force exerted on the arrester base and to the terminal imposed by the line conductor. All similar parts, particularly removable ones, shall be interchangeable.

Arresters shall be completely molded units with absolutely no air volume inside.

Arresters of tubular construction i.e arresters assembled in hollow core insulators with enclosed gas volume are not acceptable due to abrupt short circuit performance and poor sealing mechanism.

- a) Housing shall be polymeric to provide thermal dissipation of heat generated in the metal oxide elements during over voltage and line discharge. Polymeric housing shall be free from flaws affecting the mechanical and electrical strength of the arrester. Housing shall be capable to withstand the desired pollution stresses without flashover. Housing shall be capable to

withstand the temperature rise due to the non uniform field distribution, caused by the pollution on the surface of the housing. The rain sheds / petticoats shall be of polymeric material and shall confirm to IEC 60815.

b) The arrester shall have thermal stability to withstand the heat generated from ZnO element due to continuous operating voltages and surges. It shall remain in undamaged condition, capable protective function.

c) Arrestors shall incorporate anticontamination feature to prevent arrester failure, consequent to uneven voltage gradient across the stack in the event of contamination of the arrester insulating material. These features shall be described in detail when submitting the Bid. Arrestors shall be capable of discharging over voltages occurring during switching of unloaded transformers, capacitors banks and long lines. No radio interferences shall be caused by the arrestors operating at the normal rated voltage.

d) MO resistor diameter shall be mentioned by the bidder at the time of bidding along with its rating . MOV blocks shall have full metallization to have full face contact and to reduce contact resistance between adjacent discs.

e) Surge arresters shall be of cage type construction with no gas volume to ensure that the arrester does not explode during the short circuit test condition. The MOV blocks should be housed in cage of FRP rods appropriately crimped at both end fittings. The housing should be directly molded on stack of MOV blocks without any intermediate interface.

f) The end fittings shall be non-magnetic and of corrosion proof material. The end fittings used in polymer arrester shall be made from aluminum through machining process/pressure die-casting process. Sand casted and gravity casted end fittings are not acceptable due to poor microstructure and porosity issues.

**5.2 EARTHING PADS:**

Suitable earthing pads shall be provided in the lightning arrester and surge counter for earthing.

**5.3 MECHANICAL STRENGTH:**

a) The Lightning Arrester and its base shall withstand rated mechanical terminal load and electromagnetic forces without impairing their operational reliability.

b) The Lightning Arrester shall not come out of their positions by gravity, wind pressure, vibrations or reasonable shocks.

**5.4 SURGE COUNTER :**

a) Cyclometric 5 digit, non-resetting type counter, dial type surge counter shall be provided for each lightning arrester for automatically recording the number of discharges. Each counter shall have a continuous leakage current indicator and shall not require an external power source of

operation. The value of leakage current beyond which the operation is abnormal shall be clearly marked in red colour on the detector.

- b) Surge arrestor shall include a milli ammeter to monitor the leakage current. the milli –ammeter usually bare a red mark at the higher scale regions. Increase of leakage current to the red marked zone is essentially an indication that the arrestor is likely to attain the thermal runaway condition. The qualitative information regarding the arrestor the arrestor health, obtained from the milli-ammeter, helps the user to take preventive measures before the arrestor failure.
- c) Discharge counters and milli-ammeters shall be suitable for mounting on structure and shall be mounted at approximately 1.5 meters above ground level. The reading of the milli-ammeter and counters shall be visible through an inspection glass panel. The terminals shall be of robust and adequate size and shall be so located that incoming and outgoing connections are made with minimum possible bends.
- d) The connecting conductor from lightning arrester earth terminal to the discharge counter incoming terminal shall be insulated for a minimum of 1.1 kV and this insulated conductor shall be supplied along with the arrester by the bidder. The surge arrester surge counter connection shall be done by means insulated multi strand copper cable of minimum size 35 sq.mm to withstand the fault currents during severe operating conditions. Length of the each cable should be considered as 3.5 mtr (min.). This copper cable shall be of black color and shall have fire retardant & UV resistance properties. Approved Make for this Cable is Polycab/KEI/KEC/Sterlite/Finolex/Havells. The cable shall have copper lugs at both ends. Bimetallic strips must be provided along with Surge Counter for bimetallic connections.
- e) The surge arrester shall be designed to operate/ withstand without damage or change in performance for the high current impulse, long duration current impulse corresponding to the discharge class of the surge arrester and nominal discharged current corresponding to the discharge current of the surge with which it is used.
- f) The external and internal parts of the surge monitor shall be hermetically sealed to withstand the atmospheric variation of temperature and humidity, rain and dust encountered in station in which they are installed. RTV silicon sealant to be used. The surge Monitor line terminal shall be solidly connected to the ground terminal of the surge monitor through an inbuilt metal oxide element satisfying the operational requirement.

#### 5.5 CONNECTORS:

Aluminum terminal to be provided for Surge Arrestor. This terminal shall be connected via Standard bolted type connector (L-Shaped) connector with the network equipment via AAAC Panther Conductor. Therefore terminal connector shall be part of Surge Arrestor.



**Specification No:** ENG-EHV-1021

**Specification Name:** Technical Specification for 33KV Lightning Arrester (10 KA)

## 6. MARKING:

A stainless steel rating plate, of at least 1 mm thickness, shall be fitted to each Lightning Arrester in a visible position and shall carry all the information as specified in the standards. The letters on the rating plate shall be engraved black on the white/silver background. Fixing screws for outdoor use shall be of stainless steel or any other corrosion resistant metals. The Name plate shall be embossed with "PO no. with date" & "TPCODL/TPWODL/TPNODL/TPSODL",

The following information shall be mentioned on the Name Plate

- a) Continuous operating Voltage
- b) Rated Voltage
- c) Rated Frequency
- d) Nominal Discharge Current
- e) Pressure relief rated current in kA r.m.s.
- f) Manufacturer's Name
- g) Type and Identification of the complete
- h) Year/Month of Manufacture
- i) Serial Number.
- j) Warrantee/guarantee clause

## 7. TESTS:

All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components and fittings shall also be type tested as per the relevant standards. Following tests shall necessarily be conducted on lightning arrester in addition to others specified in IS/IEC standards: -

### 7.1 ACCEPTANCE TESTS

Acceptance test shall be as per cl. 9.2 of IEC 60099-4 ed 3 as mentioned below:

- a) Measurement of reference voltage test.
- b) Residual Voltage test on complete arrester.
- c) Partial Discharge Test
- d) Visual Inspection
- e) The resistive current drawn by the arrester at rated voltage
- f) Peel off test (removal of housing) shall be performed on 1 random samples from supplied lot to confirm cage design
- g) Measurement of power-frequency voltage on the arrester at the reference current
- h) Lightning impulse residual voltage on the arrester at nominal discharge current ( wet power frequency voltage test)

All acceptance tests shall be witnessed by the Purchaser's or his authorized

representative. The above mentioned test shall be made on the nearest lower whole number to the cube root of the number of arresters to be supplied as per IEC-60099-4.

## 7.2 ROUTINE TESTS

Routine test shall be as per cl. 9.1 of IEC 60099-4 ed 3 as mentioned below:

- a) Measurement of reference voltage test
- b) Residual Voltage Test on complete arrester
- c) Internal partial discharge test.
- d) The resistive current drawn by the arrester at rated voltage
- e) The power-frequency voltage

## 7.3 TYPE TESTS

- a) Insulation Withstand Test of Housing ( Lightning impulse – (cl. 8.2.8; IEC 60099-4 ed.3))
- b) Residual voltage test (cl. 8.3.2, cl. 8.3.3., cl 8.3.4; IEC 60099-4 ed.3)
- c) Long duration current impulse withstand test (cl. 8.4; IEC 60099-4 ed.3)
- d) Operating duty test (cl. 8.7; IEC 60099-4 ed.3)
- e) Short circuit test (Low (600A)/High Current (40kA) (cl. 8.10; IEC 60099-4 ed.3)
- f) Test for Bending moments (cl. 8.11; IEC 60099-4 ed.3)
- g) Weather aging test on full arrester 1000 hrs (cl. 8.12 and annexure-C; IEC 60099-4 ed.3)
- h) Partial Discharge Test (cl. 8.15; IEC 60099-4 ed.3)
- i) Wet power frequency voltage test (cl. 8.2.8; IEC 60099-4 ed.3)
- j) Power frequency (voltage VS time curve) (cl. 8.8; IEC 60099-4 ed.3)
- k) Test to verify repetitive charge transfer withstand (cl. 8.5; IEC 60099-4 ed.3)
- l) Heat Dissipation behavior verification of test sample (cl. 8.6; IEC 60099-4 ed.3)

## 8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA** as per relevant standard. Type tests should have been conducted during the period not exceeding **5** years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/TPWODL/TPNODL/TPSODL.

## 9. PRE-DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPWODL/TPNODL/TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPWODL/TPNODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPWODL/TPNODL/TPSODL or its authorized





**Specification No:** ENG-EHV-1021

**Specification Name:** Technical Specification for 33KV Lightning Arrester (10 KA)

representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPWODL/TPNODL/TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPWODL/TPNODL/TPSODL
- c) TPCODL/TPWODL/TPNODL/TPSODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

#### **10. INSPECTION AFTER RECEIPT AT STORE:**

The material received at TPCODL/TPWODL/TPNODL/TPSODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.


#### **11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 18 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

The bidder shall further be responsible for ' free replacement' for another period of THREE years from the end of gurantee period for any 'latent defects' if noticed by the company.

#### **12. PACKING AND TRANSPORT:**

Bidder shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be taken at

	<p><b>Specification No:</b> ENG-EHV-1021</p> <p><b>Specification Name:</b> Technical Specification for 33KV Lightning Arrester (10 KA)</p>
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site. The material should be packed in vertical position in individual box in such a way that the shape of rain shed does not get deformed during transportation and storage.

**13. TENDER SAMPLE:**

NA

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Bidder shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

**16. MANUFACTURING FACILITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

The successful bidder will have to submit technical compliance document and drawing as per RC line items for getting approval before mass manufacturing.

Manufacturing shall start only after getting CAT-B approved drawings or as per intimation from TPCODL/TPWODL/TPNODL/TPSODL.

**17. SPARES, ACCESSORIES AND TOOLS**


Spares:Not applicable.

**Service Level Agreement**

- In case of any failure vendor shall report to site, within 24 hours of receipt of reporting of failure occurrence.
- Vendor shall provide detailed root cause analysis of the fault within 15 days from the date of occurrence of the fault/ failure.
- Any spare part replacement, testing and its commissioning to be done by the vendor only, without any price implication to the purchaser.

**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be prepared based on

	<b>Specification No:</b> ENG-EHV-1021  <b>Specification Name:</b> Technical Specification for 33KV Lightning Arrester (10 KA)
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TPCODL/TPWODL/TPNODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

- a) Completely filled in Technical Particulars
- b) General description of the equipment and all components including brochures
- c) General arrangement drawing for Surge Arrestor (SA)
- d) Bill of material
- e) Experience List
- f) Type test certificates

**Drawings / documents to be submitted after the award of the contract are as under:**

**List of Drawings/Parameters to be submitted:**

S.No.	Description	For Approval	For Review Information	For Final Submission
1	Technical Particulars	✓	✓	✓
2	General Arrangement drawings including cross sectional view, mounting arrangement, Zno Block drawing, Surge Counter drawing, Name plate along with detailed Bill of Material)	✓	✓	✓
3	Terminal and Connection Drawing	✓	✓	✓
4	Manual/catalogue	✓	✓	✓
5	Installation/Commissioning Manuals	✓	✓	✓
6	Instruction for use	✓	✓	✓
7	Transport / Shipping dimension drawing	✓	✓	✓
8	QA & QC Plan	✓	✓	✓
9	Routine, Acceptance and Type Test Certificates	✓	✓	✓

**Additional Documents to be submitted:**

- a) List of raw materials as well as bought out accessories and the names of sub-suppliers selected from those furnished along with offer.
- b) Type test certificates of the raw materials and bought out accessories.
- c) The successful Bidder shall submit the routine test certificates of bought out accessories and central excise passes for raw material at the time of routine testing.

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all relevant drawings/parameters/calculation to TPCODL/TPWODL/TPNODL/TPSODL for approval.





**Instruction Manuals:**

Bidder shall furnish softcopies of nicely bound manuals (In English language) covering erection and maintenance instructions and all relevant information and drawings

pertaining to the main equipment as well as auxiliary devices.

**19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS:**

GENERAL TECHNICAL PARTICULARS			
SL. NO.	TECHNICAL PARTICULARS	SM Class (Class-III)	SL Class (Class-II)
1	Installation		
2	Reference standards (Latest Amend.)		
3	Arrester Type and Housing		
4	Normal System Voltage		
5	Highest System Voltage		
6	Rated Frequency		
7	Maximum Continuous Operating Voltage (M.C.O.V)		
8	Arrester Rating		
9	<b>Discharge Current</b>		
a	Nominal Discharge Current		
b	Switching impulse discharge current		
10	Short Circuit rating		
11	<b>Voltage Withstand on Arrester Housing</b>		
a	Standard rated short duration Power Frequency withstand Voltage (Dry/Wet) as per IS:2165		
b	Standard rated Lightning Impulse withstand Voltage (Peak in kV)		
12	Lightning Impulse Protection Level (at 10kA)		
13	<b>Long Duration Current</b>		
a	Peak Current		
b	Virtual duration of Peak T		
14	High Current impulse Operating Duty		
15	Creepage Distance of Arrester Housing		
16	Partial Discharge at 1.05 times M.C.O. V		
17	Energy Absorption capacity (KJ/KV)		
18	Repetitive charge transfer withstand (coloumbs),Qrs		
19	<b>Temporary over voltage (TOV)</b>		
a	1 sec		
b	10 sec		
20	<b>Maximum Lightning Impulse Residual voltage with 8/20 microsecond wave</b>		

   	<b>Specification No:</b> ENG-EHV-1021  <b>Specification Name:</b> Technical Specification for 33KV Lightning Arrester (10 KA)
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a	at 5kA		
b	at 10kA		
c	at 20kA		
21	Maximum switching current impulse residual voltage in kVP at 500 A		
22	Max. Cantilever Strength		
23	Total height of the arrester		
24	Total weight of the arrester		
25	No. of Metal oxide blocks in arrester		
26	Rating of individual ZnO blocks used for assembly		
27	Power Losses of the Arrester in watt		
28	Type of Mounting		
29	Material of Insulating base		
30	Insulating Terminal Cap	Polyolefin	
31	Material of Nuts and bolts	Stainless Steel	

**20. SCHEDULE "B" DEVIATIONS:**

**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

SL. No	Clause No.	Details of deviation with justifications

~~We confirm that there are no deviations apart from those detailed above.~~

Seal of the Company:

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1036**

**Specification Name : Technical Specification for 33KV Polymeric Disc Insulator (90KN & 120KN)**

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
BARSHA BANDITA	ASMITA JENA	JYOTIPRAKASH MOHANTY	Vijender Goyal	KHAJAN BHARDWAJ	POURUSH GARG
TPCODL	TPNODL	TPWODL	TPSODL	TPCODL	TPCODL
18-03-2023	21-03-2023	31-03-2023	06-04-2023	26-04-2023	26-04-2023

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## **CONTENTS**

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

## 1. SCOPE

This specification covers the technical requirements of design, manufacture, performance, testing at manufacturer's works, packing & forwarding, supply and unloading at store/ site, performance of 33 kV Ball and Socket Disc Polymer Insulator complete with all the accessories for trouble free and efficient performance.

## 2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

Ref. IS/IEC	Description
IEC:61109	Definition, test methods and acceptance criteria for composite insulators for A.C. overhead lines above 1000V.
IS:2071/ IEC:60060-1	Methods of High Voltage Testing.
IS:2486/ IEC:60120/ IEC:60372	Specification for Insulator fittings for Overhead Power Lines with a nominal voltage greater than 1000V.  Ball and socket couplings of string insulator units –Dimensions  Locking devices for ball and socket couplings of string insulator units - Dimensions and tests
IEC:60575	Thermal-mechanical performance test and mechanical performance test on string insulator units.
IS: 13134/ IEC: 60815	Guide for the selection of insulators in respect of polluted condition.
IEC: 60433	Insulators for overhead lines with a nominal voltage above 1000 V - Ceramic insulators for AC systems - Characteristics of insulator units of the long rod type.
STRI guide 1.92/1	Hydrophobicity Classification Guide.
IS:8263/ IEC:60437	Methods of RI Test of HV Insulators.
IS:4759	Hot dip zinc coatings on structural steel & other allied products.
IS:2629	Recommended practice for Hot Dip galvanization for iron and steel
IS:6745	Method for determination of mass of zinc coating on zinc coated iron and steel articles.
IS:3203	Methods of testing of local thickness of electroplated coatings.



Ref. IS/IEC	Description
IS:2633	Testing of Uniformity of coating of zinc coated articles.
ASTM D 578-05	Standard specification for glass fiber standards.
IS:4699	Refined secondary zinc

### 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL.NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

TPCODL/TPNODL/TPSODL/ TPWODL service area **has heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph.** The atmosphere is generally laden with mild acid, dust in suspension during the dry months, and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

- i) The Composite insulators will be used on 33kV lines on which the conductor will be ACSR/AAAC of sizes 148 & 232 Sq.mm. The insulators should withstand the conductor tension, the reversible wind load as well as the high frequency vibrations due to wind. Insulator shall be suitable for moderately to heavily polluted, Humid & High saline atmosphere.
- ii) Bidder must be indigenous manufacturer and supplier of Composite insulator of rating 33kV or above or must have developed proven in house technology and manufacturing process for composite insulators of above rating or possess technical collaboration/association with the manufacturer of composite insulators of rating 33kV or above. The Bidder shall furnish necessary evidence in support of the above along with the bid which can be in the form of certification from Utilities concerned, or any other documents to the satisfaction of the Owner.
- iii) Insulators shall be suitable for Strain type of load and shall be of B&S type. The diameter of Composite Insulator shall be as per technical specification.
- iv) Insulators shall have sheds with good self-cleaning properties. Insulator shed profile, spacing, projection etc. and selection in respect of polluted conditions shall be generally in accordance with the commendation of IEC- 60815/ IS: 13134.
- v) The tolerances on all dimensions e.g. diameter, length and creepage distance shall be allowed as follows in line with-IEC 61109:
  - ± (0.04d + 1.5) mm when d ≤ 300 mm
  - ± (0.025d+6) mm when d > 300 mm

Where, d being the dimensions in millimetres for diameter, length or creepage distance as the case may be. **However, no negative tolerance shall be applicable to creepage distance.**
- vi) The composite insulators including the end fitting connection shall be standard design suitable for use with the hardware fittings of any make conforming to relevant IEC/IS standards.
- vii) All surfaces shall be clean, smooth, without cuts, abrasions or projections. No part shall be subjected to excessive localized pressure. The insulator and metal parts shall be so designed and manufactured that it shall avoid local corona formation and not generate any radio interference beyond specified limit under the operating conditions.
- viii) The composite insulators offered shall be suitable for use of hotline maintenance technique so that usual hot line operation can be carried out with ease, speed and safety.

SL. No.	TECHNICAL PARTICULARS	DESIRED VALUE	
		33 kV 90 KN	33 kV 120 KN
1	Type of Insulator	Polymeric B&S	Polymeric B&S
2	Standard according to which the insulators manufactured and tested.	IEC 61109	IEC 61109
3	Name of material used in manufacture of the insulator with class/grade)	High voltage grade Silicone rubber Wacker-Germany, Dow Corning-USA	High voltage grade Silicone rubber Wacker-Germany, Dow Corning-USA
(a)	Material of core (FRP rod) (I) E-glass of ECR-glass.	ECR or BORRON FREE	ECR or BORRON FREE
(b)	Material of housing weather sheds (silicon content)	Silicon content of minimum 40% by weight	Silicon content of minimum 40% by weight
(c)	Material of end fittings	MCI/SGI/Forged Steel	MCI/SGI/Forged Steel
(d)	Sealing compound for end fittings	RTV SILICON	RTV SILICON
4	Colour	GREY	GREY
5	Electrical characteristics		
(a)	Nominal system voltage	33 kV	33 kV
(b)	Highest system voltage	36 kV	36 kV
(c)	Dry Power frequency withstand voltage	105 kV	105 kV
(d)	Wet Power frequency withstand voltage	75 kV	75 kV
(e)	Dry flashover voltage	>105 kV	>105 kV
(f)	Wet flash over voltage	>75kV	>75kV
(g)	Dry lighting impulse withstand voltage		
	(a) Positive	170 kVp	170 kVp
	(b) Negative	180 kVp	180 kVp
(h)	Dry lighting impulse flashover voltage		
	a) Positive	180kVp	180kVp
	b) Negative.	190kVp	190kVp
(i)	FRP rod leakage current at 175 V/mm	< 0.05 mA	< 0.05 mA
(j)	RIV at 1 MHz when energized at 10 kV/30kV (rms) under dry condition.	< 70 microvolt	< 70 microvolt
(k)	Creepage distance (Min.)	900 MM	900 MM
6	Minimum failing load.	90 KN	120 KN
7	<b>Dimensions of insulator</b>		
(i)	Weight	1.6 kg	1.8 kg
(ii)	Dia of FRP rod	16 mm	20 mm
(iii)	Length of FRP rod	440 mm	440 mm
(iv)	Dia of weather sheds	≥100 mm	≥100 mm
(v)	Thickness of housing	3 mm	3 mm
(vi)	Dry arc distance Dimensioned drawings of insulator (including weight with tolerances in weight)	380 mm	380 mm

SL. No.	TECHNICAL PARTICULARS	DESIRED VALUE	
		33 kV 90 KN	33 kV 120 KN
8	Method of fixing of sheds to housing (specify). Single mould or Modular construction (injection moulding/compression)	Injection Moulding	Injection Moulding
9	Type of sheds	Aerodynamic	Aerodynamic

## 5. GENERAL CONSTRUCTIONS:

Composite Insulators shall be designed to meet the light quality, safety and reliability and are capable of withstanding a wide range of environmental conditions. Polymeric Insulators shall consist of THREE parts, at least two of which are insulating parts:

- (a) Core- the internal insulating part
- (b) Housing- the external insulating part
- (c) Metal end fittings.

### 5.1 CORE

It shall be a glass-fiber reinforced epoxy resin rod of high strength (FRP rod). Glass fibers and resin shall be optimized in the FRP rod. Glass fibers shall be Boron free electrically corrosion resistant (ECR) glass fiber and shall exhibit both high electrical integrity and high resistance to acid corrosion. The matrix of the FRP rod shall be Hydrolysis resistant. The FRP rod shall be manufactured through Pultrusion process. The FRP rod shall be void free. Electrically Corrosion Resistant (ECR) grade fiber glass reinforced plastic (FRP) rod having at least 80% fibres by weight.

### 5.2 POLYMER HOUSING:

The FRP rod shall be covered by a seamless sheath of high voltage grade Silicone rubber housing of thickness 3mm minimum. It shall be one- piece housing using only Injection Moulding process to cover the core. The housing shall be designed to provide the necessary creepage distance and protection against environmental influences, external pollution and humidity. Housing shall conform to the requirements of IEC 60815 with latest amendments. All surfaces shall be clean, smooth, without cuts, abrasions or projections. No part shall be subjected to excessive localized pressure. The insulator and metal parts shall be so designed and manufactured that it shall avoid local corona formation and not generate any radio interference beyond specified limit under the operating condition. It shall be extruded or directly moulded on core and shall have chemical bonding with the FRP rod. The strength of the bond shall be greater than the tearing strength of the polymer. Sheath material in the bulk as well as in the sealing / bonding area shall be free from voids.

### 5.3 WEATHERSHEDS

The composite polymer weathersheds made of high voltage grade Silicone rubber polymer shall be moulded as part of the sheath and shall be free from imperfections. It should protect the FRP rod against environmental influences, external pollution and humidity. The weathersheds should have **silicon content of minimum 40% by weight**. The strength of the weather shed to sheath interface shall be greater than the tearing strength of the polymer. The interface, if any, between sheds and sheath (housing) shall be free from voids. Housing and weathersheds material shall have tensile strength of 3 Mpa with 400% elongation minimum and tear strength of 16 N/mm.

### 5.4 HARDWARE FITTINGS:

- a) End fitting transmit the mechanical load to the core. They shall be made of spheroidal graphite cast iron, malleable cast iron or forged steel or aluminium alloy. Metal end fitting shall be suitable for Ball and socket type hardware of respective specified mechanical load and shall be hot dip galvanized in accordance with IS 2629.
- b) They shall be connected to the rod by means of a controlled compression technique. The material used in fittings shall be corrosion resistant. As the main duty of the end fittings is the transfer of mechanical loads to the core the fittings should be properly attached to the core by a coaxial or hexagonal compression process & should not damage the individual fibers or crack the core.
- c) The gap between fittings and sheath shall be sealed by flexible silicone elastomeric compound or silicone alloy compound sealant, system of attached of end fitting to the rod shall provide superior sealing performance between housing, i.e. seamless sheath and metal connection. The sealing must be moisture proof.
- d) The dimensions of end fittings of insulators shall be in accordance with the standard dimensions stated in IEC: 60120/IS: 2486 - Part-II.
- e) Outer portion of ball or socket should be Zinc sleeved with minimum 99.95% purity of Electrolytic high grade zinc.
- f) **Ball pin and socket couplings:** Ball pin and socket shall be of forged steel and dimensions are as specified in IS 2486 (Part-2). Insulator metal caps shall be made of malleable cast iron conforming to IS 14329.
- g) **Locking device of the coupling:** The security clips to be used as a locking device for ball and socket coupling shall be 'R' shaped hump type or 'W' type as per IS 2486. The locking device shall be resilient, corrosion resistant, and of suitable mechanical strength. Material to be used for 'W' locking clip is phosphor bronze and for 'R' type locking clip is stainless steel. The hardness and temper of material are important for their satisfactory operation. The locking devices shall retain their ability after being operated from the locking to the

coupling position at least twenty times at normal temperature. They should be effective at the lowest temperature likely to be encountered in service. Socket for use with W-clips have the lower edge of the rectangular slot at the level of bottom of the socket. The slot is so shaped that it will accept the W-clip and retain it in two distinct positions when operated for coupling and locking. The shape of the W-clip is such that complete withdrawal when moving from the locking to the coupling position prevented.

- h) All ferrous parts shall be hot dip galvanized to give a minimum average coating of zinc equivalent to 705 gm/Sq.m, or 100mm min. thickness and shall be in accordance with the requirement of IS: 4759, The zinc used for galvanizing shall be of purity 99.5% as per IS: 4699. The zinc coating shall be uniform, adherent, smooth, reasonably bright continuous and free from imperfections such as flux, ash rust stains, bulky white deposits and blisters. Before ball fittings and galvanized, all die flashing on the shank and on the bearing surface of the ball shall be carefully removed without reducing the design dimensional requirements.

## 6. MARKING:

Each insulator shall be legibly and indelibly marked (embossing/engraved) to show the following:

- a) Name & Trade mark of the manufacturer
- b) Voltage Grade
- c) Year of manufacturing
- d) Minimum failing load in KN
- e) "TPCODL/TPNODL/TPWODL/TPSODL" Name should be mentioned on each insulator

## 7. TESTS

The bidder shall be required to submit complete set of the following test reports along with the offer: -

### 7.1 ACCEPTANCE TESTS

- i) Verification of dimensions
- ii) End Sealing test (FRP rod and Silicone rubber housing)
- iii) Visual examination (Free from voids, cavity, foreign particle and scratch/nick spot)
- iv) Mechanical performance Test
- v) Galvanizing Test
- vi) Mechanical Failing Load Test
- vii) Dry Power Frequency Withstand Voltage Test
- viii) Wet Power Frequency Withstand Voltage Test
- ix) Verification of the locking system or the tightness of the interface between end fitting and insulator housing

## 7.2 ROUTINE TESTS

- i) Visual examination (Free from voids, cavity, foreign particle and scratch/nick spot)
- ii) Mechanical Load test
- iii) Electrical Routine Test

## 7.3 TYPE TESTS

### A) For Insulators

- i) Dry Power Frequency Withstand Voltage Test
- ii) Dry Power Frequency Voltage Flashover Test
- iii) Dry lightning impulse withstand voltage test.
- iv) Wet Power Frequency Withstand Voltage Test
- v) Wet Power Frequency Voltage Flashover Test
- vi) Mechanical failing load test.
- vii) Salt fog test: On insulators for 1000 hr as per IEC
- viii) Galvanization test
- ix) Damaged Limit Proof Test
- x) Radio interference test.

### B) For Silicon rubber

- i) Tensile Strength
- ii) Elongation
- iii) Tear Strength
- iv) Inclined plane Tracking & Erosion resistance test
- v) Volume Resistivity
- vi) Dielectric constant
- vii) Dielectric Strength
- viii) Density
- ix) Hardness
- x) Arc Resistance
- xi) Silicone Content
- xii) Flammability
- xiii) Limiting oxygen index test
- xiv) Resistance to weathering & UV.
- xv) Specific gravity

**C) For FRP rods**

- i) Verification of dimensions
- ii) Specific Gravity
- iii) Glass Content
- iv) Water Diffusion Test
- v) Hardness
- vi) Dye Penetration Test
- vii) Flexural Strength
- viii) Brittle fracture resistance test.
- ix) Water Diffusion Test

**D) For End Fittings**

- i) Thickness of Zinc coating
- ii) Uniformity of Zinc Coating
- iii) Micro-structural of metal fitting

**8. TYPE TEST CERTIFICATES:**

The Bidder shall furnish the type test certificates of the for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA/Other Govt. Lab** as per the relevant IS/IEC. For **High voltage Silicone rubber material used for Polymer housing** the test are conducted at **CIPET/CPRI** as per the relevant standards. TPCODL/TPWODL/TPNODL/TPSODL. TATA-POWER reserves the right to allow any other NABL accredited/ Govt. lab report under exceptional circumstances after due diligence/ scrutiny by DISCOM. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/TPNODL/TPWODL/TPSODL.

**9. PRE DISPATCH INSPECTION:**

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPWODL/TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPNODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPWODL/TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific



MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/ TPNODL/ TPWODL/ TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPWODL/TPSODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

#### 10. INSPECTION AFTER RECEIPT AT STORES:

The material received at TPCODL/TPNODL/TPWODL/TPSODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

#### 11. GUARANTEE:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 18 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

The bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of guarantee period for any 'latent defects' if noticed by the company.

#### 12. PACKING:

Supplier shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport and be packed in such a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly. All insulators shall be packed in strong corrugated box of min. 7 ply duly palette or wooden crates. The gross weight of the crates along with the material shall not normally exceed 100

Kg to avoid handling problem. The crates shall be suitable for outdoor storage under wet climate during rainy season. Each wooden case / crate / corrugated box shall have all the markings stencilled on it in indelible ink. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**~~13. TENDER SAMPLE:~~**

~~Bidder shall submit the sample of material during submission of Bids.~~

**14. QUALITY CONTROL:**

The bidder shall submit with the offer Quality Assurance Plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections. The bidder shall ensure that the material supplied is as per the Guaranteed Technical Particulars as specified in the specifications.

**15. TESTING FACILITIES:**

Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

**16. MANUFACTURING ACTIVITIES:**

The bidder shall get the approved drawing and GTP before start of manufacturing activity. The successful bidder will have to submit details of the offered design & components for approval as per specification. CAT-A/CAT-B is mandatory to start manufacturing.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

**18. DRAWINGS AND DOCUMENTS**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled-in clause wise compliance of the specification
- b) Schedule "B" Deviations
- c) Work Experience details
- d) Type test certificates.
- e) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.

**19. SCHEDULE- “A” GUARANTEED TECHNICAL PARTICULARS**

Bidder to submit completely clause wise compliance of this specification

**~~20. SCHEDULE “B” DEVIATIONS:~~**

**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-GEN-4004**

**Specification Name : AAAC CONDUCTOR- 100,148, 232 Sq.mm**

<b>JYOTIPRAKASH MOHANTY</b>	<b>SATYA PRASAD NAYAK</b>	<b>Vijender Goyal</b>	<b>SHANTAPRIYA JENA</b>	<b>ANUP JAWASE</b>	<b>VARUN BHATNAGAR</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPWODL	TPCODL	TPSODL	TPNODL	TPWODL	TPWODL
02-01-2023	03-01-2023	03-01-2023	03-01-2023	03-01-2023	04-01-2023

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TPWODL*



**Specification No:** [ENG-GEN-4004](#)

**Specification Name:**  
SPECIFICATION FOR AAAC CONDUCTOR- 100,148,  
232 Sq.mm

## **CONTENTS**

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING FACILITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

**1. SCOPE:**

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at site/store and performance of AAAC Conductors(100 Sq.mm,148 Sq.mm,232 Sq.mm) with all accessories and necessary training for trouble free & efficient performance.

**2. APPLICABLE STANDARDS:**

AAAC Conductors covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with latest revisions of relevant Indian Standards/ IEC and shall conform to the regulations of local statutory authorities.

SI. No	IEC/IS	Description
1	IEC :1089	Round wire concentric lay overhead electrical standard Conductor
2	IS 398:4	Aluminum Alloy Stranded Conductors
3	IS 9997	Aluminum Alloy redraw rods for electrical purposes
4	IEC 502: 1994	Extruded solid dielectric insulated power cables for rated voltages 1.0 kV up to 30 kV
5	IEC 104	Aluminum Magnesium Silicon alloy wire for overhead line conductors
6	IS 1778	Reels and drums of bare conductor.

**3. CLIMATIC CONDITIONS:**

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%



Specification No: [ENG-GEN-4004](#)

Specification Name:  
SPECIFICATION FOR AAAC CONDUCTOR- 100,148,  
232 Sq.mm

5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1200m
8	Wind Pressure	300 Km/hr.
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/TPNODL/TPSODL/TPWODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Kmph. The atmosphere is generally laden with mild acid, dust in suspension during the dry months, and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

The wires shall be of heat-treated aluminum, magnesium silicon alloy containing approximately silicon-0.5 to 0.9 %, magnesium-0.6 % to 0.9%, Fe-0.5% (maximum), Copper- 0.1% (max), Mn-0.03%, Cr-0.03%, Zn-0.1%, B-0.06%, and having the mechanical and electrical properties specified in the table and be smooth and free from all imperfections, such as, spills, splits and scratches. Neutral grease shall be applied between the layers of wires. The drop point temperature of the grease shall not be less than 120°C.

SL. NO.	TECHNICAL PARTICULARS	UNIT	DOG (100Sq.mm) (7 / 4.26mm)	COYOTE (148 Sq.mm) (19 / 3.15mm)	PANTHER (232 Sq.mm) (19 / 3.94mm)
1	Make				
a)	Aluminium Alloy rod		HINDALCO/BALCO/ VEDANTA/ NALCO		
b)	Conductor		Name of Company		
2	Type	No/mm	7 / 4.26	19 / 3.15	19 / 3.94
3	Particulars of Raw material				
a)	Si	%	0.50 - 0.90	0.50 - 0.90	0.50 - 0.90
b)	Mg	%	0.60-0.90	0.60-0.90	0.60-0.90
c)	FE	%	0.50 max	0.50 max	0.50 max
d)	Cu	%	0.10 max	0.10 max	0.10 max
e)	Mn	%	0.03 max	0.03 max	0.03 max

f)	Cr.	%	0.03 max	0.03 max	0.03 max
g)	Zn	%	0.10 max	0.10 max	0.10 max
h)	B	%	0.06 max	0.06 max	0.06 max
i)	Other Elements (Each)	%	0.03 max	0.03 max	0.03 max
j)	Other Elements (Total)	%	0.10 max	0.10 max	0.10 max
k)	Aluminium	%	Remainder	Remainder	Remainder
4	Aluminium Alloy wire Strands				
i	Diameter (mm)				
a)	Normal	mm	4.26	3.15	3.94
b)	Maximum	mm	4.3	3.18	3.98
c)	Minimum	mm	4.22	3.12	3.90
ii	Cross Section Area of Nominal dia. wire	Sq. mm	14.25	7.79	12.19
iii	Minimum Breaking Load of each strand after stranding	KN	4.18	2.29	3.58
iv	Minimum elongation % on gauge length of 200 mm (After Strand)	%	4	4	4
v	Max. Resistance at 20 Deg.C	Ohm/ KM	2.345	4.290	2.746
5	AAAC Stranded conductor		DOG	COYOTE	PANTHER
5.1	Nominal Sectional Area	sq. m	100	148	232
5.2	Overall Diameter	mm	12.78	15.75	19.70
5.3	Approx. Mass	Kg. /Km	272.86	406.91	636.67
5.4	Minimum Ultimate Breaking Load of Conductor	KN	29.26	43.5	68.05
5.5	Lay ratio of conductor (Min. / Max.)		10 / 14	10/16	10/16
5.6	Calculated Max. resistance of conductor at 20° C	Ohm/ Km.	0.3390	0.2290	0.1471
6	Standard length of conductor (meter)	Mtr.	2000	2000	2000
6.1	Continuous max. current carrying capacity in still air at 40°C ambient temperature	Amp	345(min)	447(min)	593(min)





Specification No: [ENG-GEN-4004](#)

Specification Name:  
SPECIFICATION FOR AAAC CONDUCTOR- 100,148,  
232 Sq.mm

6.2	Temperature rises for above current		35° C Over the ambient	35° C Over the ambient	35° C Over the ambient
6.3	Tolerance on standard length of Conductor (%)	%	±5		
6.4	Direction of lay for outside layer		Right Hand		
7	Modulus of Elasticity	Kg/cm <sup>2</sup>	0.6324 x10 <sup>6</sup> Kg/cm <sup>2</sup>	0.612 x106 Kg/cm2	
8	Joints- There shall be no joints in any wire of a stranded conductor containing continuation				
9	Co-efficient of liner expansion per deg. C	Per °C	23x10 <sup>-6</sup>		
10	Density of Material	Kg/cm <sup>3</sup>	2.7		

Maximum resistance values given have been calculated from the maximum values of the resistivity as specified and the cross-sectional area based on the minimum diameter. The minimum breaking load is calculated on nominal diameter at ultimate tensile strength of 0.3 09 KN / mm<sup>2</sup> for wire before stranding and 95% of the ultimate tensile strength after stranding.

#### 5. GENERAL CONSTRUCTION:

The conductors shall be constructed as per IS 398 (Part IV). The steel strands shall be uniformly grease coated as anti-corrosive agent in Dog, Coyote, Panther conductors. Neutral Lithium based Grease shall comply to IS 7623.

#### Lay Ratios for Aluminum Alloy Stranded Conductors

Number of Wires in Conductor	LAY RATIOS							
	3/6 Wire Layer		12 Wire Layer		18 Wire Layer		24 Wire Layer	
	Min	Max	Min	Max	Min	Max	Min	Max
7	10	14	---	---	---	---	---	---
19	10	16	10	14	---	---	---	---



**Specification No:** [ENG-GEN-4004](#)

**Specification Name:**  
SPECIFICATION FOR AAAC CONDUCTOR- 100,148,  
232 Sq.mm

## 5.1 MATERIALS.

- 5.1.1 The materials shall be as per clause 4.0 & 6.0 of IS 398 (Part IV). The Aluminum conductor strands shall be drawn from 99.5% pure electrolytic EC grade Aluminum rods.
- 5.1.2 Aluminum raw material shall be procured from NALCO, BALCO, HINDALCO and VEDANTA only.
- 5.1.3 The galvanized steel wire shall be drawn from high carbon steel rods produced by either acid or base open-hearth process, electric furnace or basic oxygen process.
- 5.1.4 Steel raw material shall be from Tata Steel, Jindal steel, SAIL, JSW only
- 5.1.5 Grease shall be from BPCL, HPCL, Balmer Lawrie only

## 5.2 SURFACE CONDITION.

Surface conditions of the conductor shall be generally as per clause 7.0 of IS 398 (Part IV). The wires used for standard conductor shall be smooth and free from imperfections, such as spills and split the conductor shall be free from points, sharp edges, abrasions and other departures from smoothness on uniformity of surface contour that would increase radio interference and corona losses. When subjected to tension up to 50% of the ultimate strength of the conductor, the surface shall not depart from the cylindrical form on any part of the compartment, parts or strands, more relative to each other in such a way as to get out of place and disturb the longitudinal smoothness of the conductor.

## 6. MARKING:

Each drum shall have the following information stenciled on it in indelible ink along with other essential data:

- a) Contract/Award letter number
- b) Name and address of consignee.
- c) Manufacture's name and address.
- d) Drum and lot number
- e) Size and type of conductor
- f) Length of conductor in meters
- g) Arrow marking for unwinding
- h) Position of the conductor ends
- i) Number of turns in the outer most layer.
- j) Gross weight of the drum after putting lagging.
- k) Average weight of the drum without lagging.

ISI mark Manufacturer Name/ Trade Mark

"TPCODL/TPNODL/TPSODL/TPWODL" P.O No and Date



Specification No: [ENG-GEN-4004](#)

Specification Name:  
SPECIFICATION FOR AAAC CONDUCTOR- 100,148,  
232 Sq.mm

## 7. TESTS:

The bidder shall be required to submit complete set of the following test reports along with the offer:

### 7.1 ACCEPTANCE TESTS: Acceptance Test on Finished Conductor

- i. Lay Ratio/Direction of the lay Mechanical Properties
- ii. Diameter
- iii. Breaking Load / Tensile Test
- iv. Resistance
- v. Wrapping Test
- vi. Elongation
- vii. Density Test (using Hygrometer)

### 7.2 ROUTINE TESTS

- i. Check for Joints
- ii. Surface Condition of the strand and stranded conductor
- iii. All acceptance tests
- iv. Check the drum

### 7.3 TYPE TESTS

Type Test of Finished Conductor

- i) UTS test on stranded conductor Mechanical Properties
- ii) DC resistance test on stranded conductor

## 8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ ERDA/ Approved Govt. Labs by TATA ODISHA DISCOM** as per relevant IS. Type tests should have been conducted during the period not exceeding 10 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e., any test report not acceptable, same shall be carried out without any cost implication to TPCODL/TPNODL/TPSODL/TPWODL.

## 9. PRE-DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL or its authorized representatives shall not



**Specification No:** [ENG-GEN-4004](#)

**Specification Name:**  
SPECIFICATION FOR AAAC CONDUCTOR- 100,148,  
232 Sq.mm

relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPSODL/TPWODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL
- c) TPCODL/TPNODL/TPSODL/TPWODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

#### **10. INSPECTION AFTER RECEIPT AT STORE:**

The material received at TPCODL/TPNODL/TPSODL/TPWODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

#### **11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements). Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed period, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be. Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.

#### **12. PACKING AND TRANSPORT:**

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. Standard Length of the conductors is 2000 Mtrs. / as per PO terms and conditions. The bidder shall provide



Specification No: [ENG-GEN-4004](#)

Specification Name:  
SPECIFICATION FOR AAAC CONDUCTOR- 100,148,  
232 Sq.mm

instructions regarding handling and storage precautions to be taken at site.

**~~13. TENDER SAMPLE:~~**

~~Bidder shall submit the sample of 1 mtr. material during the tender evaluation process with the offer.~~

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars & Schedule "B" Deviations
- b) Work Experience details
- c) Type test certificates.
- d) Drawing 1 Set of Hard Copy & Soft Copy PDF File containing complete information about manufacturing.

**19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS: To Be Furnished by Bidder**


SL. NO	TECHNICAL PARTICULARS	UNIT	DOG (100 Sq.mm) (7 / 4.26mm)	COYOTE (148 Sq.mm) (19 / 3.15mm)	PANTHER (232 Sq.mm) (19 / 3.94mm)
<b>1</b>	<b>Make</b>				
a)	Aluminium Alloy rod				
b)	Conductor				
<b>2</b>	<b>Type</b>	No/mm			
<b>3</b>	<b>Particulars of Raw material</b>				
a)	Si	%			
b)	Mg	%			
c)	FE	%			
d)	Cu	%			
e)	Mn	%			
f)	Cr.	%			
g)	Zn	%			
h)	B	%			
i)	Other Elements (Each)	%			
j)	Other Elements (Total)	%			
k)	Aluminium	%			
<b>4</b>	<b>Aluminium Alloy wire Strands</b>				
i	Diameter (mm)				
a)	Normal	mm			
b)	Maximum	mm			
c)	Minimum	mm			
ii	Cross Section Area of Nominal dia wire	Sq. mm			
iii	Minimum Breaking Load of each strand after stranding	KN			
iv	Minimum elongation % on gauge length of 200 mm (After Strand)	%			



Specification No: [ENG-GEN-4004](#)

Specification Name:  
SPECIFICATION FOR AAAC CONDUCTOR- 100,148,  
232 Sq.mm

v	Max. Resistance at 20 Deg.C	Ohm/ KM			
<b>5</b>	<b>AAAC Stranded conductor</b>				
5.1	Nominal Sectional Area	sq. m			
5.2	Overall Diameter	mm			
5.3	Approx. Mass	Kg. /Km			
5.4	Minimum Ultimate Breaking Load of Conductor	KN			
5.5	Lay ratio of conductor ((Min. / Max.)				
5.6	Calculated Max. resistance of conductor at 20° C	Ohm/ Km.			
<b>6</b>	Standard length of conductor (meter)	Mtr.			
6.1	Continuous max. current carrying capacity in still air at 40°C ambient temperature	Amp			
6.2	Temperature rises for above current				
6.3	Tolerance on standard length of Conductor (%)	%			
6.4	Direction of lay for outside layer				
<b>7</b>	<b>Modulus of Elasticity</b>	GN/Mtr <sup>2</sup>			
8	Joints-- There shall be no joints in any wire of a stranded conductor containing continuation				
9	Co-efficient of liner expansion per deg. C	°C			

	<b>Specification No:</b> <a href="#">ENG-GEN-4004</a>  <b>Specification Name:</b> SPECIFICATION FOR AAAC CONDUCTOR- 100,148, 232 Sq.mm
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10	Density of Material	Kg/ cm3	
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~~**20. SCHEDULE “B” DEVIATIONS:**~~

~~**(TO BE ENCLOSED WITH TECHNICAL BID)**~~

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

~~Signature~~

~~Designation~~



# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1015**

**Specification Name : Technical Specification for 33kV and 11kV Outdoor Current Transformer**

<b>SWARUP NAYAK</b>	<b>Jyoti Ranjan Sahu</b>	<b>JYOTIPRAKASH MOHANTY</b>	<b>SHANTAPRIYA JENA</b>	<b>KHAJAN BHARDWAJ</b>	<b>POURUSH GARG</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPCODL	TPSODL	TPWODL	TPNODL	TPCODL	TPCODL
11-01-2023	13-01-2023	16-01-2023	18-01-2023	21-01-2023	31-01-2023

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**Specification No:** ENG-EHV-1015

**Specification Name:** Technical Specification for 33kV and 11kV Outdoor Current Transformer

## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SAMPLE DRAWINGS
20. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
21. SCHEDULE "B" DEVIATIONS



**Specification No:** ENG-EHV-1015

**Specification Name:** Technical Specification for 33kV and 11kV Outdoor Current Transformer

### 1. SCOPE

This specification covers the technical requirements of design, manufacture, testing at manufacturers works, packing, forwarding, supply and unloading at store/site of 11KV & 33 KV Outdoor Current Transformer complete with all accessories for efficient and trouble free operation of rating.

### 2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, constructed and tested in accordance with latest revisions of relevant Indian/IEC/other applicable standards shall confirm to the regulations of local statutory authorities.

IS 2705-1992/IEC 60044-1	Specification for Current Transformer
IS 5621-1980	Specification for Hollow insulator for use in Electrical Equipment
IS 2099-1986	Specification of Bushings for AC Voltage above 1000 Volts
IS 335-1983	Specification for new insulation oil
IS 11322-1985	Method for partial discharge measurement in instrument transformer
IS 8603-2008	Dimensions for Porcelain Transformer Bushing for use in heavily polluted atmosphere.

### 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g



**Specification No:** ENG-EHV-1015

**Specification Name:** Technical Specification for 33kV and 11kV Outdoor Current Transformer

10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)
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TPCODL/TPNODL/TPSODL/TPWODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS

GENERAL TECHNICAL REQUIREMENTS									
S.	Description	As specified by TPCODL/TPNODL/TPSODL/TPWODL							
1	Service	33 KV				11 KV			
2	Rated voltage	36 KV				12 KV			
3	Rated	50 Hz				50 Hz			
4	Rated Lightning	170 KVp				75 KVp			
5	Rated primary	800-400-200 A				800-400-200 A			
6	Rated Power frequency dry	70 kV rms				28 KV rms			
7	Rated Power frequency Wet	70 kV rms				28 KV rms			
8	Transformation Ratio (CT)	800-400-200/1-1-1A				800-400-200/1-1-1A			
9	Rated continuous	1.2 times of primary current				1.2 times of primary current			
10	Short time thermal	25 kA for 3 sec				25 kA for 3 sec			
11	Rated dynamic	2.5 times of short time thermal current rating				2.5 times of short time thermal current rating			
12.	Core details	Core-1	Core-	Core-		Core-1	Core-2	Core-3	
12.	Accuracy	PS	0.2s	5P20		PS	0.2s	5P20	
12.	Rated burden	---	30VA	30VA		---	30VA	30VA	
12.3	Knee point voltage (Vk) min.	> 500V at 400/1	---	---		> 500V at 400/1	---	---	
12.4	Resistance of Secondary winding,	<6				<6			



**Specification No:** ENG-EHV-1015

**Specification Name:** Technical Specification for 33kV and 11kV Outdoor Current Transformer

12.5	Maximum Exciting Current mA at $V_k/2$	<30mA				<30mA			
12.6	Instrument security factor		<5				<5		
13	Tan Delta Value	Shall be within 0.7% for new and shall remain less than 1% for at least 5 years							
14	Limits of Current (ratio) Error and phase displacement for metering purpose	IS Per IS 2705							
15	Limits of Current (ratio) Error and phase displacement for protection core	Ratio error +/-1% and Phase displacement +/-60deg							
16	Limits of Current (ratio) Error for PS class	Ratio error +/- 0.25%							
17	Maximum temperature rise over ambient temperature	55 deg C as per IS 2705-1							
18	Minimum creepage for HT bushing	25 mm/ KV							
19	Gauge of the tank	3 mm							

20	Dimension of CT Base LXB Hole Centre-Centre Distance (mm)	450 X 450	310 X 310
21	Oil Details		
a	BDV of Oil (KV)		
b	Standard of oil		
c	Color of oil		
d	Qty of oil (L)		
22	Bushing details:		
a	Make		
b	IS standards		
c	Total creepage (mm)		

## 5. GENERAL CONSTRUCTIONS

### 5.1 CURRENT TRANSFORMER

Design and construction of current transformer shall be sufficient to withstand the thermal and mechanical stresses resulting from the specified short circuit currents. The core lamination shall be of high grade steel or other equivalent alloy. The exciting current shall be as low as possible and the current transformer shall be capable of maintaining its rated accuracy for burden and saturation limits specified in the technical requirement.

Current transformers shall be of dead tank design. The tank material shall be made of GI with 3 mm thickness and painted. The current transfer area of the terminals shall be adequate enough to meet the temperature rise requirements as per IS: 2705. CT shall be supplied complete with required quantity of insulating oil for installing at site. The insulating oil shall comply to IS: 335. P1 and P2 markings shall be permanently riveted. The alignment and center line of CT primary terminals shall be correct so as to avoid bending connections. The primary terminals of CT shall be of silver coated / tinned Copper.

Current transformers shall be provided with a capacitance test tap in the HV lead to enable future monitoring of conditions of HV insulation. Suitable earthing arrangement to be provided for the tap point. Current transformers shall be provided with nameplate showing the particulars and diagram of the connections. CTs shall be provided with suitable lifting arrangement on all the sides.



**Specification No:** ENG-EHV-1015

**Specification Name:** Technical  
Specification for 33kV and 11kV Outdoor Current  
Transformer

CT characteristics shall be such as to provide satisfactory protection for burdens ranging from 25% to 100% of rated burden in case of metering CTs and up to the accuracy limit factor/ knee point voltage in case of protective CTs. CTs shall be complete with accessories such as grounding lugs, filing and drain plugs, oil sight glass (prismatic type), weather proof terminal box, wedge type terminal connector etc.

## 5.2 TERMINAL BOX

The secondary terminals shall be brought in a weather proof terminal box (IP-55). The terminal box shall be provided with glands suitable, steel wire armored and PVC sheathed multicore 6 sq. mm. stranded copper conductor cables. For Tan Delta testing separate terminals shall be provided in the terminal box. The value of Tan Delta test shall be within 0.7% for new CTs and shall remain less than 1% for at least 5 years and if the said criterion is not fulfilled than the Bidder shall be liable to replace the CTs without any additional cost to the purchaser. Polarity marks shall be indelibly marked on the primary terminals of the current transformer and on the secondary lead at the associated terminal block. Suitable facility shall be provided for short circuiting and grounding the CT secondary at the terminal blocks.

## 5.3 BUSHINGS

Bushings shall be made of homogeneous, vitreous, porcelain of high mechanical and dielectric strength. Glazing of porcelain shall be of uniform brown or dark color, with a smooth surface arranged to shed away rain water. Suitable arrangement shall be provided for indicating oil level. The bushings shall be of Oil filled condenser type. Oil filled bushings shall be hermetically sealed to prevent ingress of moisture. Cast metal and caps for bushing shall be of high strength, hot dip galvanized malleable iron. They shall have smooth surface to prevent discharge taking place between the metal parts and porcelain as a result of ionization.

## 5.4 GROUNDING TERMINALS

Two grounding terminals shall be provided on the tank of current transformers on opposite sides, for connecting to station earth grid. Earthing terminal shall also be provided in the secondary junction box for earthing of secondary winding of CT. The earthing terminals shall be readily accessible and so placed that the earth connection of the current transformer is maintained even when the cover or any other movable part is removed. The earthing terminals shall be of adequate size, be protected against corrosion and shall be metallically clean. Under no circumstances shall a movable metal part of the enclosure be insulated from the part carrying the earthing terminal when the movable part is in place. The earthing terminal shall be identified by means of the symbol "⏚" marked in a legible and indelible manner on case or frame to be earthed; adjacent to the terminals.

## 5.5 TERMINAL CONNECTOR

Suitable bimetallic connector in scope of Bidder  
ACSR Zebra conductor used for 33KV equipment connection  
ACSR Panther conductor used for 11KV equipment connection.

## 5.6 PAINT

All interior and exterior of tanks, and other metal parts shall be thoroughly cleaned to remove all rust, corrosion, grease or other adhering foreign matter. All steel surfaces in contact with



**Specification No:** ENG-EHV-1015

**Specification Name:** Technical  
Specification for 33kV and 11kV Outdoor Current  
Transformer

insulating oil as far as accessible shall be painted with not less than two coats of heat resistant, oil insoluble, insulating varnish. Steel surfaces exposed to the weather shall be given a priming coat of zinc chromate and two coats of final paint of shade RAL 7032/ Shade 631 as per 15-5. All metal parts not accessible for painting shall be made of a corrosion resisting material. All machine finished or bright surfaces shall be coated with a suitable preventive compound and suitably wrapped, or otherwise protected. All paints shall be carefully selected to withstand tropical heat and extremes of weather. The paint shall not scale or wrinkle or to be removed by abrasion due to normal handling. Bolts and nuts exposed to the atmosphere shall be of hot dip galvanized steel.

## 6. NAME PLATE & MARKING

The equipment shall be provided with durable and legible name plate. A stainless steel rating plate, of at least 1 mm thickness, shall be fitted to each current transformer in a visible position and shall carry all the information as specified in the standards. The terminal markings shall also be in line with relevant standards. The letters on the rating plate shall be engraved black on the white/silver background. Fixing screws for outdoor use shall be of stainless steel or any other corrosion resistant metals. The Name plate shall be embossed with "PO no. with date" & "PROPERTY OF TPCODL/TPNODL/TPSODL/TPWODL".

The following information shall be mentioned on the Name Plate

- i) Manufacturer's name and Country
- ii) Type designation
- iii) Serial number
- iv) Month and Year of manufacture
- v) Rated primary and secondary current
- vi) Rated frequency
- vii) Highest system voltage
- viii) Rated insulation level
- ix) Rated short time thermal current
- x) Rated dynamic current
- xi) Rated output and corresponding accuracy class
- xii) Warrantee/guarantee clause
- xiii) PO no. & date
- xiv) "PROPERTY OF TPCODL/TPNODL/TPSODL/TPWODL"
- xv) Relevant standards

## 7. TESTS

All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components and fittings shall also be type tested as per the relevant standards. For Bushings all the tests as defined in IS 2099-1986 shall be conducted. For current transformers following tests shall be necessarily conducted in addition to the tests specified in IS/IEC:

### 7.1 ROUTINE TEST

- a) Verification of terminal marking and polarity
- b) Power frequency dry withstand tests on primary windings
- c) Power frequency dry withstand tests on secondary windings





**Specification No:** ENG-EHV-1015

**Specification Name:** Technical Specification for 33kV and 11kV Outdoor Current Transformer

- d) Over voltage inter-turn tests
- e) Partial discharge measurement
- f) Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class

Optional tests:

The following optional tests where applicable, shall be carried out by mutual agreement between the purchaser and bidder.

- g) Chopped lightning impulse test as a type test.

## 7.2 ACCEPTANCE TESTS

- i) Verification of terminal marking and polarity
- ii) Power frequency dry withstand tests on primary windings
- iii) Power frequency dry withstand tests on secondary windings
- iv) Over voltage inter-tum tests
- v) Partial discharge measurement
- vi) Determination of errors or others characteristics according to the requirements of the appropriate designation or accuracy class.
- vii) Tan Delta test as specified in Clause 4

All acceptance tests shall be witnessed by the Purchaser's or his authorized representative. The above mentioned test shall be made on the 100% of arresters to be supplied.

## 7.3 TYPE TEST

- a) Short time current tests
- b) Temperature rise test ,
- c) Lightning impulse test for voltage transformers for service in electrically exposed installation.
- d) High voltage power frequency wet withstand voltage tests on outdoor current transformers.
- e) Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.

## 8. TYPE TEST CERTIFICATES

The bidder shall furnish the type test certificates as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA as per the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable same shall be carried out without any cost implication to Purchaser.

## 9. PRE DISPATCH INSPECTION

Equipment shall be subject to inspection by a duly authorized representative of the Purchaser. Inspection may be made at any stage of manufacture at the option of the purchaser and the equipment if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to Purchaser's representatives at all times when the work is in progress. Inspection by the Purchaser or its



**Specification No:** ENG-EHV-1015

**Specification Name:** Technical  
Specification for 33kV and 11kV Outdoor Current  
Transformer

authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by the Purchaser.

Following documents shall be sent along with material :

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee/Warranty card
- g) Delivery Challan
- h) Other Documents (as applicable)

#### **10. INSPECTION AFTER RECEIPT AT STORES**

The material received at Purchaser store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering.

#### **11. GUARANTEE**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 60 months from the date of commissioning or 66 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs within the mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges ( @ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Company

#### **12. PACKING**

Bidder shall ensure that all equipment covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit.

#### **13. TENDER SAMPLE**

NA

#### **14. QUALITY CONTROL**

The bidder shall submit with the offer, quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and after finishing, bought out items and fully assembled component and equipment including

drives. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The purchaser's engineer or its nominated representative shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

**15. MINIMUM TESTING FACILITIES**

The Bidder shall have in house testing facilities for carrying out all routine tests and acceptance tests as per relevant international/Indian standards.

**16. MANUFACTURING ACTIVITIES**

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart shall be in line with the Quality assurance plan submitted with the offer. The bar chart will have to be submitted within 15 days from the release of the order.

**17. SPARES, ACCESSORIES AND TOOLS**

- 1) Double compression gland 25mm dia for each CT unit. (1 no's)
- 2) Suitable size lugs for each CT unit. (10 no's)

**18. DRAWINGS AND DOCUMENTS**

Following drawings and documents shall be prepared on Purchaser's specifications and statutory requirements and shall be submitted with the bid:

- a) Completely filled in Technical Particulars
- b) General arrangement drawing of the CT
- c) General arrangement drawing of Primary terminal assembly
- d) Terminal Block and connection drawing
- e) Foundation Plan and loading details
- f) General description of the equipment and all components with makes and technical requirement
- g) Type Test Certificate.
- h) Experience List.
- i) Manufacturing schedule and test schedule

Drawings/documents to be submitted after the award of the contract.

S.No.	Description	For Approval	For Review Information	For Final Submission
1	Technical Particulars	✓		✓
2	General Arrangement drawings	✓		✓
3	Terminal block and Connection Drawing	✓		✓

4	General arrangement drawing of Primary terminal assembly	✓		✓
5	Foundation Plan and loading details on Cantilever arrangement of CP	✓		✓
6	Manual/catalogue		✓	
7	Installation/Commissioning Manuals		✓	
8	Instruction for use		✓	
9	Transport I Shipping dimension drawing		✓	
10	QA & QC Plan	✓	✓	✓
11	Routine, Acceptance and Type Test Certificates	✓	✓	✓

All the Documents and Drawings shall be in English Language.

Instruction Manuals: Bidder shall furnish two (2) soft copies and Three (3) hard copies of nicely bound manual (in English Language) covering erection and maintenance instructions and all relevant information pertaining to the main equipment as well as auxiliary devices.

**19. SAMPLE DRAWING**

NA

**20. GUARANTEED TECHNICAL PARTICULARS**

GENERAL TECHNICAL REQUIREMENTS			
S.	Description	11kV	33kV
1	Service		
2	Rated voltage		
3	Rated		
4	Rated Lightning		
5	Rated primary current		
6	Rated Power frequency dry withstand voltage		
7	Rated Power frequency Wet withstand voltage		

8	Transformation Ratio (CT)								
9	Rated continuous thermal current								
10	Short time thermal current rating for 1 second								
11	Rated dynamic current								
12	Core details	Core-1	Core-2	Core-3		Core-1	Core-2	Core-3	
12.1	Accuracy class								
12.2	Rated burden								
12.3	Knee point voltage (Vk)								
12.4	Resistance of Secondary winding,								
12.5	Maximum Exciting Current mA at $V_k/2$								
12.6	Instrument security factor								
13	Tan Delta Value								
14	Limits of Current (ratio) Error and phase displacement for metering purpose								
15	Limits of Current (ratio) Error and phase displacement for protection								

	core (As per IS/IEC)		
16	Limits of Current (ratio) Error for PS class (As per IS IEC)		
17	Maximum temperature rise over ambient temperature		
18	Minimum creepage for HT bushing		
19	Gauge of the tank		
20	Dimension of Tank (mm)		
21	Total Weight of Tank (kg)		
22	Weight of core and winding of CT (Kg)		
22	Bushing Distance between Metal Part and Earth		
23	Clearance Between HV to Earth (mm)		
24	Lifting Attangement		



**Specification No:** ENG-EHV-1015

**Specification Name:** Technical Specification for 33kV and 11kV Outdoor Current Transformer

**21.**

**~~SCHEDULE OF DEVIATIONS~~**  
**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>S. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

~~Signature  
Designation~~

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1014**

**Specification Name : Technical Specification for 33kV and 11kV Outdoor Potential Transformer**

<b>SWARUP NAYAK</b>	<b>Jyoti Ranjan Sahu</b>	<b>SHANTAPRIYA JENA</b>	<b>JYOTIPRAKASH MOHANTY</b>	<b>KHAJAN BHARDWAJ</b>	<b>POURUSH GARG</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPCODL	TPSODL	TPNODL	TPWODL	TPCODL	TPCODL
11-01-2023	13-01-2023	17-01-2023	17-01-2023	17-01-2023	19-01-2023

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## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SAMPLE DRAWINGS
20. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
21. SCHEDULE "B" DEVIATIONS

## 1 SCOPE

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at store/site of 11KV and 33 KV Voltage transformers units for metering & Protection purpose complete with all accessories for efficient and trouble free operation.

## 2 APPLICABLE STANDARDS

The equipment covered by this specification shall conform to the requirements stated in latest editions of relevant Indian/ IEC Standards and shall conform to the regulations of local statutory authorities.

- IS: 3156-1992 : Specification for Voltage transformer
- IS: 5621-1980 : Specification for hollow insulators for use in Electrical equipment
- IS: 2099-1986 : Specification for bushings for AC Voltages above 1000 Volts
- IS: 335-1983 : Specification for new insulating oil
- IS: 8603- 2008 : Dimensions for Porcelain Transformer Bushings for use in Heavily Polluted Atmospheres
- IS 11322-1985 : Method for partial discharge measurement in instrument transformers
- IEC 60044-2 Ed. 1.0 b : Instrument transformers - Part 2 Inductive voltage transformers

## 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/TPNODL/TPSODL/TPWODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS

SL. No	TECHNICAL PARAMETER	REQUIREMENTS	
		11 KV	33KV
1	Type	Single phase, Outdoor, Oil filled & hermetically sealed	Single phase, Outdoor, Oil filled & hermetically sealed
2	Rated Voltage	12 KV	36 KV
3	Service Voltage	11 KV	33 KV
4	Frequency	50Hz	
5	Rated One minute Power Freq Dry withstand Voltage	28 KV ON SECONDARY :3KV rms	70 KV
6	Rated One minute Power Freq Wet withstand Voltage	rt2 * 28 kVp	rt2 * 70kVp
7	Rated Lightning Impulse withstand voltage	75 KVp	170 KVp
8	Class of Insulation	Class A	
9	Creepage Distance	25KV/mm	
10	Ratio	11000/ $\sqrt{3}$ : 110/ $\sqrt{3}$ Volt	33000/ $\sqrt{3}$ : 110/ $\sqrt{3}$ Volt
11	Winding Connection for PT	Star-Star	
12	Class of Accuracy	3P/3P/0.2	3P/3P/0.2

13	Burden	100VA	100VA
14	Voltage factor	1.2 Continuous, 1.5 times for 30 Sec	
15	Application	Instrumentation, Metering and Protection	
16	Limit of Voltage (ratio) error	+/- 0.2	
17	Limit of Phase Displacement (Minutes)	+/- 10	
18	Max Tempo rise over ambient Temp	55 deg C as per IS 3156 Part-1	
19	Place of installation	Out Door, Structure mounted, Dead Tank	
20	Primary terminal connector	Rigid type suitable for PT Stud to ACSR Panther Conductor	Rigid type suitable for PT Stud to ACSR Zebra Conductor
21	Fixing hole dimension	During Detailed Engineering	
22	Painting	Paint shed: Battleship gray as per IS 5 Paint thickness: 60 micron (minimum)	
23	Tank	Fabrication with GI (3mm)	
24	Secondary terminal box	IP 55	
25	Suitability	Should be suitable for upright mounting on Steel Structure in outdoor Switch yard with matching to TPCODL/TPNODL/TPSODL/TPWODL's Standard base structure	

## 5.0 GENERAL CONSTRUCTIONAL REQUIREMENTS:

### 5.1 Potential Transformer

Design and construction of potential transformer shall be sufficient to withstand the thermal and mechanical stresses resulting from the specified short circuit currents. The core lamination shall be of high grade steel or other equivalent alloy. The exciting current shall be as low as possible and the potential transformer shall be capable of maintaining its rated accuracy for burden and saturation limits specified in the technical requirement.

Potential transformers shall be of dead tank design. The material of the tank shall be GI with 3 mm thickness. PT shall be supplied complete with required quantity of insulating oil for installing at site. The insulating oil shall comply to IS: 335. P1 and P2 markings shall be permanently riveted. The alignment and centre line of PT primary terminals shall be correct

so as to avoid bending connections. The primary terminals of PT shall be of silver coated I tinned Copper.

Potential transformers shall be provided with a capacitance test tap in the HV lead to enable future monitoring of conditions of HV insulation. Suitable earthing arrangement to be provided for the tap point. Potential transformers shall be provided with nameplate showing the particulars and diagram of the connections. PTs shall be provided with suitable lifting arrangement on all the sides .

PT characteristics shall be such as to provide satisfactory protection for burdens ranging from 25% to 100% of rated burden in case of metering PTs and up to the accuracy limit factor/ knee point voltage in case, of protective PTs. PTs shall be complete with accessories such as grounding lugs, filing and drain plugs, oil sight glass (prismatic type), weather proof terminal box, wedge type terminal connector etc.

## 5.2 Terminal Box

The secondary terminals shall be brought in a weather proof terminal box with IP-55 protection. The terminal box shall be provided with glands suitable for 1100 V grade, steel wire armored and PVC sheathed multicore 6 sq. mm. stranded copper conductor cables. The secondary terminal box shall also include necessary HRC fuses for protecting the secondary circuit. Further for the purpose of fuse supervision on remote panel both terminals of fuse shall be brought to the terminal box. Polarity marks shall be indelibly marked on the primary terminals of the potential transformer and on the secondary lead terminations at the associated terminal block.

## 5. 3 Bushings:

Bushings shall be made of homogeneous, vitreous, porcelain of high mechanical and dielectric strength. Glazing of porcelain shall be of uniform brown or dark color, with a smooth surface arranged to shed away rain water. Suitable arrangement shall be provided for indicating oil level. The bushings shall be of Oil filled condenser type. Oil filled bushings shall be hermetically sealed to prevent ingress of moisture. Cast metal and caps for bushing shall be of high strength, hot dip galvanized malleable iron. They shall have smooth surface to prevent discharge taking place between the metal parts and porcelain as a result of ionization.

## 5. 4 Grounding terminals:

Two grounding terminals shall be provided on the tank of potential transformers on opposite sides, for connecting to station earthing grid with suitable marking. Earthing terminals on secondary junction box for secondary winding of PT shall be of link type. The earthing terminals shall be readily accessible and so placed that the earth connection of the voltage transformer is maintained even when the cover or any other movable part is removed. The earthing terminals shall be of adequate size, be protected against corrosion and shall be metallically clean. Under no circumstances shall a movable metal part of the enclosure be insulated from the part carrying the earthing terminal when the movable part is in place. The earthing terminal shall be identified by means of the symbol "3" marked in a legible and indelible manner on case or frame to be earthed; adjacent to the terminals. The terminal of high voltage winding intended to be earthed shall be brought out through a bushing, insulated from case or frame to be earthed by a separate connection.

## 5. 5 Paint:

All interior and exterior of tanks, and other metal parts shall be thoroughly cleaned to remove all rust, corrosion, grease or other adhering foreign matter. All steel surfaces in contact with insulating oil as far as accessible shall be painted with not less than two coats of heat resistant, oil insoluble, insulating varnish. Steel surfaces exposed to the weather shall be

given a priming coat of zinc chromate and two coats of final paint of shade RAL 7032/ Shade 631 as per IS-5. All metal parts not accessible for painting shall be made of a corrosion resisting material. All machine finished or bright surfaces shall be coated with a suitable preventive compound and suitably wrapped, or otherwise protected. All paints shall be carefully selected to withstand tropical heat and extremes of weather. The paint shall not scale off or wrinkle or to be removed by abrasion due to normal handling. Bolts and nuts exposed to the atmosphere shall be of galvanized steel.

## 6.0 NAME PLATE AND MARKING:

Units shall have a name plate clearly visible and effectively secured against removal. Indelibly and distinctly marked with all essential particulars as per relevant standards along with the following.

- i) Manufacturer's name and Country
- ii) Serial Number and Type designation
- iii) Rated primary and secondary voltage
- iv) Rated frequency
- v) Rated output (burden) and corresponding accuracy
- vi) Highest system voltage
- vii) Rated insulation level
- viii) Rated Voltage factor and corresponding rated time
- ix) Number of phases and method of connection
- x) Earthed or unearthed
- xi) Month and Year of manufacture
- xii) Number of relevant standard

## 7.0 TESTS:

All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. For bushings all the tests as defined in IS 2099 shall be conducted. Following tests shall be necessarily conducted in addition to the tests specified in IS/IEC:

### 7.1 Routine Test

- i) Verification of terminal marking and polarity
- ii) Power frequency dry withstand tests on primary windings
- iii) Power frequency dry withstand tests on secondary windings
- iv) Partial Discharge measurement
- v) Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class

### 7.2 Acceptance test:

- i) Verification of terminal marking and polarity
- ii) Power frequency dry withstand tests on primary windings
- iii) Power frequency dry withstand tests on secondary windings
- iv) Partial discharge measurement
- v) Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class

### 7.3 Type test:

- 1) Temperature rise test

- ii) Lightning impulse test for voltage transformers for service in electrically exposed installation
- Ur) High voltage power frequency wet withstand voltage tests on outdoor voltage transformers up to and including 245 kV
- iv) Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class

#### **7.4 Optional tests:**

The following optional tests where applicable, shall be carried out by mutual agreement between the purchaser and bidder.

- i) Chopped lightning impulse test as a type test
- ii) Short circuit withstand capability test as a type test
- iii) Commissioning test on non-earthed voltage transformers of up to and including 36 kV

#### **8.0 TYPE TESTS CERTIFICATES:**

The bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI / ERDA as per the relevant standards. Type test shall have been conducted in certified Test Laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports i.e. any test report not acceptable, same shall be carried out without any cost implication to the Purchaser.

#### **9.0 PRE-DISPATCH INSPECTION:**

Equipment shall be subject to inspection by a duly authorized representative of the Purchaser. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to Purchaser's representatives at all times when the work is in progress. Inspection by the Purchaser or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by the Purchaser.

Following documents shall be sent along with material

- a) Test reports
- b) MDCC issued by the Purchaser
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable)

#### **10.0 INSPECTION AFTER RECEIPT AT STORE:**

The material received at Purchaser's store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

#### **11.0 GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the

purchaser up to a period of at least 60 months from the date of commissioning or 66 months from the date of last supplies made under the contract whichever is later, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Company, failing which the purchaser will be at liberty to get it replaced/rectified at bidder's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the bidder or from the " Security cum Performance Deposit" as the case may be.

Bidder shall further be responsible for free replacement for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the purchaser.

**12.0 PACKING:**

Bidder shall ensure that all material covered under this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit.

**13.0 TENDER Sample: NA****14.0 QUALITY CONTROL:**

The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished.

The Purchaser's engineer or its nominated representative shall have free access to the bidder's/manufacture's works to carry out inspections.

**15.0 MINIMUM TESTING FACILITIES:**

Bidder shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

**16.0 MANUFACTURING ACTIVITIES:**

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart shall be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

**17.0 SPARES, ACCESSORIES & TOOLS:** Special Tools (if any) required for maintenance/ Troubleshooting in scope of customer .**18.0 DRAWINGS:**

Following drawings & Documents shall be prepared based on the Purchasers specifications and statutory requirements and shall be submitted with the bid:

- a. Completely filled-in Technical Parameters.
- b. General arrangement drawing of the PT
- c. Terminal Block and connection drawing
- d. Foundation plan and loading details



- e. General description of the equipment and all components with makes and technical requirement
- f. Type Test Certificates
- g. Experience List
- h. Manufacturing schedule and test schedule

Drawings/documents to be submitted after the award of the contract:

S. No.	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	General Arrangement drawings	√		√
3	Terminal block and Connection drawings	√		√
4	Foundation plan and loading details	√		√
5	Manual/Catalogues		√	
6	Installation/Commissioning Manuals		√	
7	Instructions for use		√	
8	Transport/ Shipping dimension drawing		√	√
9	QA & QC Plan	√	√	√
10	Routine, Acceptance and Type Test Certificates	√	√	√

All the documents & drawings shall be in English language. Supplier shall furnish two softcopies (CD) and four (4) hard copies of nicely bound manuals covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices.

## 19. SAMPLE DRAWING

## 20. GUARANTEED TECHNICAL PARTICULARS

SL No	Description	Units	As specified by the Bidder
1	Application		
2	Rated voltage	KV rms	
3	Service voltage	KV rms	
4	Rated Frequency	Hz	
5	Rated Lightning Impulse withstand voltage	KV peak	
6	Rated One minute power frequency dry		
	a) On Primary	KV rms	
	b) On Secondary	KV rms	

7	Rated One minute power frequency wet	KV Peak			
8	Rated Transformation				
9	Core details		Core-1	Core-2	Core-3
9.1	Rated Output (VA burden)	VA			
9.2	Accuracy Class				
10	Winding connection for PT				
11	Rated Voltage factor and time				
12	Minimum Creepage	mm/ KV			
13	Limit of Voltage (ratio) error				
14	Limit of phase displacement	minutes			
15	Maximum temperature rise over ambient temperature	Deg C			
16	Gauge of the tank	mm			
17	Both terminals of fuse shall be brought to the terminal box.				
18	Total weight of	Kg			
19	Dimensions of	mmXmmXmm			
20	Weight of core and winding of VT	Kg			
21	Resistance of winding at 75°C per phase at HV				
22	Resistance of winding at 75°C per phase at LV				
23	Bushing distance between metal part and earth	mm			
24	Clearance between HV to	mm			
25	Lifting				



**Specification No:** [ENG-EHV-1014](#)

**Specification Name:** Technical Specification for 33kV and 11kV Outdoor Potential Transformer

**21.**

**~~SCHEDULE OF DEVIATIONS~~**  
**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>S. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1027**

**Specification Name : Specification for 33kV 200A HG Fuse**

<b>Susavan Biswas</b>	<b>SATYA PRASAD NAYAK</b>	<b>JYOTIPRAKASH MOHANTY</b>	<b>SHANTAPRIYA JENA</b>	<b>Shailendra Kumar Jaiswal</b>	<b>SHIRISH SHARAD DIKAY</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPSODL	TPCODL	TPWODL	TPNODL	TPSODL	TPSODL
27-01-2023	01-02-2023	01-02-2023	01-02-2023	02-02-2023	02-02-2023

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## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING FACILITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. DRAWING SAMPLE (ONLY FOR TENDER PURPOSE)
20. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
21. SCHEDULE "B" DEVIATIONS

**1. SCOPE:**

This specification covers the design, manufacture, testing and supply of 33 KV, 200 A, 3 pole HG Fuse sets for outdoor installations to be used for 33/11 KV Substations. Scope also includes transportation & unloading of poles at store /site.

**2. APPLICABLE STANDARDS:**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

IS 9385	High voltage fuses
IS 2062	Hot Rolled Medium and High Tensile Structural Steel
IS 209	Zinc Igot
IS 2629	Recommended Practice for Hot-Dip Galvanizing of Iron and Steel
IS 2633	Methods for testing uniformity of coating of zinc coated articles
IS 4759	Hot-dip zinc coatings on structural steel and other allied products
IEC 62231	Composite station post insulators for substations with a.c. voltages greater than 1 000 V up to 245 kV – Definitions, test methods and acceptance criteria

**3. CLIMATIC CONDITIONS:**

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	1500 mm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPSODL/TPNODL/TPWODL/TPCODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

**4. GENERAL TECHNICAL REQUIREMENTS:**

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Name of Manufacturer	To be specified by Bidder
2	Works Address	To be specified by Bidder
3	Manufacturers Type	To be specified by Bidder
1	Standard according to which the HGF are manufactured	IS 9385-1980 (Part-II) amended up to date
2	Rated Voltage	36 kV
3	Rated Frequency	50 Hz
4	Continuous current Rating	200 Amp
5	<b>Post Insulator</b>	
6.1	Lightning Impulse Withstand Voltage Positive & Negative Polarity (1.2/50 microsec wave)	
A	Across the Isolating distance	195 kV (Peak)
B	To Earth & Between Poles	170 kV (Peak)
6.2	1 Minute Power Frequency Withstand Voltage (Dry)	95 kV RMS
6.3	1 Minute Power Frequency Withstand Voltage (Wet)	75 kV RMS
6.4	Visible Discharge Voltage	27kV RMS
6.5	Dry Flashover Voltage	95 kV
6.6	Power frequency puncture withstand voltage	1.3 times of actual dry flashover voltage
6.7	Impulse Withstand Voltage (Switching Position)	170 kV Peak
7	<b>1 Minute Power Frequency Withstand Voltage</b>	
A	Across the Isolating distance	100kV RMS
B	To Earth & Between Poles	75kV RMS
8	Temperature Rise	Within permissible limit as per IS 9385-1980 (Part-II) amended up to date
9	Outdoor/Indoor	Outdoor
10	Type of mounting	Horizontal
11	<b>Vertical clearance from top of insulator cap to mounting Channel</b>	508 mm
12	Height of the riser for carrying the horns.	250mm from the cap (top) of insulator
13	Details of Arcing Horns	Copper rod having 8.32 mm dia Silver-plated provided with screwing arrangement for fixing use wire made of copper. (Total length 995mm). All the bolts, nuts and washers should be made out of brass.)

14	Riser Unit	<p>The shape of connectors may be made out of straight copper Flat. Copper Riser 40 mm width x 5 mm Thick x 80mm height Copper Connector 40 mm width x 5 mm thick x 40 mm length. All Nonferrous parts shall be silver plated.</p> <p>(b) 170mm height G.I. Riser made of 25mm nominal bore medium gauge G.I. Pipe welded with 2 nos. G.I. Flat of 40 x 5 mm at both ends fixed with 10mm dia. bolts and nuts with flat spring washers. All the bolts, nuts and washers should be made out of brass.</p>
15	Connectors	SOCKET: Two no. of bimetallic copper sockets shall be used at both ends suitable for 148-232 sq. mm AAAC conductor.
16	Size of Base Channel (HDG)	100mmx50mmx6mm (C/C slotted hole 18x36- 250 mm) Min 960 mm long. Post insulator c/c shall be 760 mm.
17	Aluminium Strip for HG Fuse	30mmx5mmx425mm
18	<b>33 kV Post Insulator</b>	
a.	Applicable Standard	IEC 62231 amended up to date
b.	Make of Post Insulator	To be specified by Bidder
c.	Minimum failing load	10 kN
d.	CD of Post Insulator (min.)	900 mm
e.	Number of supporting Insulators per Pole	2 Nos. of 36 kV
f.	Dia. of FRP rod	34 mm
19	Total weight of Horn Gap Fuse	To be specified by Bidder
20	Marking/Engraving	TPSODL/TPNODL/TPWODL/TPCODL, Serial No., Manufacture's name or trademark, Month & Year of Manufacturing.

## 5. GENERAL CONSTRUCTION:

The H.G. Fuses shall have adjustable arcing horns made of solid copper rod having 8.32 mm dia. The horns shall be fitted with screwing devices with fly nuts for fixing and tightening the fuse wire. It shall have robust terminal connector of size as per clause no.4 made of copper duly silver plated with two numbers of 12mm dia brass bolts and double nuts with flat brass washers. The connector should be capable of connecting crimp able conductor up to 148-232 Sq.mm. size (AAAC) with bimetallic solder less sockets. The H.G. Fuse Set shall be suitable for horizontal mounting on Sub-station structures. All metal (ferrous) parts shall be galvanized and polished.

### 5.1 Insulators:



The post type insulators used for the Horn Gap Fuse Unit shall conform to IEC: IEC 62231 (amended upto date) in all respects with regard to mechanical and electrical requirements.

The electrical characteristics of the insulators shall be as follows:

1	System Voltage	33 kV
2	Lightning Impulse Withstand Voltage in kV	170
3	Power Frequency Withstand Voltage in kV (Dry)	95
4	Power Frequency Withstand Voltage in kV (Wet)	75
5	Power Frequency Flashover Voltage in kV (Dry)	135
6	Power Frequency Flashover Voltage in kV (Wet)	95
7	Creepage Distance in mm	900
8	FRP Rod Dia. in mm	34

**Minimum failing loads for Post Insulators should be 10kN for 33kV.**

The type of insulation materials, metal fittings, Creepage distance, protected Creepage distance, tensile strength compression strength, torsion strength and cantilever strength shall be as provided in the guaranteed technical particulars in clause no.19.

The bidder shall furnish the type test certificate of the post insulators from their manufacturer for reference & scrutiny. For type, test reports refer cl no 7.3.

Any fittings accessories or equipment which may not have been specifically mentioned in this specification but which are usually necessary in equipment shall be deemed included in the specification and shall be supplied by the Bidder without extra charge. All equipment shall be complete in all details whether such details are mentioned in the specification or not.

**6. MARKING:**

Below parameters should be embossed on SS sheet of thickness 1mm with black background. It should be riveted on MS channel of HG Fuse:

1. Rated Voltage
2. Manufacturer's Name
3. Month/Year of Manufacture
4. Serial Number
5. PO no.
6. Rated normal current in Amps.
7. Rated one second short-time current

**7. TESTS:**

The bidder shall be required to submit complete set of the following test reports along with the offer: -

**7.1 ACCEPTANCE TESTS**

- i) Power frequency voltage dry test.
- ii) Tests to prove satisfactory operation.
- iii) Dimension check.
- iv) Galvanization test.

**7.2 ROUTINE TESTS**

- i) Power frequency voltage dry test.
- ii) Tests to prove satisfactory operation.
- iii) Dimension check.
- iv) Galvanization test.

**7.3 TYPE TESTS**

- i) Impulse voltage dry test
- ii) Power frequency voltage dry test
- iii) Power frequency voltage wet test
- iv) Temperate rise test.
- v) Mechanical endurance test / Mechanical strength test for the post insulator.

**Type tests on Post Insulators**

- i). Dry Lightning impulse withstand voltage test. ii).

Wet power frequency test

- iii). Damage limit proof test and test of tightness of the interface between end fittings & insulator housing
- iv). Radio interference test
- v). Recovery of hydrophobicity test
- vi). Chemical composition test for silicon content
- vii). Brittle fracture resistance test.

**8. TYPE TEST CERTIFICATES:**

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA/Other govt Lab** as per relevant IS. Type tests should have been conducted during the period not exceeding 10 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPSODL/TPNODL/TPWODL/TPCODL.

**9. PRE-DISPATCH INSPECTION:**

The material shall be subject to inspection by a duly authorized representative of the TPSODL/TPNODL/TPWODL/TPCODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material,

the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPSODL/TPNODL/TPWODL/TPCODL's representatives at all times when the work is in progress. Inspection by the TPSODL/TPNODL/TPWODL/TPCODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPSODL/TPNODL/TPWODL/TPCODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPSODL/TPNODL/TPWODL/TPCODL
- c) TPSODL/TPNODL/TPWODL/TPCODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

#### **10. INSPECTION AFTER RECEIPT AT STORE:**

The material received at TPSODL/TPNODL/TPWODL/TPCODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

#### **11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

**12. PACKING AND TRANSPORT:**

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**13. TENDER SAMPLE: Not Applicable**

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

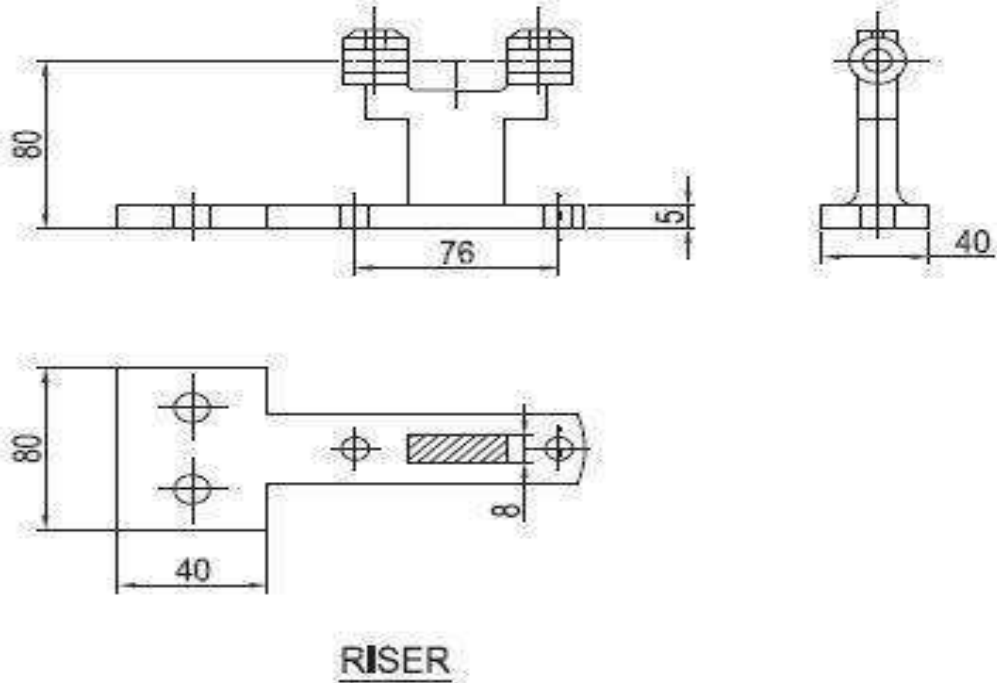
**17. SPARES, ACCESSORIES AND TOOLS: Not Applicable**

**18. DRAWINGS AND DOCUMENTS:**

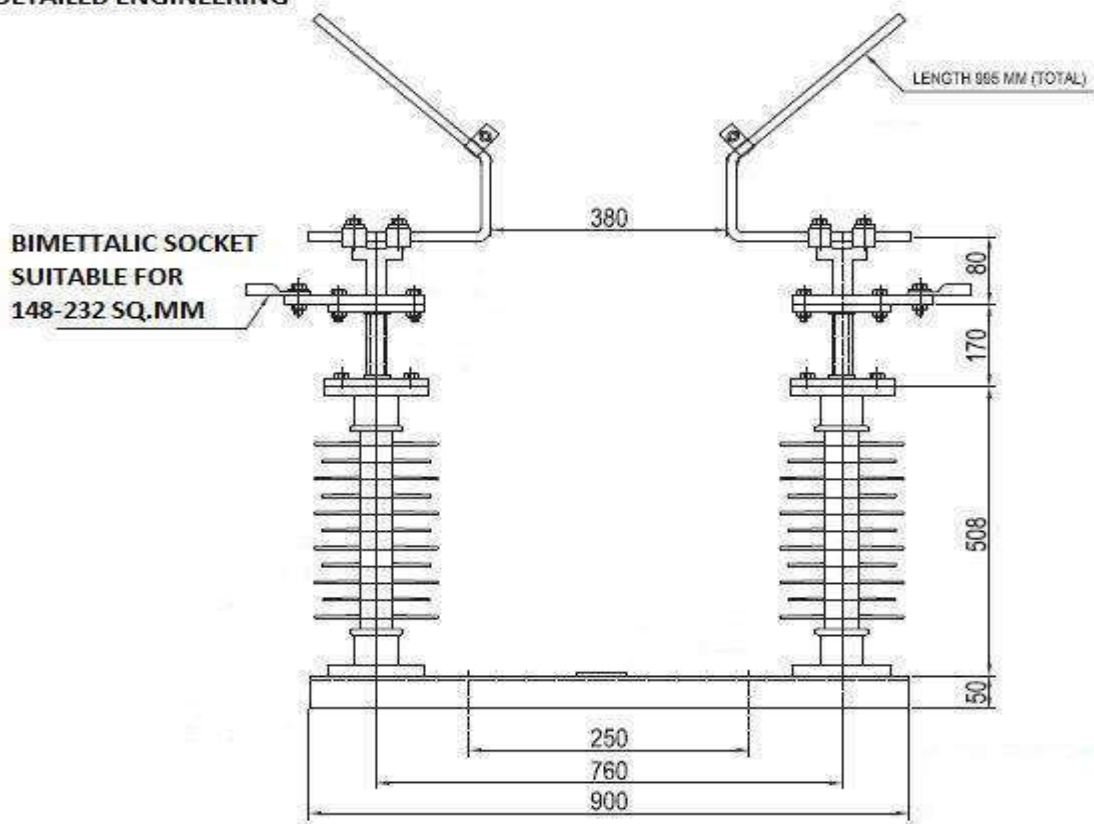
Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars.
- b) Work Experience details
- c) Type test certificates.
- d) Drawing (3 sets) of HG fuse containing complete information about manufacturing & fabrication etc.

**19. Drawing (Reference for Tender purpose only)**



**REFERENCE IS FOR TENDER PURPOSE ONLY. FINALIZATION OF GTP WILL BE AT THE TIME OF DETAILED ENGINEERING**



**20. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS:**

SL. NO.	TECHNICAL PARTICULARS	Desired Value
1	Name of Manufacturer	
2	Works Address	
3	Manufacturers Type	
4	Standard according to which the HGF are manufactured	
5	Rated Voltage	
6	Rated Frequency	
7	Continuous current Rating	
8	<b>Post Insulator</b>	
8.1	<b>Lightning Impulse Withstand Voltage Positive &amp; Negative Polarity (1.2/50microsecwave)</b>	
a	Across the Isolating distance	
b	To Earth & Between Poles	
8.2	1 Minute Power Frequency Withstand Voltage (Dry)	
8.3	1 Minute Power Frequency Withstand Voltage (Wet)	
8.4	Visible Discharge Voltage	
8.5	Dry Flashover Voltage	
8.6	Power frequency puncture withstand voltage	
8.7	Impulse Withstand Voltage (Switching Position)	
9	<b>1 Minute Power Frequency Withstand Voltage</b>	
a	Across the Isolating distance	
b	To Earth & Between Poles	
10	Temperature Rise	
11	Outdoor/Indoor	
12	Type of mounting	
13	<b>Vertical clearance from top of insulator cap to mounting Channel</b>	
13B	Height of the riser for carrying the horns.	
13C	Details of Arcing Horns	
13D	Riser Unit	
14	Connectors	
15	Size of Base Channel (HDG)	
16	Aluminium Strip for HG Fuse	
17	<b>11 kV Post Insulator</b>	
a.	Applicable Standard	
b.	Make of Post Insulator	
c.	Minimum failing load	
d.	CD of Post Insulator (min.)	
e.	Number of supporting Insulators per Pole	
18	Total weight of Horn Gap Fuse	
19	Marking/Engraving	



**Specification No:** ENG-EHV-1027

**Specification Name:** Specification for 33kV 200A HG Fuse

**21. SCHEDULE "B" DEVIATIONS:**

**(TO BE ENCLOSED WITH TECHNICAL BID)**

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

SL. No	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1018**

**Specification Name : Technical Specification for 33 kV AB switch (400 A)**

<b>YASHOBANTA ROUT</b>	<b>ANUP SAMAL</b>	<b>J DURAIRAJ</b>	<b>Sandeep Saurav</b>	<b>KHAJAN BHARDWAJ</b>	<b>POURUSH GARG</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPCODL	TPNODL	TPWODL	TPSODL	TPCODL	TPCODL
10-01-2023	10-01-2023	10-01-2023	10-01-2023	10-01-2023	12-01-2023

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## **CONTENTS**

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS/REQUIREMENTS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. MINIMUM TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE OF DEVIATIONS

## 1. SCOPE

This specification covers design, manufacturing, testing at manufacturer's works, inspection, packing & delivery of 33 kV Air Break Switch with accessories for out-door installation for use on transformer centers and tap line in Central Odisha. Aforesaid item(s) shall include loading and unloading at anywhere in Odisha.

It is not the intent to specify completely herein all the details of design and construction of Air Break Switches. However, AB Switches will confirm in all respects to high standards of engineering design and workmanship and shall be capable of performing in continuous Commercial operation up to the supplier's guarantee, in a manner acceptable to the purchaser, who will interpret the meanings of drawings and specifications and shall have the power to reject any material, which in his judgment i.e. not in accordance with the specifications/drawings.

The AB Switches offered shall be complete with all components necessary for its effective and trouble-free operation along with associated equipment etc. such components shall be deemed to be within the scope of supplier's supply, irrespective of whether those are specifically brought out in the specification and/or in order or not. Also similar parts particularly removable ones shall be inter-changeable.

## 2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

Ref. IS	Description
IS 9920 (part-I to V)	Specification for helically formed fittings for Overhead lines up to 33 kV
IS 2633 (Part 1)	Method for testing uniformity of coating on zinc coated
IEC 62231	Composite station post insulators for substations with a.c. voltages greater than 1 000 V up to 245 kV – Definitions, test methods and acceptance criteria
IEC 60168:1994+AMD1:1997+AMD2:2000 CSV	Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V
IS 9530	Recommended practice for silver plating
IS 5925	Recommended practice for silver plating for general engineering purposes
BS 2816	Testing of silver plating thickness

IS 1239	GI pipe('B' class or Medium class)
IS: 5561	Electrical Power Connectors
IS 2062	Hot rolled medium and high tensile structural steel — specification

### 3. CLIMATIC CONDITIONS OF THE INSTALLATION

SL.NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

TPCODL/TPNODL/TPSODL/TPWODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

### 4. GENERAL TECHNICAL REQUIREMENTS

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Rating of AB Switch	400 Amps AB Switch
1.a	Reference standards (latest amend.)	<b>IS 9920, IEC 129, IEC 62231, IS 1239</b>
2	Installation	Outdoor

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
3	Suitable for Mounting	Horizontal Rotating Type
4	Type	3 Pole
5	Service Voltage	33 kV
6	Rated Voltage	36 kV
7	Rated Frequency	50 Hz
8	Current Carrying Capacity	400 Amps
9	Rated short time current	16 kA for 1sec
10	Rated peak withstand current	40 kA
11	Rated Short circuit making capacity	25 KA RMS
12	Rated Cable Charging breaking capacity	40 A RMS
13	Rated line charging breaking capacity	5.3 A RMS
14	Rated Transformer off load breaking Capacity	16 A RMS
15	One-minute power frequency withstand voltage Dry	95 KV RMS
16	One-minute power frequency withstand voltage Wet	75 KV RMS
17	Power Frequency puncture withstand voltage	1.3 times of actual dry flashover voltage
A	Visible Discharge Voltage	27 KV RMS
B	Dry flashover Voltage	95 kV
18	Power Frequency withstand voltage between pole and earth	70 KV RMS
19	Power frequency withstand voltage across the isolation distance	80 KV RMS
20	Impulse withstand voltage for positive and negative polarity (1.2 / 50) micro second wave)	
A	Across Isolating distance	195 KV Peak
B	To earth and between poles	170 KV Peak
21	No. of Post Per Phase (Polymeric, IEC 62231)	02
22	Total No. of post	06
22.a	FRP Dia of the Post Insulator (min)	32mm
22.b	Dai of Weather sheds	>100mm
22.c	Thickness of Housing (min)	3mm
22.d	Type of Sheds	Aerodynamic
23	Minimum Creepage Distance	900 mm (one post)
24	Phase to Phase Clearance	1200 mm
25	Isolation Distance in switch open condition	640 mm
26	Vertical clearance from Top of Insulator cap to mounting channel	508 mm (Minimum)
27	Copper contacts Temp in Air should not exceed	65 Degree

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
28	Size of fixed contacts (Copper Type Electrolytic with silver plated) (coating thickness not less than 10 microns)	80mmx50mmx8mm Jaw assemblies are to be bolted through stainless steel flat and spring washer (Min 6 nos. of phosphor bronze high pressure spring to be used on each post).
29	Size of Moving contacts (Copper Type Electrolytic with silver plated) (coating thickness not less than 10 microns)	250mmx50mmx8mm (a Min deposit of 10 micron of Silver on copper contact)
30	Moving Contact supporting Angle	50mmx50mmx6mm
31	Size of rods used for arcing horns	10 mm
32	Insulation for tinned Copper braid/rope	Polyolefin, (RSFR-H) type
33	Copper Flexible BRAIDED Tape - 420 mm Long, Tined plated with Brass Nut, bolt & Washers both end shall be crimped with copper socket through brass bolts and nuts	450gm /Mtr
34	Minimum size*Length of Coupling Hot Dip GI Solid Pipe for Phase coupling pipe, B Class (IS 1239)( Nominal Bore)	25mm Dia & 2500mm long
35	Operating Down Pipe, B Class (IS 1239)(Nominal Bore)	32mm Dia & 7 Mtr Long (one piece)
36	Temperature Rise Limit (w.r.t ambient temp) - Tinned Copper contacts - Terminals - Metal Parts	50°C 40°C 40°C
37	Arching Horns	10 mm dia GI rod
38	Locking Arrangement	Provision for pad locking at both 'ON' & 'OFF' position
39	Earth Terminal	M12 Bolts with nuts and flat washer shall be provided at base channel as earthing Terminal.
40	'T' Connection	The T connection provided on the channel having 'moving contact' shall be G.I Nut & bolt at the bottom end to facilitate replacement of this unit only during requirements & avoid entire change of arm.
41	'I' bolt	The I bolt shall be longer with 75 mm thread.
42	Supporting Channel HDG 100 micron	100x50x6 mm hot dip galvanized channel (C/C slotted 18x36 hole 250 mm) Min. 760 mm length
43	Connectors/sockets	Connectors shall be of hard drawn electrolytic copper or brass. The connector should be of 4 bolted type and suitable for 100-232 sqmm AAC conductor. SOCKET: Two no. of bimetallic copper sockets shall be used at both ends suitable for 100-232 sqmm AAC conductor.

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
44	Terminal Connectors/ Pads	The size of fixed connector shall be (80 x 50 x 8) and size of movable connector shall be (80 x50)x (80 x 50) x 8 mm of HDE copper with uniform machine finishing duly silver plated with 2 no. of 14 mm dia holes provided with suitable brass bolts, double nuts, washers & spring washers
45	Bearing	4 nos. self-lubricating bearing to be provided with grease nipple including 4 <sup>th</sup> bearing being a thrust bearing.
46	Marking/Engraving (Parameters should be embossed on SS sheet of thickness 1mm with black background. It should be riveted on MS channel of AB switch)	1. Rated Voltage 2. Manufacturer Name 3. Month/Year of Manufacture 4. Serial No. 5. PO No. 6. Rated Normal Current in Amps 7. Rated One Second Short-Time Current
47	Pressure Spring	Stainless steel

**5. GENERAL CONSTRUCTIONS/REQUIREMENTS**

1. The Air break switch shall be outdoor type, rotating type gang operated and shall be suitable for horizontal installation having 2 no. of polymeric post insulators per phase.
2. The Rotating type operating mechanism shall be suitable for manual operation from ground level and shall be designed in such way that all the three phases shall open and close simultaneously in smooth way.
3. The air break switch shall be with the arcing horns, 10mm for 33 kV 400 A AB switch of GI rod.
4. The current carrying connectors should be two-bolt type having nuts and bolts, with spring washer and plane washer.
5. Each joint shall be provided with one plane and one spring of not less than 2mm thickness.
6. Connectors shall be of H D electrolytic copper or Brass.
7. Tinned Copper braid/rope shall be insulated by Polyolefin (RSFR-H) type to prevent animal electrocution. It shall be 420 mm long minimum and shall weigh 450 G/M. It shall be punched at both ends.
8. All ferrous parts shall be hot dip galvanized with heavy coating after proper surface treatment as per standards. Coating thickness shall not be less than 100 micron at any point.
9. All Copper parts shall be silver plated as per relevant standards and coating thickness not less than 10 microns at any point.
10. Equipment grounding shall be provided by bidder at two points with terminals. .
11. All the nut bolt used must be Hot dip Galvanized and of size not less than M10 until and unless specified.
12. A rigid base of galvanized steel channel of size approx.100x50x6 mm Length 760 mm min. (C/C slotted hole 18x 36 mm- 250mm shall be provided with clamps and bolts for Horizontal mounting firmly on steel structure.
13. Each member of the switch shall be free from Rust, sharp edges, burr and any kind of deformation.

14. The phase coupling rod, operation rod with intermediate guide braided with flexible electrolytic copper, tail piece of required current carrying capacity and operation mechanism with 'ON' & 'OFF' positions shall be provided.
15. The operation rod shall be medium gage of 32mm diameter nominal bore G.I. pipe single length 7 meters. The phase coupling rod for gang operation shall be of medium gauge 25mm dia & 2500 mm length nominal bore G.I. pipe.
16. Spacing: The Minimum clearance between phase to switch shall be 1200 mm. The operating down rod shall be at a transverse distance of 300 mm from the outer limb of the switch. The center spacing between two post insulators of the same phase shall be 560 mm. in open position of the AB switches the moving blade shall rotate through an angle of 90 degree. This shall be exhibited in the drawing.
17. Non-threaded type spindle shall be provided for connection with down pipe.
18. Provision for operating handle earth with flexible copper wire shall be provided.

## 6. MARKING

Below parameters should be embossed on SS sheet of thickness 1mm with black background.

It should be riveted on MS channel of AB switch:

1. Rated Voltage
2. Manufacturer's Name
3. Month/Year of Manufacture
4. Serial Number
5. PO no.
6. Rated normal current in Amps
7. Rated one second short-time current in Amps

## 7. TESTS CERTIFICATE

### 7.1 Type Test

The A.B. switches shall be subjected to the following type tests in accordance with clause No. 6 of IS-9920 (Part-1)/2002.

- (i) Tests to prove that the temperature rise of any parts does not exceed the values specified in part-2 of this standard.
- (ii) Tests to prove the capability of the switch to carry the rated peak withstand current and the rated short time current.
- (iii) Measurement of the resistance of the main circuit.
- (iv) Tests to prove the ability of the switch to make and break the specified currents.
- (v) Tests to verify the insulation level including withstand tests at power frequency voltages on auxiliary equipment if any. Di-electric tests include impulse withstand tests, power frequency voltage withstand tests, and power frequency voltage withstand tests.
- (vi) Tests to prove satisfactory operation and Mechanical endurance.
- (vii) Tests to prove the integrity of the external insulation under conditions of the air pollution.

Note 1: The type test certificate should not be more than 5 years old as on due date of opening of tender.

Note 2: Type test certificate of polymeric post Insulator shall be submitted and shall be issued from CPRI/ERDA or Government lab only.

### 7.2 Acceptance Tests

The following acceptance test should be carried out as per IS: 9920 (P4/1985) on

number of samples selected from the offered lot.

- (i) Visual Inspection.
- (ii) Checking of Dimensions (of all parts as per the approved drawing).
- (iii) Power frequency voltage dry test.
- (iv) Measurement of the resistance of the main circuit.
- (v) Test to prove satisfactory operation
- (vi) Galvanizing test as per IS: 2633.
- (vii) Temperature rise test.

### 7.3 Routine Tests:

Supplier shall provide a control plan, which will be implemented on AB switches. Routine test reports should be submitted by the manufacturer with inspection call.

The following routine tests as outlined in clause No.4 of IS: 9920 (Part4/1985) shall be carried out by the manufacturer on each unit to check certain essential requirements.

- i) Power frequency voltage dry tests.
- ii) Measurement of the resistance of the main circuit.
- iii) Test to prove satisfactory operation.
- iv) Dimension check
- v) Galvanization test

The tenderer shall clearly indicate what testing facilities are available in the works of manufacturer & whether facilities are adequate to carry out all Acceptance & Routine Tests. These facilities should be available to TPCODL/TPNODL/TPSODL/TPWODL's representative if deputed or carry out or witness the tests in the manufacturer works.

## 8. TESTS

Along with the bid, the bidder must submit Type Test Reports on AB switches as per this technical specification, carried out within last five years from the date of opening of techno-commercial bid of the tender from CPRI/ERDA labs only. Otherwise the tender may be rejected.

## 9. PRE DISPATCH INSPECTION

Equipment shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. Inspection may be made at any stage of manufacture at the option of the TPCODL/TPNODL/TPSODL/TPWODL and the equipment if found unsatisfactory as to workmanship or material is liable to rejection. Supplier shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.



Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPSODL/TPWODL. Following documents shall be sent along with material

- a) Routine Test reports
- b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings
- f) Delivery Challan
- g) Installation and maintenance Manual soft copy for all components
- h) Other Documents (as applicable)

**10. INSPECTION AFTER RECEIPT AT STORES/SITE**

The material received at TPCODL/TPNODL/TPSODL/TPWODL Store/Site will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection. If any deviation or anomaly observed at this stage same need to be rectified by bidder at bidders own cost at earliest.

**11. GUARANTEE**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is earlier. Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be.

**12. PACKING**

Bidder shall ensure that all equipment covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The packing should be in such manner that during storage and its components should not be damaged. No single use plastic to be used in packing material. Packing should be done with environment friendly recyclable materials

**~~13. TENDER SAMPLE~~**

~~Bidder shall submit the sample of material with the offer (in case of first supply to TPCODL/TPNODL/TPSODL/TPWODL).~~

#### 14. QUALITY CONTROL

The bidder shall submit with the offer, assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and after finishing, bought out items and fully assembled component and equipment including drives. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The TPCODL/TPNODL/TPSODL/TPWODL's or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections. To ensure proper operation of Product the bidder shall provide onsite training of TPCODL/TPNODL/TPSODL/TPWODL teams as and when required. To ensure quality of installations bidder shall provide supervision support during impartation.

#### 15. MINIMUM TESTING FACILITIES

Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

#### 16. MANUFACTURING ACTIVITIES

The bidder shall get the approved drawing and GTP before start of manufacturing activity. The successful bidder will have to submit details of the offered design & components for approval as per specification. CAT-A/CAT-B is mandatory to start manufacturing.

#### 17. SPARES, ACCESSORIES AND TOOLS

Not applicable.

#### 18. DRAWINGS AND DOCUMENTS

Following documents to be submitted along with the bid for evaluation:

- a) Completely filled-in clause wise compliance of this specification.
- b) Signed and stamped copy of drawing
- c) Complete Type test reports
- d) Completely filled signed and stamped copy of tender document.
- e) Any other requisite document
- f) Experience List.

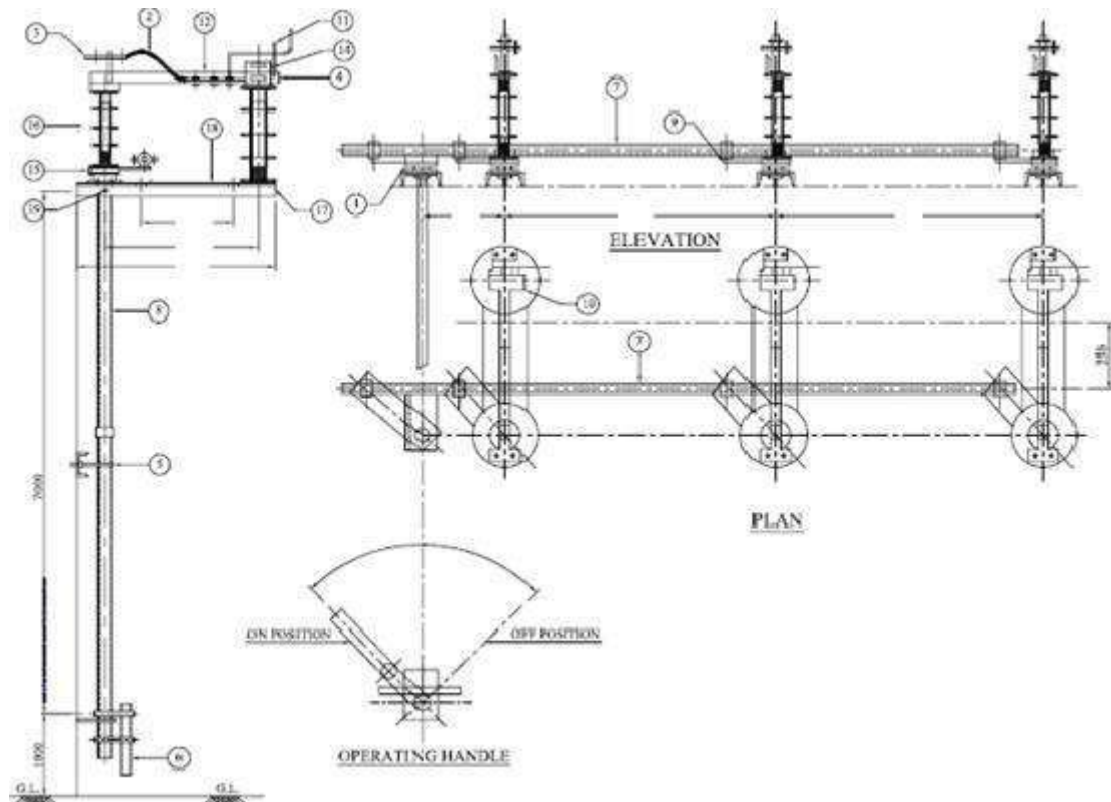
Following documents shall be submitted after award of RC/PO before manufacturing:

- a) Completely filled-in clause wise compliance of the specification.
- b) Signed and stamped copy of GA drawing
- c) Signed and stamped copy of installation drawing
- d) Compliance of all undertaking submitted during technical evaluation, if any
- e) Type test Certificates for each specified test if not submit during technical evaluation

Following Drawings/Documents shall be submitted after the award of the contract.

S. No	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	Manual/Catalogues/drawings for all components.		√	
3	Technical details and test certificates.		√	√
4	Installation Instructions		√	√
5	Transport/shipping dimension drawing		√	√
6	QA & QC Plan	√	√	√
7	Routine, Acceptance and Type test Certificates	√	√	√

All the Documents and Drawings shall be in English Language.



**Indicative drawing of 33 KV 400A AB Switch**

**19. GUARANTEED TECHNICAL PARTICULARS**

Completely filled-in clause wise compliance of this specification along with bid.

**20. SCHEDULE OF DEVIATIONS**

**(TO BE ENCLOSED WITH TECHNICAL BID)**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

~~Signature~~

~~Designation~~

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1022**

**Specification Name : Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33KV Power Cable**

<b>BARSHA BANDITA</b>	<b>MILAN MAITY</b>	<b>K GOVINDARAJ</b>	<b>Syed Mohammed Yousuf Raja</b>	<b>KHAJAN BHARDWAJ</b>	<b>POURUSH GARG</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPCODL	TPNODL	TPWODL	TPSODL	TPCODL	TPCODL
10-01-2023	10-01-2023	11-01-2023	12-01-2023	12-01-2023	12-01-2023

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**Specification No:** [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable  
Straight through Joint & Termination for 33kV  
Power Cable

## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
- 10.INSPECTION AFTER RECEIPT AT STORES
- 11.GUARANTEEE
- 12.PACKING
- 13.TENDER SAMPLE
- 14.QUALITY CONTROL
- 15.TESTING FACILITIES
- 16.MANUFACTURING FACILITIES
- 17.SPARES, ACCESSORIES AND TOOLS
- 18.DRAWINGS AND DOCUMENTS
- 19.SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
- 20.SCHEDULE "B" DEVIATIONS

## 1. SCOPE:

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at site/store and performance of 33 kV Power Cable-Heat Shrinkable Straight Through Joint & termination with all accessories and necessary training for trouble free & efficient performance.

## 2. APPLICABLE STANDARDS:

The equipments covered in this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with latest revisions of relevant Indian Standards/ IEC and shall conform to the regulations of local statutory authorities.

SI. No	IEC/IS	Description
1	IS-13573(part2): 2011	Test Requirements-Cable Accessories for Extruded Power Cables (for working voltages from 3.3 kV up to and including 33 KV)
2	IS 7098(part2):2011	Cross-linked polyethylene insulated thermoplastic sheathed cables (for working voltages from 3.3 kV up to and including 33 KV)
3	IS 692: 1994	Paper insulated lead sheathed cables for rated voltages up to and including 33 KV
4	IEC 60502: 2009	Power cables with extruded insulation and their accessories for rated voltages from 1 kV up to 30 kV
5	ASTM D-2303	Standard Test Methods for Liquid Contaminant, Inclined plane track and Erosion of insulating materials
6	ASTM D-2671	Standard Test Methods for Heat Shrinkable Tubing
7	ENA TS 09-13.1981	High Voltage Heat Shrinkable Components for use with HV solid type cables up to and including 33 kV
8	IEC 61238(part1): 2003	Test methods and requirements - Compression and mechanical connectors for power cables for rated voltages up to 30 kV. For in house connectors, third party certification is mandatory.
9	IS 2633:1986	Method for testing of uniformity of zinc coating
10	IS 4826: 1979	Hot dipped galvanized coatings on round steel wires
11	IS 12444:1988	Continuously Cast and Rolled Electrolytic Copper Wire Rods for electrical conductors



**Specification No:** [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

12	IS 191	Copper
13	IS 10810	Methods of test for cables
14	IEC 60216 part 2	Determination of thermal endurance properties of electrical insulation materials
15	IEC 60216 part 8	Instructions for calculating thermal endurance characteristics using simplified procedures

**3. CLIMATIC CONDITIONS:**

SL.NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

Environmentally, some of the regions, where the work will take place include coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for





Specification No: [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

outdoor insulators. Some places are in heavily industrial polluted areas. Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere.

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.

**4. GENERAL TECHNICAL REQUIREMENTS:**

General design and sizes of 33 kV XLPE insulated cables operated in TPCODL/ TPWODL/ TPNODL/ TPSODL Network are as mentioned below:

**A) XLPE Insulated Underground Cables as per IS 7098-2: 33 KV (E)**

A2XCWY-(Aluminum stranded compacted conductor, XLPE insulation, copper tape screen, wire GI armour, PVC sheath)

A2XCWAY (Aluminum stranded compacted conductor, XLPE insulation, copper tape screen, wire Aluminum armour, PVC sheath)

CAS 33 kV 1Core- 300, 400 sq.mm (Aluminum stranded compacted conductor, XLPE insulation, copper tape screen, Corrugated Aluminum armour, PVC sheath)

- i. 3CX35 sq.mm A2XCWY
- ii. 3CX50 sq.mm A2XCWY
- iii. 3CX70 sq.mm A2XCWY
- iv. 3CX95 sq.mm A2XCWY
- v. 3CX185 sq.mm A2XCWY
- vi. 3CX240 sq.mm A2XCWY
- vii. 3CX300 sq.mm. A2XCWY
- viii. 3CX400 sq.mm. A2XCWY
- ix. 1CX300 sq.mm. A2XCWaY
- x. 1CX400 sq.mm. A2XCWaY and Corrugated Aluminum Armour
- xi. 1CX630 sq.mm. A2XCWaY
- xii. 1CX1000 sq.mm. A2XCWaY

Type & Size of cable	Type of Joint
33 kV 3C X 185, 3C X 240, 3CX300 and 400 sq.mm. XLPE insulated cable	Indoor termination with 185-400 sq.mm. tinned coated mechanical connector



**Specification No:** [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

Type & Size of cable	Type of Joint
	Straight through Joint with 185-400 sq.mm. tinned coated mechanical connector
	Outdoor termination with 185-400 sq.mm. tinned coated mechanical connector
33 kV 3CX35, 3CX50, 3CX70, 3CX95, 3C X150 XLPE insulated cable	Indoor termination with Aluminium crimping ferrule
	Straight through Joint with Aluminium crimping ferrule
	Outdoor termination with Aluminium crimping ferrule
33 kV 1CX300, 1CX400 Sq.mm XLPE Insulated Cable	Indoor termination with 185-400 sq.mm. tinned coated mechanical connector
	Straight through Joint with 185-400 sq.mm. tinned coated mechanical connector
	Outdoor termination with 185-400 sq.mm. tinned coated mechanical connector
33 kV 1CX630 Sq.mm XLPE Insulated Cable	Indoor termination with 630 sq.mm. tinned coated mechanical connector
	Straight through Joint with 630 sq.mm. tinned coated mechanical connector
	Outdoor termination with 630 sq.mm. tinned coated mechanical connector
33 kV 1CX1000 Sq.mm XLPE Insulated Cable	Indoor termination with 1000 sq.mm. tinned coated mechanical connector
	Straight through Joint with 1000 sq.mm. tinned coated mechanical connector
	Outdoor termination with 1000 sq.mm. tinned coated mechanical connector
PILCA to XLPE transition joints	Screened Transition joint 3CX300/400 sq.mm. XLPE insulated cable with 3CX300/400 sq.mm PILCA cable (with mechanical connector)

The jointing kit containing heat shrinkable tubing, mastics, lugs, mechanical connector and other accessories for making a complete joint and termination shall be designed to meet TPCODL/TPWODL/TPNODL/TPSODL specification, ENA TS 09-13, IEC 60502, IEC 61238 part1 and IS 13573, part 2 and other relevant standards. Cable Joint and termination material shall not be adversely affected in any manner even after contact with material used in cable construction and material used as accessories in the construction of cable joints and terminations and there will be no chance of corrosion developing on any metal surface.

Assembled jointing kit components shall perform without distress in system with parameters



**Specification No:** [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33KV Power Cable

(mentioned below):

S. No.	Parameter	Units	Requirement
1	Max Withstand System Voltage	KV	36
2	Partial Discharge at 1.73 U <sub>o</sub>	pC (Pico-coulombs)	<10
3	Impulse Peak Withstand	KV	170
4	Continuous operation withstand Temperature	°C	90 °C
	Short Circuit withstand temperature	°C	250 °C
5	Short Circuit Withstand Current	KA/1Sec	As per Size of the Conductor
6	Storage Temperature Range	°C	-10°C to +45°C
7	Shelf life of kit components excluding mastic and solution	Years	Min.5
8	Shelf life of mastic and solution	Years	Min.2

**A. General Technical Particular for Heat Shrinkable Insulation Tubing/Sleeves/Wrap around Sleeve:**

S. No.	Parameter	Requirement
1	Visual Examination	Free from protrusions, pin holes, cracks, nicks and other visible defects.
2	Wall thickness Ratio	0.6 or 60% (Minimum at any two points of measurements)
3	Internal dia of tube after full recovery	Shall not be higher than as specified in approved BOM/GTP
4	Longitudinal change	10% Max.
5	Electric Strength	10KV/MM(Min.)
6	Tensile Strength	10N/mm <sup>2</sup> (Min.) [8N/mm <sup>2</sup> for anti-tracking]
7	Ultimate Elongation	200%(Min.)
8	Heat Shock	No Splitting, Cracking, Dripping or flowing after 30 mins. At 200 °C (Min.) (For stress control tube: 30 Mins. At 200 °C Minimum)
9	Low Temperature Flexibility	No cracking after 4 Hrs at -20Deg.C (Max.)
10	Tracking Resistance	No tracking, erosion to top surface or flame failure after 1 hr. @ 2.5KV 1 hr. @ 2.7KV 1 hr. @ 3KV 20 min @ 3.25KV



**Specification No:** [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

S. No.	Parameter	Requirement
11	Volume Resistivity	1x10 <sup>10</sup> Ohm-meter (min.) For stress control tube VR: 1X10 <sup>7</sup> Ohm-meter Min.)
12	Flame Retardant (Applicable only for Anti tracking Tubes/ sleeves)	After 1 min. burn: Burnt or charred length 250mm Max.

**B. General Technical Particular for Heat Shrinkable Moulded Components/Breakouts/Weather Sheds:**

S. No.	Parameter	Requirement
1	Visual Examination	Free from protrusions, pin holes, cracks, nicks and other visible defects.
2	Wall thickness Ratio	0.6 or 60% (Minimum at any two points of measurements)
3	Internal dia of tube after full recovery	Shall not be higher than as specified in approved BOM/GTP
4	Longitudinal change	25% Max.
5	Electric Strength	10 KV/MM(Min.)
6	Tensile Strength	8N/mm <sup>2</sup> (Min.)
7	Ultimate Elongation	200 % ( Min.)
8	Heat Shock	No Splitting, Cracking, Dripping or flowing after 30 mins. At 250 °C Min.
9	Low Temperature Flexibility	No cracking after 4 Hrs at -20°C(Max.)
11	Volume Resistivity	1x10 <sup>10</sup> Ohm-meter(min.)
12	Flame Retardant (for anti-tracking moulded components)	After 1 min. burn: Burnt or charred length 250mm Max.

**5. GENERAL CONSTRUCTION:**

- a) Termination kit shall be designed based on heat shrink technology and shall be suitable for installation for 33 kV, three core and single core aluminum conductor, XLPE insulated (in line with TPCODL/TPWODL/TPNODL/TPSODL Specification for underground IS 7098-part 2. IS 13573 Part 2 &3).
- b) Length of 33 KV terminations (from bottom of breakout to center of lug hole) shall be minimum:
  - i) 1 core cable I/D 900 mm
  - ii) 1 core cable O/D 1100 mm
  - iii) 3 core cable (I/D) Indoor terminations: 1100 mm
  - iv) 3 core cable O/D (Outdoor terminations): 1500 mm

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

• **Components of Termination Kit:**

S. No.	Components	Requirement																																																
1	Heat Shrinkable insulating tube/Sleeve	<p>a) Surface of material: shall be smooth and free from protrusion, voids and nicks.</p> <p>b) Wall thickness ratio (before recovery) of all sleeves/tubes shall not be less than 60% st any two points of measurement.</p> <table border="1"> <thead> <tr> <th>SI no</th> <th>Size</th> <th>Tube type</th> <th>Qty</th> <th>Size (min in mm)</th> <th>OD (Before/After shrinking) mm</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3C 300/400 sqmm I/D &amp; O/D</td> <td>Stress control tube</td> <td>3</td> <td>300</td> <td>65/30</td> </tr> <tr> <td>2</td> <td>3C 300/400 sqmm O/D</td> <td>Anti tracking tube</td> <td>3</td> <td>2000</td> <td>70/30</td> </tr> <tr> <td>3</td> <td>3C 300/400 sqmm O/D</td> <td>Anti tracking tube</td> <td>3</td> <td>900</td> <td>70/30</td> </tr> <tr> <td>4</td> <td>3C 300/400 sqmm I/D</td> <td>Anti tracking tube</td> <td>3</td> <td>1200</td> <td>70/30</td> </tr> <tr> <td>4</td> <td>1C 300/400 sqmm O/D &amp; ID</td> <td>Stress control tube</td> <td>1</td> <td>300</td> <td>65/30</td> </tr> <tr> <td>5</td> <td>1C 300/400 sqmm O/D &amp; ID</td> <td>Anti tracking tube</td> <td>1</td> <td>1300</td> <td>70/30</td> </tr> <tr> <td>6</td> <td>1C 300/400 sqmm O/D &amp; ID</td> <td>Insulating tube</td> <td>3</td> <td>300</td> <td>35/12</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>For lower sizes length &amp; OD of tubes should be adjusted proportionally.</li> <li>O/D – Outdoor termination , I/D indoor termination</li> </ul>	SI no	Size	Tube type	Qty	Size (min in mm)	OD (Before/After shrinking) mm	1	3C 300/400 sqmm I/D & O/D	Stress control tube	3	300	65/30	2	3C 300/400 sqmm O/D	Anti tracking tube	3	2000	70/30	3	3C 300/400 sqmm O/D	Anti tracking tube	3	900	70/30	4	3C 300/400 sqmm I/D	Anti tracking tube	3	1200	70/30	4	1C 300/400 sqmm O/D & ID	Stress control tube	1	300	65/30	5	1C 300/400 sqmm O/D & ID	Anti tracking tube	1	1300	70/30	6	1C 300/400 sqmm O/D & ID	Insulating tube	3	300	35/12
SI no	Size	Tube type	Qty	Size (min in mm)	OD (Before/After shrinking) mm																																													
1	3C 300/400 sqmm I/D & O/D	Stress control tube	3	300	65/30																																													
2	3C 300/400 sqmm O/D	Anti tracking tube	3	2000	70/30																																													
3	3C 300/400 sqmm O/D	Anti tracking tube	3	900	70/30																																													
4	3C 300/400 sqmm I/D	Anti tracking tube	3	1200	70/30																																													
4	1C 300/400 sqmm O/D & ID	Stress control tube	1	300	65/30																																													
5	1C 300/400 sqmm O/D & ID	Anti tracking tube	1	1300	70/30																																													
6	1C 300/400 sqmm O/D & ID	Insulating tube	3	300	35/12																																													
2	Tinned coated Mechanical connector/ Compression lugs	<p><b><u>Mechanical connector:</u></b></p> <p>a) Tinned coated Aluminium Alloy 185-400 mm<sup>2</sup>/ 630mm<sup>2</sup>/1000mm<sup>2</sup></p> <p>b) Type tested as per IEC 61238(part1):2003</p> <p>c) Dimensions shall be as annexure-I of this specification.</p> <p>d) Approved make NILLED, PFISTERER, NEXANS, TYCO</p>																																																

		(GERMANY)  <b>Compression Lugs:</b> a) Material: Aluminium b) All Aluminum lugs with anti-corrosive paste shall be long barrel type as per IS 8309: 2003. c) Dimensions shall be as annexure-I of this specification. d) 1000mm <sup>2</sup> Aluminum lugs shall be without palm hole. e) Conductivity of ferrule shall be as per IS 8309:2003.
3	<b>Lug Seal, Anti-tracking tube, weather sheds, stress control tube</b>	a) Heat shrinkable b) Fire resistant and weather resistant as per ENA TS 09-13 c) For lug seals, weather sheds & anti tracking tube
4	<b>Mastic tape</b>	a) Mastic tape shall be electrically insulating, non-tracking and water/humidity resistant. b) Volume resistivity of mastic shall not be less than volume resistivity of insulating tube as specified in ENA TS 09-13. c) Stress control mastic tape for semicon area d) Moisture sealing mastic for lugs/connectors
5	<b>Heat Shrink Breakout</b>	a) Heat shrinkable b) Fire resistant and weather resistant as per ENA TS 09-13 – for lug seals, weather sheds and Anti- tracking tubes c) Adhesive coated Breakouts shall be provided on outer sheath of the cable to prevent water ingress.
6	<b>Tinned coated copper braid</b>	a) Shall be completely insulated with adhesive coated fire retardant and weather resistant HS tube/sleeve up to copper lug at one end. b) Fire resistant and weather resistant as per ENA TS 09-13 c) Size and length as per below: For 3C cables: 70 mm <sup>2</sup> X 750 mm X 1 Run for 150/185/240/300/400/630 mm <sup>2</sup> cables. 50 mm <sup>2</sup> X 750 mm X 1 Run for below 150 sqmm. For 1C cables: 70mm <sup>2</sup> X 750 mm X 1 Run for 300/400/630 & 1000 mm <sup>2</sup> cables. Additionally 3 nos x 150 mm <sup>2</sup> Al lugs with sealing sleeves/mastic for armor back fold earth bonding.
7	<b>Tinned coated copper braid as a leakage current collector</b>	a) Leakage current collector tinned copper braid b) 1R x 7 mm <sup>2</sup> x 150 mm per core shall be provided for terminations
8	<b>Tinned copper wire mesh</b>	Minimum 2" X 0.5m I/D & 0.7m O/D (2.5mm <sup>2</sup> ) tinned copper mesh shall be provided on armor circumference beneath the copper braid.
9	<b>Sub-kit components</b>	a) GI Solid Collet dia of dia as per cable OD (1no only in 3C cables),

		<p>b) Worm drive clip/ Jubilee clip of stainless steel (2nos)</p> <p>c) Compatible support rings (Aluminium for single core and GI for three core cables)</p> <p>d) Soldering on copper screen is not acceptable</p> <p>e) Constant pressure roll shall be provided for screen connections as per compatible size. For 3 core- 3nos, for 1C -1nos</p> <p>f) Plumb earthing on PILCA side is unacceptable.</p> <p>Constant pressure roll spring should be used for same</p> <p>g) Tinned copper binding wire 20 SWG, qty 50gms- 3C, 25gms- 1C</p> <p>h) Nylon string OD 1mm, 2mtr</p> <p>i) Silicone grease, 30 gms- 3C, 10gm -1C</p> <p>j) Cleaning liquid</p> <p>k) Vinyl tape</p> <p>l) Al oxide cloth</p> <p>m) Other necessary items</p>
10	<b>Submission of BOM and instruction sheet</b>	<p>a) Participating bidder shall submit BOM(during pre bid) with dimensions of each size and quantity of all components</p> <p>b) BOM shall be approved during tender evaluation and during GTP approval</p> <p>c) Instruction sheet should be submitted in each kit.</p>

• **Components of Straight Through Jointing Kit:**

Sl. no	Components	Requirement												
1	<b>Heat Shrinkable insulating tube/Sleeve</b>	<p>a) Surface of material: shall be smooth and free from protrusion, voids and nicks.</p> <p>b) Recovered thickness: Recovered thickness of insulation tubes over ferrule or connector circumference shall not be less than 10.56 mm at any point of measurement.</p> <p>c) Wall thickness ratio (before recovery) of all sleeves/tubes shall not be less than 60% st any two points of measurement.</p> <p>Following tubes shall be included in BOM</p> <table border="1"> <thead> <tr> <th>Sl no</th> <th>Size</th> <th>Tube type</th> <th>Qty</th> <th>Size (min in mm)</th> <th>OD (Before/After shrinking) mm</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3C 300/400 sqmm</td> <td>Stress control tube</td> <td>3</td> <td>650</td> <td>60/25</td> </tr> </tbody> </table>	Sl no	Size	Tube type	Qty	Size (min in mm)	OD (Before/After shrinking) mm	1	3C 300/400 sqmm	Stress control tube	3	650	60/25
Sl no	Size	Tube type	Qty	Size (min in mm)	OD (Before/After shrinking) mm									
1	3C 300/400 sqmm	Stress control tube	3	650	60/25									

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

		<table border="1"> <tr> <td>2</td> <td>3C 300/400 sqmm</td> <td>Red Insulating tube</td> <td>6</td> <td>640</td> <td>65/27- 3nos, 85/37- 3nos</td> </tr> <tr> <td>3</td> <td>3C 300/400 sqmm</td> <td>Dual wall tube</td> <td>3</td> <td>640</td> <td>110/40</td> </tr> <tr> <td>4</td> <td>1C 300/400 sqmm</td> <td>Stress control tube</td> <td>1</td> <td>60</td> <td>60/25</td> </tr> <tr> <td>5</td> <td>1C 300/400 sqmm</td> <td>Red Insulating tube</td> <td>2</td> <td>590</td> <td>66/27, 85/37</td> </tr> <tr> <td>6</td> <td>1C 300/400 sqmm</td> <td>Dual wall tube</td> <td>1</td> <td>580</td> <td>110/40</td> </tr> </table> <ul style="list-style-type: none"> <li>For lower sizes length &amp; OD of tubes should be adjusted proportionally.</li> </ul>	2	3C 300/400 sqmm	Red Insulating tube	6	640	65/27- 3nos, 85/37- 3nos	3	3C 300/400 sqmm	Dual wall tube	3	640	110/40	4	1C 300/400 sqmm	Stress control tube	1	60	60/25	5	1C 300/400 sqmm	Red Insulating tube	2	590	66/27, 85/37	6	1C 300/400 sqmm	Dual wall tube	1	580	110/40
2	3C 300/400 sqmm	Red Insulating tube	6	640	65/27- 3nos, 85/37- 3nos																											
3	3C 300/400 sqmm	Dual wall tube	3	640	110/40																											
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5	1C 300/400 sqmm	Red Insulating tube	2	590	66/27, 85/37																											
6	1C 300/400 sqmm	Dual wall tube	1	580	110/40																											
2	<b>Tinned coated Mechanical connector/ Compression lugs</b>	<p><b><u>Mechanical connector:</u></b></p> <p>a) Tinned coated Aluminium 185-400 mm<sup>2</sup>/ 630mm<sup>2</sup>/1000mm<sup>2</sup></p> <p>b) Type Tested as per IEC 61238(part1):2003</p> <p>c) Dimensions shall be as annexure-I of this specification.</p> <p>d) Approved make NILLED, PFISTERER, NEXANS, TYCO (GERMANY)</p> <p><b><u>Compression Lugs:</u></b></p> <p>a) Material: Aluminium</p> <p>b) All Aluminum lugs with anti-corrosive paste shall be long barrel type as per IS 8309: 2003.</p> <p>c) Dimensions shall be as annexure-I of this specification.</p> <p>d) 1000mm<sup>2</sup> Aluminum lugs shall be without palm hole.</p> <p>e) Conductivity of ferrules/mechanical connectors shall be as per IS 8309: 2003.</p>																														
3	<b>Mastic tape</b>	<p>a) Mastic tape shall be electrically insulating, non-tracking and water/humidity resistant.</p> <p>b) Volume resistivity of mastic shall not be less than volume resistivity of insulating tube as specified in ENA TS 09-13.</p> <p>c) Stress grading mastic should be provided for both connector portion and semicon portion.</p> <p>d) Water resistant sealing mastic shall also be provided for end sealing in straight through kit and lug sealing in termination kit.</p>																														
4	<b>Tinned coated copper braid for GI armour continuity/</b>	<p>Tinned coated copper braid for GI armor continuity:</p> <p>Uniformly tinned coated copper braid shall be provided for armor continuity.</p>																														



	<b>Ferrules for Aluminium armour continuity</b>	<p>a) Wrap tinned copper wire mesh with 50% overlap around the joint area and continue 25mm over the copper screen on both sides.</p> <p>Bind the copper wire mesh on copper screen with CFS</p> <p>a) Uniformly tinned coated wire mesh shall be provided for armor continuity.</p> <p>b) Tinned copper braid shall be provided for wrapping over armor circumference beneath the copper braid and size shall be as below:</p> <p>For 3C cables: 70 mm<sup>2</sup> X 2600 mm X 1 Run for 150/185/240/300/400 mm<sup>2</sup> cables.</p> <p>For 1C cables: 70mm<sup>2</sup> X 2500 mm X 1 Run for 630 mm<sup>2</sup> &amp;1000 mm<sup>2</sup> cables.</p> <p>Additionally 2 nos x 150 mm<sup>2</sup> Al lugs for aluminium armor continuity.</p>
5	<b>Tinned coated copper braid for screen continuity</b>	7 mm <sup>2</sup> x 150 mm- 6 nos. for 3 core only
6	<b>Tinned copper wire mesh</b>	<p>Uniformly tinned coated copper braid shall be provided for screen continuity.</p> <p>Minimum 2.5mm<sup>2</sup> tinned copper mesh shall be provided on both sides of armor circumference beneath the copper braid.</p> <p>For 3C 2" X 10mtr (min 2.5 sqmm)</p> <p>For 1C 2" X 12mtr (min 2.5 sqmm) 2nos &amp; 2" X 10mtr (min 2.5 sqmm) 1 no</p>
7	<b>GI wire mesh/ copper wire mesh</b>	<p>a) Mechanical protection shall be provided in GI armored cables by means of heavily zinc coated GI mesh as per IS 4826</p> <p>b) In 1C Aluminium armored cables, for mechanical protection, copper wire mesh shall be provided as mentioned in SI no 5.</p> <p>c) For 3C W 3" X 15mtr (heavily zinc coated) minimum</p>
8	<b>Breakouts</b>	Adhesive coated breakout shall be provided on outer sheath at both sides on the cable to prevent water ingress. Qty. 2nos
9	<b>Nesting &amp; end sealing tube</b>	<p>a) Hot melted adhesive coated bested end sealing tube for protection of moisture ingress in cores.</p> <p>b) Length 200mm minimum</p> <p>c) 6 nos for 3C, 2 nos for 1C</p>
10	<b>Wrap around insulating tube/Sleeve as outer most tube</b>	<p>Material: Cross-linked polyolefin (Heat Shrinkable) as a waterproof seal.</p> <p>Shape: Wrap around form with hot-melt adhesive liner on the inner surface of the sleeve (Upon heating, the sleeve shrinks and the adhesive melts, creating a water-tight bond between the sleeve and the</p>

		<p>cable).</p> <p>Stainless steel channel shall be provided along the wrap around to close the sleeve during installation.</p> <p>Excellent mechanical and corrosion protection, and atmospheric sealing.</p> <p>High split resistance.</p> <p>*Note: Overlapping of wrap around sleeve is not acceptable. Length of one sleeve: Minimum 1000mm, Qty. 2nos Insulating sleeve of 500 mm should be provided to cover mid joints Portion</p>
11	<b>Sub kit components</b>	<p>a) GI Solid Collet dia of dia as per cable OD (2nos only in 3C cables),</p> <p>b) Worm drive clip/ Jubilee clip of stainless steel (3 core- 6nos, 1C 2nos),</p> <p>c) Compatible support rings (Aluminium for single core and GI for three core cables)</p> <p>d) Soldering on copper screen is not acceptable</p> <p>e) Constant pressure roll shall be provided for screen connection as per compatible size.. For 3 core- 6nos, for 1C -2nos</p> <p>f) Plumb earthing on PILCA side is unacceptable.</p> <p>Constant pressure roll spring should be used for same</p> <p>a) Tinned copper binding wire 20 SWG, qty 50gms</p> <p>b) Nylon string OD 1mm, 2mtr</p> <p>c) Silicone grease, 30 gms</p> <p>d) Cleaning liquid</p> <p>e) Vinyl tape</p> <p>f) Al oxide cloth</p> <p>g) Other necessary items</p>
12	<b>Submission of BOM and instruction sheet</b>	<p>a) Participating bidder shall submit BOM(during pre bid) with dimensions of each size and quantity of all components</p> <p>b) BOM shall be approved during tender evaluation and during GTP approval</p> <p>c) Instruction sheet should be submitted in each kit.</p>



Specification No: [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

SL no	Cable size	Joint type	Connector type
1	3C 185/240/300/400	Straight through, I/D termination, O/D termination	Mechanical
2	1C 300/400/630/1000	Straight through, I/D termination, O/D termination	Mechanical
3	3C 35/70/95/150 sqmm	Straight through, I/D termination, O/D termination	Crimping

**6. MARKING:**

Following details shall be printed in the box:

- Manufacture's name and address.
- Month & Year of Manufacturing
- Voltage Grade
- PO No.
- "TPCODL/ TPWODL/ TPNODL/ TPSODL" Name

**HS Sleeves/tubes and breakout components shall be embossed with:**

- Manufacture's name and address.
- Month & Year of Manufacturing
- Batch No. / Lot No.
- Shrink Ratio
- Size
- Type
- "TPCODL/ TPWODL/ TPNODL/ TPSODL" Name

**7. TESTS:**

All Routine, Acceptance & Type tests shall be carried out in accordance with the Relevant IS/IEC/ ENA TS 09-13. All the components shall also be type tested as per the relevant standards mentioned below. Following tests shall be necessarily conducted on the Joint and Termination Kits In addition to others specified in IS/IEC/ENA-TS 09-13 standards:



**Specification No:** [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

### 7.1 ACCEPTANCE TESTS:

Test	Clause No.	Reference Standard
Visual inspection	3.15	ENA -TS 09-13
Physical verification of kit contents and dimensions	As per TPCODL/TPWODL/TPNODL/TPSODL approved BOM	
Electric Strength test	3.4	ENA -TS 09-13
Ultimate Elongation tests	3.12	ENA -TS 09-13
Tensile Strength	3.12	ENA -TS 09-13
Volume Resistivity	3.16	ENA -TS 09-13
Wall thickness ratio	3.3	ENA -TS 09-13
Expanded and recovered diameters	3.3	ENA -TS 09-13
Longitudinal change after recovery	3.3	ENA -TS 09-13
Heat shock test	3.7.1/3.7.2	ENA -TS 09-13
Low temperature flexibility	4.5	ENA -TS 09-13
Insulation build up thickness after shrink on Ferrule	8.1	IS 10810 -6
Flame retardant test on anti-tracking tubes and anti-tracking moulded components and earth braid protective tube after shrink on mandrill for terminations	3.5.1/ 3.5.2	ENA -TS 09-13
Area measurement of tinned copper braids (Area of one wire x no. of wires x no. of carriers)	As per TPCODL/TPWODL/TPNODL/TPSODL specification/ approved BOM	
Conductivity test on ferrules/ connectors/ lugs	8.3	IS 8309/ As per IEC 61238 part 1
Uniformity of zinc coating on GI mesh (Manufacturer's TC to be provided)	4.1	IS 2633

### 7.2 ROUTINE TESTS

Test	Clause No.	Reference Standard
Visual inspection of tubing and moulded components for free from pin holes, cracks, nicks, protrusion and other defects	3.15	ENA -TS 09-13
Dimension check	As per TPCODL/TPWODL/TPNODL/TPSODL	

Test	Clause No.	Reference Standard
		approved BOM
Electric Strength	3.4	ENA -TS 09-13
Ultimate Elongation	3.12	ENA -TS 09-13
Tensile Strength	3.12	ENA -TS 09-13
Volume Resistivity	3.16	ENA -TS 09-13
Wall thickness ratio	3.3	ENA -TS 09-13
Expanded and recovered diameters of tubes	3.3	ENA -TS 09-13

### 7.3 TYPE TESTS:

#### (i) Terminations & Straight Through joints

Test	Clause No.	Reference Standard
Conductor resistance with Ferrule/Lugs/Mechanical connectors	4.1	IS 13573(Part-2)
AC Voltage withstand Test (Air)	4.2	IS 13573(Part-2)
AC Voltage withstand test (under wet conditions) (for outdoor termination only)	4.2	IS 13573(Part-2)
Partial Discharge	7.0	IS 13573(Part-2)
Impulse voltage test	6	IS 13573(Part-2)
Heat Cycle test in air and water	9.1 and 9.2	IS 13573(Part-2)
Thermal Short Circuit Test for Screen	10	IS 13573(Part-2)
Thermal Short Circuit Test for Conductor	11	IS 13573(Part-2)
DC Voltage Withstand	5	IS 13573(Part-2)
Dynamic short circuit test	12	IS 13573(Part-2)
Thermal Endurance test	IEC 60216 part 2 & 8	
Salt fog test (Only for Outdoor terminations only)	13	IS 13573(Part-2)



Specification No: [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

**(II) Kit Components**

**a) For Tubing and Moulded Components**

Test	Clause No.	Reference Standard
Corrosion Resistance	3.1	ENA -TS 09-13
Density	3.2	ENA -TS 09-13
Dimensions	3.3	ENA -TS 09-13
Electric Strength	3.4	ENA -TS 09-13
Flame Retardance	3.5	ENA -TS 09-13
Heat Shock	3.7	ENA -TS 09-13
Low temperature flexibility	3.8	ENA -TS 09-13
Relative Permittivity	3.9	ENA -TS 09-13
Tensile strength and Ultimate elongation	3.12	ENA -TS 09-13
Thermal Ageing	3.13	ENA -TS 09-13
Tracking Resistance	3.14	ENA -TS 09-13
Visual Examination	3.15	ENA -TS 09-13
Volume Resistivity	3.16	ENA -TS 09-13
Water Absorption	3.17	ENA -TS 09-13

**b) For Compression Lugs, Compression Ferrules and Mechanical connectors**

Test	Reference Standard
Mechanical Pull Test	IEC 61238, part - 1
Heat cycle Test (1000 Nos.)	IEC 61238, part - 1
Short circuit Test	IEC 61238, part - 1

**8. TYPE TEST CERTIFICATES:**

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA** as per relevant IS. However, TPCODL/ TPWODL/ TPNODL/ TPSODL/ TATA-POWER reserves the right to allow any other NABL accredited/ Govt. lab report / Lab having accreditation from ILAC Signatory under exceptional circumstances after due diligence/ scrutiny by DISCOM. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/ TPWODL/ TPNODL/ TPSODL.

**9. PRE-DISPATCH INSPECTION:**

The material shall be subject to inspection by a duly authorized representative of the TPCODL/ TPWODL/ TPNODL/ TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser



**Specification No:** [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/ TPWODL/ TPNODL/ TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/ TPWODL/ TPNODL/ TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/ TPWODL/ TPNODL/ TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPWODL/TPNODL/TPSODL
- c) TPCODL/TPWODL/TPNODL/TPSODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

#### **10. INSPECTION AFTER RECEIPT AT STORE:**

The material received at TPCODL/ TPWODL/ TPNODL/ TPSODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

#### **11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of at least 60 months from the date of commissioning or 66 months from the date of last supplies made under the contract whichever is later.

Further Bidder shall also stand guarantee towards poor workmanship in installation of straight through joint and terminations installed by bidder's jointer up to 60 months from the date of installation.

Bidder shall be liable to undertake to replace/rectify such defects at own costs, within mutually agreed time frame, and to the entire satisfaction of TPCODL/TPWODL/TPNODL/TPSODL, failing which TPCODL/TPWODL/TPNODL/TPSODL shall be at liberty to get it replaced/rectified at bidder's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the bidder or from the "Security cum Performance Deposit" as the case may be. Bidder shall further



Specification No: [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

be responsible for free replacement for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Company.

**12. PACKING AND TRANSPORT:**

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**~~13. TENDER SAMPLE:~~**

~~Bidder shall submit the sample of material during submission of Bids.~~

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars & Schedule "B" Deviations
- b) BOM
- c) Work Experience details





Specification No: [ENG-EHV-1022](#)

**Specification Name:**

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

- d) Type test certificates.
- e) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.

**19. SCHEDULE- “A” GUARANTEED TECHNICAL PARTICULARS:**

S. No.	Parameter	Units	To be Furnished by Bidder
1	Max Withstand System Voltage	KV	
2	Partial Discharge at 1.73 Uo	pC (Pico-coulombs)	
3	Impulse Peak Withstand	KV	
4	Continuous operation withstand Temperature	°C	
	Short Circuit withstand temperature	°C	
5	Withstand short circuit current	KA/1Sec	
6	Storage Temperature Range	°C	
7	Shelf life of kit components excluding mastic and solution	Years	
8	Shelf life of mastic and solution	Years	

**A. General Technical Particular for Heat Shrinkable Insulation Tubing/Sleeves/Wrap around Sleeve:**

S. No.	Parameter	To be Furnished by Bidder
1	Visual Examination	
2	Wall thickness Ratio	
3	Internal dia of tube after full recovery	
4	Longitudinal change	
5	Electric Strength	
6	Tensile Strength	
7	Ultimate Elongation	
8	Heat Shock	
9	Low Temperature Flexibility	
10	Tracking Resistance	
11	Volume Resistivity	
12	Flame Retardant (Applicable only for Anti tracking Tubes/ sleeves)	



Specification No: [ENG-EHV-1022](#)

Specification Name:

Technical Specification For Heat Shrinkable Straight through Joint & Termination for 33kV Power Cable

**B. General Technical Particular for Heat Shrinkable Moulded Components/Breakouts/Weather Sheds:**

S. No.	Parameter	To be Furnished by Bidder
1	Visual Examination	
2	Wall thickness Ratio	
3	Internal dia of tube after full recovery	
4	Longitudinal change	
5	Electric Strength	
6	Tensile Strength	
7	Ultimate Elongation	
8	Heat Shock	
9	Low Temperature Flexibility	
11	Volume Resistivity	
12	Flame Retardant (for anti-tracking moulded components)	

~~20. SCHEDULE "B" DEVIATIONS:~~

~~(TO BE ENCLOSED WITH TECHNICAL BID)~~

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

Seal of the Company:

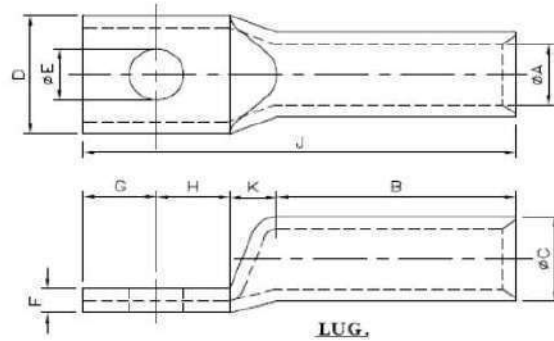
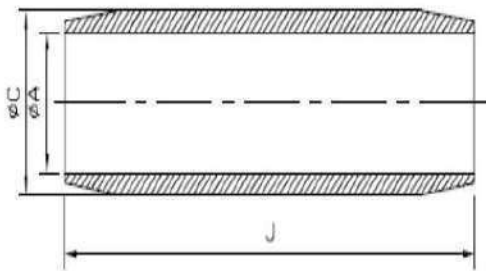
Signature

Designation

**Annexure- Dimensions Ferrules & Lugs HT**

Dimensional details of Aluminum ferrules for HT AL circular stranded compacted XLPE cables			
Cable Size in MM <sup>2</sup>	φA (mm) +0.3mm	φC (mm) +0.3 mm	J (mm) ±3mm
95	12	16.9	108
150	15.1	21.2	116
300	21.8	30.2	150
400	25	34.8	150
630	31.7	44.4	200
1000	41	56	250

Dimensional details of Aluminum Lugs for HT circular stranded compacted XLPE cables							
Cable Size in MM <sup>2</sup>	φE (mm) ±0.1mm in centre of palm	φA (mm) +0.5mm	φC (mm) +0.5 mm	D (mm) ±1.5mm	F (mm) ±0.5mm	B ±3.0mm	J (mm) ±5mm
95	13	12	16.9	23.5	4.9	73	109
150	13	15.1	21.2	29.5	6	83	128
300	17	21.8	30.2	42	8.4	89	157
400	17	25	34.8	48	9.8	113	187
630	17	31.7	44.4	61	12.7	140	225
1000	-	41	56	77.5	15	160	280

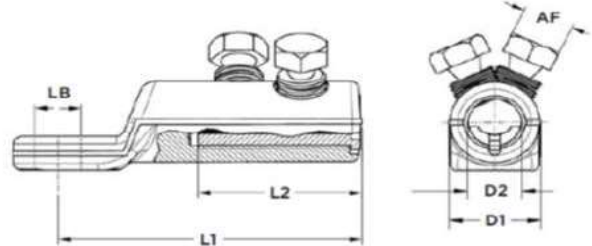
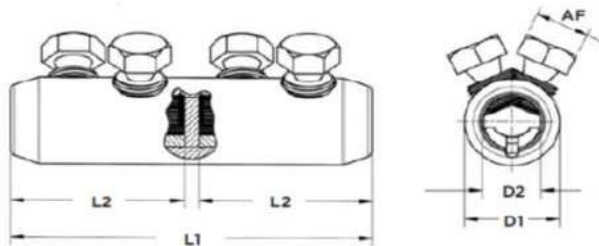


For remaining cable sizes, dimensions of Ferrules & Lugs shall be as per IS.

**Annexure- Dimensions Mechanical connectors & Mechanical Lugs**

Aluminium Mechanical connectors			
Cable Size in MM <sup>2</sup>	φD1 (mm)	φD2 (mm)	L (mm)
185-400	50	25.5-26	440- 450
185-400	42	25.5-26	170-200
500- 630	50	33- 33.5	180-230
1000	60	40	180-230

Tinned Aluminium Mechanical Lugs				
Cable Size in MM <sup>2</sup>	φLB (mm)	φD1 (mm)	φD2 (mm)	L (mm)
185-400	17	42	25.5-26	137-150
500- 630	17	50	33- 33.5	150-180
1000	2x17	60	40- 40.5	180- 240



# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1019**

**Specification Name : Technical Specification of Center rotating, Double Break Type Isolator - 33KV (1250 Amp) & 11KV (630 Amp)**

<b>SATYA PRASAD NAYAK</b>	<b>SHANTAPRIYA JENA</b>	<b>JYOTIPRAKASH MOHANTY</b>	<b>Ranjan Kumar Sahoo</b>	<b>KHAJAN BHARDWAJ</b>	<b>POURUSH GARG</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPCODL	TPNODL	TPWODL	TPSODL	TPCODL	TPCODL
18-01-2023	18-01-2023	19-01-2023	19-01-2023	21-01-2023	31-01-2023

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TPWODL*



**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SAMPLE DRAWINGS
20. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
21. SCHEDULE "B" DEVIATIONS

**1. SCOPE**

Scope covers design, manufacture, assembly, inspection, testing at manufacturer's works, supply and delivery of 33 kV 1250 & 11 KV 630 A Horizontal Operated, Center rotating, Double Break type gang-operated air-break alternating current Isolator (with and without earth switch), with Insulators, Terminal Connectors, auxiliary contact switches, position indicating device, base frames, operating mechanism box, control cabinet, arcing horns (wherever necessary) etc. and other devices whether specifically mentioned herein or not, but required for efficient and trouble free operation.

**2. APPLICABLE STANDARDS**

Isolators covered by this specification shall unless otherwise stated, be designed, constructed and tested in accordance with latest revisions of following relevant Indian Standards and shall conform to the regulations of local statutory authorities:

IS: 9921(Part 1-V)	: Alternating current Disconnecter (Isolators) and Earthing switches for voltages above 1000V
IS: 2544:	: Porcelain post insulators for systems with nominal voltages greater than 1000V
IS: 2147	: Degree of protection provided by enclosures for low voltage switchgear and control gear
IS:4691	: Degree of protection provided by enclosure for rotating electrical machinery
IS: 2629:	: Recommended practice for hot dip galvanizing of iron & steel
IS: 4759	: Hot-dip zinc coatings on structural steel and other allied products
IS: 2633	: Method of testing weight, thickness & uniformity
IS: 1573	: Electroplated coatings of zinc on iron & steel
IS: 6735	: Fasteners - Spring lock washers for screws with cylindrical heads
IS: 2016	: Plain washers
IS 1771	: Electroplated coatings of silver and silver alloys for general engineering purposes
IEC 62271	: High voltage switchgear and control gear
IEC 60129	: Alternating Current Disconnectors and Earthing switches

### 3. SERVICE CONDITIONS

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

### 4. GUARANTEED TECHNICAL REQUIREMENTS

The equipment covered in this specification shall meet the technical requirements listed below. The Isolator must be Double Break, center pole rotating type

Sl.No	Type	33KV	11KV
1	Main switch	Double break, Centre post rotating, gang operated	
2	Service	Outdoor	
3	Applicable standard	IS : 9921 / IEC-129/IEC-62271-102	
4	Pole	3 pole gang operator	
5	Rated voltage nominal/ Maximum	33/36 kV	11/12 kV
6	Rated Frequency	50 Hz	
7	System earthing	Solidly earthed	
8	Temperature rise	As per relevant IS/IEC publication	

**TPCODL****TPNODL****TPWODL****TPSODL****Specification No:** [ENG-EHV-1019](#)**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

9	Insulation level impulse with stand voltage		
	a) Across Isolating distance	195 kVpeak	85 kVpeak
	b) To earth & between poles	170 kVpeak	75 kVpeak
10	1 minute power frequency with stand voltage		
	a) Across Isolating distance	80 kVpeak	32 kVpeak
	b) To earth & between poles	70 kVpeak	28 kVpeak
11	Rated current in Amp	1250	630
12	Short time current for 3 sec	25kA	25kA
13	Rated Peak withstand Current	62.5KAp	62.5KAp
13	a). Operating mechanism: I. Isolator: Motorized/Manual	To be decided during Tendering Stage	To be decided during Tendering Stage
	II. Earth Switch	Manual	Manual
	b). Gear Box and Control Wiring for Motorized Operation	To be decided during Tendering Stage	To be decided during Tendering Stage
14	Auxiliary voltage		
	a) Control & Inter lock	24/48V DC (80% to 110%)	
	b) For Heater Lamp and Socket	1ph 240V	
15	Safe duration of overload		
	a) 150% of rated current	5 minute	
	b) 120% of rated current	30 minute	
16	Minimum creepage distance of support and Rotating insulator	25mm/KV	
17	Mounting structure	Upright on G.I structure	
18	Terminal connector type	Bimetallic clamp Zebra	Bimetallic clamp Panther



**TPCODL****TPNODL****TPWODL****TPSODL****Specification No:** [ENG-EHV-1019](#)**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

19	Control	Local/Remote	
20	Auxiliary Contact		
	Main Isolator	6 NO / 6 NC	
	Earth Switch	4 NO / 4 NC	
	Control Voltage and Current Rating of Contacts	24 / 48V DC and 10 Amp.	
21	Cantilever Strength Support	700Kg	
22	Current Density of Copper	1.75 Amp/Sq.mm	
23	Control Cabinet		
	Thickness of sheet Metal	3mm	
	Enclosure Protection	IP55	
	Paint	50-60 Microns inside & 70-80 Microns Outside Powder Coated shade 631 as per IS-5	
	Material of the Box	Stainless Steel	
24	Material of Moving and Fixed Contact	Copper Silver Plated (min 25 microns)	
25	Operating Rod Earthing with flexible copper braid of suitable length	25X6 sqmm	25X6 sqmm
26	The moving arm and current carrying contacts/joints to be covered in box type arrangement	Required	Required
27	Interlock		
	Mechanical	Castel Key Interlock	Castel Key Interlock
	Electrical	Solenoid	Solenoid
28	Mounting Condition	On Galvanised Steel Structure	
29	Type of Support Insulator	Solid Core Porcelain post insulator	
30	Minimum Clearance in Air (mm)		
	<b>When switch is closed</b>		
	(a) Between adjacent Pole of different Phases(Centre-Centre)	1500	900

	(b)Between Live Parts and Earth	508	254
	<b>When switch is open</b>		
	Between Poles of the same Phase (Centre to Centre)	440	300
	Between adjacent poles of different phases (Centre-Centre)	1500	900
31	Minimum Height of Insulator Stack (mm)	508	254

## **5 GENERAL CONSTRUCTION**

### **5.1 General Arrangement**

**Type :**

Center Rotating, outdoor, gang operated type, with blades rotating in horizontal plane

**Base Frame:**

All ferrous parts shall be hot dipped galvanized steel structure. Size of base channel shall be 100 mm X 50 mm. Galvanization thickness min (100 Microns) & Mass of Zn coating (705 Gm/M<sup>2</sup>)

**Insulators:**

3 nos, porcelain post insulators per phase (Total nos. 9) with creepage length as per GTP.

**Gang operated rods:**

Galvanized steel rods connected to common operating mechanism.

Gang operated links shall be so designed that all phases shall make and break simultaneously.

**Mounting arrangement:**

Vertical and Horizontal Mounting: Isolator (with conductive terminals, main contacts, gang-operated operating rod, and insulators) shall be suitable for mounting on galvanized steel structure. Also provision for standing of maintenance personnel shall be provided along with mounting structure.

**Limiting pins/Stopper arrangement:** Adjustable limiting pins shall be provided to limit over travel of moving post.

Stopper arrangement shall be provided for controlling of opening of isolator main blades for all the three phases. All the interlocks shall have locknut with bush arrangement type provision.



**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

**Accidental prevention design/ Dead center interlocking:** Isolators shall be constructed such that it cannot be dislodged by gravity, wind pressure, vibrations, shocks, accidental touching, breaking of the connecting rods of the operating mechanism, or open under influence of short circuit.

## **5.2 Hardware items:**

### **Nuts, bolts & washers:**

Shall be hot dip galvanized. Sufficient length of bolts shall be provided for current carrying parts

### **Teflon washer :**

Shall be provided between operating rod & arrangement of tandem & coupling pipes.

### **Spring washer .:**

Phosphorus bronze spring washers shall be used in current carrying parts

## **5.3 Contacts(male and female):**

**Material :**All non-ferrous current carrying parts/ contacts shall be of high conductivity, corrosion resistance, hard-drawn electrolytic copper or copper alloy of proper thickness and contact area with current density of 1.75 A per sq. mm. (max.) with silver plating at the contacts.

### **Contacts:**

- a) Heavy duty, self-aligning, high pressure and self-cleaning type high pressure contacts. The contacts shall wipe the contact surface during opening and closing without causing any abrasion on the contact surface.
- c) All contacts shall be replaceable at site
- d) Contact resistance - 50 micro-ohms, and up to permissible limit as defined in IS:9921(part-IV)
- e) All movable parts shall be shunted by flexible copper conductor of specified cross-section and capacity
- f) All contact blades of moving arm should have proper contact on the main current carrying rod.
- g) The fixed and moving contacts shall be able to carry the rated current continuously and the maximum fault current as per GTP for 3 seconds without any appreciable rise in temperature.

### **FC spring:**

Material: The springs shall be made of durable and nonrusting type stainless steel.

### **Vibration and Impact:**

The blades shall be self-latching in the closed position or provided with a safety latch to prevent maloperation due to impact gravity, vibration, wind pressure, electromagnetic forces or shocks.

### **Temperature Rise Limit:**

The contacts and other current carrying parts shall be so designed that their temperature rise under different operating conditions shall not exceed the value specified in IS: 99241.



**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

**Corona & RIV Corona avoidance:**

Corona and Radio interference Voltages Shall be avoided by eliminating sharp edges, points or loose metal fittings on energized parts.

The design shall be such that it is free from visible corona discharge in both closed and open positions.

**5.4 Terminal Connectors:**

**Material:**

High conductivity electrolytic grade copper.

The live parts shall be so designed that as far as possible, sharp points, edges and other corona producing surface are eliminated.

**Weight withstand capacity:**

The terminal connectors shall be designed to withstand load due to dead weight of Aluminium tube/ACSR conductor connected to it and alignment of the isolator main blade shall not be disturbed..

**Suitable for Conductor sizes :**

Zebra/Panther conductor .To be finalised during detailed engineering.

**Current Carrying Capacity:**

Terminal pad (moving arm and contact joints) shall be capable of carrying the rated continuous current as well as short circuit current as specified in GTP without exceeding temperature specified for the main blades.

**5.5 Insulator:**

**Conformance:**

Shall conform to 1S:2544 and/or IEC-61109

**Material :**

Porcelain

Glazing: Shall be uniform glazed of brown colour free from blisters, burns and other defects which may affect the mechanical and dielectric quality of the insulators

**Type:**

Shall be solid core type, homogeneous, free from cavities, tough and impervious to moisture

**End fittings :**

All ferrous parts shall be of high grade cast steel or malleable steel with smooth surface and shall be hot dip

Galvanized. The porcelain and metal parts shall be assembled in such a manner that any thermal expansion difference between the metal and the porcelain part throughout the range of temperature variation should not create any space and undue internal stresses which may affect the electrical or mechanical strength and rigidity.



**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

### **5.6 Bearings:**

**Type:**

Shall be ball or roller type and shall be protected from weather by means of housing arrangement /covers and grease retainers.

All bearings shall be-sealed type such that no lubrication or maintenance is required.

The design and construction of various bearings shall comply all the features required to withstand climatic condition specified, to ensure effective operation even after long period of un-operability of isolators.

### **5.7 Manual Operating Mechanism: Control Cabinet of Isolator or Earth Switch:**

**Housing/Enclosure:**

Material: Stainless steel

Degree of protection: IP 55

Housing/Enclosure Sloping rain hood shall be provided to cover all sides.

Thickness of sheet: min. 3 mm.

The cabinet shall be suitable for mounting on support structure.

**Earthing terminals:**

2 Nos. M12 size

**Gland plates:**

Control cabinet shall be provided with removable gland plate at the bottom of the box with double compression type brass cable glands shall be provided with each operating mechanism for connection of cables.

**Internal wiring:**

Size of wire: 2.5 sq.mm. FRLS

Material: Copper stranded conductor, 1100 V grade

**Hinges:**

Hinges on the door of the box shall be concealed. Hinged door shall be provided with padlocking arrangement.

**TOM (Top Operating mechanism)**

Shall be provided with nylon nut and check nut

**Auxiliary Switches:**

(i) Each isolator shall be provided with a mechanically driven auxiliary switch with all necessary contacts for control, indication and interlocking purposes with 6 NO and 6 NC contacts and 4 NO and NC contacts for earth switch.

(ii) All isolator and earthing switches shall be provided with auxiliary switches suitable for 24/48V DC

(iii) Mechanically coupled auxiliary contacts shall not slip during smooth operation of the isolator.

(iv) Remote status monitoring & electrical interlocking:

The contacts of the auxiliary switches shall be used for remote indication of open or close position in the control panel as well as for electrical interlock with other equipments.



**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

**Terminal Block and wiring:**

- (i) All auxiliary switches, interlocks and other terminals shall be wired up to 'terminal block' housed in the mechanism box.
- (ii) The spare contacts shall also be bought out on to the terminal block. The terminal block shall have at least 20% extra terminals.
- (iii) it shall be possible to change normally open contacts into normally closed contacts and vice-versa at site if required.
- (iv) Stud type terminals of Elemax or equivalent make of 1100 V grade having washers, nuts & check nuts shall be provided for terminating the control cables/ wire.

**Indicator:**

Indication of isolator opening & closing shall be provided with direction

**Fuse for DC supply :**

Fuses for control supply shall be provided

**Castile key Provision:**

Shall be provided

**Fixing bracket:**

Of MS HDG shall be provided on the top of the mechanism box

**Operating pipe:**

Shall be min. of 40 NB dia. GI pipe. Thickness: 3MM

Length of Operating Down Pipe: 2.5Mtr/ 4.5Mtr: Final Length of the pipe will be decided during detailed engineering as per the site requirement

**Tandem pipe :**

3 mm thick

Outer dia — 34 mm

Inner dia ~ 28 mm

**Flange:**

With 14 holes

**Gasket:**

EPDM rubber/ Neoprene gaskets shall be provided on a all 4 sides at front between hinged door and cabinet.

**Space heater:**

Space Heater thermostatically controlled, suitable for single phase 240 V AC supply shall be provided to Space heater prevent condensation. A switch and fuse/link shall be | provided in the operating mechanism.

**Switch and Plug :**

One 230 V combined 5A/15A AC plug with socket and arrangement switch shall be provided.



**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

**Lamp arrangement :**

Switch, HRC fuse and holder suitable for a 240 V LED lamp shall be provided in manually operated mechanism box with protective fixture.  
Cubicle illumination lamp with door switch shall be provided.

**Limit switches:**

Limit switch shall be separate from auxiliary switch.  
Limit switch for control shall be fitted on the isolator shaft within the cabinet to sense the open and close positions of the isolators and earth switches. Limit switches shall be of reputed make.

**Push button :**

Local/Remote selector switch:

A set of open/close push buttons shall be provided on the control cabinet of the isolator to permit its operation through local or remote. Provision shall be made in the control cabinet to disconnect power supply to prevent local/remote power operation.

**Operating handle:**

Length shall be 180 mm. The operating rods and pipe shall be rigid enough to maintain control under adverse conditions to withstand all torsional and bending stresses arising from operation.

**Safety feature:**

Isolator shall be self-locking in open and closed positions

**Operation:** Manual / Motorized to be decided during Tender Stage.

For Motorized Operation: Gear Box, other control wirings is required

For Manual Operation: No Gear Box is required

**Rotating parts:**

- a) All rotating parts shall be provided with grease packed roller or ball bearings in sealed housings designed to prevent ingress of moisture, dirt or other foreign material.
- b) Bearing pressure shall be kept low to ensure long life and ease of operations.
- c) Bearings used shall be permanently lubricated and no further lubrication will be required for complete life span.

**Reduction Gear mechanism:**

The disconnecter may be required to operate after considerably long idle intervals. Special care shall be taken for selection of material for gear and lubrication of gears to meet this requirement. The gears shall be made out of aluminium bronze or forged material and suitably chosen (rust free) to avoid bending/jamming on operation after a prolonged nonoperation and lubricated for life with graphite or better quality non-draining and non-hardening type grease. Wherever necessary automatic relieving mechanism - shall be provided. Complete details of components, material, grade, self-lubricating arrangement, and grade of lubricants, details of jig, fixtures and devices used for quality check shall be furnished by bidder in this offer.

**5.8 Earth Switch (wherever required):**

**Material:**

Earth switch material shall be silver plated copper of electrolytic grade.  
Spring in female contact: Stainless steel



**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

**Mechanical Interlock with isolator:**

Earth switch shall form an integral part of each pole of the isolator. Each earth switch shall be mechanically interlocked with its own main switch to prevent closure of the earth blades when the main blades are closed and vice versa.

**Common earth connection:**

Multiple flexible tinned copper strips 1 mm thick shall be suitably attached to the earthing connector for common earth connection

**Gang Operation:**

Three phase operation shall be conducted via gang operation. Earth switch shall be provided with gang operated operating rod mechanism mechanically connected to Earth Control Cabinet

**Hot dip galvanization:**

The entire ferrous control mechanism shall be hot dip galvanized and design and material shall match in quality with that of the main isolators

**Auxiliary contacts :**

4 NO+4 NC

**5.9 Interlock**

**Mechanical interlock with circuit breaker:**

Provision for mechanical interlock (castle key type) shall be incorporated for interlocking with associated circuit breaker. The key shall be released only when the isolator is fully closed or fully opened.

Interlocking to be compatible with LOTO arrangement.

**Electrical interlocking between isolator and circuit breaker:**

Sufficient quantity of locks, identical to the one fitted on the isolator, shall be supplied for fixing on the circuit breaker. Exact type and quantity shall be finalized during Tender check. In addition, an electrical interlock also shall be provided.

**Mechanical Interlocking of Isolator with Earth Switch:**

Earth switches for the line isolators shall be so designed to provide mechanical interlocking to prevent closure of earth switch blades when the isolator is in closed position. Interlocking to be compatible with LOTO arrangement.

All interlocks shall be designed to prevent mal-operation. Failure of supply to any electrical interlocks shall not permit mal operation.

**Electrical interlocking of Isolator with Earth Switch:**

Electrical interlock shall be through a solenoid operated by AC 110V/230V. Necessary relays shall be provided to attain interlock.

**Counter balance spring:**





**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

Counter balance springs, cushions etc., shall be provided to prevent impact at the end of travel both on opening and closing of the isolator. The springs shall be made of durable and non-rusting type alloy.

**5.10 Performance Requirement:**

During the course of normal operation, it is likely that the isolator may be left in the open/closed position for long periods of time. They shall be designed to operate satisfactorily even after being kept in one position for long period,

The isolator shall be capable of breaking the magnetizing current of associated power transformer.

**5.11 Earthing Pads:**

a) Each pole of the isolator shall be provided with 2 nos. earthing pads of noncorrosive material at opposite ends and brazed at the base.

b) Flexible tinned copper braid of adequate size shall be provided for connecting operating handles, earthing switches for the earthing system.

**5.12 Temperature rise:**

The temperature rise of any part of the isolator and associated equipment shall not exceed the maximum permissible temperature rise values as stipulated in the applicable standard of latest issue corresponding to ambient temperature.

**5.13 Special Requirements:**

a) All joints in link mechanism exposed directly to external environment should not require any periodic lubrication and shall not create jamming which can result into loss of setting of complete isolator or deformation in links and levers.

b) Provision of continuous adjustment/alignment of insulator should be provided to compensate permitted tolerances of insulator and structure or base frame assembly. Adjustment/alignment using shim washers are not allowed.

c) Bottom bearing assembly of base frame shall be sealed such that there cannot be ingress of dust/dirt water etc. Whole assembly shall be lubricated for lifelong service.

d) Terminal head of isolator arms where conductor will be terminated shall be strong and robust. It should have 360 degree freedom of rotation and should have built-in cover to eliminate deposition of dust or foreign particles.

e) Isolators and Operating mechanisms should not require periodic maintenance for any periodic lubrication/adjustments in linkages, bearings, bush-pins, hinges. Bidder shall enclose test reports for additional extended mechanical endurance test, which justifies that there are no undue wear & tear and loss of adjustment after large number of operations.

f) Link mechanism shall have 'Dead center interlocking' to prevent any change in end position of disconnecter due to external forces on the arm (e.g. Earthquake, Short line fault, Wind etc.) even when the drive is de-coupled from disconnecter.

**5.14 Duty Requirement:**



**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

Isolator and Earth Switch in their closed position shall be capable of withstanding dynamic and thermal effect of maximum short circuit current of the system. They shall be so constructed such that they do not get open under influence of short circuit current.

#### **5.15 Completeness of Supply:**

Any fittings, accessories or apparatus which may not have been mentioned in this specification but which are necessary for efficient operation / performance shall be deemed to be included in the contract.

### **6.0 NAME PLATE AND MARKING**

Following details shall be suitably embossed on a stainless steel name plate fixed on the operating mechanism box:

- a) Name of manufacturer
- b) Property of TPCODL
- c) PO No.
- d) Month/Year of manufacture
- e) Type of Isolator
- f) Rated Voltage
- g) Rated Normal Current
- h) Serial No.
- i) Weight
- j) Rated insulation level
- k) Short time current for 3 sec
- l) Operating mechanism type
- m) DC Control voltage
- n) Guarantee period
- o) Frequency

### **7.0 TESTS:**

All Routine, Acceptance & Type tests shall be carried out in accordance with relevant IS/IEC. All Routine and Acceptance tests shall be witnessed by TPCODL authorized representative. All the components should also be type tested as per the relevant standards. Following tests shall be necessarily conducted on the Isolator:

#### **7.1 ROUTINE TESTS**

- a) Power Frequency test on Control and Auxiliary circuit
- b) Voltage control tests on auxiliary circuit
- c) Operation Tests
- d) Measurement of resistance of main circuit.
- e) Mechanical Operating Tests.
- f) Galvanizing Measurement.
- g) Tinning Thickness Measurement.

#### **7.2 ACCEPTANCE TESTS:**

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**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

- a) Verify the Insulation level, including withstand tests at Power frequency voltages on auxiliary equipments.
- b) Voltage tests on auxiliary circuit
- c) Operation Tests
- d). Measurement of resistance of main circuit
- e) Visual checks
- f) Dimensional checks
- g) Alignment check of post insulator check
- h) Galvanization test
- i) Mechanical operation test

### **7.3 Type Tests for Isolator:**

- a) Lightning impulse voltage test(Dry)
- b) Power frequency voltage withstand test(Dry)
- c) Power-frequency voltage withstand test(Wet)
- d) Short time withstand current test
- e) Peak withstand current test
- f) Temperature rise test
- g) Measurement of contact resistance
- h) Short time withstand current test for Earth Switch
- i) Peak withstand current for Earth Switch
- j) Satisfactory Operation & Mechanical endurance test

### **8.0 TYPE TEST CERTIFICATES:**

Bidder shall submit Type test Certificates for the tests as mentioned above. All the tests should have been conducted during the period not exceeding five years from the date of opening the bid and at **CPRI/ ERDA** as per the relevant standards.

In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPCODL.

### **9.0 PRE-DISPATCH INSPECTION:**

The Material shall be subject to inspection by a duly authorized representative of the TPCODL. Inspection may be made at any stage of manufacture at the discretion of the Purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL's representatives at all times when the work is in progress. Inspection by the TPCODL or its authorized representatives shall not relieve the Bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL.

Following documents shall be sent along with material

- a) Test reports
- b) MDCC issued by TPCODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card



**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

- g) Delivery Challan
- h) Other Documents (as applicable).

#### **10.0 INSPECTION AFTER RECEIPT AT STORES:**

The material received at TPCODL site/store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Projects department.

#### **11.0 GUARANTEE:**

Supplier shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 36 months from the date of commissioning or 42 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs within mutually agreed timeframe, and to the entire satisfaction of TPCODL, failing which TPCODL shall be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus TPCODL own charges( @ 20% of expenses incurred), from the supplier or from the " Security cum Performance Deposit" as the case may be.

#### **12.0 PACKING:**

The equipment shall be packed in crates suitable for vertical/horizontal transport, as the case may be and suitable to withstand bundling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbols. Wherever necessary, proper arrangement for lifting, such as lifting hooks etc., shall be provided. Any material found short inside the packing cases shall be supplied by Supplier without any extra cost.

Each consignment shall be accompanied by a detailed packing, list containing the following information:-

- a) Name of the consignee.
- b) Details of consignment.
- c) Destination.
- d) Total weight of consignment.
- e) Handling and unpacking instructions.
- f) Bill of material indicating contents of each package.

The supplier shall ensure that the packing list and bill of material are approved by the purchaser before dispatch.

#### **13.0 TENDER SAMPLE: NA**

#### **14.0 QUALITY CONTROL:**

The Bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and

**TPCODL****TPNODL****TPWODL****TPSODL****Specification No:** [ENG-EHV-1019](#)**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. TPCODL shall reserve the sole rights for the type test of a random sample from the lot and in case of any discrepancy or deviation from the Type test certificates submitted along with the Bid, the complete Lot shall be rejected. The Purchaser's engineer or its nominated representative shall have free access to the Bidder's works to carry out inspections.

**15.0 MINIMUM TESTING FACILITIES:**

Bidder shall have adequate in house testing facilities for carrying out the following test at the factory.

- a. Power frequency voltage test
- b. Voltage tests on auxiliary circuit
- c. Operation Tests
- d. Measurement of resistance of main circuit.
- e. Temperature rise test
- f. Mechanical endurance test.

**16.0 Manufacturing Activities:**

The successful Bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

**17.0 SPARES, ACCESSORIES AND TOOLS:**

The bidder shall submit a recommended list of maintenance spares, tools and accessories for smooth and trouble free operation of the isolator.

The bidder, if at any time changes the design of the isolator or discontinue manufacturing of the isolator, shall provide opportunity to TPCODL for purchase of spares for future use so as to ensure smooth & trouble free functioning of the isolators before such change in design or discontinuing of manufacturing activity. The bidder shall arrange for service engineer for proper alignment at the time of erection and testing of isolators.

**18.0 Drawings and Documents:**

Following drawings and documents shall be prepared based on Purchaser's specifications and statutory requirements and shall be submitted with the bid:

- a) Completely filled in Technical Particulars
- b) Bill of material
- c) Fault Calculations for Corrugated Aluminum Sheath.
- d) Type Test certificates.
- e) Detailed dimensional cross-sectional drawing of the cable
- f) Experience List

After the award of the contract four (4) copies of drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy of all the drawing, GTP, Test certificates shall be submitted after the final approval of the same to purchaser.

Following drawings / documents shall be submitted by the bidder for Purchaser's approval.

S.No.	Description	For Approval	For Review Information	Final Submission
1	Technical Particulars	√		√

**TPCODL****TPNODL****TPWODL****TPSODL****Specification No:** [ENG-EHV-1019](#)**Specification Name:** Technical Specification of Centre rotating, Double Break Type Isolator - 33KV (1250 Amp) & 11KV (630 Amp)

2	General Arrangement drawings	√		√
3	Terminal and connection Drawing	√		√
4	Drawing showing Mechanical Interlocks b/t line & Earth Switch and Wiring diagram	√		√
5	Manual / catalogue		√	
6	Installation / Commissioning Manuals		√	
7	Instruction for use		√	
8	Transport / Shipping dimension drawing		√	
9	QA & QC Plan	√		√
10	Routine, Acceptance and Type Test Certificates	√		√
11	Sectional view & descriptive details for blades, contacts, arms, contact pressure, contact support bearing, housing of bearing, balancing of heights, phase coupling pipes, base plate, operating shaft, guides swivel joints, operating mechanism & its component etc	√	√	√

All the documents & drawings shall be in English language.

Instruction Manuals: Bidder shall furnish two softcopies and four (4) hard copies of nicely bound manuals (In English language) covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices.

## 19.0 GUARANTEED TECHNICAL PARTICULARS

To be furnished by Bidder

Sl.No	Type	33KV	11KV
1	Main switch		
2	Service		
3	Applicable standard		
4	Pole		
5	Rated voltage nominal/ Maximum		
6	Rated Frequency		
7	System earthing		
8	Temperature rise		
9	Insulation level impulse with stand voltage		
	a) Across Isolating distance		

**TPCODL****TPNODL****TPWODL****TPSODL****Specification No:** [ENG-EHV-1019](#)**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

	<b>b) To earth &amp; between poles</b>		
<b>10</b>	<b>1 minute power frequency with stand voltage</b>		
	<b>a) Across Isolating distance</b>		
	<b>b) To earth &amp; between poles</b>		
<b>11</b>	<b>Rated current in Amp</b>		
<b>12</b>	<b>Short time current for 3 sec</b>		
<b>13</b>	<b>Rated Peak withstand Current</b>		
<b>13</b>	<b>Operating mechanism</b>		
<b>14</b>	<b>Auxiliary voltage</b>		
	<b>a) Control &amp; Inter lock</b>		
	<b>b) For Heater Lamp and Socket</b>		
<b>15</b>	<b>Safe duration of overload</b>		
	<b>a) 150% of rated current</b>		
	<b>b) 120% of rated current</b>		
<b>16</b>	<b>Minimum creepage distance of support and Rotating insulator</b>		
<b>17</b>	<b>Mounting structure</b>		
<b>18</b>	<b>Terminal connector type</b>		
<b>19</b>	<b>Control</b>		
<b>20</b>	<b>Auxillary Contact</b>		
	<b>Main Isolator</b>		
	<b>Earth Switch</b>		
	<b>Control Voltage and Current Rating of Contacts</b>		
<b>21</b>	<b>Cantilever Strength Support</b>		

**TPCODL****TPNODL****TPWODL****TPSODL****Specification No:** [ENG-EHV-1019](#)**Specification Name:** Technical  
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Amp)

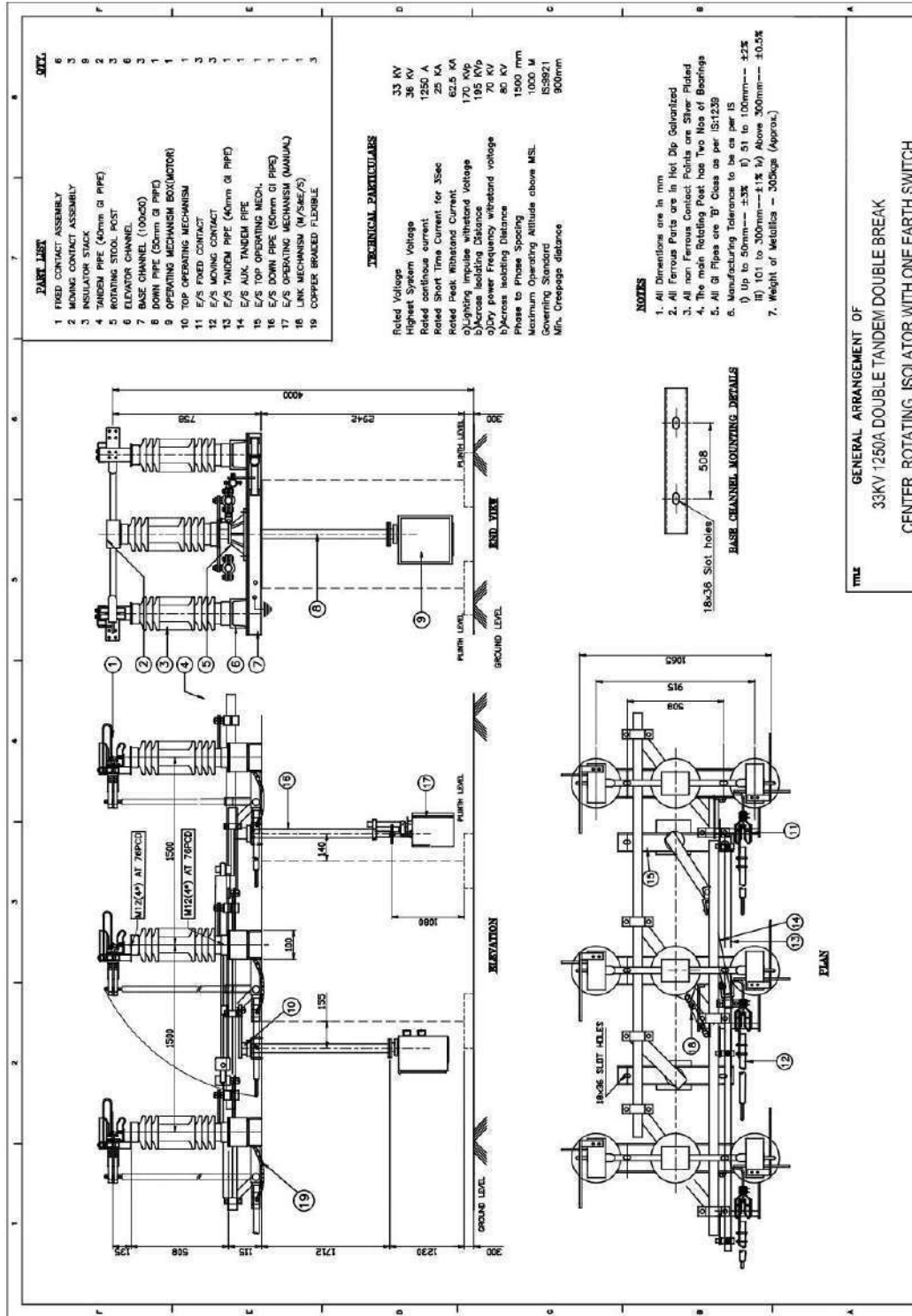
22	Current Density of Copper		
23	Control Cabinet		
	Thickness of sheet Metal		
	Enclosure Protection		
	Paint		
	Material of the Box		
24	Material of Moving and Fixed Contact		
25	Operating Rod earthing with flexible copper braid of suitable length		
26	The moving arm and current carrying contacts/joints to be covered in box type arrangement		
27	Interlock		
	Mechanical		
	Electrical		
28	Mounting Condition		
29	Type of Support Insulator		
30	Minimum Clearance in Air (mm)		
	When switch is closed		
	(a) Between adjacent Pole of different Phases(Centre-Centre)		
	(b)Between Live Parts and Earth		
	When switch is open		

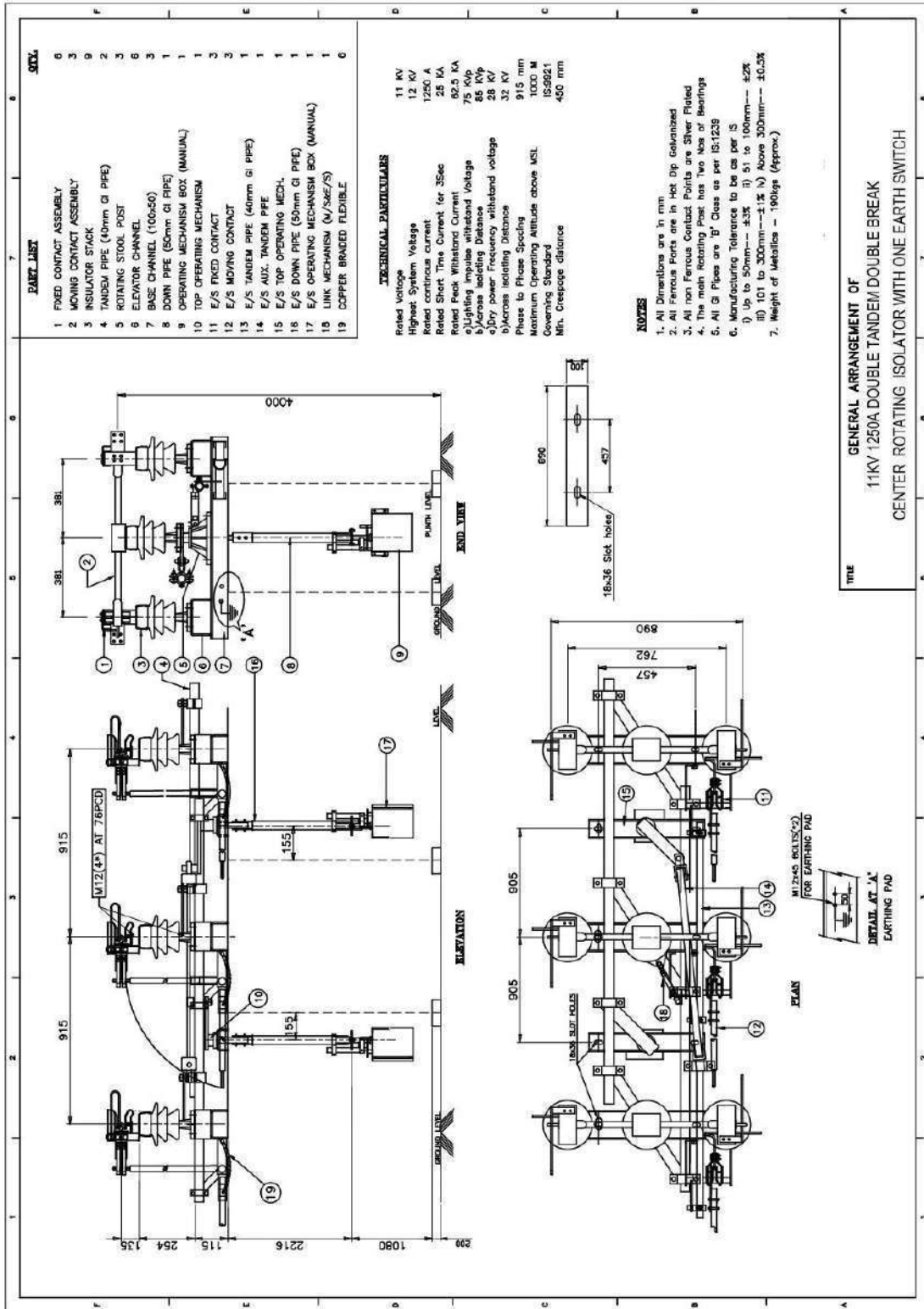


**TPCODL****TPNODL****TPWODL****TPSODL****Specification No:** [ENG-EHV-1019](#)**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

	<b>Between Poles of the same Phase (Centre to Centre)</b>		
	<b>Between adjacent poles of different phases (Centre-Centre)</b>		
<b>31</b>	<b>Minimum Height of Insulator Stack (mm)</b>		

20. Sample Drawings (For Tendering Purpose only .Dimensions are for reference purpose only and may change as per Manufacturers Type Tested Design. Design Subject to change during detailed engineering)





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**Specification No:** [ENG-EHV-1019](#)

**Specification Name:** Technical  
Specification of Centre rotating, Double Break  
Type Isolator - 33KV (1250 Amp) & 11KV (630  
Amp)

**21.**

**~~SCHEDULE OF DEVIATIONS~~**  
**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>S. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

Seal of the Company:

~~Signature~~

~~Designation~~

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1010**

**Specification Name : ENG-ELC-005- SPECIFICATION FOR 33kV XLPE  
ARMoured CABLE- R1**

<b>JYOTIPRAKASH MOHANTY</b>	<b>SHANTAPRIYA JENA</b>	<b>SATYA PRASAD NAYAK</b>	<b>Ranjan Kumar Sahoo</b>	<b>VARUN BHATNAGAR</b>	<b>VARUN BHATNAGAR</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPWODL	TPNODL	TPCODL	TPSODL	TPWODL	TPWODL
10-12-2022	10-12-2022	12-12-2022	12-12-2022	13-12-2022	13-12-2022

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TPWODL*



**Specification No:** [ENG-EHV-1010](#)

**Specification Name:**  
TECHNICAL SPECIFICATION FOR 33 kV XLPE  
ARMOURED CABLE

## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

**1. SCOPE:**

This specification covers technical requirements of design, manufacture, testing at manufacturer’s works, packing, forwarding, supply and unloading at site/store, performance of 33 kV XLPE armoured cable for trouble free and efficient operations.

Inclusive Sizes: -

<b>3 CORE CABLE</b>	<b>1 CORE CABLE</b>
3CX 35 sq.mm	1C X 300 sq.mm
3CX 50 sq.mm	1C X 400 sq.mm
3CX 70 sq.mm	1C X 630 sq.mm.
3CX 95 sq.mm	1C X 1000 sq.mm.
3C X 300 sq.mm	
3C X 185 sq.mm	
3C X 240 sq.mm	
3C X 400 sq.mm	

**2. APPLICABLE STANDARDS:**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

IS 7098 (Part 2)	Cross-linked Polyethylene (XLPE) insulation for Cables
IS 8130	Conductors for insulated electrical cables and flexible cords
IS 10418	Specification for Drums for Electric cables
IEC 60228	Conductor for insulated cables
IS 3975	Low carbon galvanized steel wires, formed wires and tapes for armoring of cables
IS 5831	Specification for PVC insulation sheath for electric cables
IEC-60811	Test methods for insulations and sheaths of electric cables and cords.
ASTM D 6097	Standard test method for relative resistance to vented water tree growth in Solid Dielectric insulating materials
ICEA T 31-610	Test method for conducting longitudinal water penetration resistance tests on blocked conductors
IS 10810	Methods of tests for cables
IS 4905	Methods for random sampling
IS 4984	High density polyethylene pipes for water supply
IS 2530	Methods of test for polyethylene moulding materials and polyethylene compounds
IS 4826	Specification for hot dipped galvanized coatings on round steel wires
IS 5:2007	Colors for ready mixed paints and enamels

ASTM 2863	Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)
IEC 60754	Apparatus and procedure for the measurement of the amount of halogens evolved during the combustion of materials taken from electric or optical fiber cable constructions
IEC-60502 (Part-2)	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1.2 kV) up to 30 kV (Um = 36 kV) - Part 2: 22kV Cables for rated voltages from 6 kV (Um = 7.2 kV) up to 30 kV (Um= 36 kV).
IEC 332	Test on electric cables on the fire conditions
ASTM 2843	Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics

### 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL.NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.



Environmentally, some of the regions, where the work will take place include coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas. Therefore, outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere.

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The design of equipment and accessories shall be suitable to withstand seismic forces as mentioned above.

**4. GENERAL TECHNICAL REQUIREMENTS:**

S. No.	Description	Requirement	
		3 CORE CABLE	1 CORE CABLE
1	Voltage grade	33 kV (Earthed system)	
2	Max System voltage	36 kV	
3	Frequency	50 Hz	
4	Variation in frequency	+/- 3%	
5	Conductor	Watertight Stranded Aluminum (compacted circular)	
6	Conductor screen	Semi conducting tape and screen	
7	Insulation	XLPE	
8	Insulation screen	Shall have three layers:	Shall have three layers:
9		a) Bonded Semiconducting, b) Semiconducting water swellable tape, c) Metallic copper tape	a) Bonded Semiconducting b) Semiconducting water swellable tape, c) Metallic copper tape d) Polyester transparent tape over copper screen
10	Core identification strip	Beneath copper screen	NA
11	Inner sheath	Pressure Extruded PVC ST- 2 with PP fillers	Extruded PVC ST-2
12	Armour	GI wire round banded with rubberized cotton binding tape	Aluminum wire banded by rubberized cotton tape
13	Outer sheath	PVC ST-2 FRLSH type of color 'Yellow Lemon shade' code: 355 as per IS 5:2007	

**5. GENERAL CONSTRUCTION:**

The cross-linked polyethylene insulated (XLPE) 33 kV Cable Dry cured & water cooled shall be manufactured and tested strictly in accordance with the Indian Standard IS 7098 (Part – 2)/ Relevant IEC/ International standards and its latest amendments.

All material used in the manufacturing of cables shall be new and shall be selected as the best available for the intended use.

The rating factors for variation in ground and air temperature, depth of laying, thermal resistivity of soil and different laying configuration of cables shall be provided by the Bidder.

**5.1 Conductor**

S.No.	Parameter	Requirement						
1	Conductor	As per IS 8130						
2	Class	Class II						
3	Material	Plain Aluminium, grade H2/H4						
4	Shape	Stranded Compacted Circular						
5	Nominal size of conductormm <sup>2</sup>	95	185	240	300	400	630	1000
6	Min. number of strands	15	30	30	30	53	53	30
7	Max. DC resistance @ 20deg C (Ohm/km)	0.32	0.164	0.125	0.1	0.0778	0.0469	0.0291
8	Conductor Short circuit current rating for 1 second (KA)	9	17.4	22.6	28.3	37.7	59.4	94.3
9	Min. weight of conductor(kg/km/core)	244	481	624	780	1080	1650	2600
10	Longitudinal water sealing ofconductor	a) Non-conductive water swellable yarn/ tape/ combination of both shall be provided in between interstices of the conductor. b) Also, this water swellable tape and yarn shall be compatible to withstand conductor continuous temperature of 90 deg C and short circuit temperature of 250 deg C without any decay. c) It shall not affect the electrical conductivity of the conductor.						

S.No.	Parameter	Requirement
11	Cleanliness and uniformity	a) Before stranding, the cross-section of the Aluminium conductor shall be circular, and shall have uniform smooth surface, free from sharp edges and free from any defects. b) Stranded Conductor shall be free from oil traces & aluminum dust. Conductor (after stranding) shall be super cleaned c) Traces of aluminum dust on conductor or conductor screen shall not be acceptable.
12	Conductor jointing	Not acceptable in any strand or in any conductor after it is stranded.
13	Raw material supplier	Conductor raw material shall be procured from reputed suppliers viz., BALCO/ HINDALCO/ NALCO/ Vedanta
14	Diameter of conductor	To be specified by bidder

### 5.2 Conductor Screen:

S. No.	Parameter	Requirement
1	Material	<b>1<sup>st</sup> layer:</b> Semi-conducting tape <b>2<sup>nd</sup> layer:</b> Semi-conducting compound
2	Configuration	<b>1<sup>st</sup> layer:</b> Semi-conducting tape shall be applied over conductor with nominal thickness of 0.2 mm. <b>2<sup>nd</sup> layer:</b> Semi-conducting compound screen shall be applied through triple extrusion process.
3	Min. thickness	Minimum thickness of semi-conducting compound screen shall be 0.5 mm at any point of measurement.
4	Resistivity	Resistivity of semiconducting conductor screen shall not exceed 1000 $\Omega$ -m
5	Uniformity on interfacial region	Interfacial region between conductor screen and insulation shall be uniform. Protrusion/ convolution/ other defects are not acceptable in the region.
6	Raw material supplier	Semiconducting compound shall be procured from reputed raw material suppliers viz., Dow/Borealis/Hanwa

### 5.3 Insulation:

S. No.	Parameter	Requirement
1	Material and extrusion process	XLPE insulation shall be applied through CCV/VCVline by triple extrusion process with 'Dry Curing' and 'Water Cooling'.

2	Raw material supplier	a) XLPE compound shall be procured from reputed raw material suppliers viz., Dow/Borealis/Hanwa b) Both XLPE and semi conductive compounds shall be used from same raw material supplier.
3	Thickness and Eccentricity	a) Nominal thickness shall be 8.8 mm. b) Minimum thickness shall be 7.82 mm at any point of measurement. c) Eccentricity of insulation shall not exceed 10%.
4	Thermal stability	The insulation properties shall be stable under thermal conditions arising out of continuous operation at conductor temperature of 90 deg. C rising momentarily to 250 deg. C under short circuit conditions.
5	Cleanliness and uniformity	Interfacial region between insulation and insulation screen shall be uniform. Protrusion/convolution/ other defects are not acceptable. Core shall be free from void and contamination.

#### 5.4 Insulation Screen & Core identification strip:

S. No.	Parameter	Requirement
1	Material	a) <b>1<sup>st</sup> layer:</b> Semi-conducting compound b) <b>2<sup>nd</sup> layer:</b> Semi-conducting water swellable tape c) <b>3<sup>rd</sup> layer:</b> Annealed copper tape

	Configuration	<p><b>a) 1<sup>st</sup> layer: Non-Metallic Part:</b> Extruded Insulation semiconducting screen shall be bonded type. Resistivity shall not exceed 500 <math>\Omega</math>-meter. Surface of insulation screen shall be smooth, free from cavity/ nicks/scratches/ other visible defects. Min. thickness shall be 0.5 mm at any point of measurement.</p> <p><b>b) 2<sup>nd</sup> layer: Water Swellable tape:</b> Semi-conducting water swellable tapes shall be applied over non-metallic screen. Minimum thickness of water swellable shall be 0.3 mm and minimum overlapping shall be 15%.</p> <p><b>Core identification strip:</b> <b><u>For 3 Core Cable</u></b> Each of the three core identification strips shall be applied longitudinally beneath copper screen. Width of the colored strip shall be 7-10 mm. R, Y, B</p>
		<p><b><u>For 1 Core Cable</u></b> NA</p> <p><b>c) 3<sup>rd</sup> layer: Metallic Part:</b> Annealed copper tape, helically wound over the water swellable tape with minimum 15% overlap. Minimum thickness shall be 0.045 mm at any point of measurement.</p>
3	Raw material supplier	Semiconducting compound shall be procured from reputed raw material suppliers viz., Dow/ Borealis/ Hanwa
4	Diameter of cores	To be specified by bidder
5	Weight of cores/km (approx.)	To be specified by bidder
6	Weight of copper tape/km (approx.)	To be specified by bidder

**5.5 Fillers:**

S. No.	Parameter	Requirement	
		3 CORE CABLE	1 CORE CABLE
1	Material	Virgin Polypropylene fibers of natural color	NA
2	Configuration	Virgin Polypropylene fibers shall be tightly filled in empty space as fillers.	

**5.6 Inner Sheath:**

S. No.	Parameter	Requirement							
		3 CORE CABLE	1 CORE CABLE						
1	Material	Black colored Polyvinyl chloride (PVC) type ST-2 compound							
2	Configuration	The laid-up cores shall be provided with <i>pressure extruded</i> Polyvinyl chloride (PVC) type ST- 2 compound conforming to IS: 5831 with latest amendments. Pressurized extrusion is required to remove any gaps remaining in between the fillers and to make the cable as circular as possible. It shall be applied to fit closely on to the laid-up cores and shall be possible to remove easily without causing any damage to the underlying insulated cores and screens.	Extruded PVC ST-2 type conforming to IS: 5831. It shall be applied to fit closely and shall be possible to remove easily without causing any damage to the underlying insulated cores and screens.						
3	Raw material supplier	PVC compound shall be procured from reputed raw material suppliers viz., Shakun, Kalpana, KLJ, DCM ShriRam. PVC compound from cable manufacturer shall be considered only after factory evaluation for the same.							
4	Min. thickness at any point of measurement	<b>3 CORE CABLE</b>							
		35 sq. mm.	50 sq. mm.	70 sq. Mm.	95 sq.mm.	185 sq.mm	240 sq.mm	300 sq.mm.	400 sq.mm.
		0.7mm	0.7mm	0.7mm	0.7 mm	0.7mm	0.7mm	0.7 mm	0.7 mm
		<b>1 CORE CABLE</b>							
		300 sq.mm.		400 sq.mm.			630 sq.mm.		1000 sq.mm.
0.5mm		0.5 mm			0.6 mm		0.7 mm		

**5.7 Armour:**

S. No.	Parameter	Requirement							
		3 CORE CABLE				1 CORE CABLE			
1	Material	Low carbon annealed hot dipped galvanized round steel wires				H4 Grade Aluminium wires			
2	Compliance to Standard	It shall comply with the requirements of IS 3975 along with latest amendments. Hot dipped galvanizing layer shall be uniform on low carbon annealed steel wires. Zinc coating shall be 290 g/m <sup>2</sup> as per IS 4826:1979.				It shall comply with the requirements of IS 8130 along with latest amendments.			
3	Nominal Dimensions	<b>3 Core cable</b>							
		35 sq.mm	50 sq.mm	70 sq.mm	95 sq.mm	185 sq.mm	240 sqmm	300 sq.mm	400 sq.mm
		3.15 (GI Wire)	3.15 (GI Wire)	3.15 (GI Wire)	3.15 (GI Wire)	4.00 (GI Wire)	4.00 (GI Wire)	4.00 (GI Wire)	4.00 (GI Wire)

S. No.	Parameter	Requirement				
		3 CORE CABLE			1 CORE CABLE	
4	Approx. Short circuit rating in kA for 1 sec	<b>3 Core cable</b>				
		300 sq.mm	400 sq.mm	630 sq.mm	1000 sq.mm	
		2 mm (Aluminum wire)	2 mm (Aluminum wire)	2.5 mm (Aluminum wire)	3.15 mm (Aluminum wire)	
		<b>3 Core cable</b>				
		95 sq.mm	185 sq.mm	240 sq.mm	300 sq.mm.	400 sq.mm
		9	20	20	20	20
		<b>1 Core cable</b>				
		400 sq.mm	630 sq.mm	1000 sq.mm		
		20	20	20		
		Fault current for the armour with minimum 90 % coverage.				

5	Jointing in the armour wires	Not acceptable in any armour wire	
6	Laying of armour	The armor wires shall be applied as closely as practicable. Shall not be less than 90% of total circumference.	
7	Binding	The rubberized cotton binding tape shall be applied to bind the armor wires such that it shall not affect the electrical properties of the armor wires and the overall cable.	
8	Weight of armor	To be furnished by Bidder	
9	Raw material supplier	Steel armour shall be procured from reputed raw material suppliers viz., TATA Steel, Jindal Steel, SAIL	Aluminium armour shall be procured from reputed raw material suppliers viz., TATA/ BALCO/ HINDALCO/ NALCO/ Vedanta

### 5.8 Outer Sheath

S.No.	Parameter	Requirement							
1	Material	Polyvinyl chloride (PVC) ST-2 <b>FRLSH</b> type compound with ' <b>lead naphthenate</b> ' additive							
2	Configuration	Polyvinyl chloride (PVC) ST-2 <b>FRLSH</b> type compound with ' <b>lead naphthenate</b> ' additive as 'termite & rodent repellent' applied by extrusion process.							
3		<b>3 CORE CABLE</b>							
	Min. Thickness at any point of measurement	35 sq.mm	50 sq.mm	70 sq.mm	95 sq.mm	185 sq.mm	240 sq.mm	300 sq.mm	400 sq.mm
		2.52 mm	2.52 mm	2.68 mm	2.68 mm	3.0 mm	3.0 mm	3.0 mm	3.0 mm
		<b>1 CORE CABLE</b>							
		300 sq. mm.		400 sq.mm		630 sq.mm		1000 sq.mm	
		2.04 mm		2.04 mm		2.36 mm		2.52 mm	
4	Color	Yellow Lemon color, color code: 355 as per IS 5:2007.							
5	Surface uniformity	Surface of outer sheath shall be free from cavity/ nicks/ other visible defects.							
6	Raw material supplier	PVC compound shall be procured from reputed raw materials suppliers viz., Shakun, Kalpana, KLJ, DCM ShriRam. PVC compound from cable manufacturer shall be considered only after factory evaluation for the same.							





Specification No: [ENG-EHV-1010](#)

Specification Name:  
TECHNICAL SPECIFICATION FOR 33 kV XLPE  
ARMOURED CABLE

7	Weight of outer sheath/km	To be provided by bidder
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### 5.9 Sealing End Cap:

S.No.	Parameter	Requirement
1	Material	Adhesive coated polyolefin heat shrinkable
2	Configuration	Adhesive coated polyolefin heat shrinkable end cap shall be provided at both ends of the cable.
3	Additional requirements	2 nos. additional cable end caps shall be provided with each drum and placed in the drum.

### 5.10 Other Requirements:

S.No.	Parameter	Requirement
1	Overall diameter of cable in mm	To be provided by bidder
2	Weight of Overall cable in kg/km	To be provided by bidder

## 6. MARKING:

Steel drums shall be provided. Drum shall be free from sharp edges and visual defect. Stencil plate on one flange side of the drum and laminated paper sheet on other side flange of drum.

Cable length on one drum shall be 250 meters max. +/- 5%. As per PO terms

### I. Following details shall be provided on flanges of drum:

- Manufacturer's name
- Type of Cable
- Size of Cable
- Voltage Grade
- Length of the cable on the drum
- Direction of the rotation of the drum
- Gross mass
- Country of manufacture
- Year and month of manufacture
- Purchase Order no.
- Drum No.

### II. Following details shall be embossed on the outer sheath:

At interval of every 1 meter, following details to be embossed:

- TPWODL/ TPCODL/ TPNODL/ TPSODL



Specification No: [ENG-EHV-1010](#)

Specification Name:  
TECHNICAL SPECIFICATION FOR 33 kV XLPE  
ARMOURED CABLE

- ii) Manufacturer name
- iii) Month & Year of Manufacture
- iv) Voltage grade
- v) Size of the cable
- vi) Purchase Order no.
- vii) Cable code

Note: - Sequential meter marking shall be printed.

## 7. TESTS:

The bidder shall be required to submit complete set of the following test reports along with the offer:

### 7.1 ACCEPTANCE TESTS

#### Test on Conductor

- Conductor resistance test
- Test for non-conductivity of water swellable tape/yarn of conductor
- Visual inspection for conductor cleanliness
- Conductor water penetration test

#### Test on Conductor Screen

- Thickness of semi-conducting tape over conductor
- Test for conductivity of semi-conducting tape over conductor
- Resistivity of extruded semi-conducting conductor screen
- Thickness of extruded semi-conducting conductor screen

#### Test on Insulation

- Tensile strength & Elongation at break (before ageing)
- Insulation thickness
- Eccentricity and Ovality of insulation
- Hot set test
- Volume resistivity
- Void & contamination test on core (by silicon oil dip method)
- Surface smoothness of insulation

**Test on Insulation Screen**

- Resistivity of insulation screen
- Thickness of insulation screen
- Visual inspection for any convolution/ protrusion between conductor screen and XLPE insulation, XLPE insulation and insulation screen
- Thickness & % Overlapping of semi-conducting water swellable tape
- Thickness & % Overlapping of copper tape

**Test on Inner Sheath**

- PVC thickness
- Color of inner sheath

**Test on Armour (For 3 Core)**

- Tensile test
- Mass of zinc coating
- Uniformity of zinc coating
- Adhesion test
- Diameter and no. of wires
- Coverage %

**Test on Armour (For 1 Core)**

- Tensile test
- Wrapping test
- Resistance test
- Diameter and no. of wires
- Coverage %

**Test on Outer sheath**

- Thickness
- Tensile strength and Elongation at break (before ageing)
- Color of outer sheath
- Surface uniformity of outer sheath (on full drum)/ shall be free from any damage- void, nick, cavity

- Presence of lead naphthenate in PVC outer sheath
- Flammability test
- Oxygen index
- Temperature index
- Acid gas generation
- Smoke density

#### **Test on Complete Cable**

- Partial discharge test
- High voltage test
- Raw material consumption verification

### **7.2 ROUTINE TESTS**

- Conductor resistance test
- Partial discharge
- High voltage test with power frequency
- Resistance test for Aluminium armour

### **7.3 TYPE TESTS**

#### **Tests on Conductor**

- Conductor resistance test
- Conductor water penetration test

#### **Tests on Insulation**

- Tensile strength & Elongation at break (before ageing)
- Ageing in air oven
- Tensile strength & Elongation at break
- Tests for thickness of insulation
- Eccentricity and Ovality of insulation
- Hot set test
- Shrinkage test
- Gravimetric test (Water absorption)
- Volume resistivity/ Insulation Resistance

### **Tests on Inner Sheath**

- PVC thickness

### **Tests on Extruded semi-conducting screen**

- Volume resistivity test of conductor screen
- Volume resistivity test of core screen

### **Tests on Outer Sheath (PVC)**

- Flammability test for outer sheath
- Thickness
- Tensile strength and Elongation at break (before ageing)
- Tensile strength and Elongation at break (after ageing)
- Variation due to ageing
- Loss of mass test
- Shrinkage test
- Hot deformation test
- Heat shock test
- Thermal stability test
- Flammability test
- Oxygen index
- Temperature index
- Acid gas generation
- Smoke density

### **Tests on Armour for 3 Core Cable**

- Tensile test
- Torsion test
- Wrapping test
- Resistance test
- Mass of zinc coating
- Uniformity of zinc coating
- Adhesion test

**Tests on Armour for 1 Core Cable**

- Tensile test
- Torsion test
- Wrapping test
- Resistance test

**Tests on complete cable**

- Partial discharge test
- Thermal ageing test
- Bending test
- Dielectric power factor test
- High voltage test
- Heat cycle test
- Impulse withstand test

**Additional Tests**

- Raw material consumption
- Color coding identification over copper screen (for 3C cable)
- Sequential marking check
- Cable drum length verification
- Packaging of cable on cable drum
- Weight of conductor/km
- Diameter of Conductor
- Weight of XLPE insulation plus semiconducting screen (of conductor & insulation)/ km
- Diameter over core
- Weight of core
- Weight of copper tape/km
- Diameter over inner sheath
- Weight of armour/ km
- Cable sealing end caps
- Weight of outer sheath/ km
- Diameter of complete cable

**8. TYPE TEST CERTIFICATES:**

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI / ERDA as per relevant IS. Type tests should have been conducted during the period not exceeding 10 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPWODL/ TPCODL/ TPNODL/ TPSODL.

**9. PRE-DISPATCH INSPECTION:**

The material shall be subject to inspection by a duly authorized representative of the TPWODL/ TPCODL/ TPNODL/ TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPWODL/ TPCODL/ TPNODL/ TPSODL's representatives at all times when the work is in progress. Inspection by the TPWODL/ TPCODL/ TPNODL/ TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPWODL/ TPCODL/ TPNODL/ TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPWODL/ TPCODL/ TPNODL/ TPSODL
- c) TPWODL/ TPCODL/ TPNODL/ TPSODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

**10. INSPECTION AFTER RECEIPT AT STORE:**

The material received at TPWODL/ TPCODL/ TPNODL/ TPSODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

**11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an

integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 60 months from the date of commissioning or 72 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by TATA utilities.

## 12. PACKING:

- a) **Standard length of Cable:** The cable shall be supplied in continuous standard length of 250 (3 cores) & 500 (Single core) running meters with +/- 5% tolerance.
- b) **Filling condition:** Drum shall not be overfilled.
- c) **Cable drum:** The cable shall be wound on non-returnable steel drums without any extra cost to TPWODL/ TPCODL/ TPNODL/ TPSODL as per IS 10418 and its latest amendments.
- d) **Sealing of cable ends:** The ends of the cable shall be sealed by means of heat shrinkable polyolefin end caps. Additional 2 nos. end caps shall be provided with each drum.
- e) **Requirements for Cable drums:** Cable drums shall be so constructed as to have required mechanical strength so that the drum flanges and other components do not break during transport, in actual use or in storage. The flanges and the outside surface of the barrel shall be free from protruding materials/projections/ unevenness/ sharp edges that can damage the cable or hands of the operator during rotation of drums.  
A metal preservation shall be applied to the entire drum.
- f) Bottom end of cable should be clamped on drum by jute or nylon rope.
- g) All ferrous metal parts used shall be treated with a suitable rust-free finish or coating to avoid rusting during transit or storage. The drums shall withstand normal handling and transport.
- h) **Rail/ Road transportation:** The bidder shall ensure that the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.
- i) **Packaging shall be as per climate change perspective. Cable wound on cable drum shall be covered by recyclable PVC sheet for dust proof.**



**13. TENDER SAMPLE:**

Not Applicable

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars & Schedule "B" Deviations
- b) Work Experience details
- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.

**19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS:**

Bidder to submit clause wise compliance.



Specification No: [ENG-EHV-1010](#)

Specification Name:  
TECHNICAL SPECIFICATION FOR 33 kV XLPE  
ARMOURED CABLE

**20. SCHEDULE "B" DEVIATIONS:**

~~(TO BE ENCLOSED WITH TECHNICAL BID)~~

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1008**

**Specification Name : ENG-ELC-072- SPECIFICATION FOR ACCESSORIES OF  
33kV XLPE COVERED CONDUCTOR-R1**

<b>JYOTIPRAKASH MOHANTY</b>	<b>SHANTAPRIYA JENA</b>	<b>SATYA PRASAD NAYAK</b>	<b>Ranjan Kumar Sahoo</b>	<b>VARUN BHATNAGAR</b>	<b>VARUN BHATNAGAR</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPWODL	TPNODL	TPCODL	TPSODL	TPWODL	TPWODL
10-12-2022	10-12-2022	12-12-2022	12-12-2022	13-12-2022	13-12-2022

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## **CONTENTS**

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

## 1. SCOPE

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at site/store of Accessories for All Aluminum Alloy Stranded XLPE Covered Conductors for use on 33kV Distribution System.

## 2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

Ref. IS	Description
EN 50397-1:2006	Covered Conductor Specification- Up to 33 kV
EN 50397-2:2006	Covered Conductor Accessories Specification- up to 33 kV
EN 50397-2 (MARCH 2010)	Covered conductors for overhead lines and the related accessories for rated voltages above 1kV a.c. and not exceeding 36kV a.c. PART 2: Accessories for covered conductors: tests and acceptance criteria
IS 398:1996 (Part IV)	Specification for aluminum conductors for overhead distribution purpose
EN 61238-1: 2003	Compression and mechanical connectors for power cables for rated voltages up to 36 kV Test methods and requirements
ANSI C119.4 :2011	Electric Connectors - Connectors for Use Between Aluminum-To-Aluminum and Aluminum-To-Copper Conductors Designed For Normal Operation At Or Below 93 °C And Copper-To-Copper Conductors Designed for Normal Operation at Or Below 100 °C

## 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL.NO.	CONDITIONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C

5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Cm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

Environmentally, some of the regions, where the work will take place includes hilly areas, subject to high relative humidity, which can give rise to condensation. Atmosphere is generally laden with mild acid and dust due to industrial activities. Some places are in heavily industrial polluted areas. On occasions, the combination of humid, acidic and dust condensation may create pollution conditions for outdoor equipment's. Therefore, outdoor materials and equipment's shall be designed and protected for use exposed, heavily polluted, acidic, corrosive, tropical and humid atmosphere.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

The Accessories of 33kV XLPE Covered Conductor are specified below and shall consist of the following:

##### 4.1 TENSION ASSEMBLY-WEDGE TYPE (TA)/CRIMPING TYPE

Sl. No.	Technical Parameters	Desired Values
1	Name of the manufacturer	To be furnished by bidder
2	Applicable Standard	EN 50397-2
3	Range of Conductor size	50 Sq.mm to 240 Sq.mm /as per covered conductor size
4	Installation (with/without disassembly)	Ready-to-use (without disassembly)
5	Type & grade	Heat treated aluminium Alloy for Body and Weather resistant Thermoplastic for wedge/crimping type
6	Operating/Rated voltage	33kV/36kV
7	Mechanical Strength	To be furnished by the Bidder for each type of conductor

8	Dimensions (mm)	To be furnished by bidder
9	Tension Load	To be furnished by bidder

#### 4.2 NON-METALLIC ALIGNMENT TIES

Sl. No.	Technical Parameters	Desired Values
1	Name of the manufacturer	To be furnished by bidder
2	Applicable Standard	EN 50397-2
3	Range of Conductor size	50 Sq.mm to 240 Sq.mm /as per covered conductor size
4	Mounting	Can mount directly on cable without any accessories
5	Type	Top Tie/side tie/helical tie
6	Material	UV Resistant Thermoplastic
7	Operating/Rated voltage	33 kV/36kV
8	Dimensions (mm)	To be furnished by bidder

#### 4.3 MECHANICAL CONNECTOR WITH HEAT SHRINK SLEEVE

Sl. No.	Technical Parameters	Desired Values
1	Name of the manufacturer	To be furnished by bidder
2	Applicable Standard	IEC 61238-1
3	Range of Conductor size	For Phase conductor of diameter range 50-240 sq.mm/as per covered conductor size
4	Installation	Crimping by shear head bolt compression
5	Type of connection required	Connection by compression pressure
6	Is any metallic part carrying potential in operation exposed during installation	No
7	Material	Aluminium Alloy For mechanical connector UV resistant polymer for heat shrink sleeve
8	Connector ID	Ø 14 mm to Ø 33 mm

#### 4.4 INSULATION PIERCING CONNECTOR

Sl. No.	Technical Parameters	Desired Values
1	Name of the manufacturer	To be furnished by bidder
2	Applicable Standard	EN 50397-2
3	Range of Conductor sizes accommodated for Main & Branch	Main : 50 - 240 sq.mm Tap : 50 - 240 sq.mm /as per covered conductor size
4	Operating/Rated voltage	33 kV/36kV
5	Type of connection required	Insulation Piercing Type (Covered to Covered)

6	Is any metallic part carrying potential in operation exposed during installation	No
7	Are end caps of branch cable a) Slide on type (b) Rigid	Slide on type
<b>Sl. No.</b>	<b>Technical Parameters</b>	<b>Desired Values</b>
8	Are torque limiting shear heads provided to tightening bolts	Yes
9	Specified Torque	18±1.5 Nm
10	Torque for establishing connection between main and Tap (Nm)	Within 70% of Min. Torque specified

#### 4.5 MID SPAN JOINTS

Sl. No.	Technical Parameters	Desired Values
1	Name of the manufacturer	To be furnished by bidder
2	Applicable Standard	EN 50483-4
3	Type No & Size Range	For Phase conductor of 50 Sq.mm to 240 sq. mm/as per covered conductor size
4	Operating/Rated voltage	33 kV/36kV
5	Type of connection required	Crimping type
6	Is any metallic part carrying potential in operation exposed during installation	No
7	Installation	Crimping by Hexagonal Compression
8	Guarantee	24 months from the date of commissioning or 30 months from the date of last supplies made under the contract

#### 5. GENERAL CONSTRUCTIONS:

##### 5.1 TENSION ASSEMBLY-WEDGE TYPE (TA)

For fitting onto a pole for tensioning at the beginning or end of a length of Covered Conductor, or for anchoring while a major change in direction. The Tension assembly consists of one wedge type Tension anchoring clamp and one Tracking protection IPC.

The following key criterion to be followed for the design of the same: -

- a) There shall be no losable part (except Tracking IPC) in the process of clamping arrangement.
- b) The clamp should consist of an Aluminum alloy corrosion resistant casted body and self-adjusting fully insulating type of mechanical and weather resisting thermoplastic wedges which shall anchor/hold the conductor.
- c) Locking mechanism should be wedge type self-locking. Wedges are to be made of high strength, climatic resistance Engineering Plastic with glass fiber.
- d) The fittings shall be able to withstand the specific minimum failure load (SMFL) and shall not damage the covering of cable. SMFL is the minimum failure load for clamp at which mechanical



failure will not take place.

- e) No tools shall be needed for fitting the Covered Conductor into the clamp.
- f) The Anchoring clamp shall have an IPC to avoid tracking phenomenon by maintaining the metallic clamp as well as the cable passing through it at equipotential.

## 5.2 NON-METALLIC ALIGNMENT TIES:

For supporting and aligning Covered Conductor at an intermediate pole in a length, with small angle of deviation. The Tie hold the Covered Conductor in its position on top of the pin insulator. Tie consists of an "Insulated Plastic" Type for Lin Alignment. The ties shall be designed suitably to hold the Covered Conductor in its position on top of the insulator. The Tie shall be made of Insulating Plastic materials (UV Resistant Thermoplastic) to ensure tracking resistance and to avoid any insulation damage to covered conductor due to abrasion while mechanical or wind induced vibration. Plastic coated metallic ties are not allowed.

## 5.3 MECHANICAL CONNECTOR WITH HEAT SHRINK SLEEVE:

It is used for main (Bare) to main (Covered Conductor) networking Connection. This connector is to ensure the electrical characteristics with in the required limits, while ensuring necessary insulation protection against tracking and water penetration on Covered Conductor. The body as well as the shear head screws of the mechanical connector should be made of aluminum alloy. It should have a centered bore with tapered edges and a moisture block barrier in the center of the tube. Heat shrink sleeve shall be rated for up to 36kV

## 5.4 INSULATION PIERCING CONNECTOR:

Insulation Piercing Connectors (IPC) are used for making Tee / Tap-off/ connections to a Covered Conductor. Insulation Piercing Connectors are designed to make a connection between the uncut main conductor and a branch cable conductor without having to strip either cable to expose the conductor. Instead, the tightening action of the IPC will first pierce the Insulation, then make good electrical contact between the main and branch conductor while simultaneously insulating and sealing the connection. The connector bodies shall be made entirely of mechanical and weather resistant plastic insulation material made of weather & UV resistant reinforced polymer and no metallic part outside the housing is acceptable except for the tightening bolt or nuts.

Any metallic part that is exposed must be free from potential during or after connector installation.

Screws or nuts assigned for fitting with IPC (Insulating Piercing connector), must be fitted with torque limiting shear heads to prevent over tightening or under tightening.

The min & max torque values should not exceed 27 N mtr for IPC for main conductor < 95 sq

mm, and 42 Nmtr for main conductor >95, but < 240 sq mm.

The contact teeth or blade of the connector is made of tinned copper with equivalent Cross Section with respect to % IACS to suit the max branch cable size declared. The shear bolt/nut shall be suitable for tightening with a hexagonal socket of 13 mm or 17mm.

The IPCs shall be water proof and the water tightness shall be ensured by appropriate elastomeric materials and not by grease, gel or paste alone. Grease can be applied to protect the contact blade alone and shall not be visible on the outer surface of the connector. Connector should not be dipped in grease.

Each IPC should be provided with a cap to seal the cut end of the Branch cable. It should be of a design that once the connector is installed, it should not be possible to remove the cap without dismantling the connector.

All the metallic parts of the connector should be corrosion resistant and there should not be any appreciable change in contact resistance & temperature after overloads & load cycling and should confirm to the long duration tests specified in this standard.

#### **5.5 MID SPAN JOINTS:**

Mid-span tension joints for jointing covered conductor over a span. The sleeves should be Pre-Insulated type. Sleeve should be made of Aluminum, insulated with an Anti-UV black thermoplastic tube hermetically sealed two ends with 2 flexible rings. Strip length, Hexagonal crimping die reference and size to be marked on the outer surface of plastic sleeve.

#### **5.6 ARC PROTECTION DEVICES:**

Arching Horn Assembly is an Arc protection device for power arc evacuation without insulator damage. The arching Horn Assembly protection device consists of:

- a) Two arcing horns with adjustable distance "L" directly mounted on the insulator terminals.
- b) A covered conductor with clamp on the horn side.
- c) An insulation piercing connector on the main cable side.

#### **6. MARKING:**

The following particulars shall be properly legible embossed/Printing on the accessories.

- a) Name & Trade mark of the manufacturer
- b) Product Code
- c) Batch Number
- d) The minimum and maximum cross section of Conductor for which the unit is suitable
- e) Month and Year of Manufacturer



**Specification No:** [ENG-EHV-1008](#)

**Specification Name:**  
SPECIFICATION FOR ACCESSORIES OF 33kV XLPE  
COVERED CONDUCTOR

f) "TPWODL/ TPCODL/ TPNODL/ TPSODL" Name

## 7. TESTS

A type test shall be performed on the accessories. All the Acceptance test, Type test and Routine test should be as per EN 50397-2 and latest amendment. The bidder shall be required to submit complete set of the following test reports along with the offer: -

### 7.1 ACCEPTANCE TESTS

#### i) Tension Assembly-Wedge Type (TA)

- a) Visual examination
- b) Dimension verification
- c) Tensile test at ambient temperature
- d) Check for permanent marking

#### ii) Non-Metallic Alignment Ties

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Failure Load Tests
- e) Slip Load Tests
- f) Lift / Side Load Tests

#### iii) Mechanical Connector with Heat Shrink Sleeve

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Mechanical Test
- e) Water Tightness test

#### iv) Insulation Piercing Connector

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Mechanical Test

#### v) Mid Span Joints

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Mechanical Test

**vi) Arc Protection Devices**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Clamp Bolt Tightening Test
- e) Short Circuit test

**7.2 ROUTINE TESTS****i) Tension Assembly-Wedge Type (TA)**

- a) Visual examination
- b) Dimension verification

**ii) Non-Metallic Alignment Ties**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Failure Load Tests
- e) Slip Load Tests
- f) Lift / Side Load Tests

**iii) Mechanical Connector with Heat Shrink Sleeve**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Mechanical Test

**iv) Insulation Piercing Connector**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Mechanical Test

**v) Mid Span Joints**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Mechanical Test

**vi) Arc Protection Devices**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Clamp Bolt Tightening Test

**7.3 TYPE TESTS**

**i) Tension Assembly-Wedge Type (TA)**

- g) Visual examination
- h) Dimension verification
- i) Tensile test at ambient temperature
- j) Tensile test at low temperature
- k) Tensile test at high temperature
- l) Corrosion test
- m) Climate ageing test
- n) Check for permanent marking

**ii) Non-Metallic Alignment Ties**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Failure Load Tests
- e) Slip Load Tests
- f) Lift / Side Load Tests
- g) Thermal Tests under load
- h) Corrosion test
- i) Climate ageing test

**iii) Mechanical Connector with Heat Shrink Sleeve**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Mechanical Test
- e) Water Tightness test
- f) Climatic Ageing Test
- g) Corrosion Test
- h) Electrical Ageing Test

**iv) Insulation Piercing Connector**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Mechanical Test
- e) Water Tightness test
- f) Climatic Ageing Test
- g) Corrosion Test
- h) Electrical Ageing Test

**v) Mid Span Joints**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Mechanical Test
- e) Water Tightness test
- f) Climatic Ageing Test
- g) Corrosion Test

**vi) Arc Protection Devices**

- a) Visual examination
- b) Dimension verification
- c) Check for permanent marking
- d) Clamp Bolt Tightening Test
- e) Short Circuit test

**8. TYPE TEST CERTIFICATES:**

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards and as per CEA guidelines. All the tests shall be conducted at CPRI / ERDA as per relevant IS/IEC standard. Type tests should have been conducted in certified Test laboratories during the period not exceeding 7years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPWODL/ TPCODL/ TPNODL/ TPSODL.

**8. PRE-DISPATCH INSPECTION:**

The material shall be subject to inspection by a duly authorized representative of the TPWODL/ TPCODL/ TPNODL/ TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access

to the places of manufacture to TPWODL/ TPCODL/ TPNODL/ TPSODL's representatives at all times when the work is in progress. Inspection by the TPWODL/ TPCODL/ TPNODL/ TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPWODL/ TPCODL/ TPNODL/ TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPWODL/ TPCODL/ TPNODL/ TPSODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

#### **9. INSPECTION AFTER RECEIPT AT STORES:**

The material received at TPWODL/ TPCODL/ TPNODL/ TPSODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

#### **10. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 24 months from the date of commissioning or 30 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

The bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of guarantee period for any 'latent defects' if noticed by the company.

The guarantee clause is applicable for all the items covered in this specification.

**11. PACKING:**

Supplier shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport and be packed in such a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

~~**12. TENDER SAMPLE:**~~

~~Bidder shall submit the sample of material during submission of Bids.~~

**13. QUALITY CONTROL:**

The bidder shall submit with the offer Quality Assurance Plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections. The bidder shall ensure that the material supplied is as per the Guaranteed Technical Particulars as specified in the specifications.

**14. TESTING FACILITIES:**

Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

**15. MANUFACTURING ACTIVITIES:**

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

**16. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

**17. DRAWINGS AND DOCUMENTS**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars & Schedule "B" Deviations
- b) Work Experience details
- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.



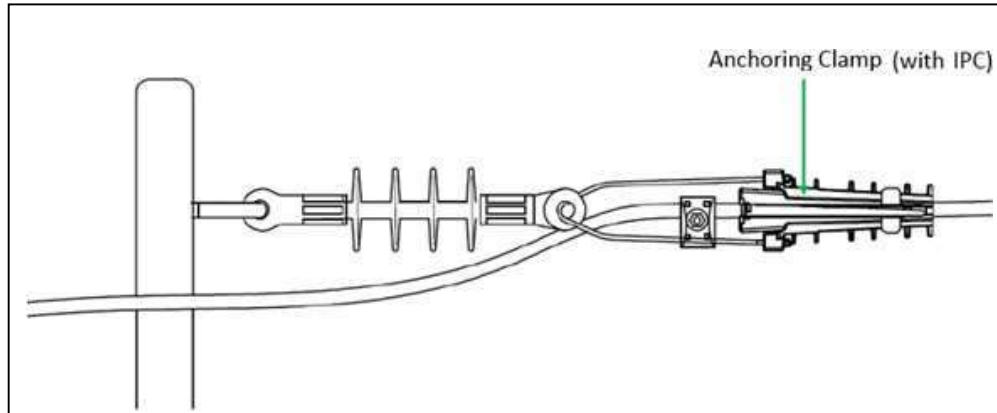


Fig.1: - Tension Assembly (TA) with Anchoring clamp and one Tracking protection IPC

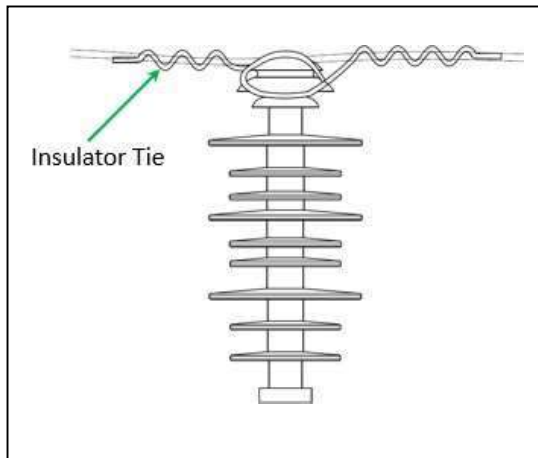


Fig.2: - Non-Metallic Alignment Tie

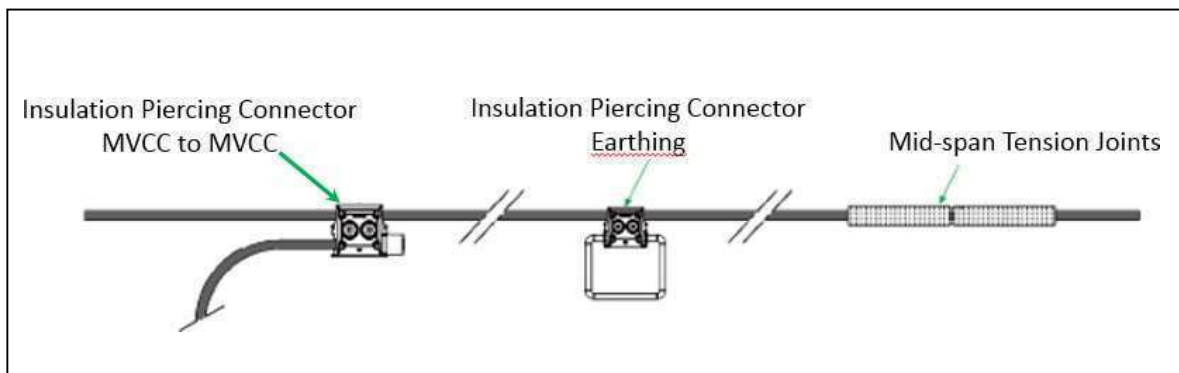


Fig.3:- Insulation Piercing Connector for Networking / Branching / Looping and Midspan Joints

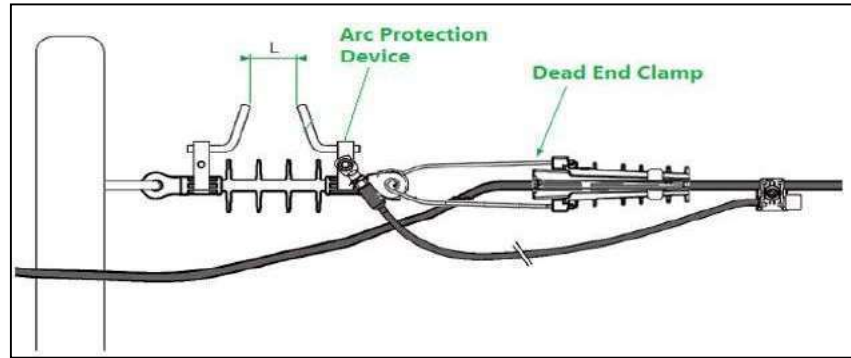


Fig.4: - Arc Protection Device

Note: - These are the Sample Drawing for tender purpose only.

**18. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS**

**TENSION ASSEMBLY-WEDGE TYPE (TA)**

Sl. No.	Technical Parameters	To Be Furnished By The Bidder
1	Name of the manufacturer	
2	Applicable Standard	
3	Range of Conductor size	
4	Installation (with/without disassembly)	
5	Type & grade	
6	Application	
7	Mechanical Strength	
8	Dimensions (mm)	

**NON-METALLIC ALIGNMENT TIES**

Sl. No.	Technical Parameters	To Be Furnished by The Bidder
1	Name of the manufacturer	
2	Applicable Standard	
3	Range of Conductor size	
4	Mounting	
5	Type	
6	Material	
7	Application	
8	Dimensions (mm)	

**MECHANICAL CONNECTOR WITH HEAT SHRINK SLEEVE**

Sl. No.	Technical Parameters	To Be Furnished by The Bidder
1	Name of the manufacturer	
2	Applicable Standard	
3	Range of Conductor size	
4	Installation	
5	Type of connection required	
6	Is any metallic part carrying potential in operation exposed during installation	
7	Material	
8	Connector ID	

**INSULATION PIERCING CONNECTOR**

Sl. No.	Technical Parameters	To Be Furnished by The Bidder
1	Name of the manufacturer	
2	Applicable Standard	
3	Range of Conductor sizes accommodated for Main & Branch	
4	Application	
5	Type of connection required	
6	Is any metallic part carrying potential in operation exposed during installation	
7	Are end caps of branch cable a) Slide on type (b) Rigid	
8	Are torque limiting shear heads provided to tightening bolts	
9	Specified Torque	
10	Torque for establishing connection between main and Tap (Nm)	

**MID SPAN JOINTS**

Sl. No.	Technical Parameters	To Be Furnished by The Bidder
1	Name of the manufacturer	
2	Applicable Standard	
3	Type No & Size Range	



Specification No: [ENG-EHV-1008](#)

Specification Name:  
SPECIFICATION FOR ACCESSORIES OF 33kV XLPE COVERED CONDUCTOR

4	Application	
5	Type of connection required	
6	Is any metallic part carrying potential in operation exposed during installation	
7	Installation	

~~19. SCHEDULE "B" DEVIATIONS:~~

~~(TO BE ENCLOSED WITH TECHNICAL BID)~~

~~All deviations from this specification shall be set out by the Bidders, clause by clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>Sl. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

~~Signature~~

~~Designation~~

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-GEN-4002**

**Specification Name : Technical Specification for Earth Enhancement Material**

<b>Vijender Goyal</b>	<b>SHANTAPRIYA JENA</b>	<b>SATYA PRASAD NAYAK</b>	<b>JYOTIPRAKASH MOHANTY</b>	<b>Shailendra Kumar Jaiswal</b>	<b>SHIRISH SHARAD DIKAY</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPSODL	TPNODL	TPCODL	TPWODL	TPSODL	TPSODL
07-12-2022	07-12-2022	07-12-2022	07-12-2022	08-12-2022	09-12-2022

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## CONTENTS

- 1.0 SCOPE
- 2.0 APPLICABLE STANDARDS
- 3.0 CLIMATIC CONDITIONS OF THE INSTALLATION
- 4.0 GENERAL TECHNICAL REQUIREMENTS
- 5.0 NAME PLATE AND MARKING
- 6.0 TESTS and TYPE TEST CERIFICATES
- 7.0 PRE-DISPATCH INSPECTION
- 8.0 INSPECTION AFTER RECEIPT AT STORE
- 9.0 GUARANTEE
- 10.0 PACKING
- 11.0 TENDER SAMPLE
- 12.0 QUALITY CONTROL
- 13.0 MINIMUM TESTING FACILITIES
- 14.0 MANUFACTURING ACTIVITIES
- 15.0 DRAWING AND DOCUMENTS
- 16.0 GUARANTEED TECHNICAL PARTICULARS
- 17.0 SCHEDULE OF DEVIATIONS

**1. Scope:**

Ground Enhancement Material/ Backfill / Grounding Improvement Material shall be maintenance free. It should not need re-charging with salts or any other chemicals and shall maintain its earth resistance with time. It shall be placed around earth electrode in the earth pit/earth mat to improve the conductivity of earth electrode & ground contact area. The material shall be supplied in sealed moisture proof bags. These bags shall be marked with the name of the manufacturer or trade name, quantity, batch no., date of manufacture etc. It shall have following characteristics.

**2. APPLICABLE STANDARDS**

- **Ground Enhancement Material / Backfill / Grounding Improvement Material shall confirm IEEE 80-2000 Clause No.14.5 (b).**
- **Ground Enhancement Material / Backfill / Grounding Improvement Material shall comply with the requirements and all applicable tests as per IEC 62561.**

**3. CLIMATIC CONDITIONS OF THE INSTALLATION /SERVICE CONDITIONS:**

The equipment to be supplied against this Specification shall be suitable for mounting on outdoors structures for protection of transformers and tapping points under the following tropical conditions:

The material shall be suitable for following climatic conditions,

- i. Maximum altitude above sea level 1,000m
- ii. Maximum ambient air temperature 50°C
- iii. Maximum daily average ambient air temperature 40 °C
- iv. Minimum ambient air temperature 0°C
- v. Maximum relative humidity 95%
- vi. Average number of thunderstorm days per annum (isokeraunic level) 70
- vii. Average number of rainy days per annum 120
- viii. Average annual rainfall 150cm
- ix. Earthquakes of an intensity in horizontal direction - equivalent to seismic acceleration of 0.3g
- x. Earthquakes of an intensity in vertical direction - equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)
- xi. Wind velocity: 300 km/hr, 200 km/hr and 160 km/hr.

Environmentally, some of the regions, where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas. Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.

#### 4. GENERAL TECHNICAL REQUIREMENTS

The Earth Enhancement Material shall be placed between primary earth electrode and perforated cage to improve the conductivity of earth electrode & ground contact area. Earth enhancement material (Back fill compound) shall be according to IEC 62561-7, and superior conductive material that improves earthing effectiveness especially in areas of poor conductivity such as rocky ground, sandy soil & areas of moisture variation with different soil strata. The material must ensure consistent Ohmic value of earth resistivity throughout the life span of the earthing.

Sr. No	Description	TPSODL Requirement (Bentonite Based)	TPSODL Requirement (Marconite Based)
<b>One Option out of both may be opted as per requirement of user</b>			
1	Brand name of the earth enhancement material.	To be mentioned by Bidder	To be mentioned by Bidder
2	Resistivity of the earth enhancement material	Less than 0.12 Ohm-m	0.001 Ohm-m
3	PH value of the earth enhancement material	> 7 & < 9	> 7 & < 9
4	Moisture retaining capacity at 105°C	10% moisture at 105°C	No moisture required
5	Granular size of the material	0.1mm to 3mm	0.25 mm to 3mm
6	water solubility (in Percentage)	30%	<5%
7	Thermal stability of the material (Temperature Range)	(-10°C to 60°C)	(-10°C to 60°C)
8	Weight of material per bag	20 Kg	20 Kg
9	Conductive Cement:	15 %	Mix
10	Graphite carbon powder	45%	67%
11	Sodium montmorillonite/ Sodium Bentonite Powder	30 %	NA
12	Hydrous aluminum silicate	10 %	NA
13	Maximum permissible limit of Salt content	Below 2 %	NA
14	Sulphur content in the back-fill compound	Below 2 %	Below 1 %

The Earth Enhancement Material/ Backfill compound shall be Highly Conductive Compound, maintenance free. The watering shall be required at the time of its installation only. No re-charging with water, salts or any other chemical shall be required and it shall maintain almost constant earth resistance during its life cycle without manual watering. The material must have the following features:

- a) It must set firmly and should not dissolve or decompose or otherwise pollute the soil or the local water table.
- b) It should have capacity to retain more than 10% moisture at 105°C. Test certificate for the same from CPRI/ERDA/NABL approved laboratory shall be submitted.
- c) Material shall be non-toxic, non-reactive, non-explosive & non-corrosive. It shall not cause burns, irritation to eye, skin etc. It shall not pollute the soil or local water table & shall meet environmental friendly requirements

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for landfill.

- d) It should have an excellent hygroscopic properties to absorb moisture. It should absorb & release the moisture in the dry weather condition and help in maintaining the moisture around the earth electrode. Material shall be thermally stable between temperature ranges of -10°C to 60°C. Material shall not decompose or leach out with time.
- e) Material shall not decompose or leach out with time. The leach test shall be tested as per IEC 62561-7 Clause 5.3 at NABL accredited Government/ government supported laboratory.
- f) Sulphur Determination test and Corrosion Test - As per IEC 62561-7 clause 5.3 & 5.5 respectively.
- g) The resistivity of the backfill compound shall not be higher than 0.120 Ω-m when using bentonite based earth enhancement compound & 0.001 Ω-m when using Marcionite based earth enhancement compound, when it is tested with 4 electrode method.

## 5. NAME PLATE AND MARKING

The identifying markings which shall be indelibly marked on bags of the compound are given below:

1. Suppliers/Manufacturer's name
2. Property of "TPSODL, BERHAMPUR"
3. Date of Manufacturing;
4. Net weight (Kg):
5. PO No-

## 6. TESTS & TYPE TEST CERTIFICATES :

Following type tests shall be necessarily conducted on the ground enhancement material as specified in IS/IEC/ANSI standards. Test to be carried out at CPRI/ERDA/NABL accredited laboratories. These type tests should have been carried out within five years prior to the date of opening of this tender.

- a) Leaching test
- b) Sulphur content
- c) Corrosion test
- d) Resistivity test

In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPSODL. In case the type test certificates are dated beyond 5 years and up to 10 years maintaining basic component design same then deviation should be submitted on vendor letter head. TPSODL will have the rights to accept/reject the same. The Bidder/Manufacturer must have the facility of applicable routine /acceptance tests.


## 7. PRE-DISPATCH INSPECTION

Inspection shall be carried out by duly authorized representative of TPSODL. Bidder shall grant free access to the places of manufacture to TPSODL's representatives at all times when the work is in progress. Inspection may be made at any stage of manufacturing at the discretion of TPSODL and the material/ equipment, if found unsatisfactory as to workmanship or material quality / quantity, the same is liable to rejection. Inspection by TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. One Copy of the report shall be sent to Contracts & Engineering department.

Dispatch of material: Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPSODL.

Following documents shall be sent along with the supplied material:

- a) Test reports
- b) MDCC issued by TPSODL

	<p><b>Specification No: ENG-GEN-4002</b></p> <p><b>Specification Name: Technical Specification for Earth Enhancement Material</b></p>
---	---

- c) Invoice in duplicate
- d) Packing list
- e) Delivery Challan

**8. INSPECTION AFTER RECEIPT AT STORES**

The material received at TPSODL, Store, Odisha store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection.

**9. GUARANTEE:**

Requirement: Bidder shall confirm for guarantee towards design, material, workmanship & quality of process / manufacturing for integrated product delivered under the contract. In the event any defect is found by TPSODL , up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of TPSODL, failing which TPSODL will be at liberty to get it replaced/rectified at Bidder’s risks and costs and recover all such expenses plus the TPSODL’s own charges (@ 20% of expenses incurred), from the Bidder or from ‘Security cum Performance Deposit’ as the case may be.

**10. PACKAGING:**

Bidder shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly.

~~**11. TENDER SAMPLE**~~


~~1 no. nonreturnable sample bag has to be submitted during technical evaluation of Tender for testing purpose at Engineering department of TPSODL Corporate office.~~

**12. QUALITY CONTROL:**

The bidder shall submit ‘Quality Assurance Plan’ followed in respect of bought out Items Manufactured by him

- a) Raw materials in process
- b) Final inspection
- c) Packaging
- d) Marking.

As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. TPSODL reserves the sole rights for the type test of random sample from the lot and in case of any discrepancy or deviation from the Type test certificates submitted along with the bid, the complete Lot shall be rejected. TPSODL’s nominated representative shall have free access to the bidder's works to carry out inspections.

	<p><b>Specification No: ENG-GEN-4002</b></p> <p><b>Specification Name: Technical Specification for Earth Enhancement Material</b></p>
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**13. MINIMUM TESTING FACILITIES**

Bidder shall have adequate in house testing facilities for carrying out all routine and acceptance tests as per relevant International / Indian standards.

**14. MANUFACTURING ACTIVITIES**

The successful bidder will have to submit (after placement of RC/ PO) technical compliance document of the material for getting approval before mass manufacturing. Manufacturing mass quantity to start only after getting CAT-A approved drawings & GTP or as per intimation from TPSODL.

**15. Drawings & Documents:**

**Following documents shall be submitted along with the bid for approval after award of RC/PO:**

- a) Completely filled-in clause wise compliance of the specification.
- b) General description of the equipment and all components including brochures
- c) Type test Certificates for each specified test
- d) Experience List.
- e) Packaging Details.

All the Documents and Drawings shall be in English Language.

**16. GUARANTEED TECHNICAL PARTICULARS**

Bidder to submit clause wise compliance.

~~**17. SCHEDULE OF DEVIATIONS**~~

~~**(TO BE ENCLOSED WITH TECHNICAL BID on Bidders Letter head)**~~

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this Schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to Confirm the purchaser's specifications.~~

Sr. No.	Clause No.	Details of deviation with justifications

~~We confirm that there are no deviations apart from those detailed above.~~

Seal of the Company  
Designation:

Signature:

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-GEN-4023**

**Specification Name : Technical Specification For Fuse Wire**

<b>SAYANTANI DAS</b>	<b>MILAN MAITY</b>	<b>SANTOSH KUMAR PATRA</b>	<b>Susavan Biswas</b>	<b>KHAJAN BHARDWAJ</b>	<b>POURUSH GARG</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPCODL	TPNODL	TPWODL	TPSODL	TPCODL	TPCODL
24-01-2023	25-01-2023	25-01-2023	27-01-2023	30-01-2023	31-01-2023

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TPWODL*

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. NAME PLATE AND MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DESPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORE
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. MINIMUM TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWING AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

**1. SCOPE:**

This specification is intended to cover the design, manufacture and testing before dispatch, supply and delivery of Tinned Copper Fuse Wire at TPCODL/ TPNODL/ TPWODL/ TPSODL stores. Tinned copper fuse wire shall be used for re-wire able type electric fuses for protection of lines and transformers.

**2. APPLICABLE STANDARDS:**

The Tinned Copper Fuse wire shall be generally comply in all respect to the requirement of relevant IS: 9926/1981 amended till date except wherever modified in this specification. Consideration may be given to alternative which the supplier consider advisable by reasons of his own manufacturing requirements and experiences, provided descriptive matter is submitted and recommended device of arrangement is equal to or superior to that required by the accompanying specification and if the purchaser is convinced of the quality and/ or superiority of the material.

IS: 8130: 1984: Specification for conductor for insulated electric cables and flexible cord.

**3. CLIMATIC CONDITION OF THE INSTALLATION**

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	1500mm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000mm
8	Wind speed	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/ TPNODL/ TPWODL/ TPSODL service area has heavy saline conditions

along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

#### 4. TECHNICAL SPECIFICATION:

The Tinned Copper Fuse wire shall be conforming to the IS 9926/1981 with latest amendments, if any.

Diameter & maximum allowable Resistance should be as below :

Sr. No.	Item Description	SWG	Nom Dia (in mm)	Tolerance (+/-)t	Permissible resistance in Ohm per meter at 20 ° C (Max/Min)	
1	6A TC Fuse Wire	36	0.20	0.003	0.5644	0.5250
2	10A TC Fuse Wire	33	0.35	0.004	0.1834	0.1730
3	16A TC Fuse Wire	25	0.50	0.005	0.0898	0.0848
4	20A TC Fuse Wire	23	0.63	0.006	0.0566	0.0535
5	25A TC Fuse Wire	22	0.75	0.008	0.0400	0.0376
6	32A TC Fuse Wire	20	0.85	0.009	0.0311	0.0293
7	40A TC Fuse Wire	18	1.25	0.011	0.0143	0.0136
8	63A TC Fuse Wire	16	1.50	0.015	0.0099	0.0094
9	80A TC Fuse Wire	15	1.80	0.018	0.0069	0.0065
10	100A TC Fuse Wire	14	2.00	0.020	0.0056	0.0053

For the specified sizes, those are not defined in Indian Standards, but are procured sometimes for O&M activities, bidder to provide the below details :

Sr. No.	Item Description	SWG	Nom Dia (in mm)	Tolerance (+/-)t	Permissible resistance in Ohm per meter at 20 ° C (Max/Min)	
1	2.5A TC Fuse Wire				Bidder to provide	
2	8.5A TC Fuse Wire					
3	200A TC Fuse Wire					
4	300A TC Fuse Wire					

#### 5. GENERAL CONSTRUCTION

The Tinned Copper fuse wire shall comply with the following requirements: -

a) The fuse wire shall be made from electrolytic tough pitched (ETP) copper (tinned) conforming to IS:8130/1984 amended up to date.



- b) The fuse wire is designed to melt and open the circuit to avoid any fault to circuit
- c) The fuse wire shall be circular and shall have a uniform cross section and free from pits, draw marks or any other harmful surface defects.
- d) The tin coating layer shall be uniform, smooth, continuous and firmly adherent to the base copper material.
- e) The electrical properties of the material used ETP copper, for making the fuse wires shall be as given here under
  - i. Resistivity at 20 ° C --- 0.017241 ohm mm Sq./m
  - ii. Density at 20 ° C ----- 8.89 gm/cub cm.
  - iii. Constant mass temp. Deficient of resistance at 20 ° C --- 0.00393/ ° C .
  - iv. Coefficient of linear expansion --- 17 x 10-6 / ° C.

## 6. NAME PLATE & MARKING

Not Applicable

## 7. TESTS:

All the routine and acceptance tests shall be carried out in accordance with the relevant IS/ IEC standards. All routine and acceptance tests shall be witnessed by the purchaser/ his authorized representative. All components shall be type tested as per relevant standards.

### 7.1 TYPE TESTS

The following tests shall be carried out: -

- i) Visual examination.
- ii) Dimensional Check.
- iii) Resistance test
- iv) Per sulphate test

### 7.2 ROUTINE TESTS

- i) Visual examination.
- ii) Dimensional Check.

iii) Resistance test

### 7.3 ACCEPTANCE TESTS

- i) Visual examination.
- ii) Dimensional Check.
- iii) Resistance test

## 8. TYPE TEST CERTIFICATES

The bidder shall furnish the type test certificates of the fuse wire for the tests as mentioned as above as per the corresponding standards. All the tests shall be conducted by CPR/ ERDA or TPCODL/ TPNODL/ TPWODL/ TPSODL recommended other government Laboratories as per the relevant standards. Type test should have been conducted in certified Test Laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPCODL/ TPNODL/ TPWODL/ TPSODL.

## 9. PRE-DISPATCH INSPECTION

The material shall be subject to inspection by a duly authorized representative of the TPCODL/ TPNODL/ TPWODL/ TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/ TPNODL/ TPWODL/ TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/ TPNODL/ TPWODL/ TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/ TPNODL/ TPWODL/ TPSODL.

Following documents shall be sent along with material.

- a. Test reports
- b. MDCC issued by TPCODL/ TPNODL/ TPWODL/ TPSODL
- c. Invoice in duplicate
- d. Packing list
- e. Drawings & catalogue

- f. Guarantee / Warrantee card
- g. Delivery Challan

Other Documents (as applicable).

## **10. INSPECTION AFTER RECEIPT AT STORE**

The material received at TPCODL/ TPNODL/ TPWODL/ TPSODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering & contracts department.

## **11. GUARANTEE**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements). Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be.

Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.

## **12. PACKING:**

The fuse wires shall be supplied in spools weighing 1 kg. The bidder shall ensure that all the fuse wire spools shall be adequately protected and specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.

## ~~**13. TENDER SAMPLE:**~~

~~Bidder to share the Tender sample of material with the offer.~~

## **14. QUALITY CONTROL:**

The bidder shall submit with the offer Quality Assurance Plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-suppliers works to carry out inspections. The bidder shall ensure that the material supplied is as per the Guaranteed Technical Particulars as specified in the specifications.

#### **15. MINIMUM TEST FACILITIES**

Bidder shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards. In case of supply by the channel partner, the manufacturer shall have the in house testing facilities to carry out the routine and acceptance tests.

#### **16. MANUFACTURING ACTIVITIES**

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

#### **17. SPARES, ACCESSORIES & TOOLS**

Not Applicable.

#### **18. DRAWING & DOCUMENTS**

Following documents shall be prepared based on TPCODL/ TPNODL/ TPWODL/ TPSODL specifications and statutory requirements with complete BOM and shall be submitted with the bid:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars.
- b) Work Experience details
- c) Type test certificates.
- d) Drawing (3 sets) of Guy Insulator containing complete information about manufacturing

& fabrication etc.

After the contract soft copies of drawing and GTP shall be forwarded for approval. Soft copies of all the drawing, GTP, test certificates shall be submitted after the final approval of the same to the purchaser.

Following Drawings/Documents shall be submitted after the award of the contract				
Sl No.	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	Required		Required
2	Manual/Catalogues/drawings for all components.		Required	
3	Technical details of fuse wire.		Required	Required
4	Installation Instructions		Required	Required
5	Instructions for use		Required	Required
7	Transport/shipping dimensions		Required	Required
8	OA & QC Plan	Required	Required	Required
9	Routine, Acceptance and Type test Certificates	Required	Required	Required

All the Documents and Drawings shall be in English Language.

**Instruction Manuals:** Bidder shall furnish soft copies of manual (in English Language) covering erection and maintenance instructions and all relevant information pertaining to the main equipment as well as auxiliary devices

## 19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS

S.No	Description	Units	To be furnished by bidder
1	Nominal Diameter	mm	To be furnished by bidder
2	Rated Current of Fuse Wire	±t	
3	Tolerance	A	
4	Rated SWG of the fuse wire with reference the rated current	SWG	
5	Maximum Permissible Resistance at 20°C	ohm/m	
6	Minimum Permissible Resistance at 20°C	ohm/m	
7	Weight of each Packing Spool	kg	

## 21. ~~SCHEDULE "B" DEVIATION:~~

**TPCODL**  
**TPWODL**

**TPNODL**  
**TPSODL**

**Specification No:** ENG-GEN-4023

**Specification Name:** Technical Specification of Fuse Wire

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>Sl No.</del>	<del>Clause No.</del>	<del>Details of Deviation with Justification</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of Company~~

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-GEN-4005**

**Specification Name : GALVANISED IRON (GI) FLATS OF DIFFERENT SIZES**

<b>Ranjan Kumar Sahoo</b>	<b>SATYA PRASAD NAYAK</b>	<b>SHANTAPRIYA JENA</b>	<b>JYOTIPRAKASH MOHANTY</b>	<b>Shailendra Kumar Jaiswal</b>	<b>SHIRISH SHARAD DIKAY</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPSODL	TPCODL	TPNODL	TPWODL	TPSODL	TPSODL
22-12-2022	22-12-2022	22-12-2022	22-12-2022	22-12-2022	22-12-2022

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TPWODL*

## **CONTENTS**

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTION
6. NAME PLATE AND MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. TRAINING
15. QUALITY CONTROL
16. MINIMUM TESTING FACILITIES
17. MANUFACTURING ACTIVITIES
18. SPARES, ACCESSORIES AND TOOLS
19. DRAWINGS AND DOCUMENTS
20. GUARANTEED TECHNICAL PARTICULARS
21. SCHEDULE OF DEVIATIONS



<p><b>1.0</b></p>	<p><b>SCOPE</b></p>	<p>This specification covers technical requirements of design, manufacturing, testing, Inspection, Supply &amp; transportation of Hot dip Galvanised Iron (GI) Flat 25X3 MM, 25X4 MM, 25X6 MM, 50X6 MM, 75X10 MM, 90X6 MM at TPCODL/TPNODL/TPSODL/TPWODL stores/site.</p>
<p><b>2.0</b></p>	<p><b>APPLICABLE STANDARDS</b></p>	<p>The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall confirm to the regulations of the local Statutory authorities:</p> <ul style="list-style-type: none"> <li>•</li> <li>• IS 1239 (Part1): Specification for Steel Tubes, Tubulars &amp; other wrought steel fittings.</li> <li>• IS 1239 (Part2): Specification for Steel Tubes, Tubulars &amp; other steel fittings.</li> <li>• IS 228: Method for chemical analysis of steels.</li> <li>• IS 4736 : Specification for Hot dip zinc coating on mild steel tubes</li> <li>• IS 4759: Specification for Hot dip zinc coating on structural steel and other allied products.</li> <li>• IS 1387: General requirements for the supply of metallurgical materials.</li> <li>• IS 1608: Mechanical testing of metals-Tensile Strength.</li> <li>• IS 4711: Methods for sampling of steel pipes, tubes and fittings.</li> <li>• IS 4740: Code of practice for packaging of steel tubes.</li> <li>• IS 10748: Hot rolled steel strip for welded tubes &amp; pipes.</li> <li>• IS 12278: Method for ring tensile test on metallic tubes.</li> <li>• IS 3043-1987: Code of practice for earthing.</li> <li>• IS 1367: Technical supply conditions for threaded steel fastners.</li> <li>• IS 14394: Industrial fastners-Nuts of product GradeC- Hot Dip Galvanised.</li> <li>• IS 2016:-1997: Specification for plain washers.</li> <li>• IS 1730-1989: Steel plates, sheets, strips and flats for structural</li> <li>• And general engineering purpose-Dimensions</li> <li>• IS 814-2004: covered electrodes for manual metal Arc welding</li> <li>• of carbon and carbon Manganese steel- specification.</li> <li>• IS: 2629(1966)- Recommended practice for hot dip galvanized of Iron Earthing Strips</li> <li>• IS: 2633(1972)- Methods of testing weight, thickness &amp; uniformity of coating on hot dip galvanized articles.</li> <li>• IS: 5358(1969)- Specification for hot dip galvanized coating on fastness I</li> <li>• IS:3203-Specification for Electroplating</li> <li>• IS: 4759(1968)- IS: 4759(1968)</li> <li>• IS 2062</li> </ul> <p><i>*In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.</i></p>

<b>3.0</b>	<b>CLIMATIC CONDITIONS OF INSTALLATION</b>	1	Maximum ambient temperature	50 deg C
		2	Max. Daily average ambient temp	35 deg C
		3	Min Ambient Temperature	0 deg C
		4	Maximum Humidity	95%
		5	Average Annual Rainfall	150cm
		6	Average No. of rainy days per annum	120
		7	Altitude above MSL not exceeding	1000m
		8	Wind Pressure	300 Km/hr
		9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
		10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)
		<p>TPCODL/TPNODL/TPSODL/TPWODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.</p>		
<b>4.0</b>	<b>GENERAL TECHNICAL REQUIREMENTS</b>	<p><b>MATERIAL</b></p> <p>Supplier has to purchase raw materials (MS Flat) as per relevant IS at his own cost. The zinc required for galvanizing shall be quality Zn-99.95% or better Zinc grade &amp; shall confirm to IS and its latest amendments.</p> <p>The Supplier shall make his own arrangement for procurement before the commissioning of work, sufficient quantity of electrolytic zinc of proper quality for galvanizing. The Supplier shall however not link the delivery period with the supply of zinc. TPCODL/TPNODL/TPSODL/TPWODL is at liberty to have sample of zinc used and to test in any laboratory at his own cost and reject the particular supply, is found below standard.</p> <p>All raw materials required for galvanizing etc. and for complete execution of work shall be stocked in adequate quantities by the Supplier to ensure that the progress of work is not hampered.</p>		

SL. NO.	TECHNICAL PARTICULARS	Requirement
1	Material	Hot-Dip Galvanized Flat
2	Relevant Standard	IS: 2062, IS: 2633, IS: 2629, IS: 4759
3	Make	SAIL, TATA Steel, ESSAR, JSW Steel and TATA steel BSL
4	Grade of Steel	E 250 A
5	Minimum Tensile Strength in Mpa	410
6	Yield Stress in Mpa	250
7	Percentage Elongation (Min.) at Gauge Length	23%
8	Bend Test (Internal Dia)	Min-2t
9	Mass of Zinc Coating	705 gm/m <sup>2</sup>
10	Zinc Coating Thickness & No of Dips	100 Micron (6 Dip)
11	Chemical composition	Grade: E 250 A (As per IS: 2062)
12	Standard length of supply	6 Metre Long
13	Tolerances	As per IS 1852 latest Amendment
<b>5.0</b>	<b>GENERAL CONSTRUCTION</b>	<p>GI Flat intended for different use in electricity distribution utility. The zinc coating shall be uniform. The materials shall be strictly from approved vendors' i.e. SAIL, TATA Steel, ESSAR, JSW Steel and TATA steel BSL &amp; Billets(grade E250) with re rolling shall be allowed for mentioned MAKE. Documentary evidence certifying the raw material lifted from the approved vendor, which should not be less than the ordered quantity. Similarly the zinc for galvanization shall be procured from Hindustan zinc LTD. or Vedanta LTD. And the firm shall submit the documentary evidence certifying not less than the ordered quantity of zinc lifted from the approved vendor. The hot dip galvanization shall be done only after the all fabrication and welding done. The nut bolt, &amp; washers provided shall be as per relevant IS.</p> <p><b>5.1 Mass of the Flats are as follows:-</b></p> <p>a) 25X3 mm: - 0.589kg/m</p> <p>b) 25X4 mm: - 0.785kg/m</p> <p>c) 25X6 mm: - 1.18kg/m</p> <p>d) 50x6 mm: - 2.36kg/m</p>

- e) 75x10 mm: -5.89kg/m
- f) 90x6 mm: -4.24kg/m

**5.2 Chemical Composition**

Chemical composition for Fe 410 WA Grade

- a)C - 0.23% Max
- b)Mn - 1.5% Max
- c)S - 0.045% Max
- d)P - 0.045%Max
- e)SI - 0.40% Max
- f) CE (Carbon Equivalent)- 0.42%

**5.3 Galvanization:**

All flats shall be hot dip galvanized, are as following:

- a) All galvanizing shall be carried out by the hot dip process, in accordance with Specification IS 2629.
- b) The zinc coating (705 gms per sq.mt / 100Micron,6 dips) shall be smooth, continuous and uniform. It shall be free from acid spot and shall not scale, blister or be removable by handling or packing.
- c) There shall be no impurities in the zinc or additives to the galvanic bath which could have a detrimental effect on the durability of the zinc coating. Purity of zinc shall be Zn 99.95% or better.
- d) In the event of damage to the galvanizing the method used for repair shall be subject to the approval of the Engineer in Charge or that of his representative. Repair of galvanization at site will not be permitted in any situation.
- e) Partial immersion of the work shall not be permitted and the galvanizing tank must therefore be sufficiently large to permit galvanizing to be carried out by one immersion.

After galvanizing no drilling or welding shall be performed on the galvanized parts. To avoid the formation of white rust galvanized materials shall be stacked during

		transport and stored in such a manner as to permit adequate ventilation. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization. The galvanized steel shall be subjected to test as per IS-2633.
6.0	<b>NAME PLATE AND MARKING</b>	The body of the device shall be appropriately marked with “TPCODL/TPNODL/TPSODL/TPWODL” , Manufacture’s name or trademark and Year of Manufacturing. at suitable location such that it is permanent and does not harm the body of the device.
7.0	<b>TESTS</b>	All routine, acceptance & type tests shall be carried out in accordance with the relevant IS.
7.i)	<b>TYPE TEST</b>	<p>The following tests shall constitute the type tests and shall be carried out as per IS: 1239 Part-1: 2004(Latest Amendment)</p> <ol style="list-style-type: none"> <li>1)Test for Mechanical Properties (As per 1239 Part-1: 2004 or Latest Amendment clause no.14.1 &amp; 14.1.1) <ul style="list-style-type: none"> <li>• Percentage of Elongation.</li> <li>• Tensile strength.</li> </ul> </li> <li>2) Mass of zinc coating. (As per 4736:1986 or Latest Amendment clause no.5.1)</li> <li>3) Chemical composition. (As per 1239 Part-1: 2004 or Latest Amendment clause no.6.1.1)</li> </ol>
7.ii)	<b>ROUTINE/ ACCEPTANCE TEST</b>	<p>The following tests shall be got conducted in presence of TPCODL/TPNODL/TPSODL/TPWODL representative as per IS: 1239 Part-1: 2004 (Latest Amendment) on the samples taken from the offered lot material for the purpose of acceptance of that lot of material.</p> <ol style="list-style-type: none"> <li>1) Dimension of GI Flat. (As per IS 1239 Part-1: 2004 clause No.9.1 a&amp;b)-Test shall be performed.</li> <li>2) Chemical composition (Manufacturer’s Test Certificate for raw material-Document Review only.)</li> <li>3) Mass of zinc coating. (As per 4736:1986 or Latest Amendment clause no.5.1)-Test shall be performed.</li> <li>4) Test for mechanical properties (Manufacturer’s Test Certificate for raw material-Document Review only.)</li> <li>5) Galvanizing/Electroplating test</li> <li>6) Visual Inspection test to confirm products free from any defects</li> </ol>
8.0	<b>TYPE TEST CERTIFICATES</b>	The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI / ERDA / Other Government Labs/ NABL accredited Lab as per relevant IS. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/TPNODL/TPSODL/TPWODL .

<p><b>9.0</b></p>	<p><b>PRE DISPATCH INSPECTION</b></p>	<p>The Material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL . Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL 's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPSODL/TPWODL . The pre-dispatch inspection shall be carried out as per annexure-IV</p> <p>Following documents shall be sent along with material</p> <ul style="list-style-type: none"> <li>a) Test reports</li> <li>b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL</li> <li>c) Invoice in duplicate</li> <li>d) Packing list</li> <li>e) Drawings &amp; catalogue</li> <li>f) Guarantee / Warrantee card</li> <li>g) Delivery Challan</li> <li>h) Other Documents (as applicable)</li> </ul>
<p><b>10.0</b></p>	<p><b>INSPECTION AFTER RECEIPT AT STORES</b></p>	<p>The material received at TPCODL/TPNODL/TPSODL/TPWODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to each QA and Plant Engineering group.</p>
<p><b>11.0</b></p>	<p><b>GUARANTEE</b></p>	<p>Bidder shall stand guarantee towards design, materials, workmanship &amp; quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of 12 months from the date of commissioning or 18 months from the date of last supplies made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be.</p> <p>Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.</p>
<p><b>12.0</b></p>	<p><b>PACKING</b></p>	<p>Bidder shall ensure that the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.</p>
<p><b>13.0</b></p>	<p><b>TENDER SAMPLE</b></p>	<p>Samples to be provided as required to TPCODL/TPNODL/TPSODL/TPWODL</p>

		Engineering Dept.
14.0	<b>TRAINING</b>	Not Applicable
15.0	<b>QUALITY CONTROL</b>	The bidder shall have a prove track of not less than 10 years in GI Flat in manufacturing and servicing in national or international market. The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.
16.0	<b>MINIMUM TESTING FACILITIES</b>	Bidder shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.
17.0	<b>MANUFACTURING ACTIVITIES</b>	The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.
18.0	<b>SPARES ACCESSORIES AND TOOLS</b>	To be provided by BA
19.0	<b>DRAWINGS AND DOCUMENTS</b>	<p>Constructional drawings are attached as annexure-I, annexure-II, annexure-III should be followed for fabrication.</p> <p>Following documents shall be prepared based on TPCODL/TPNODL/TPSODL/TPWODL specifications and statutory requirements with complete BOM and shall be submitted with the bid:</p> <ol style="list-style-type: none"> <li>1. Completely filled in Technical Particulars along with Size and weight/sq.m of G.I. Flat, Standard Length, Galvanization Process, Galvanization thickness</li> <li>2. General description of the equipment and all components including brochures.</li> <li>3. Bill of Material</li> <li>4. Type test Certificates</li> <li>5. Experience List.</li> </ol> <p>After award of order Soft of all the drawing, GTP, test certificates shall be submitted for the final approval of the same to the purchaser.</p> <p>Following Drawings/Documents shall be submitted after the award of the contract:</p>

Sl. No	Description	For Approval	For Review Information	Final Submission
1	General Technical Parameters	√		√
2	Manual/Catalogues/drawings for all components.		√	
3	Technical details and test certificates of the component.		√	√
4	Instructions for use		√	√
5	Transport/shipping dimension drawing		√	√
6	QA & QC Plan	√	√	√
7	Routine, Acceptance and Type test Certificates	√	√	√

All the Documents and Drawings shall be in English Language.

<b>20.0</b>	<b>GUARANTEED TECHNICAL PARTICULARS</b>	Clause wise compliance shall be provided by bidders
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<b>21.0</b>	<b>SCHEDULE OF DEVIATIONS</b>	<b><u>(TO BE ENCLOSED WITH THE BID)</u></b>				
		<p><del>All deviations from this specification shall be set out by the Bidders, clause by clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the TPCODL/TPNODL/TPSODL/TPWODL's specifications:</del></p> <table border="1"> <thead> <tr> <th><del>S.No.</del></th> <th><del>Clause No.</del></th> <th><del>Details of deviation with justifications</del></th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p><del>We confirm that there are no deviations apart from those detailed above.</del></p> <p><del>Seal of the Company:</del></p> <p style="text-align: right;"><del>Signature</del> <del>Designation</del></p>	<del>S.No.</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>	
<del>S.No.</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>				



# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-GEN-4028**

**Specification Name : Technical Specification for Disc Insulator Hardware Fittings (70KN, 90KN & 120KN)**

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
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TPCODL	TPNODL	TPWODL	TPSODL	TPCODL	TPCODL
13-03-2023	13-03-2023	18-03-2023	20-03-2023	21-03-2023	21-03-2023

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## **CONTENTS**

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

## 1. SCOPE

The Specification covers the design, manufacture, testing preferably at manufacturer's works before supply and delivery of combined unit of hardware fittings for string insulators suitable for use in 33kV and 11kV overhead power lines.

The combined units offered shall be complete with all components which are necessary (excepting disc insulator) or usual for their effective performance and easy maintenance and inter changeability at site. Such parts shall be deemed to be within the scope of contract.

## 2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

Ref. IS	Description
IS 2486 (Part 1) IS 2486 (Part 2) IS 2486 (Part 3)	Specification for metal fittings of insulators for overhead power lines with nominal voltage greater than 1000 V. Specification for Insulator fittings for overhead power lines with nominal voltage greater than 1000V. (dimensional requirements) Specification for Insulator fittings for overhead power lines with nominal voltage greater than 1000 V. (locking devices)
IS 4759	Specification for hot-dip zinc coatings on structural steel and other allied products.
IS : 6745	Determination of mass of zinc coating on zinc coated iron and steel articles.
IS : 2633	Method for testing uniformity of coating on zinc coated.
IS 6603	Stainless Steel Bars and Flats
IS 2016	Plain washers
IS:1573	Specification for electroplated coatings of zinc on iron and steel.
IS 209	Specification of Zinc
IS 6639, BS:916	Specification for Hexagonal bolts and nuts

**3. CLIMATIC CONDITIONS OF THE INSTALLATION:**

SL.NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

TPCODL/TPNODL/TPSODL/ TPWODL service area **has heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph.** The atmosphere is generally laden with mild acid, dust in suspension during the dry months, and is subjected to fog in cold months.

**4. GENERAL TECHNICAL REQUIREMENTS:**

- i) All ferrous parts including fasteners shall be hot dip galvanized, after all machining has been completed. Nuts may however be tapped (threaded) after galvanizing and the threads oiled. Spring washers shall be electro-galvanized. The bolt threads shall be undercut to take care of the increase in diameter due to galvanizing. Galvanizing shall be done in accordance with IS-2629-1985 and shall satisfy the tests mentioned in IS: 2633-1986. Fasteners shall

**Specification Name:**

Technical Specification For Disc Insulator Hardware Fittings (70KN, 90KN &120KN)

withstand four dips while spring washers shall withstand three dips of one-minute duration in the standard Preece test. Other galvanized materials shall be guaranteed to withstand at least six successive dips each lasting one minute under the Standard Preece test for galvanizing.

- ii) The zinc coating shall be perfectly adherent of uniform thickness, smooth, reasonably bright, continuous and free from imperfections such as flux, ash, rust stains, bulky white deposits and blisters. The zinc used for galvanizing shall be of grade Zn 99.95 as per IS 209.

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE		
1	Type	<b>B&amp;S type</b>		
2	Ultimate Strength	70 KN (3 Bolted)	90 KN (4 Bolted)	120 KN (4 Bolted)
3	Suitable for conductor Size	AAAC-80 Sq mm, 100 Sq mm	AAAC-148 Sq mm	AAAC-232 Sq mm
4	Slip strength of tension clamp	95% of UTS	95% of UTS	95% of UTS
5	Referred IS Standard	IS 2486	IS 2486	IS 2486
6	Material Used			
a)	Cross Arm Strap	Mild Steel (HDG)	Mild Steel (HDG)	Mild Steel (HDG)
b)	Ball Eye	16mm Forged Steel	20mm Forged Steel	20mm Forged Steel
c)	Socket Eye	16 mm Forged Steel	20mm Forged Steel	20mm Forged Steel
d)	Bolted Type Tension Clamp and Keeper	Aluminum Alloy	Aluminum Alloy	Aluminum Alloy
e)	Security Clip	Stainless steel	Stainless steel	Stainless steel
f)	Split Pin	Stainless steel	Stainless steel	Stainless steel
g)	Cotter Pin and Bolt	Mild Steel (HDG)	Mild Steel (HDG)	Mild Steel (HDG)
h)	Nuts	Mild Steel (HDG)	Mild Steel (HDG)	Mild Steel (HDG)
i)	Spring Washer	Electro- galvanized	Electro- galvanized	Electro- galvanized
j)	Plain Washer	Mild Steel (HDG)	Mild Steel (HDG)	Mild Steel (HDG)
k)	Zn confirming to grade	IS 209	IS 209	IS 209
m)	Size of U Bolt	M16	M16	M16
7	Galvanizing	Min 705 g/sq meter/100 microns 6 dips	Min 705 g/sq meter/100 microns 6 dips	Min 705 g/sq meter/100 microns 6 dips
8	Tolerance	+/-5%	+/-5%	+/-5%

## **5. GENERAL CONSTRUCTIONS:**

### **5.1 Fittings for Strain Insulators with clamp**

- i) Cross arm strap confirming to IS 2486 (Part 2). Forged Steel ball eye for attaching the socket end of the Disc insulator to the cross arm strap. Dimensions shall be in accordance with IS: 2486 (Part-2) unless otherwise specified.
- ii) Cross-arm straps shall be manufactured from MS Flat hot dip galvanized and to connect the cross-arm/bracket of the structure at one end and the Ball Clevis at the other end.
- iii) It should be complete with hexagonal bolts, nuts, spring washers and Cotter pin at the threaded end to lock the unit. Minimum Threaded portion of the bolt shall be 30mm.
- iv) Aluminum alloy thimble socket made of permanent high strength aluminum alloy for attaching the disc insulator at one end and for accommodating the loop of conductor at the other end. The thimble socket shall be attached to the disc insulator with the help of locking pin as per the dimensions given in IS:2486 (Part 2).
- v) The tension hardware with three bolts and four bolts strain hardware shall have minimum slip strength not less than 95% of the strength of respective conductor.
- vi) All forgings & castings shall be of good finish and free from flaws or any other defects which may cause decrement of efficiency while in operation. The edges on the outside of the fittings such as at the ball socket & holes and the grooves shall be smooth & rounded. Sharp radius of curvature, ridges etc. which may lead to localized pressure or cause damage to the conductors in service shall be avoided. The clamp shall permit the conductor to slip before the failure of conductor occurs.
- vii) All parts of different fittings which provide for interconnection shall be made such that sufficient clearance is provided at the connection point to ensure free movement. All ball and socket connections shall be free in this manner, but care shall be taken that too much clearance between ball and socket is avoided.
- viii) All ferrous fittings and the parts other than those of stainless steel, shall be galvanized. Small fittings like spring washers, nuts, etc. should be electro-galvanized-Coating thickness as per IS: 1573.
- ix) The nominal dimensions of the ball and sockets, ball eye and cross-arm straps are as per the IS:2486 (Part 2).

### **5.2 FASTENERS: Bolts, Nuts & Washers:**

- i) All bolts and nuts shall conform to IS-6639. U bolt, Hexagonal Bolt, Nut, Plain Washer and all other ferrous parts shall be Hot dip Galvanized. In case of Hot Dip Galvanization, minimum Value of Mass of zinc coating should be 705 g/m<sup>2</sup>. All bolts and nuts shall have

hexagonal heads, the heads being truly concentric, and square with the shank, which must be perfectly straight.

- ii) Flat washers and spring washers shall be provided wherever necessary and shall be of positive lock type. Spring washers shall be electro-galvanized. The thickness of washers shall conform to IS-2016.
- iii) The split pin to be used on the cotter pin shall be of Humpback type & shall be made of Stainless Steel conforming to IS: 6603 with a minimum hardness of 160 HV.
- iv) Locking devices (R Type) for ball and socket lockers shall be of Stainless Steel conforming to IS: 6603 with minimum hardness of 160 HV. The dimension shall conform to IS: 2486.

## 6. MARKING:

Each Hardware fittings shall be legibly and indelibly marked (embossing/engraved) to show the following:

- a) Name & Trade mark of the manufacturer
- b) Year of manufacturing
- c) Minimum failing load in KN
- d) "TPCODL/TPNODL/TPWODL/TPSODL"

## 7. TESTS

The bidder shall be required to submit complete set of the following test reports along with the offer: -

### 7.1 ACCEPTANCE TESTS

#### For Clamps

- i) Visual Examination Test
- ii) Chemical Composition Test
- iii) Verification of dimensions
- iv) Mechanical Test
- v) Ultimate Strength Test
- vi) Galvanizing Test
- vii) Electrical resistance test

#### On Insulator string fittings

- i) Visual Examination
- ii) Chemical Composition Test
- iii) Verification of dimensions
- iv) Ultimate Strength Test
- v) Galvanizing Test

## 7.2 ROUTINE TESTS

- i) Visual Examination Test
- ii) Mechanical Routine Test

## 7.3 TYPE TESTS

### For Clamps

- i) Visual Examination
- ii) Verification of dimensions
- iii) Slip strength tests
- iv) Ultimate Strength test
- v) Electrical resistance test
- vi) Heating Cycle test
- vii) Galvanizing/ Electroplating Test

### On Insulator string fittings except Clamps

- i) Visual Examination
- ii) Verification of dimensions
- iii) Mechanical Test
- iv) Galvanizing Test
- v) Chemical Composition Test

## 8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates of the for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA/Other Government Labs** as per the relevant IS/IEC. TPCODL/ TPWODL/ TPNODL/ TPSODL. TATA-POWER reserves the right to allow any other NABL accredited/ Govt. lab report under exceptional circumstances after due diligence/ scrutiny by DISCOM. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/TPNODL/TPWODL/TPSODL.

## 9. PRE DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPWODL/TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to



the places of manufacture to TPCODL/TPNODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPWODL/TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/ TPNODL/ TPWODL/ TPSODL.

Following documents shall be sent along with material.

<<<

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPWODL/TPSODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

**10. INSPECTION AFTER RECEIPT AT STORES:**

The material received at TPCODL/TPNODL/TPWODL/TPSODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

**11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 18 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

The bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of guarantee period for any 'latent defects' if noticed by the company.

**12. PACKING:**

Supplier shall ensure that all the material covered under this specification shall be prepared for rail/road transport and be packed in such a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly. Fittings for different sizes of conductors shall be packed in different boxes/gunny bags and shall be complete with their minor accessories fitted in place and colour codes on tags/fittings shall be marked to identify suitability for different sizes. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

~~**13. TENDER SAMPLE:**~~

~~Bidder shall submit the sample of material during submission of Bids.~~

**14. QUALITY CONTROL:**

The bidder shall submit with the offer Quality Assurance Plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections. The bidder shall ensure that the material supplied is as per the Guaranteed Technical Particulars as specified in the specifications.

**15. TESTING FACILITIES:**

Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

**16. MANUFACTURING ACTIVITIES:**

The bidder shall get the approved drawing and GTP before start of manufacturing activity. The successful bidder will have to submit details of the offered design & components for approval as per specification. CAT-A/CAT-B is mandatory to start manufacturing.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

**18. DRAWINGS AND DOCUMENTS**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars & Schedule "B" Deviations

- b) Work Experience details
- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.

**19. SCHEDULE- “A” GUARANTEED TECHNICAL PARTICULARS**

Bidder to submit completely clause wise compliance of this specification.

**20. SCHEDULE “B” DEVIATIONS:**

**(TO BE ENCLOSED WITH TECHNICAL BID)**

~~All deviations from this specification shall be set out by the Bidders, clause by clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

Signature

Designation



**Specification No:** ENG-GEN-4019

**Specification Name:** Technical Specification For HDPE Pipe

## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING FACILITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

**TPCODL****TPNODL****TPWODL****TPSODL****Specification No:** ENG-GEN-4019**Specification Name:** Technical Specification For HDPE Pipe**1. SCOPE:**

This specification covers the design, manufacture, testing and supply of High Density Polyethylene (HDPE) pipe- 160MM, 125MM & 100MM. Scope also includes transportation & unloading of pipes at TPCDOL store / site.

**2. APPLICABLE STANDARDS:**





The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

Sl.No	IS	Description
1	IS 4984:2016	Specification for Polyethylene Pipes for Water Supply (fifth revision)
2	IS 7328:1992	High Density Polyethylene Materials for Molding and Extrusion – Specification(first revision)
3	IS 2530	Methods of test for polyethylene molding materials and polyethylene compounds

**3. CLIMATIC CONDITIONS:**

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150Cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/TPNODL/TPWODL/TPSODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden

   	<b>Specification No:</b> ENG-GEN-4019  <b>Specification Name:</b> Technical Specification For HDPE Pipe
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with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

SI.No	TECHNICAL REQUIREMENTS	200MM	160 MM	125 MM	110MM	25MM
1.	Nominal size or Outside diameter (mm)	200 MM	160 MM	125 MM	110 MM	25MM
2.	Wall thickness (mm)	14.7(min) 16.3(max)	11.8(min) 13.1(max)	9.2(min) 10.2(max)	8.1 (min) 9.0 (max)	1.9 (min) 2.2 (max)
3.	Standard dimension ratio(SDR)	SDR- 13.6	SDR- 13.6	SDR- 13.6	SDR- 13.6	SDR- 13.6
4.	Min. required strength of PE resin 200 C for 50 years life	8Mpa	8Mpa	8Mpa	8Mpa	8Mpa
5.	Design Stress at 20 <sup>o</sup> C	6.3Mpa	6.3Mpa	6.3Mpa	6.3Mpa	6.3Mpa
6.	Melt Flow Rate of polymer (sample pre-heated for 10 mins at 190°C, and weight application of 5kgf)	Shall Not deviate from MFR of the resin by more than 30%	Shall Not deviate from MFR of the resin by more than 30%	Shall Not deviate from MFR of the resin by more than 30%	Shall Not deviate from MFR of the resin by more than 30%	Shall Not deviate from MFR of the resin by more than 30%
7.	Raw material grade	PE-80	PE-80	PE-80	PE-80	PE-80
8.	Nominal pressure rating	PN-8	PN-8	PN-8	PN-8	PN-8
9.	Range of Base Density of HDPE @ 27 deg C	930 to 960 Kg/M3	930 to 960 Kg/M3	930 to 960 Kg/M3	930 to 960 Kg/M3	930 to 960 Kg/M3
10	% of Antioxidant	<0.3% by mass of finished resin	<0.3% by mass of finished resin	<0.3% by mass of finished resin	<0.3% by mass of finished resin	<0.3% by mass of finished resin
11	Color of pipe	Black with blue identification stripes (3 Strips)	Black with blue identification stripes (3 Strips)	Black with blue identification stripes (3 Strips)	Black with blue identification stripes (3 Strips)	Black with blue identification stripes (3 Strips)
12	Identification Stripes	As per IS:4984-2016 Clause 6.2.1	As per IS:4984-2016 Clause 6.2.1	As per IS:4984-2016 Clause 6.2.1	As per IS:4984-2016 Clause 6.2.1	As per IS:4984-2016 Clause 6.2.1

13	Surface finish	Internal and External surface of the pipe shall be smooth and free from grooving and other defects	Internal and External surface of the pipe shall be smooth and free from grooving and other defects	Internal and External surface of the pipe shall be smooth and free from grooving and other defects	Internal and External surface of the pipe shall be smooth and free from grooving and other defects	Internal and External surface of the pipe shall be smooth and free from grooving and other defects
14	Carbon Black content	2.5 ± 0.5 %	2.5 ± 0.5 %	2.5 ± 0.5 %	2.5 ± 0.5 %	2.5 ± 0.5 %
15	Overall migration	Max. 10 Mg/dm <sup>2</sup>	Max. 10 Mg/dm <sup>2</sup>	Max. 10 Mg/dm <sup>2</sup>	Max. 10 Mg/dm <sup>2</sup>	Max. 10 Mg/dm <sup>2</sup>
16	Reversion	<= 3%	<= 3%	<= 3%	<= 3%	<= 3%
17	Hydraulic Characteristics	No sign of localizes swelling, leakage or weeping (at 80°C for 48 hrs. (acceptance test) & 165 hrs.(type test))	No sign of localizes swelling, leakage or weeping (at 80°C for 48 hrs. (acceptance test) & 165 hrs.(type test))	No sign of localizes swelling, leakage or weeping (at 80°C for 48 hrs. (acceptance test) & 165 hrs.(type test))	No sign of localizes swelling, leakage or weeping (at 80°C for 48 hrs. (acceptance test) & 165 hrs.(type test))	No sign of localizes swelling, leakage or weeping (at 80°C for 48 hrs. (acceptance test) & 165 hrs.(type test))
18	Continuous Temperature withstand capacity	120 °C	120 °C	120 °C	120 °C	120 °C
19	Standard Length	6 Meters	6 Meters	6 Meters	6 Meters	6 Meters
20	Marking	As per <b>Clause:6 (Marking)</b> of this technical specification				

## 5. GENERAL CONSTRUCTION:

PE resin used for the manufacture of HDPE pipe shall conform to the following requirements:

- The material used for the manufacture of pipes should not constitute toxic hazard, should not support microbial growth and should not give rise to unpleasant taste or odor, cloudiness or discoloration of water. Pipe manufacturers shall obtain a certificate to this effect from the manufacturer of raw material.
- Polyethylene, which may include co-polymers of ethylene and higher olefin, in which the higher olefin constituent does not exceed 10 percent (mass/mass) and density of 910- 950 kg/m<sup>3</sup>.
- The resin shall be compounded with carbon black. Carbon black particle size should be less than 0.025 microns.

**Specification No:** ENG-GEN-4019

**Specification Name:** Technical Specification For HDPE Pipe

- d) The percentage of anti-oxidant used shall not be more than 0.3% by mass of finished resin. The anti-oxidant used shall be physiologically harmless and shall be selected from the list given in IS 10141
- e) **Visual appearance:** The internal and external surface of the pipe shall be smooth, clean and free from grooving and other defects. The ends of the pipes shall be cleanly cut square with the axis of the pipe to within the tolerances given below and free from deformity. Slight shallow longitudinal grooves or irregularities in the wall thickness shall be permissible, if the wall thickness remains within the permissible limits. Pipe should be capable to withstand internal pressure creep rupture test without showing signs of localized swelling, leakage or weeping and shall not burst.

## 6. MARKING:

Marking on the HDPE pipe shall carry the following minimum information:

- a) Manufacturer name
- b) Pipe Designation (Material grade, SDR, Nominal outside diameter, Pressure rating)
- c) ISI mark
- d) Date and year of manufacture
- e) PO No. & Date
- f) Property of TPCODL/TPNODL/TPWODL/TPSODL.

## 7. TESTS:

All Routine, Acceptance & Type Tests shall be carried out in accordance with the relevant IS as mentioned above. All Routine /Acceptance Tests shall be witnessed by TPCODL/TPNODL/TPWODL/TPSODL representative.

### 7.1 ACCEPTANCE TESTS

The following tests shall be conducted in presence of TPCODL/TPNODL/TPWODL/TPSODL representative on the samples taken from the offered lot material:

- i. Visual appearance and dimensions
- ii. Melt flow rate
- iii. Density
- iv. Reversion test
- v. Elongation at break
- vi. Carbon black content
- vii. Carbon black dispersion
- viii. Oxidation induction
- ix. Internal pressure creep rupture test (hydrostatic resistance test) @ 80°C for 48 hrs



**Specification No:** ENG-GEN-4019

**Specification Name:** Technical Specification For HDPE Pipe

## 7.2 ROUTINE TESTS

Same as Acceptance Test

## 7.3 TYPE TESTS

- i. Tensile strength for butt fusion
- ii. Overall migration
- iii. Internal pressure creep rupture test (hydrostatic resistance test) @ 27 deg C for 100 hrs
- iv. Internal pressure creep rupture test (hydrostatic resistance test) @ 80 deg C for 165 hrs
- v. Internal pressure creep rupture test (hydrostatic resistance test) @ 80 deg C for 1000 hrs
- vi. Slow crack growth rate test


## 8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CIPET/CPRI/ERDA/other Govt Lab** as per relevant IS. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, it shall be carried out without any cost implication to TPCODL/TPNODL/TPWODL/TPSODL.

## 9. PRE-DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPWODL/TPSODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPNODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPWODL/TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPWODL/TPSODL. Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPWODL/TPSODL
- c) TPCODL/TPNODL/TPWODL/TPSODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

	<p><b>Specification No:</b> ENG-GEN-4019</p> <p><b>Specification Name:</b> Technical Specification For HDPE Pipe</p>
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**10. INSPECTION AFTER RECEIPT AT STORE:**

The material received at TPCODL/TPNODL/TPWODL/TPSODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

**11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 54 months from the date of commissioning or 60 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be. Galvanization Guarantee- Quality of Hot Dip Galvanization should be guaranteed for any type of damage due to harsh climatic condition for 5 Years.

**12. PACKING AND TRANSPORT:**

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**13. TENDER SAMPLE:**





Not Applicable

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests &

   	<b>Specification No:</b> ENG-GEN-4019  <b>Specification Name:</b> Technical Specification For HDPE Pipe
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acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.





**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule “A” Guaranteed Technical Particulars.
- b) Work Experience details
- c) Type test certificates.
- d) Drawing (3 sets) of HDPE Pipe containing complete information about manufacturing etc.
- e)

**19. SCHEDULE- “A” GUARANTEED TECHNICAL PARTICULARS: To be Furnished By Bidder**

SI.No	TECHNICAL REQUIREMENTS	200MM	160MM	125MM	110MM	25MM
1.	Nominal size or Outside diameter (mm)					
2.	Wall thickness (mm)					
3.	Standard dimension ratio(SDR)					
4.	Min. required strength of PE resin 20° C for 50 years life					
5.	Design Stress at 20° C					
6.	Melt Flow Rate of polymer (sample pre-heated for 10 mins at 190°C, and weight application of 5kgf)					
7.	Raw material grade					
8.	Nominal pressure rating					
9.	Range of Base Density of HDPE @ 27 deg C					
10	% of Antioxidant					

   	<b>Specification No:</b> ENG-GEN-4019  <b>Specification Name:</b> Technical Specification For HDPE Pipe
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11	Color of pipe					
12	Identification Stripes					
13	Surface finish					
14	Carbon Black content					
15	Overall migration					
16	Reversion					
17	Hydraulic Characteristics					
18	Continuous Temperature withstand capacity					
19	Standard Length					
20	Marking					

**~~20. SCHEDULE "B" DEVIATIONS:~~**

**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<b>SL. No</b>	<b>Clause No.</b>	<b>Details of deviation with justifications</b>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

Signature

Designation

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-GEN-4021**

**Specification Name : Technical Specification For G.I Nut & Bolt**

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
PONRAJ GA	YOGESH KHARAT	SAURAV BEHERA	Syed Mohammed Yousuf Raja	KHAJAN BHARDWAJ	POURUSH GARG
TPCODL	TPNODL	TPWODL	TPSODL	TPCODL	TPCODL
17-02-2023	22-02-2023	24-02-2023	03-03-2023	18-03-2023	18-03-2023

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**TPCODL**

**TPNODL**

**TPWODL**

**TPSODL**

**Specification No:** ENG-GEN-4021

**Specification Name:** Technical Specification of  
GI nut and bolt

## CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

### 1. SCOPE:

This specification covers the design, manufacture, testing and supply of GI Nuts and Bolts to be used in structures. Scope also includes transportation & unloading at store / site.




### 2. APPLICABLE STANDARDS:

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

IS: 1363/ Part-I & III	Hexagon Head Bolts, Screws and Nuts of Product Grade C Part 1: Hexagon Head Bolts (Size Range M 5 to M 64) Part 3: Hexagon Nuts (Size Range M5 to M64)
IS 14394	Industrial Fasteners - Hexagon Nuts of Product Grade C - Hot-Dip Galvanized (Size Range M12 to M36)
IS 1367/ Part- III, VI & XIII	Technical Supply Conditions for Threaded Steel Fasteners, Part 3: Mechanical Properties of Fasteners Made of Carbon Steel and Alloy Steel - Bolts, Screws and Studs Part 6: Mechanical Properties and Test Methods for Nuts with Specified Proof Loads Part 13: Mechanical Properties of Fasteners Made of Carbon Steel and Alloy Steel - Bolts, Screws and Studs
IS 2633	Methods for testing uniformity of coating of zinc coated articles
IS 4759	Hot-dip zinc coatings on structural steel and other allied products
IS 6745	Method for determination of mass of zinc coating on zinc coated iron and steel articles

### 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m

   	<b>Specification No:</b> ENG-GEN-4021  <b>Specification Name:</b> Technical Specification of GI nut and bolt
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8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/TPNODL/TPSODL/TPWODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Material details	Hot-Dip Galvanized Nut, Bolt & Washer
2	Material	Carbon steel
3	Relevant Standard	IS:1363, IS 1367, IS: 2633, IS: 2629.
4	Grade of Steel	5.6
5	Mass of Zinc Coating	As per IS 1367 Part XIII
6	Zinc Coating Thickness	As per IS 1367 Part XIII
7	Chemical Properties	C:-0.13-0.55 Max P:-0.05 Max S:- 0.06 Max B:-0.003 Max
8	Tensile Load	Table 6 of IS 1367 Part III

#### 5. GENERAL CONSTRUCTION:

Bolts & Nuts should be strictly supplied confirming to IS-1363/Part-I & III. The Bolt and Nut should be hot dip galvanized. The Chemical Composition should be as per IS 1367 Part-III.

#### 6. MARKING:

Following distinct non-erasable embossing is to be made on each Nut and Bolt to be supplied to TPCODL/TPNODL/TPSODL/TPWODL under this Tender.


- a) Manufacturer's name
- b) Grade of steel
- c) Year of manufacturing

#### 7. TESTS:

The bidder shall be required to submit complete set of the following test reports along with the

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TPCODL/TPNODL/TPWODL/TPSODL >



	<p><b>Specification No:</b> ENG-GEN-4021</p> <p><b>Specification Name:</b> Technical Specification of GI nut and bolt</p>
---	---

offer:-

### 7.1 ACCEPTANCE TESTS

- i) Visual Inspection
- ii) Verification of Dimensions
- iii) Checking of threads,
- iv) Galvanization Test
- v) Proof Load Test
- vi) Hardness Test
- vii) Surface Integrity Test

### 7.2 ROUTINE TESTS

Same as Acceptance Test

### 7.3 TYPE TESTS


- i) Visual Inspection
- ii) Verification of Dimensions
- iii) Checking of threads,
- iv) Galvanization Test

### 8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI / ERDA / Other Government Labs** as per relevant IS. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL/TPNODL/TPSODL/TPWODL.

### 9. PRE-DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL or its authorized

	<p><b>Specification No:</b> ENG-GEN-4021</p> <p><b>Specification Name:</b> Technical Specification of GI nut and bolt</p>
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representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPSODL/TPWODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL
- c) TPCODL/TPNODL/TPSODL/TPWODL Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

#### 10. INSPECTION AFTER RECEIPT AT STORE:


The material received at TPCODL/TPNODL/TPSODL/TPWODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

#### 11. GUARANTEE:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 12 months from the date of commissioning or 18 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

#### 12. PACKING:

Supplier shall ensure that all material covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The bidder shall provide instructions regarding handling and storage precautions to be

	<b>Specification No:</b> ENG-GEN-4021  <b>Specification Name:</b> Technical Specification of GI nut and bolt
---	--

taken at site.

**~~13. TENDER SAMPLE:~~**

~~Bidder shall submit the sample of material during submission of Bids.~~

**14. QUALITY CONTROL:**

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**15. TESTING FACILITIES:**

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

**16. MANUFACTURING FACILITIES:**

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.





**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars & Schedule "B" Deviations
- b) Work Experience details
- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.

**19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS:-**

SL. NO.	TECHNICAL PARTICULARS	TO BE FURNISHED BY BIDDER
1	Material	
2	Relevant Standard	

 	<b>Specification No:</b> ENG-GEN-4021  <b>Specification Name:</b> Technical Specification of GI nut and bolt
 	

3	Grade of Steel	
4	Mass of Zinc Coating	
5	Zinc Coating Thickness	
6	Chemical Properties	
7	Tensile Load	

**20. ~~SCHEDULE "B" DEVIATIONS:~~**

**~~(TO BE ENCLOSED WITH TECHNICAL BID)~~**

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~

<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~

Signature

Designation

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>	<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>		
	<b>TECHNICAL BOOKLET</b>		
<b>Document Title</b>	<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date: 23.08.2022</b>	
<b>Revision No.</b>	02	<b>Page 4 of 259</b>	
<b>Prepared by:</b> Engineering & Quality Dept	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Rajkumar Rastogi

## 1. GALVANIZATION (Spec: TPCO-OTH-010)

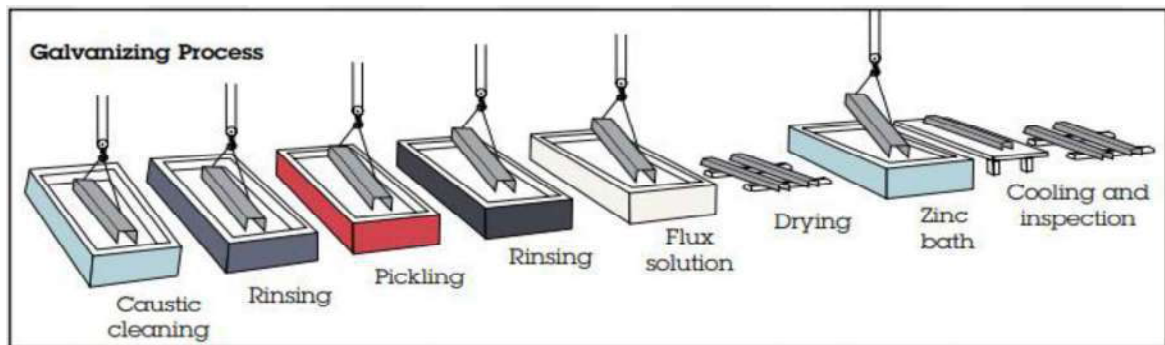
Zinc Coating thickness/ Mass of Zinc Coating to be as per mentioned in Tender /TPCODL requirements. Minimum Zinc Coating to be as detailed below:

Sl. No.	Product	Minimum Value for Average Mass of Coating (g/m <sup>2</sup> )	Coating thickness in microns (No of Dip)
1	Fabricated steel articles:		
	a) 5 mm thick and over	705	100 (6Dip)
	b) Under 5 mm, but not less 2 mm	610	86 (5 Dip)
	c) Under 2 mm, but not less than 1.2 mm	340	48 (3 Dip)
	d) All type Steel Pole	850	120 (7 Dip)
2	Threaded items (Nuts & bolts etc.) other than tubes and tube fittings:		
	a) 10 mm dia. and over	460	65
	b) Under 10 mm dia.	320	45

### NOTES:

- Mass of Zinc coating shall be as per IS 4759.
- The requirements for the minimum mass of coating shall be increased as agreed to between the galvanizer and the purchaser.

Detailed Process Flow of Galvanization Steps:



<b>TPCODL</b> TP CENTRAL ODISHA DISTRIBUTION LIMITED		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR <b>TECHNICAL BOOKLET</b>	
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### 13. GI BARBED WIRE

#### GENERAL TECHNICAL PARTICULARS

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE
1	Nominal Diameter OF Wire	2.5mm (Line) x 2.5mm (Point)
2	Min Breaking Load of complete Barbed wire	3.7KN
3	Tolerance in diameter	+/- 0.08 mm
4	Tensile strength Of line Wire	390-590 N/mm <sup>2</sup>
5	Type of coating Heavy/Medium/Light	Heavy
6	Variety Hard/Soft	Hard
7	Weight of Zn Coating (gm/mtr <sup>2</sup> ) (After stranding)	150
a	No of dips the coating is able to withstand at 18±2°C in CuSO4 Solution	2x 1 min ,1x ½ min
8	Distance from Between Two Barbs	75 mm +/- 12mm
9	Barbs Points	35° To the Axis of Wire Forming Barbs
10	No of Lays in Between Two Consecutive Barbs.	2 to 7
11	Wrapping Test	8 ON x 8 OFF x OWN Dia
12	Adhesion Test	4D x 10 Turn
13	Freedom from defects	The wire shall be free from all kinds of surface defects.
14	<b>Chemical composition of the MS Wire used shall not exceed (IS:7887/1992)</b>	
a)	Sulphur & Phosphorous	0.055%
b)	Carbon	0.25%
15	Standard	IS: 278/2009
16	Weight of Each Coil (In Kg)	28-32
17	Marking/ Packing	Coil attached with a metallic tag containing:
		Manufacturer make & Trade mark,
		Coil no,
		Size,
		Length, Mass of coil
		TPCODL
Year of Manufacturing		

# **STANDARD TECHNICAL SPECIFICATION COVER SHEET**

**Specification No. : ENG-EHV-1009**

**Specification Name : ENG-ELC-070- TECHNICAL SPECIFICATION FOR 33kV  
XLPE COVERED CONDUCTOR- R1**

<b>JYOTIPRAKASH MOHANTY</b>	<b>SHANTAPRIYA JENA</b>	<b>SATYA PRASAD NAYAK</b>	<b>Ranjan Kumar Sahoo</b>	<b>VARUN BHATNAGAR</b>	<b>VARUN BHATNAGAR</b>
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPWODL	TPNODL	TPCODL	TPSODL	TPWODL	TPWODL
10-12-2022	10-12-2022	12-12-2022	12-12-2022	13-12-2022	13-12-2022

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TPWODL*

## **CONTENTS**

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS



### 1. SCOPE

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at site/store of 33kV All Aluminum Alloy Stranded XLPE Covered Conductors. The material shall be complete with all components, which are necessary or usual for their efficient performance and trouble-free operation.

### 2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International Standards and shall conform to the regulations of the local authorities:

Ref. IS	Description
IS 398:1996 (Part IV)	Specification for aluminum conductors for overhead distribution purpose
EN 50397-1:2006	Covered Conductor Specification for voltage 1kV to 33kV
IS : 10418	Reels and drums for bare conductors

### 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL.NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W

12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

Environmentally, some of the regions, where the work will take place include coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas. Therefore,

Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere.

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The design of equipment and accessories shall be suitable to withstand seismic forces as mentioned above.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

The XLPE covered conductor shall comply in all respect with IS: 398 (Part.4)/1996 with latest amendment, if any from the date of its applicability

Sl. No.	Technical Parameters	Desired Values		
1	Name of the manufacturer	To be furnished by Bidder		
2	Applicable Standard	EN 50397-1:2006, IS 398-IV/1994		
3	Type of Conductor	AAAC XLPE Covered Conductor		
4	Voltage Grade	36kV/ 33kV		
5	Nominal Cross-sectional area of conductor	100	148	232
6	Conductor			
a)	Material	Aluminium Alloy (AAAC)		
b)	Shape	Stranded Circular and Watertight		
c)	No / diameter of wire (before stranding)	7x4.26	19x3.15	19x3.94
d)	Approx. conductor diameter	12.78 mm	15.75 mm	19.7 mm

e)	Max. D.C. Resistance at 20°C	0.339 Ω/Km	0.229 Ω/Km	0.1471 Ω/Km
f)	Resistance Temperature co-efficient	0.004 / °C	0.004 / °C	0.004 / °C
g)	Minimum Tensile strength of conductor	29.26 kN	43.5 kN	68.05 kN
7	Thickness and dimensions			
7.1	Conductor Screen			
a)	Material	Extruded Semi-Conducting Compound		
b)	Nominal Thickness	0.4 mm	0.4 mm	0.4 mm
7.2	Insulation inner layer			
a)	Material	Extruded XLPE		
b)	Nominal thickness	2.43 mm	2.43 mm	2.43 mm
7.3	Insulation Outer layer			
a)	Material	Track Resistance, UV Resistant and Erosion Resistance XLPE (Black)		
b)	Nominal thickness	1.2 mm	1.2 mm	1.2 mm
8	Lightening Impulse withstand strength of XLPE Layer	170 KVp	170 KVp	170 KVp
9	Approx. Overall Diameter	20.5 mm	23.5 mm	28.1 mm
10	Maximum continuous operating temperature	90 °C	90 °C	90 °C
11	Max short circuit current, 1 sec (KA)	9.4kA	13.912kA	21.808kA
12	Approx. Weight	480 kg/km	700 kg/km	970 kg/km
13	Standard Packing length	1000 (+/- 5%) as per PO terms	1000 (+/- 5%) as per PO terms	1000 (+/- 5%) as per PO terms
14	Raw Material Make	Conductor raw material shall be procured from reputed suppliers viz., BALCO/ HINDALCO/ NALCO/ Vedanta		

## 5. GENERAL CONSTRUCTIONS:

### 5.1 CONDUCTOR

a) The properties of stranded all aluminum alloy conductors of various sizes are as follows

Actual Area	Stranding & wire dia.	Approx. overall dia.	Approx. mass	Calculated resistance at 20 d.c. (max.)	Approx. calculated Breaking Load	Reactance per km	Current Rating
mm. sq.	mm	mm	Kg/km	Ohm/km	kN	Ohms	Amps
100	7/ 4.26	12.78	272.86	0.339	29.26	0.3394	325
148	19/ 3.15	15.75	406.91	0.2290	43.50	0.3238	440
232	19 / 3.94	19.70	636.67	0.1471	68.05	0.3146	520

- b) The properties of aluminum alloy wires to be used in the construction of the Stranded conductors are as follows:

Diameter		Cross sectional area of Nominal Diameter	Mass	Minimum Breaking Load after stranding	Resistance at 20 deg.c
Nom	Max				
mm	mm	Sq.mm	Kg	kN	Ohm/kM
3.15	3.18	7.793	21.04	2.29	4.290
3.94	3.98	12.190	32.92	3.58	2.746
4.26	4.30	14.25	38.48	4.18	2.345

- c) No negative tolerance shall be permitted on the nominal diameter aluminum wire used in the manufacture of XLPE COVERED CONDUCTOR. However, positive tolerance in this respect shall be as provided in IS: 398 (Part IV)/1994 (amended up to date).
- d) The wire shall be smooth and free from all imperfections such as spills, splits, slag inclusion, dia. marks scratches, fittings, blow holes, projections, looseness, overlapping of strands, chipping of aluminum layers etc. and all such other defects which may hamper the mechanical and electrical properties of the conductor. Special care should be taken to keep away dirt, grit etc. during stranding.
- e) There shall be no joint in any wire of a stranded conductor containing seven wires, except those made in the base rod or wire before final drawing.
- f) In conductors containing more than seven wires, joints in individual wires are permitted in any layer except the outermost layer (in addition to those made in the brass rod or wire before final drawing) but no two such joints shall be less than 15 m apart in the complete stranded conductor, such joint shall be made by resistance or cold pressure butt welding. They are not required to fulfill the mechanical requirement of unjointed wires. Joints made by resistance butt welding shall, subsequent to welding, be annealed over a distance of at least 200 on each side of the joint.
- g) The wires used in the construction of a stranded conductor shall, before stranding satisfy all the relevant requirements of this standard.
- h) Conductor raw material shall be procured from reputed suppliers viz., BALCO/ HINDALCO/ NALCO/ Vedanta
- i) The lay ratio of the different layers shall be within the limits given below: -

No. of wires in Conductors	Lay Ratio in			
	6 - wire layer		12 - wire layer	
	Min.	Max.	Min.	Max.
7	10	14	-	-

19	10	16	10	14
----	----	----	----	----

**5.2 FILLING (WATER BLOCKING):**

The Stranded Conductor shall be longitudinally water tight by means of a water blocking material incorporated during the extrusion process. The use of grease/water swell able tape / water swell able powder etc. is not permitted. The water blocking material shall be stable at maximum operating conductor temperature of 90 Deg. Cent. The water blocking compound shall be compatible with the conductor material as well as the semi conducting screen above it and not adversely affect its electrical or mechanical properties.

**5.3 SEMICONDUCTING SCREEN:**

An extruded semi conductive compound should be applied over the filled stranded conductor to ensure a lower voltage stress on the Insulation applied over the screen.

**5.4 INSULATIONS:**

The Insulation should be dual layered with the Inner Layer being XLPE with a nominal thickness of 2.43 mm and the Outer Layer being a suitable XLPE which is UV Resistant, Anti Tracking and Erosion Resistant with a nominal wall thickness of 1.2 mm. The minimum combined Insulation Thickness of both Layers should be 3.63 mm.

The conductor manufacturing and stranding process shall incorporate the longitudinal water blocking also.

The Semiconducting Screen, Inner Insulation and Outer Insulation should be extruded in one step i.e. triple extrusion to ensure a good, permanent bond between the three layers and also with the conductor. It shall be possible to remove the Semi Conducting Screen, Inner and Outer Insulation Layers without damage to the conductor.

**6. MARKING:**

The following particulars shall be properly legible embossed on the covered conductor at the intervals of not exceeding one meter throughout the length of the Conductor. The covered conductor with poor and illegible embossing shall be liable for rejection.

- a) Name & Trade mark of the manufacturer
- b) Voltage Grade
- c) Year of manufacture
- d) Size of Covered Conductor
- e) EN 50397-1: 2006
- f) PO Number

- g) "TPWODL/ TPCODL/ TPNODL/ TPSODL" Name

Note: - Sequential meter marking shall be printed (after each meter)

**Following details shall be provided on flanges of drum:**

- a) Manufacturer's name
- b) Type of Cable/Conductor
- c) Size of Cable/Conductor
- d) Voltage Grade
- e) Length of the cable/conductor on the drum
- f) Direction of the rotation of the drum
- g) Gross mass
- h) Country of manufacture
- i) Year and month of manufacture
- j) Purchase Order no.
- k) Drum No.

**7. TESTS**

A type test shall be performed on every covered conductor type, irrespective of the cross-sectional area. All the type test, Routine test and acceptance test should be as per EN 50397-1:2006 and latest amendment. The bidder shall be required to submit complete set of the following test reports along with the offer: -

**7.1 ACCEPTANCE TESTS**

- a) Visual examination and Dimension Check Test
- b) Conductor Resistance Test
- c) High Voltage Test
- d) Spark Test
- e) Hot Set Test on covering
- f) Longitudinal Water Tightness Test
- g) Anti-tracking Test
- h) Marking

**7.2 ROUTINE TESTS**

- a) Visual examination and Dimension Check Test
- b) Conductor Resistance Test
- c) High Voltage Test
- d) Spark Test
- e) Hot Set Test on covering

- f) Longitudinal Water Tightness Test
- g) Marking

### 7.3 TYPE TESTS

#### i) Electrical Test

- a) Conductor Resistance Test
- b) High Voltage Test
- c) Spark Test
- d) Leakage Test
- e) Tracking Resistance

#### ii) Non-Electrical Test on Covering

- a) Mechanical properties Test
- b) Carbon Black Content
- c) Resistance to UV rays
- d) Ageing of complete product sample
- e) Shrinkage Test
- f) Hot Set Test
- g) Pressure Test At High Temperature
- h) Water Absorbs Test
- i) Hardness Test
- j) Longitudinal Water Tightness Test
- k) Marking
- l) Slippage Test

#### iii) Visual examination and Dimension Check Test

#### iv) Mechanical properties of the conductor.

### 8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards and as per CEA guide line. All the tests shall be conducted at CPRI / ERDA as per relevant IS/ IEC standard. Type tests should have been conducted in certified Test laboratories during the period not exceeding 10 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPWODL/ TPCODL/ TPNODL/ TPSODL.

### 9. PRE-DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPWODL/ TPCODL/ TPNODL/ TPSODL. Inspection may be made at any stage of manufacture at the

discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPWODL/ TPCODL/ TPNODL/ TPSODL's representatives at all times when the work is in progress. Inspection by the TPWODL/ TPCODL/ TPNODL/ TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPWODL/ TPCODL/ TPNODL/ TPSODL. Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPWODL/ TPCODL/ TPNODL/ TPSODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable).

#### **10. INSPECTION AFTER RECEIPT AT STORES:**

The material received at TPWODL/ TPCODL/ TPNODL/ TPSODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

#### **11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 24 months from the date of commissioning or 30 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

The bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of guarantee period for any 'latent defects' if noticed by the company.



**12. PACKING:**

Supplier shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport and be packed in such a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly. The bidder shall provide instructions regarding handling and storage precautions to be taken at site. The Conductor shall be wound on wooden/STEEL drums and packed in line with requirements of IS 10418-1982. The ends of the Conductor shall be sealed by means of non-hygroscopic sealing material. Heat or cold Shrinkable end caps with sealant shall be used for effectively sealing the end terminals of the covered conductor. The inner diameter range of cap shall be such that it shall tightly fit to the covered conductors to prevent moisture ingress.

~~**13. TENDER SAMPLE:**~~~~Bidder shall submit the sample of material during submission of Bids.~~**14. QUALITY CONTROL:**

The bidder shall submit with the offer Quality Assurance Plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections. The bidder shall ensure that the material supplied is as per the Guaranteed Technical Particulars as specified in the specifications.

**15. TESTING FACILITIES:**

Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

**16. MANUFACTURING ACTIVITIES:**

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

**17. SPARES, ACCESSORIES AND TOOLS**

Not applicable.

**18. DRAWINGS AND DOCUMENTS**

Following drawings and documents shall be submitted in line with the requirement of Tender

specifications:

- a) Completely filled in Schedule “A” Guaranteed Technical Particulars & Schedule “B” Deviations
- b) Work Experience details
- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.

**19. SCHEDULE- “A” GUARANTEED TECHNICAL PARTICULARS**

Sl. No.	Technical Parameters	To Be Furnished By The Bidder		
1	Name of the manufacturer			
2	Applicable Standard			
3	Type of Conductor			
4	Voltage Grade			
5	Nominal Cross-sectional area of conductor	100	148	232
6	Conductor			
a)	Material			
b)	Shape			
c)	No / diameter of wire (before stranding)			
d)	Approx. conductor diameter			
e)	Max. D.C. Resistance at 20°C			
f)	Resistance Temperature co-efficient			
g)	Minimum Tensile strength of conductor			
7	Thickness and dimensions			
7.1	Conductor Screen			
a)	Material			
b)	Nominal Thickness			
7.2	Insulation inner layer			
a)	Material			
b)	Nominal thickness			
7.3	Insulation Outer layer			
a)	Material			
b)	Nominal thickness			
8	Lightening Impulse withstand strength of XLPE Layer			
9	Approx. Overall Diameter			
10	Maximum continuous operating temperature			



Specification No: [ENG-EHV-1009](#)

Specification Name:  
TECHNICAL SPECIFICATION FOR 33kV XLPE  
COVERED CONDUCTOR

11	Max short circuit current, 1 sec (KA)			
12	Approx. Weight			
13	Standard Packing length			
14	Raw Material make			

~~20. SCHEDULE "B" DEVIATIONS:~~

~~(TO BE ENCLOSED WITH TECHNICAL BID)~~

~~All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:~~


<del>SL. No</del>	<del>Clause No.</del>	<del>Details of deviation with justifications</del>

~~We confirm that there are no deviations apart from those detailed above.~~

~~Seal of the Company:~~


~~Signature~~

~~Designation~~

		TATA POWER CENTRAL ODISHA LIMITED, BHUBANESWAR <b>TECHNICAL BOOKLET</b>	
Document Title		<b>Quality Assurance Plan</b>	
Document No.		TPCODL-QA -001	Issue Date: 09.02.2022
Revision No.		02	Page <b>176</b> of <b>259</b>
Prepared by: Engineering & Quality Dept		Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg
		Issued By: Rajkumar Rastogi	

#### 54. QUALITY ASSURANCE PLAN

##### 54.1 Structural Steel

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)									
<b>Quality Assurance Plan for Structural Steel (made of Beam, Channel, Angle &amp; Flat)</b>											
Doc. Title		Quality Assurance Plan for Structural Steel (made of Beam, Channel, Angle & Flat)									
Doc. No.		TPCODL-EQ-MQAP-01				Issue Date: 12.05.2021					
Rev. No.		0				Other detail:					
Prepared By: Vaibhav Srivastava		Reviewed By: Phiroj Kr. Uttaray			Approved By: Pourush Garg			Issued By: Rajkumar Rastogi			
<b>A. Process Description:- Raw Material Inspection</b>											
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	W-Witness, P-Perform, R-Review Responsibility		Remarks		
1	Structural Steel Member (Beam/Channel/ Angle/Flat)	1.0	Material from approved Vendor	Physical	Raw material to be procured from SAIL, JINDAL, TATA, RINL	Technical Specification	100%	R	R		
		1.1	Surface Finish	Physical	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	IS 2062	100%	R	R		
		1.2	Dimension	Measurement	As per approved drawing	IS 1730/ Technical Specification	100%	R	R		
		1.3	Mechanical Test								
		1.31	Ultimate Tensile Strength	Mechanical	As per IS 2062/ IS 1608	IS 2062/ IS 1608	100%	R	R		
		1.32	Yield Stress	Mechanical			100%	R	R		
		1.33	% Elongation	Mechanical			100%	R	R		
		1.34	Bend Test	Mechanical			100%	R	R		
		1.4	Chemical Composition	Chemical			100%	R	R		
		2	Zinc for Galvanization	2.1	Chemical Composition	Chemical	As per IS 2062	IS 2062	100%	R	R
2.1	Chemical Composition			Chemical	As per IS 209	IS 209	100%	R	R		
<b>B. Process Description:- Stage Inspection</b>											
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	W-Witness, P-Perform, R-Review Responsibility		Remarks		
1	Fabrication Structural Steel Member	1.1	Visual Inspection	Visual	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	Relevant standard/ Technical Specification	IS 2500 (Part-I)	P	R/W		
		1.2	Dimensional check	Measurement	As per approved drawing	Approved drawing		P	R/W		
		1.3	Edge Security	Measurement	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification		P	R/W		
		1.4	Punching & Drilling	Physical	No visual blow holes, slags, undercuts, cracks etc.	Relevant standard/ Technical Specification		P	R/W		
		1.5	Noching	Measurement	As per approved drawing	Approved drawing		P	R/W		
		1.6	Bending	Physical/ Measurement	As per approved drawing/ Technical Specification	Drawing/ Technical Specification		P	R/W		
		1.7	Welding	Measurement	As per approved drawing/ Technical Specification	Drawing/ Technical Specification		P	R/W		
2	Proto-Inspection of Structural Steel Member	2.1	Dimensional Inspection after assembly	Measurement	Dimensions & fixing arrangement to be checked.	Approved drawing	One member from each type of structure	P	R/W		
		3.1	Degreasing	Chemical	As per IS 2629	IS 2629	IS 2500 (Part-I)	P	R/W		
		3.2	Pickling	Chemical	As per IS 2629	IS 2629		P	R/W		
		3.3	Rinsing	Chemical	As per IS 2629	IS 2629		P	R/W		
		3.4	Pre-fluxing in Zinc Chloride & Ammonium Chloride	Chemical	As per IS 2629	IS 2629		P	R/W		
		3.5	Pre-heating	Thermal	As per IS 2629	IS 2629		P	R/W		
		3.6	Dipping								
3	Galvanization of structural steel member	3.61	Zinc bath temperature indicator & verification	Physical	As per IS 2629	IS 2629	IS 2500 (Part-I)	P	R/W		
		3.62	Immersion time & withdrawal time	Physical	As per IS 2629	IS 2629		P	R/W		
		3.62	Quenching & Dichromating	Physical	As per IS 2629	IS 2629		P	R/W		
		3.7	Galvanization check								
		3.71	Visual check	Physical	As per IS 2629				P	R/W	
		3.72	Thickness of Zinc Coating	Measurement	As per IS 2629/ TPCODL Specification				P	R/W	
		3.73	Uniformity of Zinc Coating	Physical	As per IS 2633				P	R/W	
		3.74	Mass of Zinc Coating	Physical	As per IS 2629/ TPCODL Specification				P	R/W	
3.8	Adhesion of Zinc Coating (Pivot Hammer Test)	Physical	As per IS 2629		IS 2629, 2633, TPCO-OTH-010	P	R/W				

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date:	23.08.2022
Revision No.	02	Page	177 of 259
Prepared by:	Reviewed By:	Approved By:	Issued By:
Engineering & Quality Dept	Phiroj Uttaray Khajan C. Bhardwaj	Pourush Garg	Rajkumar Rastogi

C. Process Description:-		Final Inspection			W-Witness, P-Perform, R-Review					
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
							BA	TPCODL		
1	Fabrication Structural Steel Member	1.1	Visual Inspection	Visual	As per approved drawing/ TPCODL Specification	Approved drawing/ TPCODL Specification	IS 2629, 2633, TPCO-OTH-010	IS 4759 (1996)	P	W
		1.2	Dimension Check	Measurement					P	W
2	Galvanization of structural steel member	2.1	Visual check	Physical	As per IS 2629	IS 2629, 2633, TPCO-OTH-010	IS 4759 (1996)	P	W	
		2.2	Thickness of Zinc Coating	Measurement	As per IS 2629/ TPCODL Specification			P	W	
		2.3	Uniformity of Zinc Coating	Physical	As per IS 2629			P	W	
		2.4	Mass of Zinc Coating	Physical	As per IS 2629/ TPCODL Specification			P	W	
3	Physical property of structural steel members	2.5	Adhesion of Zinc Coating (Pivot Hammer Test)	Physical	As per IS 2629	IS 2062/ IS 1608	IS 4759 (1996)	P	W	
		3.1	Ultimate Tensile Strength	Mechanical	As per IS 2062/ IS 1608			P	W	
		3.2	Yield Stress	Mechanical				P	W	
		3.3	% Elongation	Mechanical				P	W	
3.4	Bend Test	Mechanical	P	W						
4	Chemical Composition	4.1	Chemical Composition	Chemical	As per IS 2062, TS. (for pole structure)	IS 2062	P	W		
5	Marking	5.1	Marking	Visual	As per TS	TS	P	W		

D. Process Description:-		Packing & Pre-Ship ment			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
							BA	TPCODL	
1	Packing & Pre-Ship ment	1.1	Physical Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R
		1.2	Packing List Verification	Measurement	The Packing List should be in complete set as per Inspection Call requirement.	Inspection Call Letter	100%	P	R

54.2 PSC Pole

	<b>TP Central Odisha Distribution Limited</b>		
	(A Tata Power & Odisha Govt. joint venture)		
<b>QUALITY ASSURANCE PLAN for PSC Pole</b>			
Doc. Title	Quality Assurance Plan for PSC Pole		
Doc. No.	TPCODL-EQ-MQAP-02	Issue Date:	14.06.2021
Rev. No.	0	Other detail:	
Prepared By: Vaibhav Srivastava	Reviewed By: Phiroj Kr. Uttaray	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

A. Process Description:-		Raw Material Inspection			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
							BA	TPCODL	
1	HT Pre stressing Cold Drawn Indented Wire	1.1	Physical/Dimensional Check	Measurement	IS: 6003, No any Welding/ joint is allowed	IS: 6003	IS: 6003	R	R
		1.2	Chemical Composition Analysis	Chemical	IS: 6003	IS: 6003		R	R
		1.3	Tensile Strength	Mechanical	IS: 6003	IS: 6003		R	R
2	GI Wire for Earthing	2.1	Physical/Dimensional Check	Measurement	IS: 280, No any Welding/ joint is allowed	IS: 280	One sample per spool	R	R
		2.2	Chemical Composition Analysis	Chemical	IS: 280	IS: 280		R	R
		2.3	Zinc Grade	Physical	IS: 209	IS: 209		R	R
		2.4	Zinc Coating	Physical	IS: 4826	IS: 4826		R	R
		2.5	Galvanizing	Physical	IS: 2629/ 6745/ 2633	IS: 2629/ 6745/ 2633		R	R
3	Cement 43 Grade OPC	3.1	Chemical Composition Analysis	Chemical	IS: 8112	IS: 8112	IS: 8112	R	R
		3.2	Mfg. Batch verification	Physical	Mfg. Batch to be within 3 months	IS: 8112		R	R
		3.3	Compressive Strength	Cube Test	IS: 8112	IS: 8112		R	R
4	Aggregates (Coarse, Fine)	4.1	Size	Sieve Analysis	The nominal maximum sizes of aggregates shall in no case exceed 12 mm	TS/IS: 383	IS: 2430	P	R
		4.2	Crushing Strength	Mechanical	IS: 2386	IS: 2386		P	R
5	Water	5.1	Physical Test	Physical	Water should be free from chlorides, sulphates, other salts and organic matter.	TS	100%	P	R
6	Admixture	6.1	Chemical Test	Chemical	Admixture should not contain Calcium Chloride or other chlorides and salts which are likely to promote corrosion of pre-stressing steel.	TS/IS: 9103	100%	R	R

B. Process Description:-		Stage Inspection			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
							BA	TPCODL	
		1.1	Check Casting Moulds for Dimensions, Soundness, Support, Alignment & Cleanliness	Physical	Free from defects. Alignment/cleaness/dimension to be checked confirming to IS and GTP & drawing.	TPCODL Specification	100%	P	R

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 178 of 259			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		

1	Manufacturing	1.2	Pre stressing of HT Wires, GI Earth Wire	Measurement	Dimension/ Joints/physical free from defects.	TPCODL Specification/ IS 6003	100%	P	R	
		1.3	Concrete Mix M42	Cube Test	The pre-stressing wires shall be de-tensioned only after the concrete has attained the specified strength at transfer 210 kg/cm <sup>2</sup> and after 28 days Cube strength to be >420 kg/cm <sup>2</sup>	IS: 516	As per IS:516	P	R	
		1.4	Casting	Visual	IS:456/ Standard practice	IS:456/ Standard practice	100%	P	R	
		1.5	Test for Cover	Measurement	IS: 1678/ Approved Drawing	IS: 1678/ Approved Drawing	IS: 1678	P	R	
		1.6	Position, Numbers & Dimension of Lifting Hooks	Visual	Approved Drawing/ TPCODL Specification	Approved Drawing/ TPCODL Specification	For every Casting	P	R	
		1.7	Compacting	Visual	Concrete shall be compacted by spinning, vibrating, shocking or other suitable mechanical means. Hand Compacting shall not be permitted.	Standard practice	100%	P	R	
		1.8	De-moulding & De-tensioning	Physical	Standard practice/ TPCODL Specification	De-tensioning shall be done when the concrete attains strength of 21 N/mm <sup>2</sup> .	100%	P	R	
		1.9	Curing	Physical	Standard practice	Standard practice	100%	P	R	

C.		Process Description:-	Final Inspection			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
							BA	TPCODL		
1	Final Product Testing	1.1	Dimensional Check for overall length, cross-sectional, dimensional & uprightness	Measurement	IS: 1678/ Approved GTP-Dwg.	IS: 1678/ Approved GTP-Dwg.	IS: 1678	P	W	
		1.2	Transverse Strength Test	Physical	IS: 2905/ Approved GTP-Dwg.	IS: 2905/ Approved GTP-Dwg.	IS: 1678	P	W	
		1.3	Test for Cover	Measurement	IS: 1678/ Approved Drawing	IS: 1678/ Approved Drawing	IS: 1678	P	W	Poles Tested for Ultimate Transverse Strength shall be tested for Cover
	Cube Test	2.1	Concrete Mix M42	Cube Test	After 28 days Cube strength to be >420 kg/cm <sup>2</sup>	IS: 516	As per IS:516	P	R / W	Cube Samples shall be witnessed while Inspection
2	Marking	3.1	Marking above Planting depth	Visual	Technical Specification/ Approved GTP-Dwg.	Technical Specification/ Approved GTP-Dwg.	100%	P	R	

D.		Process Description:-	Packing & Pre-Shipments			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
							BA	TPCODL		
1	Packing & Pre-Shipments	1.1	Stacking of Poles	Visual	Stacking with broader face Vertical, Each tier in the stack should be supported on timber sleeper located as 0.15 times the overall length. The timber supported in the stack should be aligned in vertical line.	Technical Specification	100%	P	R	
		1.2	Handling/ Transportation	Physical	As per Technical Specification	Technical Specification	100%	P	R	
		1.3	Physical Verification.	Physical	No Physical damage	Relevant standard/ Technical Specification	100%	P	R	
		1.4	Quantity Verification.	Physical	As per Technical Specification	Technical Specification	100%	P	R	
		1.5	Identification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R	

### 54.3 ACSR Conductor



	<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)		
	<b>Quality Assurance Plan for ACSR Conductor</b>		
Doc. Title	Quality Assurance Plan for ACSR Conductor		
Doc. No.	TPCODL-EQ-MQAP-03	Issue Date: 14.07.2021	
Rev. No.		Other detail:	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page 179 of 259	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

Prepared By: Parikshit Panday	Reviewed By: Phiroj Kr. Uttaray	Approved By: Pourush Garg	Issued By: Parveen Verma
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A. Process Description:-		Raw Material Inspection				W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
								BA	TPCODL
1	Aluminium Wire	1.1	Chemical	Chemical	GTP/IS 4026 :2007/TS	GTP/IS 4026 :2007/TS	One Sample From 4 MT.	R	R
		1.2	Diameter	Measurement	GTP/IS 398 (Part-2):1996/TS			GTP/IS 398 (Part-2):1996/TECH SPEC	One sample from each coil
		1.3	Breaking Load / Tensile Test	Mechanical		R	R		
		1.4	Resistivity Test	Electrical		R	R		
		1.5	Elongation Test	Mechanical		R	R		
		1.6	Cleanliness & Surface Smoothness	Visual	The wire rod shall be smooth & free from pipes, laps, cracks, kinks, twists, scams and other injurious defects with in the limits of good commercial practices.	100% on Each Coil.	R	R	
2	Galvanised Steel Wire	2.1	Chemical	Chemical	GTP/IS 398 (Part-2):1996/TECH SPEC	GTP/IS 398 (Part-2):1996/TECH SPEC	One Sample From 4 MT.	R	R
		2.2	Diameter	Measurement				R	R
		2.3	Breaking Load / Tensile Test	Mechanical				R	R
		2.4	Elongation Test	Mechanical				R	R
		2.5	Torsion Test	Mechanical				R	R
		2.6	Wrapping Test	Mechanical				R	R
		2.7	Preece Test	Chemical	GTP/IS 2633 - 1986/TS	GTP/IS 2633 - 1986/TS	One sample from each coil	R	R
		2.8	Weight Of Zing Coating	Chemical	GTP/IS 4826 - 1979/TS	GTP/IS 4826 - 1979/TS		R	R

B. Process Description:-		Routine Inspection				W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		
								BA	TPCODL	
1	ACSR Conductor	1.1	Weight of conductor Strands	Measurement	GTP/IS 398 (Part-2):1996/TS	GTP/IS 398 (Part-2):1996/TECH SPEC	One sample from each coil	P	R/W	
		1.2	Dia Of Drawn Wire	Measurement				P	R/W	
		1.3	Breaking Load / Tensile Test	Mechanical				P	R/W	
		1.4	Resistance Test	Electrical				P	R/W	
		1.5	Wrapping Test	Mechanical				The Wire Shall Not Crack Or Break	P	R/W
		1.6	Lay Ratio / Direction & Compactness	Measurement	GTP/IS 398 (Part-2):1996/TS			P	R/W	
		1.7	Inner Aluminium Layer	Measurement				P	R/W	
		1.8	Outer Aluminium Layer	Measurement				P	R/W	
		1.9	Surface Finish & Winding	Visual	The Wire Shall Be Smooth & Free From All Imperfections Such As Spikes Spites Scale Inclusions, Die Marks, Scratches, Fillings, Blow Holes Etc.			100%	P	R/W
		1.10	Joints	Visual	No Joints				P	R/W

C. Process Description:-		Type Test				W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
								BA	TPCODL
1	Type Test	1.1	UTS test on stranded conductor	Mechanical	Rec 15-1979	Rec 15-1979	One sample from 1500 km	R	R
		1.2	DC resistance test on stranded conductor	Electrical	Rec 15-1979	Rec 15-1979		R	R
		1.3	Stress Strain Test (for 100 sq.mm and above)	Inspection	All the Type tests to be carried out as per TPCODL TS	All the Type tests to be carried out as per TPCODL TS	All the Type tests to be carried out as per TPCODL TS	R	R

C. Process Description:-		Final Inspection				W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
								BA	TPCODL
1	Acceptance Test On Aluminium strand of finished conductor.	1.1	Diameter	Measurement	GTP/IS 398 (Part-2):1996/TS	GTP/IS 398 (Part-2):1996/TS	One sample from each 10 drums	P	W
		1.2	No of Strands	Measurement				P	W
		1.3	Weight of Strands	Measurement				P	W
		1.4	Lay Ratio & Direction	Measurement				P	W
		1.5	Surface Finish	Visual				P	W

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page <b>180</b> of <b>259</b>	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

2	Acceptance Test Of Galvanised Steel Wire Of Finished product.	1.6	Breaking Load / Tensile Test / Elongation Test	Mechanical	GTP/IS 398 (Part-2):1996/TS	GTP/IS 398 (Part-2):1996/TS	P	W		
		1.7	Wrapping Test	Mechanical			P	W		
		1.8	Resistance	Electrical			P	W		
		2.1	Diameter	Measurement			P	W		
		2.2	No of Strands	Measurement			P	W		
		2.3	Weight of Strands	Measurement						
		2.4	Lay Ratio & Direction	Measurement			P	W		
		2.5	Surface Finish	Visual			P	W		
		2.6	Breaking Load / Tensile Test / Elongation Test	Mechanical			P	W		
		2.7	Wrapping Test	Mechanical			*The Wire Shall Not Break Or Flake	GTP/IS 398 (Part-2):1996/TS	P	W
		2.8	Resistance	Electrical				GTP/IS 398 (Part-2):1996/TECH SPEC	P	W
		2.9	Torsion Test/Ductility Test	Do				GTP/IS 398 (Part-2):1996/TECH SPEC	P	W
3	Acceptance Test On Finished Conductor	3.1	Lay Ratio & Direction	Measurement			P	W		
		3.2	Check For Joints Surface Finished , Overall Dia & Length Measurement	Visual/ Mechanical	GTP/IS 398 (Part-2):1996/TECH SPEC	GTP/IS 398 (Part-2):1996/TECH SPEC	P	W		
		4	Wooden Drums	4.1	Dimensions & Barrel Batten Strength Test	Measurement/Mechanical	GTP/IS 1778 - 1980/TECH SPEC	GTP/IS 1778 - 1980/TECH SPEC	P	W

D. Process Description:-		Packing & Pre-shipment				W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		
							BA	TPCODL	
1	Packing & Despatch Check For Identification & Packing	1.1	Proper Packing	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	10%	P	W
		1.2	Manufacturer Name	Visual				P	W
		1.3	Size & Code	Visual				P	W
		1.4	Gross Weight	Visual				P	W
		1.5	Tare Weight	Visual				P	W
		1.6	Nett Weight	Visual				P	W
		1.7	Length Of Conductor	Visual				P	W
		1.8	Painting	Visual				P	W

54.4 AAAC Conductor

		<b>TP Central Odisha Distribution Limited</b> <b>(A Tata Power &amp; Odisha Govt. joint venture)</b> <b>Quality Assurance Plan for AAAC Conductor</b>							
Doc. Title		Quality Assurance Plan for AAAC Conductor							
Doc. No.		TPCODL-EQ-MQAP-04						Issue Date: 22.07.2021	
Rev. No.		0						Other detail:	
Prepared By: Parikshit Panday		Reviewed By: Phiroj Kr. Uttaray			Approved By: Pourush Garg			Issued By: Rajkumar Rastogi	
A. Process Description:-		Raw Material Inspection				W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		
	Aluminium Wire Rod	1.1	Chemical	Chemical	GTP/IS 9997 :1991/TS	One Sample From 4 MT	R	R	



<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 181 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

1		1.2	Diameter	Measurement		GTP/IS 9997 :1991/TECH SPEC	One sample from each coil	R	R	
		1.3	Breaking Load / Tensile Test	Mechanical				R	R	
		1.4	Conductivity	Electrical				R	R	
		1.5	Elongation Test	Mechanical				R	R	
		1.6	Cleanliness & Surface Smoothness	Visual				The wire rod shall be smooth & free from pipes, laps, cracks, kinks, twists, seams and other injurious defects with in the limits of good commercial practices.	100% on Each Coil.	R
<b>B.</b>	<b>Process Description:-</b>	<b>Stage/In process Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>					
<b>Sl. No.</b>	<b>Equipment/ Operation</b>	<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>			
							<b>BA</b>	<b>TPCODL</b>		
	AL ALLOY DRAWN WIRE	1.6	Surface finish & Winding	Visual	The wire shall smooth, uniform and free from all imperfection such as spills, splits scale	GTP/IS 398 (Part-4)/TECH SPEC	100% on each spool	P	R/W	
		1.7	Diameter of AL Alloy wire	Measurement	GTP/IS 398 (Part-4)/TECH SPEC		One sample from each spool	P	R/W	
		1.8	Breaking Load / Tensile Test	Mechanical				P	R/W	
		1.9	Resistance Test	Electrical	GTP/IS 398 (Part-4)/TECH SPEC	GTP/IS 398 (Part-4)/TECH SPEC	One sample from each spool	P	R/W	
		1.10	Wrapping Test	Mechanical				GTP/TECH SPEC	P	R/W
		1.11	Elongation	Mechanical				P	R/W	
		1.13	Density	Test				P	R/W	
		1.14	Coefficient of liner expansion	Test				P	R/W	
		1.15	Constant mass temperature Coefficient ( $\alpha$ )	Test				P	R/W	
		1.16	Final Modulus of elasticity	Test				P	R/W	
2	FINAL CONDUCTOR STRANDING	2.1	Lay Ratio/Direction of the lay and Compactness	Visual	GTP/IS 398 (Part-4)/TECH SPEC	GTP/IS 398 (Part-4)/TECH SPEC	Each length at the beginning	P	R/W	
		2.2	Surface finish	Visual	The finished conductor shall be smooth, compact, uniform & free from all imperfection including kinks (protrusion of wire) over looseness ( wire being dislocated by finger/ hand pressure and or unusual bangle noise on tapping material inclusion or black spot (on account of reaction with trapped rain water) dirt, grease etc.	GTP/IS 398 (Part-4)/TECH SPEC	100%	P	R/W	
		2.3	Joints	Visual	No Joints	GTP/IS 398 (Part-4)/TECH SPEC	100%	P	R/W	
<b>C.</b>	<b>Type Test On Final Conductor As Applicable</b>									
1	Type Test of Finished Conductor	1.1	UTS test on stranded conductor	Mechanical	Rec 15-1979	Rec 15-1979	One sample from 1500 km	R	R	
		1.2	DC resistance test on stranded conductor	Electrical	Rec 15-1979	Rec 15-1979		R	R	
<b>D.</b>	<b>Process Description:-</b>	<b>Final Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>					
1	Routine Test	1.1	Check for Joints	Visual	No Joints	GTP/IS 398 (Part-4)/TECH SPEC	100% of each Drum	R	R	
		1.2	Surface Condition of the strand and stranded conductor	Visual	GTP/IS 398 (Part-4)/TECH SPEC	GTP/IS 398 (Part-4)/TECH SPEC	100% of each Drum	R	R	
		1.3	All acceptance test	Test	GTP/IS 398 (Part-4)/TECH SPEC	GTP/IS 398 (Part-4)/TECH SPEC	20% each Drum	R	R	
		1.4	Check the drum	Visual	As per TPCODL SPEC	As per TPCODL SPEC	As per TPCODL SPEC	R	R	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page 182 of 259	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
								BA	TPCODL
1	Acceptance Test on Finished Conductor	1.1	Lay Ratio/Direction of the lay	Visual	GTP/IS 398 (Part-4)/TECH SPEC	GTP/IS 398 (Part-4)/TECH SPEC	One sample from each 10 drums	P	W
		1.2	Diameter	Measurement				P	W
		1.3	Breaking Load / Tensile Test	Mechanical				P	W
		1.4	Resistance	Electrical	P	W			
		1.5	Wrapping Test	Mechanical	GTP/TECH SPEC	GTP/TECH SPEC		P	W
		1.6	Elongation	Mechanical	GTP/IS 398 (Part-4)/TECH SPEC	GTP/IS 398 (Part-4)/TECH SPEC		P	W
2	Conductor Length	1.8	Checks for joint, Surface finish and Rewinding the length of conductor	Measurement	GTP/IS 398 (Part-4)/TECH SPEC	GTP/IS 398 (Part-4)/TECH SPEC	P	W	
3	Wooden Drums	1.9	Dimensions & Barrel Batten Strength Test	Measurement/Mechanical	GTP/IS 1778 - 1980/TECH SPEC	GTP/IS 1778 - 1980/TECH SPEC	P	W	
<b>E. Process Description:-</b>		<b>Packing &amp; Pre-Ship ment</b>				<b>W-Witness, P-Perform, R-Review</b>			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
1	Packing & Despatch Check For Identification & Packing	1.1	Proper Packing	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	10%	P	R
		1.2	Manufacturer Name	Visual				P	R
		1.3	Size & Code	Visual				P	R
		1.4	Gross Weight	Visual				P	R
		1.5	Tare Weight	Visual				P	R
		1.6	Nett Weight	Visual				P	R
		1.7	Length Of Conductor	Visual				P	R
		1.8	Painting	Visual				P	R

#### 54.5 HT & LT Stay set



		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)									
		<b>QUALITY ASSURANCE PLAN for HT &amp; LT Stay Set</b>									
Doc. Title		Quality Assurance Plan for HT & LT Stay Set						Issue Date: 09.08.2021			
Doc. No.		TPCODL-EQ-MQAP-05						Other detail:			
Rev. No.		0						Issued By: Parveen Verma			
Prepared By: Vaibhav Srivastava		Reviewed By: Phiroj Kr. Uttaray				Approved By: Pourush Garg					
<b>A. Process Description:-</b>		<b>Raw Material Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>						
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks		
1	Steel Member (Turn Buckle, Anchor Rod, Anchor Plate, Thimble)	1.1	Surface Finish	Physical	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	IS 2062	100%	R	R		
		1.2	Dimension	Measurement	As per approved drawing	IS 1730/ Technical Specification	100%	R	R		
		1.3	Mechanical Test								
		1.31	Ultimate Tensile Strength	Mechanical	As per IS 2062/ IS 1608	IS 2062/ IS 1608	100%	R	R		
		1.32	Yield Stress	Mechanical			100%	R	R		
		1.33	% Elongation	Mechanical			100%	R	R		
		1.34	Bend Test	Mechanical			100%	R	R		

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page <b>183</b> of <b>259</b>
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		1.4	Chemical Composition	Chemical	As per IS 2062	IS 2062	100%	R	R	
2			Chemical Composition	Chemical	As per IS 209		100%	R	R	
	Zinc for Galvanization	2.1				IS 209				

B.		Process Description:-		Stage Inspection (Routine Test)			W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Fabrication of Steel Member (Turn Buckle, Anchor Rod, Anchor Plate, Thimble)	1.1	Visual Inspection	Visual	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	Relevant standard/ Technical Specification	IS 2500 (Part-I)	P	R	
		1.2	Dimensional check	Measurement	As per approved drawing	Approved drawing		P	R	
		1.3	Edge Security	Measurement	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification		P	R	
		1.4	Punching & Drilling	Physical	No visual blow holes, slags, undercuts, cracks etc.	Relevant standard/ Technical Specification		P	R	
		1.5	Bending	Physical/ Measurement	As per approved drawing/ Technical Specification	Drawing/ Technical Specification		P	R	
		1.6	Welding	Physical	As per approved drawing/ Technical Specification	Drawing/ Technical Specification		P	R	
3	Galvanization of Steel Member (Turn Buckle, Anchor Rod, Anchor Plate, Thimble)	2.1	Degreasing	Chemical	As per IS 2629	IS 2629	IS 2500 (Part-I)	P	R/W	
		2.2	Pickling	Chemical	As per IS 2629	IS 2629		P	R/W	
		2.3	Rinsing	Chemical	As per IS 2629	IS 2629		P	R/W	
		2.4	Pre-fluxing in Zinc Chloride & Ammonium Chloride	Chemical	As per IS 2629	IS 2629		P	R/W	
		2.5	Pre-heating	Thermal	As per IS 2629	IS 2629		P	R/W	
		2.6	Dipping							
		2.61	Zinc bath temperature indicator & verification	Physical	As per IS 2629	IS 2629	P	R/W		
		2.62	Immersion time & withdrawal time	Physical	As per IS 2629	IS 2629	P	R/W		
		2.62	Quenching & Di-chromating	Physical	As per IS 2629	IS 2629	P	R/W		
		3.7	Galvanization check							
		3.71	Visual check	Physical	As per IS 2629	IS 2629	P	R		
		3.72	Thickness of Zinc Coating	Measurement	As per IS 2629/ TPCODL Specification	IS 2629/ TPCODL Spec.	P	R		
		3.73	Uniformity of Zinc Coating (Dip Test)	Physical	As per IS 2629	IS 2629	P	R		
		3.74	Mass of Zinc Coating	Physical	As per IS 2629/ TPCODL Specification	IS 2629/ TPCODL Spec.	P	R		
3.8	Adhesion of Zinc Coating (Pivot Hammer Test)	Physical	As per IS 2629	IS 2629	P	R				

C.		Process Description:-		Final Inspection (Acceptance Test)			W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Physical Inspection Stay Set materials	1.1	Visual Inspection	Visual	As per approved GTP/Drawing	Approved GTP/Drawing	IS 4759 (1996)	P	W	
		1.2	Dimension Check	Measurement				P	W	
2	Galvanization Check of Stay Set materials	2.1	Visual check	Physical	As per IS 2629	IS 2629		P	W	
		2.2	Thickness of Zinc Coating	Measurement	As per IS 2629/ TPCODL Specification	IS 2629/ TPCODL Spec.		P	W	
		2.3	Uniformity of Zinc Coating (Dip Test)	Physical	As per IS 2629	IS 2629		P	W	
		2.4	Mass of Zinc Coating	Physical	As per IS 2629/ TPCODL Specification	IS 2629/ TPCODL Spec.		P	W	
		2.5	Adhesion Test	Physical	As per IS 2629	IS 2629		P	W	
3	Mechanical Test of Stay Set	3.1	Ultimate Tensile Strength	Mechanical	As per IS 2062/ IS 1608	IS 2062/ IS 1608		P	W	
		3.2	Yield Stress	Mechanical				P	W	
		3.3	% Elongation	Mechanical				P	W	
		3.4	Bend Test	Mechanical				P	W	
3.5	Load Test of Stay Set Assembly	Mechanical	As per GTP	TPCODL Specification	P	W				
4	Marking	4.1	Marking	Visual	As per TS	TS		P	W	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>			
TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET			
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 184 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

D. Process Description:-		Packing & Pre-Shipment			W-Witness, P-Perform, R-Review					
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Packing & Pre-Shipment	1.1	Physical Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R	
		1.2	Packing List Verification	Measurement	The Packing List should be in complete set as per Inspection Call requirement.	Inspection Call Letter	100%	P	R	

### 54.6 LT AB Cable

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)			
<b>Quality Assurance Plan for LT AB Cable</b>					
Doc. Title	Quality Assurance Plan for LT AB Cable				
Doc. No.	TPCODL-EQ-MQAP-06				Issue Date: 12.08.2021
Rev. No.	0				Other detail:
Prepared By: Parikshit Panday	Reviewed By: Phiroj Kr. Uttaray			Approved By: Pourush Garg	
			Issued By: Parveen Verma		

A. Process Description:-		Raw Material Inspection				W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
								BA	TPCODL
1	Aluminium Rod	1.1	Surface Finish	Visual	The conductor shall be smooth and free from scratches and burrs	IS 5484/IS 4026	10%	R	R
		1.2	Chemical Composition	Chemical	IS 4026	IS 5484/IS 4026	10%	R	R
		1.3	Diameter	Measurement	IS 5484	IS 5484/IS 4026	10%	R	R
		1.4	Breaking Load / Tensile Test	Mechanical	IS 5484	IS 5484/IS 4026	10%	R	R
		1.5	Elongation Test	Mechanical	IS 5484	IS 5484/IS 4026	10%	R	R
		1.6	Resistivity / Conductivity	Electrical test	IS 5484	IS 5484/IS 4026	10%	R	R
2	XLPE Insulation	2.1	Surface Finish	Visual	IS 14255	IS 14255	ONE SAMPLE FROM EACH LOT	R	R
		2.2	Volume Resistivity	Electrical test	1 x 10 <sup>13</sup> ohm-cm, Min at 27 deg.C 1 x 10 <sup>11</sup> ohm-cm, Min at 70 deg.C	IS 14255	ONE SAMPLE FROM EACH LOT	R	R
		2.3	Tensile strength	Mechanical	12.5 N/mm <sup>2</sup> , Min	IS 14255	ONE SAMPLE FROM EACH LOT	R	R
		2.4	Elongation at break	Mechanical	200 percent, Min	IS 14255	10%	R	R
		2.5	Ageing in air oven: Tensile strength variation	Mechanical	± 25 % Max	IS 14255	10%	R	R
		2.6	Ageing in air oven : Elongation variation	Mechanical	± 25 % Max	IS 14255	10%	R	R
		2.7	Hot set Test	Physical	Elongation under load 175% (max) and permanent elongation (set) after cooling 15% (max)	IS 14255	ONE SAMPLE FROM EACH LOT	R	R
		2.8	Water absorption	Chemical	1mg/cm <sup>2</sup> (max)	IS 14255	10%	R	R
		2.9	Shrinkage	Physical	4% (max)	IS 14255	10%	R	R
3	Wooden Drum	3.1	Surface Finish	Visual	IS 10418	IS 10418	10%	R	R
		3.2	Dimension along with spec	Physical	IS 10418	IS 10418	10%	R	R
4	Colour Pigment	4.1	Colour	Chemical	As per Test Report	As per Test Report	ONE SAMPLE FROM EACH LOT	R	R

B. Process Description:-		Stage Inspection			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria		Sample Size	Responsibility	

TPCODL TP CENTRAL ODISHA DISTRIBUTION LIMITED		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET		
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>				
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022	
Document No.	02		Page 185 of 259	
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi	
Prepared by: Engineering & Quality Dept				

						Reference Document		BA	TPCODL			
1	Aluminium Wire	1.1	Surface Finish	Visual	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.	GTP/IS 398 (Part-4) & IS 8130 :1996/TS	10% of LOT	P	R/W			
		1.2	Diameter Of Wire	Measurement	GTP/IS 398 (Part-4) & IS 8130 :1996/TS			P	R/W			
		1.3	Tensile strength	Mechanical				P	R/W			
		1.4	Resistivity	Electrical				P	R/W			
		1.5	chemical composition	Chemical				P	R/W			
		1.6	Wrapping Test	Mechanical	The Wire Shall Not Crack Or Break			P	R/W			
2	Stranding (Phase/Street Light/Messenger Wire)	2.1	No of Wires	Measurement	GTP/IS 398 (Part-4) & IS 8130 :1996/TS	GTP/IS 398 (Part-4) & IS 8130 :1996/TS	10%	P	R/W			
		2.2	Diameter Of Wire	Measurement				P	R/W			
		2.3	Lay direction / Lay Length	Measurement				P	R/W			
		2.4	Conductor dimension	Measurement				P	R/W			
		2.5	Surface Finish & Winding	Visual				P	R/W			
		2.6	DC Resistance	Electrical				P	R/W			
		2.7	Elongation and Breaking load test for Messenger conductor	Mechanical								
3	XLPE Insulation	3.1	Thickness	Measurement	GTP/IS 14255 /TS	GTP/IS 14255 /TS	10%	P	R/W			
		3.2	Dia/Dimension of core	Measurement				P	R/W			
		3.3	Core Identification	Measurement				P	R/W			
		3.4	Surface Finish	Visual				P	R/W			
		3.5	Hot set Test	Thermal				P	R/W			
		3.6	Volume Resistivity	Electrical				P	R/W			
		3.7	Colour	Visual				P	R/W			
		3.8	Tensile Strength and Elongation Test.	Mechanical				GTP/IS 14255 /TS	GTP/IS 14255 /TS	P	R/W	
4	Laying up of cores	4.1	Laying up sequence	Visual	GTP/IS 14255 /TS	GTP/IS 14255 /TS	10%	P	R/W			
		4.2	Direction of lay	Measurement				P	R/W			
		4.3	Lay length	Measurement				P	R/W			
		4.4	Dia over laid up Bundle	Measurement	Plant Standard	Plant Standard		P	R/W			
		4.5	Number of Cores	Counting				P	R/W			
<b>C.</b>	<b>Process Description:-</b>	<b>Final Inspection</b>				<b>W-Witness, P-Perform, R-Review</b>						
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility				
1	Routine Test	1.1	Conductor Resistance	Electrical	GTP/IS 8130/TS	GTP/IS 8130/TS	100%	P	R/W			
		1.2	High Voltage	Electrical	The cable shall withstand a voltage of 3 kV ac (rms) at a frequency of 40 to 60 Hz or a dc voltage of 7.2 kV between conductors for 5 minutes.	GTP/IS 14255/TS		P	R/W			
2	Acceptance Test	2.1	<b>Acceptance Test on Phase and Streetlight Conductor</b>			GTP/IS 14255/TS	As per Sampling plan of IS 14255	P	W			
		a.	Tensile test	Mechanical	Not Applicable as per IS 8130 - 1984, Cl no 6.2.1 on compact circular conductor or Shaped conductors.			P	W			
		b.	Wrapping Test	Mechanical				P	W			
		c.	Conductor Resistance	Electrical				P	W			
		d.	Dimension	Measurement				P	W			
		2.2	<b>Acceptance Test on Messenger Conductor</b>								P	W
		a.	Tensile test	Mechanical	IS 14255			P	W			
		b.	Elongation at break	Mechanical	4% (min)			P	W			
		c.	Conductor Resistance	Electrical	IS 8130 1996			P	W			
		d.	Dimension	Measurement				P	W			
		2.3	<b>Acceptance Test on XLPE insulation</b>								P	W
		a.	Thickness	Measurement	IS 14255			P	W			
		b.	Tensile strength and elongation at Break	Mechanical	12.5 N/m <sup>2</sup> (Min) and 200 % (Min) elongation			P	W			

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 186 of 259			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		

		c.	Ageing in air Oven (a)Tensile Strength Variation (b) Elongation Variation	Chemical	25 % (Max)			P	W
		d.	Hot set test					P	W
		d.1	Mechanical stress	Mechanical	20 N/CM <sup>2</sup>			P	W
		d.2	Elongation Under load	Thermal	175 % (Max)			P	W
		d.3	Permanent Elongation after(set) cooling	Chemical	15 % (Max)			P	W
		e.	Insulation Resistance Test.(Volume Resistivity)	Chemical	1 x 10 <sup>13</sup> ohm-cm, Min at 27 deg.C 1 x 10 <sup>11</sup> ohm-cm, Min at 70 deg.C			P	W
		2.4	High Voltage Test (To be conducted on the full drum length)	Electrical	The cable shall withstand a voltage of 3 kV ac (nns) at a frequency of 40 to 60 Hz or a dc voltage of 7.2 kV between conductors for 5 minutes.			P	W
		2.5	Bending Test	Mechanical	10(D+d) As per IS 14255			P	W
		2.6	Embossing and printing	Visual	TS/ GTP			P	W
		2.7	Cable Identification	Visual	IS 14255			P	W
		3.1	Type Test on Phase and Streetlight Conductor					P	R
		a.	Tensile test	Mechanical	Not Applicable as per IS 8130 - 1984, Cl no 6.2.1 on compact circular conductor or Shaped conductors.			P	R
		b.	Wrapping Test	Mechanical				P	R
		c.	Conductor Resistance	Electrical	IS 8130 1996			P	R
		3.2	Type Test on Messenger Conductor					P	R
		a.	Tensile test	Mechanical	IS 14255			P	R
		b.	Elongation at break	Mechanical	4% (min)			P	R
		c.	Conductor Resistance	Electrical	IS 8130 1994			P	R
		3.3	Type Test on XLPE insulation					P	R
		a.	Thickness	Measurement	IS 14255			P	R
		b.	Tensile strength and elongation at Break	Mechanical	12.5 N/m <sup>2</sup> (Min) and 200 % (Min) elongation			P	R
		c.	Ageing in air Oven (a)Tensile Strength Variation (b) Elongation Variation	Chemical	25 % (Max)			P	R
			Hot set test					P	R
		d.	Mechanical stress	Mechanical	20 N/CM <sup>2</sup>			P	R
		e.	Elongation Under load	Thermal	175 % (Max)			P	R
		f.	Permanent Elongation after(set) cooling	Chemical	15 % (Max)			P	R
		3.4	Shrinkage Test	Chemical	4 % (Max)			P	R
		3.5	Water Absorption (Gravimetric)	Chemical	1 mg/cm <sup>2</sup> (Max)			P	R
		3.6	Insulation Resistance Test.(Volume Resistivity)	Chemical	1 x 10 <sup>13</sup> ohm-cm, Min at 27 deg.C 1 x 10 <sup>11</sup> ohm-cm, Min at 70 deg.C			P	R
		3.7	Carbon Black	Chemical	Nominal Value 2.5 % ; Tolerance ± 0.5 %			P	R
		3.8	High Voltage Test	Electrical	The cable shall withstand a voltage of 3 kV ac (nns) at a frequency of 40 to 60 Hz or a dc voltage of 7.2 kV between conductors for 5 minutes.			P	R
4	Wooden Drums	4.1	Dimensions & Barrel Batten Strength Test	Mechanical	GTP/IS 1778 - 1980/TS	GTP/IS 1778 - 1980/TS	ONE SAMPLE FROM EACH LOT		
<b>D. Process Description:-</b>			<b>Packing &amp; Pre-shipment</b>			<b>W-Witness, P-Perform, R-Review</b>			
<b>Sl. No.</b>	<b>Equipment/ Operation</b>		<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>	
								<b>BA</b>	<b>TPCODL</b>
1	Packing & Despatch Check For Identification & Packing	1.1	Reference to the Standard	Visual	TS/ GTP	TS/ GTP	10%	P	R

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page <b>187</b> of <b>259</b>	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

	1.2	Manufacturer Name	Visual					P	R
	1.3	Type of cable	Visual					P	R
	1.4	Voltage Grade	Visual					P	R
	1.5	Number of cores	Visual					P	R
	1.6	Nominal Cross section area of conductor	Visual					P	R
	1.8	Marking of P.O	Visual					P	R
	1.9	Direction of Rotation	Visual					P	R
	1.10.	Length Of Conductor	Visual					P	R
	1.11	Gross mass	Visual					P	R
	1.12	Net mass	Visual					P	R
	1.13	Country of Manufacture	Visual					P	R
	1.14	Year of Manufacture	Visual					P	R
	1.15	Is certification Mark	Visual					P	R

**54.7 Distribution Transformer**

		<b>TP Central Odisha Distribution Limited</b> <b>(A Tata Power &amp; Odisha Govt. joint venture)</b>									
<b>Quality Assurance Plan for Distribution Transformer</b>											
Doc. Title		Quality Assurance Plan for Distribution Transformer									
Doc. No.		TPCODL-EQ-MQAP-07						Issue Date: 25.08.2021			
Rev. No.		0						Other detail:			
Prepared By: Parikshit Panday		Reviewed By: Phiroj Kr. Uttaray				Approved By: Pourush Garg		Issued By: Parveen Verma			
<b>A.</b>											
<b>Process Description:-</b>		<b>Raw Material Inspection</b>				<b>W-Witness, P-Perform, R-Review</b>					
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility				
							BA	TPCODL	Remarks		
1	CRGO Lamination	1.1	Test Certificate	Visually Check	TC Verification	IS 3024	Every Certificate	R	R		
		1.2	Visual Inspection	Visually Check	Edge should be straight without any bends. Smooth, Clean, Free from Rust and Grease		100%	R	R		
		1.3	Thickness, Max	Thickness test by micro meter	0.27mm (Max)			R	R		
		1.4	Grade of material	Physical	M3 or Better			R	R		
		1.5	Specific core loss @ 1.7 Tesla, 50Hz (Max)	Electrical	1.21 W/KG			R	R		
2	Conductor	2.1	Bare Dimension	Measure By micro meter	0 defects	IS 7404 part II/IS 6160	5 % of bobbin (min.)	R	R		
		2.2	Covered Dimension					R	R		
		2.3	No. of Covering	Visually Check	R			R			
		2.4	Covering Style	Visually Check	R			R			
		2.6	Test Certificate	Visually Check	Each certificate			Every Certificate	R		R
		2.7	Resistivity	check with micro ohm meter	0 defects			10%	R		R
		3	Transformer Oil	<b>A Function</b>				Test Certificate conforming to IS 335 2018 / TS	100%		R
3.1	Viscosity at 40 Deg C	Physical	15 mm <sup>2</sup> /S, Max	R	R						
3.2	Viscosity at 0 Deg. C	Physical	1800 mm <sup>2</sup> /S, Max	R	R						
3.3	Viscosity at -30 Deg. C	Physical	--	R	R						
3.4	Viscosity at -40 Deg. C	Physical	--	R	R						
3.5	Pour point	Physical	- 10 deg C, Max to be based on LCSET refer Table 1	R	R						
3.6	Water content	Physical	30 mg/kg /40 mg/ Kg, Max	R	R						
3.7	Breakdown voltage	Electrical	30 kV/70 kV, Min	R	R						
3.8	Density at 20 Deg C	Physical	0.895 g/ml, Max	R	R						
3.9	DDF at 90 Deg.	Electrical	0.500, Max	R	R						
3.10	Particle content		No general requirement	R	R						
<b>B Refining/Stability</b>											
Remarks											

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 188 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		3.11	Appearance		Clear, Free from sediment and suspended matter	Test Certificate conforming to IS 335 2018 / TS	100%	R	R	
		3.12	Acidity	Electrical	0.01 mg KOH/g, Max			R	R	
		3.13	Interfacial Tension	Electrical	No general requirement			R	R	
		3.14	Total sulphur content	Electrical	No general requirement			R	R	
		3.15	Corrosive sulphur		Not corrosive			R	R	
		3.16	Potentially corrosive sulphur	Electrical	Not corrosive			R	R	
		3.17	DBDS	Electrical	Not detectable (< 5 mg/kg)			R	R	
		3.18	Inhibitors according to IS 13631/IEC 6666		(U) Uninhibited oil: not detectable (<0.01%)			R	R	
				Chemical	(T) Trance inhibited oil: < 0.08%			R	R	
				Chemical	(I) Inhibited oils:0.08%-0.40% (see 3.6 to 3.8)			R	R	
		3.19	Metal passivate additives according to IS 1363/IEC 60666		Not detectable (< 5 mg/kg), or as agreed upon with the purchase			R	R	
		3.20	Other additives	Electrical	CL.NO. 7 OF TABLE 2 OF IS 335: 2018			R	R	
		3.21	2-Furfural and related compounds content	Electrical	Not detectable (<0.05 mg/kg) for each individual compound)			R	R	
<b>C Performance</b>										Re mar ks
3.22	Oxidation stability	Electrical	For oils with other antioxidant additives and mental passivate additives	Test Certificate conforming to IS 335 2018 / TS	100%	R	R			
a)	Total acidity	Chemical	1.2 mg KOH/g, Max			R	R			
b)	Sludge	Chemical	0.8%, Max			R	R			
c)	DDF at 90 Deg C	Chemical	0.500, Max			R	R			
3.23	Gassing tendency	Physical	No general requirement			R	R			
3.24	ECT		No general requirement			R	R			
<b>D Health, Safety and Environment (HSE)</b>										As per IS 335 201 8 Tabl e 2
3.25	Flash point		135 Deg C, Min	100%	R	R				
3.26	PCA content		3%, Max		R	R				
3.27	PCB Content		Not detectable (< 2 mg/kg)		R	R				
4	Insulating Material (Pressboard, Pre compressed Pbd,Perma wood board)	4.1	Dielectric Strength of paper	Measurement	Test certificate conforming to IS 1576	100%	R	R		
		4.2	Dimension	Sample Basis			R	R		
		4.3	Physical Properties (Density , Tensile strength compressibility, oil absorption, Shrinkage, Moisture Content, Compression in oil, Conductivity of organic Extract )	Measurement			AsperIS:1576/1992	R	R	
5	Rubberised cork sheet / Gasket	5.1	Thickness, Min	Measurement	Test certificate conforming to is 4253 / TS	100%	R	R		
		5.2	Tensile Strength , Min	Mechanical			15.8 kg/cm 2	R	R	
		5.3	Hardness, IRHD	Mechanical			70 +/- 5	R	R	
		5.4	Dimensional Change , Max	Mechanical			1.50%	R	R	
		5.5	Resistance to Liquid Max	Chemical			15%	R	R	
		5.6	Compressibility ,	Mechanical			25-35 %	R	R	
		5.7	Chloride content Max	Chemical			0.20%	R	R	
		5.8	Sulphate Content, Max	Chemical			0.20%	R	R	
		5.9	Recovery, Min	Mechanical			80%	R	R	
		5.10.	Flexibility	Mechanical			As per IS 4253	R	R	
		5.11	Compression set at 110 deg. C for 24 hrs % , Max	Mechanical			85	R	R	
		5.12	PH Value of water extract	Chemical			IS:4253-II	R	R	
7	MS Sheet and Mounting Chanel	6.1	Chemical Composition	Measurement	Test certificate conforming to the IS 2062	100%	R	R		
		6.2	Mechanical Properties	Measurement			As per 2062	R	R	
		6.3	Dimension verification	Measurement			R	R		
8	Kraft paper	7.1	Thickness, Min	Measurement	Test certificate conforming to IS 8570/9335 Part 2	100%	R	R		
		7.2	Finish	visual			R	R		
		7.3	Density Kg/ cm 2	Chemical			R	R		
		7.4	Oil absorption %	Chemical			R	R		
		7.5	Electrical Strength (BDV)	Electrical			As per IS 8570/9335 Part 2	R	R	
		7.6	Tensile Strength , Min	Physical			R	R		
		7.7	Ageing in air %	Physical			R	R		
		7.8	Conductivity of aqueous extract ,mS/m	Chemical			R	R		
		7.9	PH of Aqueous extract %	Chemical			R	R		
		7.10.	Moisture content %	Electrical			R	R		



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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 189 of 259			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		

Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
							BA	TPCODL		
		7.11 Mineral Ash %	Chemical				R	R		
		7.12 Freedom from conducting particles	Electrical				R	R		
<b>B. Process Description:- Stage Inspection</b>										
<b>W-Witness, P-Perform, R-Review</b>										
1	Core Assembly	1.1 Core Material	Visual	M3 or Better	Test report conforming to the TC / Approved drawing / GTP/Approved Bidder's Calculation	W=10% R=100% (TPCODL)	P	R/W		
		1.2 Thickness, Max	Measurement	0.27 Max			P	R/W		
		1.3 Remarks regarding Rusting and Smoothness of core	Measurement	Smooth, clean, free from rust			P	R/W		
		1.4 No of steps in core	Measurement				P	R/W		
		1.5 Dimension of each step (Width x Thickness) mm.	Measurement				P	R/W		
		1.6 Core Diameter	Measurement	As per bidder's calculation			P	R/W		
		1.7 Core Cross section area mm <sup>2</sup>	Measurement				P	R/W		
		1.8 Winding Height mm	Measurement				P	R/W		
		1.9 Core Length (Leg to leg), mm	Measurement				P	R/W		
		1.10. Weight of the core, Kgs	Measurement	As per approved GTP			P	R/W		
		1.11 Flux density, Tesla	Physical				P	R/W		
		1.12 Size of support channel	Measurement				P	R/W		
		1.13 Clamping arrangement	Measurement	As per Specification			P	R/W		
		1.14 Clearance between coils- core,LV-HV, PH- PH, Core coil tank	Measurement				P	R/W		
		1.15 Coil supporting arrangement	Physical				P	R/W		
2	Winding/Coil	2.1 Material	Visual	As per Specification	Test report conforming to the TC / Approved drawing / GTP/Approved Bidder's Calculation	W=10% R=100% (TPCODL)	P	R/W		
		2.2 Bare conductor Size, mm x mm	Measurement	As per approved GTP			P	R/W		
		2.3 Type of insulation for conductor	Visually Check	As per Specification			P	R/W		
		2.4 Inner and outer dia for each coil,mm	Measurement				P	R/W		
		2.5 No of coil	Measurement	As per bidder's calculation			P	R/W		
		2.6 Weight of the coil, kgs	Measurement	As per approved GTP			P	R/W		
		2.7 Current Density Max	Physical	For AL winding 1.6 A/mm <sup>2</sup> & for Cu winding 2.5 A/mm <sup>2</sup>			P	R/W		
		2.8 Resistivity	check with micro ohm meter	As per approved GTP			P	R/W		
		2.9 Method of joints	Electrical	As per Specification			P	R/W		
3	Heating/De hydration	3.1 Temperature	Visually Check by Thermometer	Voltage upto 33 KV- 500 M ohms	IR Value Inspection file	100%	P	R		
		3.2 Min. Insulation Resistance	Check with IR Tester	Voltage upto 11 KV- 750 M ohms			P	R		
4	Oil Filtration	4.1 BDV	BDV Test	Avg. BDV Should greater than 60 KV	Oil Inspection File	Each Usage	P	R/W		
5	Tank Up	5.1 Dimension (mm)	Measure by tap Scale	As per Specification	Test report conforming to the TC / Approved drawing / GTP/Approved Bidder's Calculation	W=10% R=100% (TPCODL)	P	R/W		
		5.2 Thickness of Top Bottom and side sheet,mm					P	R/W		
		5.3 Paint shade and Thickness					P	R/W		
		5.4 Radiator size	Visually Check				P	R/W		
		5.5 oil level	Thickness testing	Above 30 deg.mark of oil level			P	R/W		
		5.6 Pressure Test	Check with pressure gauge				P	R/W		
		5.7 Provision for lifting lugs	Visual	As per Specification			P	R/W		
		5.8 Conservator volume (Conservator and Tank)	Measurement				P	R/W		
		5.9 BDV of oil	Electrical	Above 60 KV rms			P	R/W		
		5.10. Type of Gasket joint at corner	Physical	As per Specification			P	R/W		
		5.11 Fitting & Accessories	Physical				P	R/W		
6	Gate and Globe valve	6.1 Material	Physical	As per Specification	Test certificate conforming to IS - 778/ Technical Specification	100%	P	R		
		6.2 Size	Physical	As per Specification			P	R		
		6.3 Pressure test for body and Seat	Physical	As per IS 778			P	R		
7	Oil Level Gauge	7.1 Visual Check	Physical	As per Specification	TC conforming to Approved Drg.	100%	P	R		
8	CT (If included as per TS)	8.1 Accuracy, Ratio, Over voltage, Inter turn test, knee point voltage, Exciting current, sec winding resistance for PS class CT	Measurement	As per Tech Specification	TC conforming to IS 2705 / Approved Drg.	100%	P	R		
		8.2 IR Test and Polarity test	Electrical	AS per IS 2705			P	R		
9	OTI (If included as per TS)	9.1 Visual and Operational Check	Physical	As per Specification	TC conforming to TS/ Approved Drg./Bidder's Data	100%	P	R		
		9.2 Calibration Certificate	Physical	As per Specification			P	R		
10	Porcelain Items (Bushing : HT & LT)	10.1 Visual Inspection	Visually Check	TC conforming to IS 2099/TS	IS:3347,2099	100%	P	R		
		10.2 Verification of Creepage Distance	Measurement				P	R		
		10.3 Porosity test on porcelain	Electrical				P	R		
		10.4 One minute power frequency dry withstand test	Electrical				P	R		

TPCODL TP CENTRAL ODISHA DISTRIBUTION LIMITED		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET		
Document Title		GENERAL TECHNICAL PARTICULARS AND DRAWINGS		
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022		
Revision No.	02	Page 190 of 259		
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi	

		10.5	One minute power frequency wet withstand test	Electrical				P	R	
		10.6	Tan Delta Test	Electrical				P	R	
		10.7	Measurement of partial discharge	Electrical				P	R	
11	Breather and Silica gel	11.1	Visual Inspection with Weight	Visually Check & Measurement	As per Technical Specification	TC conforming to TS/ Approved Drg.	100%	P	R	
		11.2	UV test certificate	Visually Check	In line with TC			P	R	
		11.3	Silicagel crystal size	Measurement	6 mm (min)			P	R	
		11.4	Silicagel Colour	Visually Check	Blue Colure			P	R	
12	Radiator	12.1	Corner Length	Visually Check	0 defects	TC conforming to TS/ Approved Drg.	100%	P	R	
		12.2	Fin Width					P	R	
		12.3	NO. of fins					P	R	
		12.4	Fitting & Location					P	R	
		12.5	Inspection Report/TC					P	R	
		12.6	Outside Painting					P	R	
		12.7	Inside varnish					P	R	
13	Buchholz Relay ( If included as per TS)	13.1	Operational Check	Physical	As per Specification	Test certificate conforming to IS 3637 / TS	100%	P	R	
		13.2	Routine and Acceptance Test	Electrical	As per 3637			P	R	
C. Process Description:-		Final Inspection				W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		
1	Routine Test	1.1	Measurement of Insulation Resistance	Electrical	As Per Approved GTP and Drawing / IS: 2026 / IS 1180	As Per Approved GTP and Drawing / IS: 2026 / IS 1180	Every Transformer	BA	TPCODL	
		1.2	Measurement of Winding Resistance at each Tap (if applicable)	Electrical				P	R	
		1.3	Measurement No load current and Loss at rated frequency and 90%, 100% and 112.5% of rated voltage.	Electrical				P	R	
		1.4	Measurement of Voltage Ratio and check of phase displacement	Electrical				P	R	
		1.5	Measurement of short circuit impedance (Principle Taping when applicable) and Load loss at 50 percent and 100 percent load	Electrical				P	R	
		1.6	Separate Source voltage withstand test (HV Test)	Electrical				P	R	
		1.7	Induced Overvoltage withstand test (DVDF Test)	Electrical				P	R	
		1.8	Unbalanced Neutral current measurement test	Electrical				P	R	
		1.9	Pressure Test	Mechanical				P	R	
		1.10	Oil Leakage Test a pressure of 0.35Kg/cm <sup>2</sup>	Mechanical				P	R	
2	Acceptance Test	2.1	Measurement of Insulation Resistance	Electrical	As Per Approved GTP and Drawing / IS: 2026 / IS 1180	As Per Approved GTP and Drawing / IS: 2026 / IS 1180	Every Transformer	P	W	
		2.2	Measurement of Winding Resistance at each Tap (if applicable)	Electrical				P	W	
		2.3	Measurement No load current and Loss at rated frequency and 90%, 100% and 112.5% of rated voltage.	Electrical				P	W	
		2.4	Measurement of Voltage Ratio and check of phase displacement	Electrical				P	W	
		2.5	Measurement of short circuit impedance (Principle Taping when applicable) and Load loss at 50 percent and 100 percent load	Electrical				P	W	
		2.6	Separate Source voltage withstand test (HV Test)	Electrical				P	W	
		2.7	Induced Overvoltage withstand test (DVDF Test)	Electrical				P	W	
		2.8	Unbalanced Neutral current measurement test	Electrical				P	W	
		2.9	BDV of Oil Sample to comply with IS 335	Electrical				P	W	
		2.10	Magnetic balance test	Electrical				P	W	
		2.11	Checking of weight, Dimension, Fitting & accessories ,tank sheet thickness, Oil Quantity, Material, Finish and Workmanship.	Electrical			P	W		
		2.12	Paint adhesion tests	Electrical			P	W		
		2.13	Pressure Test	Mechanical			P	W		
		2.14	Oil Leakage Test a pressure of 0.35Kg/cm <sup>2</sup>	Mechanical			P	W		
		2.15	Temperature rise Test	Electrical			P	W		
3	Type Test	3.1	Temperature rise Test	Electrical	As Per Approved GTP/ IS: 2026 / IS 1180	As Per Approved GTP/ IS: 2026 / IS 1180	1 no of each Rating.	P	R	
		3.2	Lightning Impulse Test	Electrical				P	R	
		3.3	Short circuit withstand test	Electrical				P	R	
		3.4	No load current at 112.5% voltage	Electrical				P	R	
		3.5	No load loss and load loss at 50 percent and 100 percent load.	Electrical				P	R	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 191 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		3.6	Pressure Test on Transformer tank and Radiator	Mechanical	As per Technical Specification			P	R	
4	Marking And Name Plate	4.1	Checking of Name Plate and Marking	Visual	As Per Approved GTP/ IS: 2026 / IS 1180	As Per Approved GTP/ IS: 2026 / IS 1180	100%	P	W	

### 54.8 AB Switch

		<b>TP Central Odisha Distribution Limited</b> <b>(A Tata Power &amp; Odisha Govt. joint venture)</b> <b>Quality Assurance Plan for AB Switch</b>								
Doc. Title		Quality Assurance Plan for AB Switch								
Doc. No.		TPCODL-EQ-MQAP-08						Issue Date: 23-09-2021		
Rev. No.		0						Other detail:		
Prepared By: Parikshit Panday		Reviewed By: Phiroj Kumar Uttaray				Approved By: Pourush Garg		Issued By: Parveen Verma		
1	Polymer Compound / Silicon Rubber	1.1	Visual Examination	Visual	Smooth, clean, free from dust and colour	Smooth, clean, free from dust and colour	100%	R	R	
		1.2	Tensile Strength	Mechanical	ASTM D412/D2240/IS 3400 part 1 and part 2 /IEC 62271/ IEC 61109/ISO 37	Test certificate conforming to ASTM D412/D2240/IS 3400 part 1 and part 2 /IEC 62271/ IEC 61109/ISO 37		R	R	
		1.3	Elongation (%)	Mechanical				R	R	
		1.4	Hardness (shore-A)	Mechanical				R	R	
		1.5	Tear Strength (KN/m)	Mechanical	As per ASTM D 624	Test certificate conforming to ASTM D 624		R	R	
		1.6	Specific Gravity	Physical	As per ASTM D 792/ IS 3400-9	Test certificate conforming to ASTM D 792/ IS 3400-9		R	R	
		1.7	Die electric Strength Test (KV/mm)	Electrical	As per ASTM D 149/ IEC 60243	Test certificate conforming to ASTM D 149/ IEC 60243		R	R	
		1.8	Volume Resistivity (Ohm-cm)	Electrical	As per IEC 60093	Test certificate conforming to IEC 60093		R	R	
		1.9	Resistance to tracking and Erosion	Electrical	As per IEC 60587/ IEC 62271/ IEC 61109	Test certificate conforming to IEC 60587/ IEC 62271/ IEC 61109		R	R	
		1.10	Resistance to weathering and UV	Electrical	No crack is to be observed in the test duration of 96hrs	Test certificate conforming to ASTM-G154-06/ IEC 62271/ IEC 61109		R	R	
		1.11	Limiting oxygen index	Physical	As per ASTM 2863/ UL 94 / IEC 62271/ IEC 61109	Test certificate conforming to ASTM 2863/ UL 94 / IEC 62271/ IEC 61109		R	R	
		1.12	Flammability Index	Physical				R	R	
		1.13	Arc Resistance	Electrical	As per ASTM 495	Test certificate conforming to As per ASTM 495		R	R	
2	Frp Rods	2.1	Visual Examination	Physical	As per Drawing & GTP	As per Drawing & GTP	100%	R	R	
		2.2	Dimension	Physical	As per Approved Drawing/ Technical Specification	As per Drawing & GTP		R	R	
		2.3	Dye Penetration	Physical	Dye Penetration shall be longer than 15	Test certificate conforming to IEC-61109		R	R	
		2.4	Water Absorption	Physical	0.1%(max)	ASTM D 570		R	R	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>	
		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 192 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		2.5	Water Diffusion Test	Physical	No Puncture in 12KV	Test certificate conforming to IEC-61109		R	R
		2.6	Brittle Fracture Resistance Test	Physical	Shall withstand	As per Plant Standard		R	R
		2.7	Bending Test	Mechanical	As per Standard	Test certificate conforming to relevant Standards		R	R
		2.8	Percentage of glass content	Physical	As per ASTM D 2584 / IS 11246	Test certificate conforming to ASTM D 2584 / IS 11246		R	R
		2.9	Tensile Strength (Mpa)	Physical	As per IS 1998	Test certificate conforming to IS 1998		R	R
		2.1	Hardness Test (Barcol)	Physical	As per ASTM D 2583	Test certificate conforming to ASTM D 2583		R	R
		2.11	Flexure strength (Mpa)	Physical	As per ASTM D 790 / IS 1998	Test certificate conforming to ASTM D 790 / IS 1998		R	R
		2.12	Specific Gravity	Physical	As per ASTM D 792	Test certificate conforming to ASTM D 792		R	R
3	Metal Fittings	3.1	Visual Examination	Visual	As per Drawing	As per Drawing	100%	R	R
		3.2	Dimension	Physical	As per Drawing	As per Drawing		R	R
		3.3	Chemical Composition	Chemical	once in 6 months	IS 1865/IS 2004		once in 6 months	R
4	Copper Flats	4.1	Visual Examination	Physical	IS-191 Part-IV, IS-1897	IS-191 Part-IV, IS-1897	100%	R	R
		4.2	Dimension	Physical	IS-191 Part-IV IS-1897	IS-191 Part-IV IS-1897		R	R
		4.3	Tensile Strength	Mechanical	IS-1608	IS-1608		R	R
		4.4	Chemical Composition	Chemical	IS-191 Part-IV IS-1897	IS-191 Part-IV IS-1897		R	R
		4.5	Bend Test	Mechanical	IS-191 Part-IV IS-1897	IS-191 Part-IV IS-1897		R	R
		4.6	Resistivity / Conductivity	Electrical	IS-191 Part-IV IS-1897	IS-191 Part-IV IS-1897		R	R
5	Aluminium Flats	5.1	Visual Examination	Physical	IS-5082	IS-5082	100%	R	R
		5.2	Dimension	Physical	IS-3965	IS-3965		R	R
		5.3	Tensile Strength	Mechanical	IS-1608	IS-1608		R	R
		5.4	Bend Test	Mechanical	IS-5082	IS-5082		R	R
		5.5	Resistivity / Conductivity	Electrical	IS-5082	IS-5082		R	R
		5.6	Chemical Composition	Chemical	IS-5082	IS-5082		R	R
6	MILD STEEL SECTIONS	6.1	Visual Examination	Physical	IS-2062	IS-2062	100%	R	R
		6.2	Dimension	Physical	IS-808, IS-1730, IS-1732, IS-3954	IS-808, IS-1730, IS-1732, IS-3954		R	R
		6.3	Tensile Strength	Mechanical	IS-1608	IS-1608		R	R
		6.4	Chemical Composition	Chemical	IS-2062	IS-2062		R	R
		6.5	Bend Test	Mechanical	IS-2062	IS-2062		R	R

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>			
		<b>TECHNICAL BOOKLET</b>			
<b>Document Title</b>		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date:</b> 23.08.2022			
<b>Revision No.</b>	02	<b>Page</b> 193 of 259			
<b>Prepared by:</b> Engineering & Quality Dept	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Rajkumar Rastogi		

7	CONTACT SPRIGS	7.1	Visual Examination	Physical	As per Standard	Test certificate conforming to IS relevant Standards	100%	R	R
		7.2	Dimension	Physical				R	R
		7.3	Functional check	Physical				R	R
		7.4	Fitment/ Springs	Physical				R	R
8	FASTNERS	8.1	Visual Examination	Physical	IS- 1367- III	IS-1367-III	100%	R	R
		8.2	Dimension	Physical	IS- 1363	IS-1363		R	R
		8.3	Wedge Test	Mechanical	IS- 1367- III	IS-1367-III		R	R
		8.4	Hardness	Mechanical	IS- 1367- III	IS-1367-III		R	R
		8.5	Galvanizing	Chemical	IS- 1367- XIII	IS-1367-XIII		R	R
9	INSULATOR( For Porcelain Insulator)	9.1	Visual	Physical	100%	IS-2544 IS-5350 IS-731	IS-2544 IS-5350 IS-731	R	R
		9.2	Dimension	Physical	IS- 2544 IS- 5350 IS-731	Approved Drgs.	Approved Drgs.	R	R
		9.3	High Voltage Test	Electrical	IS- 2544 IS-731	IS-2544 IS-731	IS-2544 IS-731	R	R
		9.4	Temperature Cycle	Electrical	IS- 2544 IS-731	IS-2544 IS-731	IS-2544 IS-731	R	R
		9.5	Mechanical Strength/ Failing load Test	Mechanical	IS- 2544 IS-731	IS-2544 IS-731	IS-2544 IS-731	R	R
		9.6	Puncture Test	Electrical	IS- 2544 IS-731	IS-2544 IS-731	IS-2544 IS-731	R	R
		9.7	Porosity Test	Physical	IS- 2544 IS-731	IS-2544 IS-731	IS-2544 IS-731	R	R
		9.8	Galvanizing test	Chemical	IS- 2544 IS- 4759 IS-731	IS-2544 IS-4759 IS-731	IS-2544 IS-4759 IS 731	R	R
10	GI TUBES	10.1	Visual	Physical	IS- 1239	IS- 1239	100%	R	R
		10.2	Dimension	Physical	IS- 1239	IS- 1239		R	R
		10.3	Chemical Analysis	Chemical	IS- 1239	IS- 1239		R	R
		10.4	Tensile Strength	Mechanical	IS- 1239	IS- 1239		R	R
		10.5	Elongation	Mechanical	IS- 1239	IS- 1239		R	R
		10.6	Bend Test	Mechanical	IS- 1239	IS- 1239		R	R
		10.7	Galvanizing	Chemical	IS- 1239	IS- 1239		R	R

B.		Process Description:-		Stage Inspection			W-Witness, P-Perform, R-Review		
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
								BA	TPCODL
1	Insulator Assembly	1.1	Visual Examination	Physical	Relevant standard/ Technical Specification/IEC 61109	IEC 61109	One sample per lot	P	R/W
		1.2	Mechanical Routine test	Mechanical				P	R/W
2	Fabrication of copper Contacts	2.1	Visual Examination	Physical	As per approved drawing and GTP/TS	As per approved drawing and GTP/TS	One sample per lot	P	R/W

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 194 of 259			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		


		2.2	Dimension	Physical	As per approved drawing and GTP/TS	As per approved drawing and GTP/TS		P	R/W
		2.3	Fitment / Assembly	Physical	As per approved drawing and GTP/TS	As per approved drawing and GTP/TS		P	R/W
		2.4	Silver Plating Check	Chemical	As per approved drawing and GTP/TS	As per approved drawing and GTP/TS		P	R/W
3	Hot dip Galvanizing	5.1	Visual Examination	Physical	IS-4759	IS-4759	One sample of each component per lot	P	R/W
		5.2	Appearance	Physical	IS-2629	IS-2629		P	R/W
		5.3	Uniformity	Chemical	IS-2633	IS-2633		P	R/W
		5.4	Mass of zinc	Chemical	IS-6745	IS-6745		P	R/W
6	Terminals Connector	6.1	Visual Examination	Physical	IS-5561	IS-5561	One sample per lot	P	R/W
		6.2	Dimension	Physical	Approved drags.	Approved Drgs.		P	R/W
		6.3	Tensile	Mechanical	IS-5561	IS-5561		P	R/W
		6.4	Resistance	Electrical	IS-5561	IS-5561		P	R/W
		6.5	Temperature Rise	Electrical	IS-5561	IS-5561		P	R/W
		6.6	Short Time Current test	Electrical	IS-5561	IS-5561		P	R/W
8	Assemblies/ Sub assemblies	8.1	Visual Examination	Physical	Approved Drgs.	Approved Drgs.	Min. one sample per lot	P	R/W
		8.2	Dimension	Physical	Approved Drgs.	Approved Drgs.		P	R/W
		8.3	Verification of components	Physical	Approved/ Floor Drgs.	Approved Drgs.		P	R/W
		8.4	Functional check	Physical	Approved/ Floor Drgs.	Approved Drgs.		P	R/W
9	Packing and Marking	9.1	Visual	Physical	Packing list Approved Drgs and Marking as per Approved GTP/TS	Packing list Approved Drgs and Marking as per Approved GTP/TS	10%	P	R/W

C.		Process Description:-	Final Inspection for Type Test			W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
								BA	TPCODL
1	Type Test	3.1	1. Dielectric tests including lightning impulse withstand tests, power-frequency withstand tests, and power-frequency voltage withstand tests on auxiliary and circuits. 2. Temperature-rise tests. 3. Measurement of the resistance of the main circuit 4. Short time withstand current and peak withstand current tests. 5. Tests to prove the ability of the switch to make and break the specified currents. 6. Tests to prove satisfactory mechanical operation and endurance. 7. Verification of the protection; 8. Tightness tests. 9. Electromagnetic compatibility (EMC) tests. 10. Tests to prove the integrity of the external insulation under conditions of air pollution;	TTR	IS 9920 ( Part 1 ) :2002, IEC 60265-1 (1998) Technical specification	IS 9920 ( Part 1 ) :2002, IEC 60265-1 (1998) Technical specification	Proto - type	P	R

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 195 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

C.	Process Description:-	Final Inspection				W-Witness, P-Perform, R-Review			
1	Complete Assembly of Insulator	1.1	Verification of Dimensions	Visual	As per approved drawing/ TPCODL Specification	Approved drawing / TPCODL Specification	10%	P	W
		1.2	Verification of Creep age		As per approved drawing/ TPCODL Specification	As per approved drawing/ TPCODL Specification	10%	P	W
		1.3	Verification of Locking system(if applicable)	Mechanical	As per approved drawing/ TPCODL Specification	As per approved drawing/ TPCODL Specification	10%	P	W
		1.4	Verification of tightness between end fittings & Insulator housing(if applicable)	Mechanical				P	W
		1.5	Dry power frequency test(withstand and flashover)	Electrical				P	W
2	Galvanization	2.1	Visual check	Physical	As per IS 2633	IS-2633	10%	P	W
		2.2	Thickness of Zinc Coating	Measurement	As per IS 2633/ TPCODL Specification		10%	P	W
		2.3	Uniformity of Zinc Coating	Physical	As per IS 2633/ TPCODL Specification		10%	P	W
3	Routine Test AB Switch	3.1	1)Power Frequency Voltage Dry Test 2)Measurement of Resistance of main circuit 3)Operating Test	Routine Checks	IS-9920, Technical specification Approved Drgs	IS-9920, Technical specification Approved Drgs	100%	P	W
4	Acceptance Tests for ab Switch	4.1	Visual Examination	Physical	IS-9920/9921,Part-I-IV	IS-9920/9921,Part-I-IV	100%	P	W
		4.2	Dimension	Physical	Approved Drgs.	Approved Drgs.	Sample as per IS: 2500	P	W
		4.3	Verification of component	Physical				P	W
		4.4	Operational check	Physical	IS-9920, Part-I-IV	IS-9920, Part-I-IV		P	W
		4.5	Measurement of Resistance on main circuits	Electrical				P	W
		4.6	Power Frequency withstand voltage test	Electrical				P	W

### 54.9 Ring Main Unit

		<b>TP Central Odisha Distribution Limited</b> <b>(A Tata Power &amp; Odisha Govt. joint venture)</b>							
		<b>QUALITY ASSURANCE PLAN for RMU</b>							
Doc. Title		Quality Assurance Plan for RMU							
Doc. No.		TPCODL-EQ-MQAP-09						Issue Date: 28.01.2022	
Rev. No.		0						Other detail:	
Prepared By: Parikshit Panday		Reviewed By: Phiroj Kumar Uttaray				Approved By: Pourush Garg		Issued By: Rajkumar Rastogi	
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
1	Support Structure and Front frame Assembly (Steel Sheet)	1.1	Visual Inspection	Visually Check	Test certificate conform to IS 513	Test certificate conform to IS 513	100%	R	R
		1.2	Material	Measurement				R	R
		1.3	Dimension	Visually Check				R	R
2	Stainless Steel Tank	2.1	Visual Inspection	Visually Check	Test certificate conform to IS 513	Test certificate conform to IS 513	100%	R	R
		2.2	Material	Measurement				R	R
		2.3	Dimension	Visually Check				R	R

TPCODL TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET			
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 196 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

3	Interrupter (If applicable)	3.1	Visual Inspection	Visually Check	AS per Bidder's Drg./Relevant IS	Test certificate conform to Bidder's Drawing/ Relevant IS	100%	R	R
		3.2	Dimension	Measurement				R	R
		3.3	Material	Visually Check				R	R
		3.4	Mechanical Properties	Mechanical				R	R
		3.5	Pressure Test (For encloser)	Mechanical				R	R
		3.6	Silver Plating thickness	Measurement				R	R
		3.7	Visual Inspection of interrupter parts like Nozzle, Fixed arcing contact, tulip arcing contact Etc.	Visually Check				R	R
		3.8	Type Test	Electrical			1 no of each Rating.	R	R
4	Relay	4.1	Appearance and finish	Visually Check	TC conforming to IEC 60255 and other relevant IS.	TC conforming to IEC 60255 and other relevant IS.	100%	R	R
		4.2	Rating and Type	Electrical				R	R
		4.3	Routine Test	Electrical				R	R
		4.4	Type Test	Electrical			1 no of each Rating.	R	R
5	Bus bars	5.1	Surface Finish	Visually Check	As per IS 613	TC conforming to IS 613 /TS/ Approved Drg.	100%	R	R
		5.2	Material	Visually Check				R	R
		5.3	Dimensions	Measurement				R	R
		5.4	Hardness	Mechanical				R	R
		5.5	Conductivity.	Electrical				R	R
6	Current Transformer(Metering core to be provide)/PT	6.1	Appearance and finish	Visually Check	As per IEC 60044 and other relevant IS.	TC conforming to IEC 60044 and other relevant IS.	100%	R	R
		6.2	Rating and Type	Electrical				R	R
		6.3	Routine Test	Electrical				R	R
		6.4	Type Test	Electrical			1 no of each Rating.	R	R
7	Bushing	7.1	Visual Inspection	Visually Check	As Per IS 62155	Test certificate conforming to IS 62155	100%	R	R
		7.2	Dimensions	Measurement				R	R
		7.3	Routine electrical Test	Electrical				R	R
8	SF6 GAS	8.1	Dielectric Strength	Electrical	As Per IEC 60376/ IEC 1634	Test certificate conforming to IEC 60376/ IEC 1634	100%	R	R
		8.2	Composition Test	Chemical				R	R
		8.3	Oxygen dipping Test	Chemical				R	R
<b>B.</b>	<b>Process Description:-</b>	<b>Stage Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>				
1	Load Break Switch	1.1	Visual Inspection	Visually Check	As per Bidder's Drg./Relevant IS	Test report conforming to relevant IS.	1 No of each RO	R	R/W
		1.2	Dimensions	Measurement				R	R/W
		1.3	Functional Check.	Electrical				R	R/W
2	Circuit Breaker Assembly (If applicable)	2.1	Rating of coil Motor	Visual	As per IEC 62271-100	Test certificate conforming to is TS / IEC 62271-100	1 No of each RO	R	R/W
		2.2	Auxiliary Switch	Visual				R	R/W
		2.3	Wiring Correctness	Continuity				R	R/W
		2.4	Gear Box, Spring Charging	Mechanical				R	R/W
		2.5	CB opening and Closing time	Mechanical				R	R/W
		2.6	Stroke adjustment	Mechanical				R	R/W
		2.7	Contact Pressure/travel	Measurement				R	R/W
		2.8	Routine Test	Electrical				R	R
		2.9	Mechanical endurance Test	Mechanical	As per TS/IS/IEC/Approved GTP			R	R
		2.10	Electrical Endurance test	Electrical	As per TS/IS/IEC/Approved GTP			R	R
		2.11	Restriking class	Electrical	As per TS/IS/IEC/Approved GTP			R	R
		2.12	DC voltage drop test of main circuit	Electrical	As per TS/IS/IEC/Approved GTP			R	R
		2.13	Operation Class	Electrical	As per TS/IS/IEC/Approved GTP			R	R
		2.14	Type Test	Electrical	As per Relevant IS/IEC			As per Relevant IS/IEC	1 no of each Rating.



<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>	
<b>TECHNICAL BOOKLET</b>		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 197 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

3	Dis connector assembly	3.1	Visual	Visual	As per Bidder's Drg./Relevant IS	Test report conforming to relevant IS.	1 No of each RO	P	R/W
		3.2	Dimensions	Measurement				P	R/W
		3.3	Functional Check.	Electrical				P	R/W
4	Tank Assembly	4.1	Visual	Visual	As per Bidder's Drg./Relevant IS	Test report conforming to relevant IS.	1 No of each RO	P	R/W
		4.2	Dimensions	Measurement				P	R/W
		4.3	Functional Check.	Electrical				P	R/W
5	SF6 GAS Leakage Test	4.3	CR test	Electrical	As per IEC 62271-200	Test report conforming to IEC 62271-200	1 No of each RO	P	R/W
		3.1	Measurement Leak Rate	Mechanical				P	R/W
		3.2	PD and HV Test	Electrical				P	R/W
6	Mechanism Mounting	5.1	Visual	Visual	As per Bidder's Drg./Relevant IS	Test report conforming to relevant IS.	1 No of each RO	P	R/W
		5.2	Dimensions	Measurement				P	R/W
		5.3	Functional Check.	Electrical				P	R/W
7	Welding/Fabrication MS component and powder coating	6.1	Visual	Physical	As per Approved Drawing	As per Approved Drawing	1 No of each RO	P	R/W
		6.2	Dimensions with thickness	Physical				P	R/W
		6.3	Filment/Assembly	Physical				P	R/W
<b>C. Process Description:-</b>		<b>Final Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>				
<b>Sl. No.</b>	<b>Equipment/ Operation</b>		<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>	
1	Routine Test	1.1	1. Power Frequency Withstand Test.	Electrical	As per approved GTP/TS/Relevant IEC 62271	As per approved GTP/TS/Relevant IEC 62271	100%	BA	TPCODL
								P	R/W
		1.2	2. Dimensional & Visual Checks (Weight)	Electrical				P	R/W
		1.3	3. Operational & Interlock Tests of breaker & isolator switches	Electrical				P	R/W
		1.4	4. Measurement of Circuit Resistance	Electrical				P	R/W
		1.5	5. SF-6 chamber pressure withstands/leakage test.	Electrical				P	R/W
		1.6	6. HV withstand test across isolator distance.	Electrical				P	R/W
		1.7	7. HV withstand test of control and auxiliary circuits.	Electrical				P	R/W
		1.8	8. Voltage Indication Tests.	Mechanical				P	R/W
		1.9	9. Breaker Contact Resistance Test	Electrical				P	R/W
		1.10.	10. Total Trip Time Check Test through Current Injection in primary.	Electrical				P	R/W
		1.11	11. IR Value	Electrical	P	R/W			
		1.12	Below routine test has to be provided on cable Boot for cable termination:	Electrical	P	R			
		1.13	a) Visual inspection of the final finished product.	Electrical	P	R			
		1.14	b) Intactness with Bushing.	Mechanical	P	R			
		1.15	c) Insulation Test.	Visual	P	R			
		1.16	d) AC HV test	Electrical	P	R			
		1.17	Routine Test for CT & PT Unit CT: (As per IS2705 Part 2) & PT: (As per 3156.1.1992)		P	R			
		1.18	Verification of terminal marking and polarity		P	R			
		1.19	Power frequency dry withstand tests on primary windings		P	R			
		1.20.	Power frequency dry withstand tests on secondary windings		P	R			
		1.21	Over voltage inter-turn tests		P	R			
1.22	Partial discharge test in accordance with IS 11322-1985		P	R					
1.23	Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.		P	R					
1.23	Accuracy & Ratio test (CT): At 20%, 100% & 120%		P	R					
2	Type Test	11kV RMU Without Metering	Electrical	AS per approved GTP / Tech Spec	AS per approved GTP / Tech Spec	1 no of each Rating.	P	R	
		1	Lightening Impulse test				Electrical	P	R
		2	Power Frequency Voltage Test				Electrical	P	R
		3	Temperature Rise Test				Electrical	P	R
		4	Measurement of Circuit Resistance				Electrical	P	R

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		<b>TECHNICAL BOOKLET</b>	
<b>Document Title</b>		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date: 23.08.2022</b>	
<b>Revision No.</b>	02	<b>Page 198 of 259</b>	
<b>Prepared by:</b> Engineering & Quality Dept	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Rajkumar Rastogi

	5	Rated Short Time and Peak Current Withstand test for main and Earth Circuit.	Electrical			P	R
	6	Breaking and Making Capacity Test for Breaker & Isolating Switches	Electrical			P	R
	7	Operational & Interlock Performance Test	Electrical			P	R
	8	Internal Arc Withstand Test	Electrical			P	R
	9	Degree of Protection (IP Code verification tests)	Electrical			P	R
	10	Mechanical Endurance Tests for Isolator and Breaker	Electrical			P	R
	11	Pressure withstand test & Leakage test on SF-6 Gas chamber	Electrical			P	R
	12	Dimensional and Visual Checks	Electrical			P	R
	13	Salt spray Test for 1000Hrs	Electrical			P	R
	<b>11kV RMU With Metering</b>		Electrical			P	R
	1	Dimensional and visual check	Electrical			P	R
	2	Temperature rise test	Electrical			P	R
	3	Internal Arc withstand test	Electrical			P	R
	4	Degree of protection test	Electrical			P	R
	5	Salt spray Test for 1000Hrs	Electrical			P	R
	6	Mechanical endurance test	Electrical			P	R
	7	Internal Arc test - IAC Test. Tank and Cable compartment (IAC-AFLR)	Electrical			P	R
	8	Degree of Protection (IP Code verification tests)	Electrical			P	R
	9	Temperature rise test	Electrical			P	R
	10	Making and Breaking test for switch and VCB	Electrical			P	R
	11	Lighting Impulse Test	Electrical			P	R
	12	Power Frequency Voltage Test	Electrical			P	R
	13	Measurement of Circuit resistance	Electrical			P	R
	14	Rated Short Circuit Time and Peak Current Withstand test for Main and Earth Circuit	Electrical			P	R
	15	Operational and Interlock Performance Test	Electrical			P	R
	16	Pressures withstand Test & Leakage Test on SF-6 Gas Chamber	Electrical			P	R
	17	Dimensional and Visual Check	Electrical			P	R
	<b>RMU with CT PT</b>		Electrical			P	R
	1	Temperature rise test	Electrical			P	R
	2	IP 54 Test	Electrical			P	R
	3	Short time current tests (Short circuit withstand test for Metering cubicle along with RMU + CT, PT, busbar and insulator)	Electrical			P	R
	<b>33kV RMU Without Metering</b>		Electrical			P	R
	1	Dimensional and visual check	Electrical			P	R
	2	Mechanical operation test and checking of interlocks	Electrical			P	R
	3	Dielectric test on main and control circuits	Electrical			P	R
	4	Temperature rise test	Electrical			P	R
	5	Internal Arc withstand test	Electrical			P	R
	6	Degree of protection test	Electrical			P	R
	7	Test to check the capability of main and earthing circuits subjected to rated peak and short time withstand current	Electrical			P	R

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>	
		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 199 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			


	8	Stability Test on the self powered electronic relay	Electrical			P	R
	9	Contact Resistance Measurement (CRM),Hi Pot Test with Leakage current Test	Electrical			P	R
	10	Gravimetric test (Water absorption)	Electrical			P	R
	11	Trial Tripping of the main circuit from the relay.	Electrical			P	R
	12	Salt spray Test for 1000Hrs	Electrical			P	R
	<b>33kV RMU With Metering</b>		Electrical			P	R
	1	Dimensional and visual check	Electrical			P	R
	2	Mechanical operation test and checking of interlocks	Electrical			P	R
	3	Dielectric test on main and control circuits	Electrical			P	R
	4	Temperature rise test	Electrical			P	R
	5	Internal Arc withstand test	Electrical			P	R
	6	Degree of protection test	Electrical			P	R
	7	Test to check the capability of main and earthing circuits subjected to rated peak and short time withstand current	Electrical			P	R
	8	Stability Test on the self powered electronic relay	Electrical			P	R
	9	Contact Resistance Measurement (CRM),Hi Pot Test with Leakage current Test	Electrical			P	R
	10	Trial Tripping of the main circuit from the relay.	Electrical			P	R
	11	Salt spray Test for 1000Hrs	Electrical			P	R
	12	Dielectric Withstand Test of breaker in combination with isolator	Electrical			P	R
	13	Short time withstand - STC withstand test	Electrical			P	R
	14	Mechanical endurance test	Electrical			P	R
	15	Internal Arc test - IAC Test. Tank and Cable compartment (IAC-AFLR)	Electrical			P	R
	16	Degree of protection test – IP67 test for tank and IP54 test for GI enclosure	Electrical			P	R
	17	IK07 impact test	Electrical			P	R
	18	Partial discharge test	Electrical			P	R
	19	Temperature rise test	Electrical			P	R
	20	Making and Breaking test for switch and VCB	Electrical			P	R
	21	Salt Spray Test for 1000Hrs	Electrical			P	R
	22	Lighting Impulse Test	Electrical			P	R
	23	Power Frequency Voltage Test	Electrical			P	R
	24	Measurement of Circuit resistance	Electrical			P	R
	25	Rated Short Circuit Time and Peak Current Withstand test for Main and Earth Circuit	Electrical			P	R
	26	Operational and Interlock Performance Test	Electrical			P	R
	27	Pressures withstand Test & Leakage Test on SF-6 Gas Chamber	Electrical			P	R
	<b>RMU with CT PT</b>		Electrical			P	R
	1	Temperature rise test	Electrical			P	R
	2	IP 54 Test	Electrical			P	R
	3	Short time current tests (Short circuit withstand test for Metering cubicle along with RMU + CT, PT, busbar and insulator)	Electrical			P	R

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>	
		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page <b>200</b> of <b>259</b>
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

3	Acceptance Test	3.1	All the tests specified under Routine Test Clause above shall be carried out as acceptance test	Electrical	As Per IEC 62271	Test report Conforming to IEC 62271/TS/Approved GTP	20%	P	W				
		3.2	PD Test On RMU Module	Electrical				P	W				
		3.3	CB Test-Opening shunt coil Test at 100% and 70% of rated voltage.	Electrical				P	W				
		3.4	CT testing and Ratio Verification.	Electrical				P	W				
		3.5	Checking relay characteristics (IDMT, Instantaneous for over current and earth fault)by primary injection through CT. Function test for tripping.	Electrical				P	W				
		3.6	Control Circuit: Electrical test on breaker and isolator (LBS- where motorized assembly is there in supply) at rated control supply voltage, 110% close open, 85% close and 70% open/ trip- Measurement of IR before and after HV test.- Stability test to check correct polarity of CT and breaker tripping.- Primary current injection test-FPI checks- Shunt coil trip test at various control voltages -Dimension checks and phase to phase clearance checks - SF6 gas contact operation check	Electrical				P	W				
		3.7	Voltage Presence Indication System	Electrical				P	W				
		3.8	Verification of wiring Circuit	Electrical				P	W				
		Acceptance Test of CT & PT Unit									P	W	
		3.9	1. Verification of terminal marking and polarity 2. Power frequency dry withstand tests on primary windings 3. Power frequency dry withstand tests on secondary windings 4. Over voltage inter-turn tests 5. IR for CT secondary @ 500 V 6. IR for PT secondary @ 500 V 7. Partial discharge test in accordance with IS 11322-1985	Electrical				As per TS/IS/IEC/Approved GTP	As per TS/IS/IEC/Approved GTP	100%	P	R	
4	Name plate and marking	4.1	AS per approved GTP / Tech Spec	Visual	AS per approved GTP / Tech Spec	AS per approved GTP / Tech Spec	100%	P	R				
Note : Type test from CPRI/ERDA not exceed from 5 Years.													

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TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET			
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 201 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

54.10 IPC Connectors

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)									
		<b>QUALITY ASSURANCE PLAN FOR IPC CONNECTORS</b>									
Doc. Title		Quality Assurance Plan for IPC Connectors						Issue Date: 31.01.2022			
Doc. No.		TPCODL-EQ-MQAP-10						Other detail:			
Rev. No.		0						Issued By: Rajkumar Rastogi			
Prepared By: Kalinkar Mohanty		Reviewed By: Phiroj Kr. Uttaray			Approved By: Pourush Garg						
A.	Process Description:-	Raw Material Inspection				W-Witness, P-Perform, R-Review					
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks		
							BA	TPCODL			
1	PVC Compound/Glass reinforced polyamide	1.1	Material from approved Vendor	Physical	Raw materials TC Verification	Technical specification/TC Verification	100%	R	R		
		1.2	Visual	Physical	Free from all imperfections	Technical Specification/ TC Verification	100%	R	R		
		1.3	Dimension	Measurement	As per approved drawing	Technical Specification	100%	R	R		
		1.4	water content	Measurement	<_0.30 %	Technical specification/Raw material TC verification	As per IS2500	R	R		
		1.5	ash content	Measurement	60+_3.00 %	Technical Specification/Raw material TC verification		R	R		
		1.6	Density	Measurement	1.66+_0.3	ISO-1183/TC Verification		R	R		
		1.7	Tensile strength at yield	Measurement	190+_5.00Mpa	ISO-527/TC Verification		R	R		
		1.8	Izod impact strength	Measurement	15+_3.00 KJ/M2	ISO-180/ 1A/TC Verification		R	R		
2	Tinned copper/aluminium alloy	2.1	Material from approved Vendor	Physical	Raw material procured TC Verification/ Technical specification	Technical Specification		100%	R	R	
		2.2	Visual	Physical	Free from all imperfections, no visual defects.	As per technical specification		100%	R	R	
		2.3	Tensile strength	Mechanical	As per IS 5082-1998/IS 191/IS 613/1987	IS 5082-1998/ IS191/613/1987/Technical Specification/TC verification		IS-2500	R	R	
		2.4	% Elongation	Mechanical	As per IS 5082-1998/IS 191/IS 613/1987	IS 5082-1998/ IS191/613/1987/Technical Specification/TC verification	R		R		
		2.5	Electrical conductivity	Electrical	As per IS 5082-1998/IS 191/IS 613/1987	IS 5082-1998/ IS191/613/1987/Technical Specification/TC verification	R		R		
		2.6	Electrical resistivity	Electrical	As per IS 5082-1998/IS 191/IS 613/1987	IS 5082-1998/ IS191/613/1987/Technical Specification/TC verification	R		R		
		2.7	Chemical composition	Chemical	As per IS 617-1994,TS .	As per IS 617-1994,TS/TC verification .	As per IS2500		R	R	
3	GI Steel nut bolts & washers	3.1	Material from approved Vendor	Physical	Raw material procured TC Verification/ Technical specification	IS-1367/IS-2633/Technical Specification/TC verification	100%		R	R	
		3.2	Visual	Physical	Free from all imperfections, no visual defects.	As per specification	100%		R	R	
		3.3	Dimension	Measurement	As per approved drawing	Technical Specification	100%	R	R		

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 202 of 259			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		

		3.4	Galvanising test							
		3.41	Thickness of zinc coating	Measurement	As per IS2629	As per IS 2629/TC Verification	100%	R	R	
		3.42	Uniformity of zinc	Physical	As per IS2633	As per IS 2633/TC Verification	100%	R	R	
		3.5	Chemical Composition	Chemical	As per IS2062	As per IS2062/TC Verification	IS 2500 (Part-I)	R	R	
		3.6	Twist test on spring washers	Physical	As per IS 3063/TPCODL specification	IS-3063	IS 2500	R	R	
		3.7	Mechanical Test (UTS & % elongation)	Mechanical	As per BS-4190/ IS1367/TPCODL specification	BS-4190/IS1367	IS 2500	R	R	
4	Elastomer seals	4.1	Material from approved Vendor	Physical	Raw materials TC Verification/Technical specification	Technical Specification	100%	R	R	
		4.2	Visual	Physical	Free from all imperfections, no visual defects.	As per specification	100%	R	R	
		4.3	Dimension	Measurement	As per approved drawing	Technical Specification	100%	R	R	

B.		Process Description:-		Stage Inspection		W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	IPC	1.1	Visual Inspection	Visual	Free from all imperfections, no visual defects	Relevant standard/ Technical Specification	IS 2500 (Part-I)	P	R/W	
		1.2	Dimensional check	Measurement	As per approved drawing	Approved drawing		P	R/W	
		1.3	Dielectric voltage test	Physical	Withstood 4KV AC for 60 sec after 30 min under water dip	Relevant standard/ EN-50483		P	R/W	
		1.4	Water tightness test	Physical	No trace of water shall be observed at the end of core.	Relevant standard/ EN-50483		P	R/W	
		1.5	Shear head function test	Mechanical	shear hear shear should be within tolerance of manufacture specified torque	Relevant standard/ EN-50483		P	R/W	
		1.6	Connector bolt tightening test at specified torque range	Physical	connector and contact teeth shall be undamaged or undeform condition	Relevant standard/ EN-50483		P	R/W	
2	Elastomer Seals	3.1	Visual	Physical	Free from all imperfections, no visual defects.	As per specification	100%	R	R/W	
		3.2	Dimension	Measurement	As per approved drawing	Technical Specification	100%	R	R/W	

C.		Process Description:-		Type Test		W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	IPC connectors	1.1	Branch cable pull-out test	Physical	core slippage should not exceed 3mm	Relevant standard/ EN-50483	one sample of each size/type	P	R	
		1.2	low temperature impact test	Physical	Electrical continuity shall be achieved at torque less than or equal to 70% of specified Torque	Relevant standard/ EN-50483		P	R	
		1.3	Dielectric voltage test	Physical	Withstood 4KV AC for 60 sec after 30 min under water dip	Relevant standard/ EN-50483		P	R	

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		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 203 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			


		1.4	Water tightness test	Physical	No trace of water shall be observed at the end of core.	Relevant standard/ EN-50483		P	R		
		1.5	Shear head function test	Mechanical	shear hear shear should be within tolerance of manufacture specified torque	Relevant standard/ EN-50483		P	R		
		1.6	Connector bolt tightening test at specified torque range	Physical	connector and contact teeth shall be undamaged or undeform condition	Relevant standard/ EN-50483		P	R		
		1.7	Climatic aging test method 2	Physical	After aging test, meet the dielectric voltage test in air	Relevant standard/ EN-50483		P	R		
		1.8	Electrical aging test	Physical	Meet requirement as per EN-50483 (for 1000cycles)	Relevant standard/ EN-50483		P	R		
		1.9	Corrosion test	Physical	IPC not affected by corrosive atmosphere	Relevant standard/ EN-50483		P	R		
<b>D.</b>	<b>Process Description:-</b>	<b>Final Inspection</b>				<b>W-Witness, P-Perform, R-Review</b>					
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
								BA	TPCODL		
1	IPC Connectors	1.1	Visual Inspection	Visual	Surface of all components shall be smooth & free from damaged, nicks & cavity	Approved drawing/ TPCODL Specification	100%	P	W		
		1.2	Colour of contact seals	Visual	blue		100%	P	W		
		1.3	Dimension Check	Measurement	As per approved drawing		100%	P	W		
		1.4	Dielectric voltage test	Physical	Withstood 4KV AC for 60 sec after 30 min under water dip	As per EN 50483 /NFC33020/TPCODL Specification		P	W		
		1.5	Water tightness test	Physical	No trace of water shall be observed at the end of core.			P	W		
		1.6	Shear head function test	Physical	shear hear shear should be within tolerance of manufacture specified torque			P	W		
		1.7	Connector bolt tightening test at specified torque	Physical	connector and contact teeth shall be undamaged or undeform condition			P	W		
		1.8	Temp. Rise test	Physical	Temperature rise test shall be conducted on randomly selected samples from offered lot by installing one IPC on two pieces of one meter of AB cable of respective sizes and apply rated continuous current (as mentioned in GTP for that particular conductor), the Elastomer caps shall be provided on tapped cable. Temperature shall be recorded using thermocouples on IPC contacts and ABC conductor (100mm vicinity of IPC) at every 20 minute until continuous three readings are of same value. Temperature shall not exceed at IPC contacts compared to ABC conductor	As Per TS/ GTP	IS 2500		P	W	
		1.9	Thickness of Tin coating at contact plates	Physical	Minimum 6 microns/ As per TS	As Per TS/ GTP			P	W	
		1.91	Glow wire test	Physical	As per IEC 60695 -2-11	IEC 60695-2-11			P	W	
2	GI Nuts , Bolts & washers	2.1	Visual	Physical	Free from all imperfections, no visual defects.	As per specification	100%	R	W		

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 204 of 259			
Prepared by:	Reviewed By:	Approved By:	Issued By:		
Engineering & Quality Dept	Phiroj Uttaray Khajan C. Bhardwaj	Pourush Garg	Rajkumar Rastogi		

		2.2	Dimension	Measurement	As per approved drawing	Technical Specification	100%	R	W		
		2.3	Galvanising test								
		2.31	Thickness of zinc coating	Measurement	As per IS2629	As per IS 2629/IS 2633	IS 2500	R	W		
		2.32	Uniformity of zinc	Physical	As per IS2633			R	W		
		2.4	Twist test on spring washers	Physical	As per IS 3063/TPCODL specification	IS-3063	IS 2500	R	W		
		2.5	Mechanical Test (UTS & % elongation)	Mechanical	As per BS-4190/ IS1367/TPCODL specification	BS-4190/IS1367	IS 2500	R	W		
3	Elastomer Seals	3.1	Visual	Physical	Free from all imperfections, no visual defects.	As per specification	100%	R	W		
		3.2	Dimension	Measurement	As per approved drawing	Technical Specification	100%	R	W		
4	Marking	3.1	Marking	Visual	As per TS/ GTP	As Per TS/ GTP	100%	P	W		

E.		Process Description:-		Packing & Pre-shipment			W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Packing & Pre-shipment	1.1	Physical Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R	
		1.2	Packing List Verification	Measurement	The Packing List should be in complete set as per Inspection Call requirement.	Inspection Call Letter	100%	P	R	

#### 54.11 Eye Hook & Pole Clamp

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)									
		<b>QUALITY ASSURANCE PLAN FOR EYE HOOK &amp; POLE CLAMP</b>									
Doc. Title		Quality Assurance Plan for Structural Eye Hook & Pole Clamp							Issue Date: 31.01.2022		
Doc. No.		TPCODL-EQ-MQAP-11							Other detail:		
Rev. No.		0							Issued By: Rajkumar Rastogi		
Prepared By: Kalinkar Mohanty		Reviewed By: Phiroj Kr. Uttaray				Approved By: Pourush Garg					
A.		Process Description:-		Raw Material Inspection			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
								BA	TPCODL		
1	Structural Steel (Flat/Rod)	1.0	Material from approved Vendor	Physical	Raw material to be procured from SAIL, JINDAL, TATA	Technical Specification/TC Verification	100%	R	R		
		1.1	Surface Finish	Physical	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	IS 2062	100%	R	R		
		1.2	Dimension	Measurement	As per approved drawing/GTP	IS 1730/ Technical Specification	100%	R	R		
		1.3	Mechanical Test								
		1.31	Ultimate Tensile Strength	Mechanical	As per IS 2062/ IS 1608	IS 2062/ IS 1608/TC Verification	100%	R	R		
		1.32	Yield Stress	Mechanical				R	R		
		1.33	% Elongation	Mechanical				R	R		
		1.34	Bend Test	Mechanical				R	R		
2	Zinc for Galvanization	1.4	Chemical Composition	Chemical	As per IS 2062	IS 2062/TC Verification	100%	R	R		
		2.1	Chemical Composition	Chemical	As per IS 209	IS 209/TC Verification	100%	R	R		
B.		Process Description:-		Stage Inspection			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
								BA	TPCODL		
1	Fabrication Structural Steel Member	1.1	Visual Inspection	Visual	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	Relevant standard/ Technical Specification	IS 2500 (Part-I)	P	R/W		
		1.2	Dimensional check	Measurement	As per approved drawing	Approved drawing		P	R/W		



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<b>TECHNICAL BOOKLET</b>							
<b>Document Title</b>				<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
<b>Document No.</b>				TPCODL-ENGG. -001		Issue Date: 23.08.2022	
<b>Revision No.</b>				02		Page <b>205</b> of <b>259</b>	
<b>Prepared by:</b>		Engineering & Quality Dept		<b>Reviewed By:</b>		Phiroj Uttaray Khajan C. Bhardwaj	
				<b>Approved By:</b>		Pourush Garg	
				<b>Issued By:</b>		Rajkumar Rastogi	


		1.3	Edge Security	Measurement	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	One member from each type of structure	P	R/W		
		1.4	Punching & Drilling	Physical	No visual blow holes, slags, undercuts, cracks etc.	Relevant standard/ Technical Specification		P	R/W		
		1.5	Notching	Measurement	As per approved drawing	Approved drawing		P	R/W		
		1.6	Bending	Physical/ Measurement	As per approved drawing/ Technical Specification	Drawing/ Technical Specification		P	R/W		
		1.7	Welding	Measurement	As per approved drawing/ Technical Specification	Drawing/ Technical Specification		P	R/W		
2	Proto-Inspection of Structural Steel Member	2.1	Dimensional Inspection after assembly	Measurement	Dimensions & fixing arrangement to be checked.	Approved drawing		P	R/W		
3	Galvanization of structural steel member	3.1	Degreasing	Chemical	As per IS 2629	IS 2629	IS 2500 (Part-I)	P	R/W		
		3.2	Pickling	Chemical	As per IS 2629	IS 2629		P	R/W		
		3.3	Rinsing	Chemical	As per IS 2629	IS 2629		P	R/W		
		3.4	Pre-fluxing in Zinc Chloride & Ammonium Chloride	Chemical	As per IS 2629	IS 2629		P	R/W		
		3.5	Pre-heating	Thermal	As per IS 2629	IS 2629		P	R/W		
		3.6	Dipping								
		3.61	Zinc bath temperature indicator & verification	Physical	As per IS 2629	IS 2629		P	R/W		
		3.62	Immersion time & withdrawal time	Physical	As per IS 2629	IS 2629		P	R/W		
		3.62	Quenching & Di chromating	Physical	As per IS 2629	IS 2629		P	R/W		
		3.7	Galvanization check								
		3.71	Visual check	Physical	As per IS 2629			P	R/W		
		3.72	Thickness of Zinc Coating	Measurement	As per IS 2629/ TPCODL Specification			P	R/W		
		3.73	Uniformity of Zinc Coating	Physical	As per IS 2633	IS 2629, 2633, 4759/TPCO-OTH-010		P	R/W		
3.74	Mass of Zinc Coating	Physical	As per IS 2629/IS 4759/ TPCODL Specification		P	R/W					
3.8	Adhesion of Zinc Coating (Pivot Hammer Test)	Physical	As per IS 2629		P	R/W					

C.		Process Description:-		Final Inspection		W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility BA TPCODL		Remarks
1	Fabrication Structural Steel Member	1.1	Visual Inspection	Visual	As per approved drawing/ TPCODL Specification	Approved drawing/ TPCODL Specification		P	W	
		1.2	Dimension Check	Measurement					P	W
2	Galvanization of structural steel member	2.1	Visual check	Physical	As per IS 2629	IS 2629, 2633, 4759/TPCO-OTH-010		P	W	
		2.2	Thickness of Zinc Coating	Measurement	As per IS 2629/ TPCODL Specification			P	W	
		2.3	Uniformity of Zinc Coating	Physical	As per IS 2633			P	W	
		2.4	Mass of Zinc Coating	Physical	As per IS 2629/IS4759/ TPCODL Specification			P	W	
		2.5	Adhesion of Zinc Coating (Pivot Hammer Test)	Physical	As per IS 2629			P	W	
3	Physical property of structural steel members	3.1	Ultimate Tensile Strength	Mechanical	As per IS 2062/ IS 1608	IS 2062/ IS 1608		P	W	
		3.2	Yield Stress	Mechanical				P	W	
		3.3	% Elongation	Mechanical				P	W	
		3.4	Bend Test	Mechanical				P	W	
4	Chemical Composition	4.1	Chemical Composition	Chemical	As per IS 2062,TS .(for structural steel)	IS 2062		P	W	
5	Marking	5.1	Marking	Visual	As per TS/ GTP	TS		P	W	

D.		Process Description:-		Packing & Pre-Shipment		W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility BA TPCODL		Remarks
1	Packing & Pre-Shipment	1.1	Physical Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R	
		1.2	Packing List Verification	Measurement	The Packing List should be in complete set as per Inspection Call requirement.	Inspection Call Letter	100%	P	R	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 206 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

54.12 Suspension and Dead End Clamp

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)								
		<b>QUALITY ASSURANCE PLAN FOR SUSPENSION AND DEAD END CLAMP (SS STRIP BINDING TYPE)</b>								
Doc. Title		Quality Assurance Plan for Suspension Clamp & Dead End Clamp with bracket fittings						Issue Date: 31.01.2022		
Doc. No.		TPCODL-EQ-MQAP-12						Other detail:		
Rev. No.		0						Issued By: Rajkumar Rastogi		
Prepared By: Kalikinkar Mohanty		Reviewed By: Phiroj Kr. Uttaray			Approved By: Pourush Garg					
<b>A.</b>										
<b>Process Description:-</b>		<b>Raw Material Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>					
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
							BA	TPCODL		
1	Aluminium Alloy	1.1	Visual	Physical	Free from all imperfections	Technical Specification	100%	R	R	
		1.2	Dimension	Measurement	As per approved drawing	Technical Specification	100%	R	R	
		1.3	Tensile strength	Physical	As per IS 5082-1998	IS 5082-1998/TS/TC verification	As per IS2500	R	R	
		1.4	% Elongation	Mechanical	As per IS 5082-1998	IS 5082-1998/TS/TC verification		R	R	
		1.5	Electrical conductivity	Electrical	As per IS 5082-1998	IS 5082-1998/TS/TC verification		R	R	
		1.6	Electrical resistivity	Electrical	As per IS 5082-1998	IS 5082-1998/TS/TC verification		R	R	
		1.7	Chemical Composition	Chemical	As per IS 617-1994,TS .	IS 617-1994/TS/TC verification	As per IS2500	R	R	
2	PVC Compound/Glass reinforced polyamide	2.1	Material from approved Vendor	Physical	Raw material procured from approved vendor/ Technical specification.	Technical Specification	100%	R	R	
		2.2	Visual	Physical	Free from all imperfections	Technical Specification/ TC Verification	100%	R	R	
		2.3	Dimension	Measurement	As per approved drawing	Technical Specification/ TC Verification	100%	R	R	
		2.4	water content	Measurement	< 0.30 %	Technical specification/ TC verification	As per IS2500	R	R	
		2.5	ash content	Measurement	60+ 3.00 %	Technical Specification/ TC verification		R	R	
		2.6	Density	Measurement	1.66+ 0.3	ISO-1183/TC Verification		R	R	
		2.7	Tensile strength at yield	Measurement	190+ 5.00Mpa	ISO-527/TC verification		R	R	
		2.8	Izod impact strength	Measurement	15+ 3.00 KJ/M2	ISO-180/IA/TC verification		R	R	
3	Steel strip & buckle	3.1	Material from approved Vendor	Physical	Raw material procured from approved vendor/ Technical specification.	Technical specification	100%	R	R	
		3.2	Visual	Physical	Free from all imperfections	Technical specification/TC verification	100%	R	R	
		3.3	Dimension	Measurement	As per approved drawing	Technical Specification	100%	R	R	
		3.4	Tensile strength	Mechanical	10.2 KN/ Technical specification	Technical specification/TC verification	As per IS2500	R	R	
4	GI Steel nut ,bolts & washers	4.1	Material from approved Vendor	Physical	Raw material procured TC Verification/ Technical specification	IS-1367/IS-2633/Technical Specification/TC verification	100%	R	R	
		4.2	Visual	Physical	Free from all imperfections, no visual defects.	As per specification	100%	R	R	

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 207 of 259			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		

		4.3	Dimension	Measurement	As per approved drawing	Technical Specification/TC verification	100%	R	R	
		4.4	Galvanising test							
		4.31	Thickness of Zinc Coating	Measurement	As per IS 2629/ TPCODL Specification	IS 2629, 2633,/TC Verification	IS 2500 (Part-I)	R	R	
		4.32	Uniformity of Zinc Coating	Physical	As per IS 2633			R	R	
		4.33	Chemical composition	Chemical	As per IS 2062	IS 2062/TC verification		R	R	
		4.5	Mechanical Test (UTS & % elongation)	Mechanical	As per BS-4190/ IS1367/TPCODL specification	BS-4190/IS1367/TC Verification		R	R	
		4.6	Twist test on spring washers	Physical	As per IS 3063/TPCODL specification	IS-3063/TC verification		R	R	

B.		Process Description:-			Stage Inspection		W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Proto-Inspection of Structural Member with fittings	1.1	Dimensional Inspection after assembly	Measurement	Dimensions & fixing arrangement to be checked.	Approved drawing	One member from each type of structure	P	R/W	
2	Slip strength test	2.1	Slip strength after assembly	Physical	No slip occurs with one minute hold on messenger wire on Applying 25% of UTS load of messenger wire for suspension & 90 % of UTS load of messenger wire for dead end clamp.	As per IS 2486 part-1/ NFC 33040-41/Technical specification	IS 2500 (Part-I)	P	R/W	
3	Mechanical Tensile Strength	3.1	Ultimate Tensile Strength	Mechanical	30 KN(Max) /Technical specification	As per IS2486 part-1/ NFC 33040-41/Technical specification	IS 2500 (Part-I)	P	R/W	

C.		Process Description:-			Final Inspection		W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Fabrication Structural Alloy Member	1.1	Visual Inspection	Visual	As per approved drawing/ TPCODL Specification	Approved drawing/ Technical Specification	IS 4759 (1996)/IS 2500	P	W	
		1.2	Dimension Check	Measurement				P	W	
2	Nuts , bolts & washers(Galvanising if applicable)	2.1	Visual check	Physical	Free from all imperfections	Approved drawing/ Technical Specification		P	W	
		2.2	Dimensions	Measurement	As per approved drawing			P	W	
		2.3	Galvanising test			IS 2629, 2633,4759		P	W	
		2.31	Thickness of Zinc Coating	Measurement	As per IS 2629/ TPCODL Specification			P	W	
		2.32	Uniformity of Zinc Coating	Physical	As per IS 2633	P		W		
		2.4	Mechanical Test (UTS & % elongation)	Mechanical	As per BS-4190/ IS1367/TPCODL specification	BS-4190/IS1367		P	W	
2.5	Twist test on spring washers	Physical	As per IS 3063/TPCODL specification	IS-3063	P	W				
3	Mechanical Tensile Strength	3.1	Ultimate Tensile Strength	Mechanical	30KN (Max)/ Technical specification/ IS-2486 part-1/ NFC 33040-41	IS 2486 part-1/ NFC 33040-41/TS		P	W	
4	Chemical Composition of structural alloy member	4.1	Chemical Composition	Chemical	As per IS 617-1994 /TS .	IS 617-1994/TS	P	W		
5	Slip strength Test	5.1	Slip strength	Physical	No slip occurs with one minute hold on messenger wire on Applying 25% of UTS load of messenger wire for suspension & 90 % of UTS load of messenger wire for dead end clamp	IS 2486 (Part-I)/ NFC 33040-41/TS	P	W		

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 208 of 259			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		

6	Glow wire Test	7.1	Glow wire test	Physical	As per IEC 60695 -2-11	As per IEC 60695-2-11/TS		P	W	
7	Steel strip & buckle	8.1	Visual	Physical	Free from all imperfections	Technical Specification		P	W	
		8.2	Dimension	Measurement	As per approved drawing	Technical Specification		P	W	
		8.3	Tensile strength	Mechanical	10.2 KN/ Technical specification	Technical Specification		P	W	
		9.1	Marking	Visual	As per TS/GTP	TS/GTP		P	W	
<b>D. Process Description:- Packing &amp; Pre-shipment W-Witness, P-Perform, R-Review</b>										
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
1	Packing & Pre-shipment	1.1	Physical Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	BA	TPCODL	
		1.2	Packing List Verification	Measurement	The Packing List should be in complete set as per Inspection Call requirement.	Inspection Call Letter	100%	P	R	

### 54.13 Power Transformer

		<b>TP Central Odisha Distribution Limited</b> <b>(A Tata Power &amp; Odisha Govt. joint venture)</b> <b>QUALITY ASSURANCE PLAN for Power Transformer</b>								
Doc. Title		Quality Assurance Plan for Power Transformer								
Doc. No.		TPCODL-EQ-MQAP-13						Issue Date: 04.02.2022		
Rev. No.		0						Other detail:		
Prepared By: Parikshit Panday		Reviewed By: Phiroj Kr. Uttaray Approved By: Pourush Garg				Issued By: Rajkumar Rastogi				
A.	Process Description:-	Raw Material Inspection				W-Witness, P-Perform, R-Review				Remarks
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		
1	CRGO Lamination	1.1	Test Certificate	Visually Check	TC Verification	IS 3024	100%	R	R	
		1.2	Visual Inspection	Visually Check	Edge should be straight without any bends	IS 3024	100%	R	R	
		1.3	Thickness	Thickness test by micro meter	0.27mm (Max)	IS 3024	100%	R	R	
		1.4	Grade of material	Physical	M3 or Better	IS 3024		R	R	
		1.5	Specific core loss @ 1.7 Tesla, 50Hz (Max)	Electrical	1.21 W/KG	IS 3024		R	R	
2	Winding/Coil	2.1	Bare Dia.	Measure By micro meter	0 defects	IS 7404 part II/IS 6160	100%	R	R	
		2.2	Covered Dia.	Visually Check		IS 7404 part II/IS 6160		R	R	
		2.3	No. of Covering			IS 7404 part II/IS 6160		R	R	
		2.4	Covering Style			IS 7404 part II/IS 6160		R	R	
		2.5	Quantity/Weight	Weight by Weighing Scale	As per PO	IS 7404 part II/IS 6160	100%	R	R	
		2.6	Test Certificate	Visually Check	Each certificate	IS 7404 part II/IS 6160	100%	R	R	
		2.7	Current Density Max	Physical	For AL winding 1.6 A/mm <sup>2</sup> & for Cu winding 2.5 A/mm <sup>2</sup>	IS 7404 part II/IS 6160	100%	R	R	
		2.8	Resistivity	check with micro ohm meter	0 defects	IS 7404 part II/IS 6160	100%	R	R	
3	Transformer Oil	<b>A Function</b>								
		3.1	Viscosity at 40 Deg C	Physical	15 mm <sup>2</sup> /S, Max	Test Certificate conforming to IS 335 :2018 / TS	100%	R	R	
		3.2	Viscosity at 0 Deg. C	Physical	1800 mm <sup>2</sup> /S, Max			R	R	
		3.3	Viscosity at -30 Deg. C	Physical	--			R	R	
3.4	Viscosity at -40 Deg. C	Physical	--	R	R					

TPCODL TP CENTRAL ODISHA DISTRIBUTION LIMITED		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET	
Document Title	<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
Document No.	TPCODL-ENGG. -001	Issue Date:	23.08.2022
Revision No.	02	Page	209 of 259
Prepared by:	Reviewed By:	Approved By:	Issued By:
Engineering & Quality Dept	Phiroj Uttaray Khajan C. Bhardwaj	Pourush Garg	Rajkumar Rastogi

		3.5	Pour point	Physical	- 10 deg C, Max to be based on LCSET refer Table 1			R	R		
		3.6	Water content	Physical	30 mg/kg /40 mg/ Kg, Max			R	R		
		3.7	Breakdown voltage	Electrical	30 kV/70 kV, Min			R	R		
		3.8	Density at 20 Deg C	Physical	0.895 g/ml, Max			R	R		
		3.9	DDF at 90 Deg.	Electrical	0.500, Max			R	R		
		3.10	Particle content		No general requirement			R	R		
		<b>B Refining/Stability</b>									
		3.11	Appearance		Clear, Free from sediment and suspended matter	Test Certificate conforming to IS 335 :2018 / TS			R	R	
		3.12	Acidity	Electrical	0.01 mg KOH/g, Max				R	R	
		3.13	Interfacial Tension	Electrical	No general requirement				R	R	
		3.14	Total sulphur content	Electrical	No general requirement				R	R	
		3.15	Corrosive sulphur		Not corrosive				R	R	
		3.16	Potentially corrosive sulphur	Electrical	Not corrosive				R	R	
		3.17	DBDS	Electrical	Not detectable (< 5 mg/kg)				R	R	
		3.18	Inhibitors according to IS 13631/IEC 6666		(U) Uninhibited oil: not detectable (<0.01%)		100%		R	R	
				Chemical	(T) Trace inhibited oil: < 0.08%				R	R	
				Chemical	(I) Inhibited oils:0.08%-0.40% (see 3.6 to 3.8)				R	R	
		3.19	Metal passivator additives according to IS 1363/IEC 60666		Not detectable (< 5 mg/kg), or as agreed upon with the purchase				R	R	
		3.20	Other additives	Electrical	CL.NO. 7 OF TABLE 2 OF IS 335: 2018				R	R	
		3.21	2-Furfural and related compounds content	Electrical	Not detectable (<0.05 mg/kg) for each individual compound)				R	R	
		<b>C Performance</b>									
		3.22	Oxidation stability	Electrical	For oils with other antioxidant additives and metal passivator additives	Test Certificate conforming to IS 335 :2018 / TS			R	R	
		a)	Total acidity	Chemical	1.2 mg KOH/g, Max		100%		R	R	
		b)	Sludge	Chemical	0.8%, Max				R	R	
		c)	DDF at 90 Deg C	Chemical	0.500, Max				R	R	
		3.23	Gassing tendency	Physical	No general requirement				R	R	
		3.24	ECT		No general requirement				R	R	
		<b>D Health, Safety and Environment (HSE)</b>									
		3.25	Flash point		135 Deg C, Min				R	R	
		3.26	PCA content		3%, Max		100%		R	R	
		3.27	PCB Content		Not detectable (< 2 mg/kg)				R	R	
		4	Conductor (Strip)	4.1	Bare Dia.	Measure By micrometer	0 defects	IS 7404 part II/IS 6160		R	R
4.2	Covered Dia.						IS 7404 part II/IS 6160	100%	R	R	
4.3	No. of Covering			Visually Check				IS 7404 part II/IS 6160		R	R
4.4	Covering Style							IS 7404 part II/IS 6160		R	R
4.5	Quantity/Weight			Weight by Weighing Scale	As per GTP/ TS		IS 7404 part II/IS 6160		100%	R	R
4.6	Test Certificate			Visually Check	Each certificate		IS 7404 part II/IS 6160		100%	R	R
4.7	Resistivity			check with microohm meter	0 defects		IS 7404 part II/IS 6160		100%	R	R
5	Porcelain Items (Bushing : HT & LT)	5.1	Visual Inspection	Visually Check				R	R		
		5.2	Vrification of Creepage Distance	Measurement				R	R		
		5.3	Porosity test on porcelain	Electrical		TC conforming to IS 2099/TS/ relevant IS	IS:3347,2099		R	R	
		5.4	One minute power frequency dry withstand test	Electrical					R	R	
		5.5	One minute power frequency wet withstand test	Electrical					R	R	
		5.6	Routine Test	Electrical					R	R	
6	Valves (Radiator & Drain Valve)	6.1	Visual Inspection	Visually Check	0 defects and in line with TC	TC conforming to TS/ Approved Drg.	100%	R	R		

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page <b>210</b> of <b>259</b>	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

		6.2	Leakage Test	Manually Check	No Leakage			R	R
		6.3	Dimension and Material	Visually Check				R	R
		6.4	Mechanical operation	Manually Check				R	R
7	Breather		Visual Inspection	Visually Check	0 defects and in line with TC	100%	TC conforming to TS/ Approved Drg.	R	R
		7.2	UV test certificate	Visually Check	In line with TC			R	R
		7.3	Silicagel gel crystal size	Measurement	6 mm (min)			R	R
		7.4	Silicagel Colour	Visually Check	Blue Collure			R	R
8	Dial Type Thermometer	8.1	Visual Inspection	Visually Check		100%		R	R
		8.2	TC	Certificate				R	R
9	Radiator	9.1	Corner Length	Visually Check	0 defects	100%	TC conforming to TS/ Approved Drg.	R	R
		9.2	Fin Width					R	R
		9.3	NO. of fins					R	R
		9.4	Fitting & Location					R	R
		9.5	Inspection Report/TC					R	R
		9.6	Outside Painting					R	R
		9.7	Inside varnish					R	R
		9.8	Leakage Test					Through Compress Air	No Leakage
10	Insulating Material ((Pressboard, Precompressed ,Perma wood board, Kraft paper)	10.1	Dielectric Strength of paper	Measurement	AsperIS:1576/1992	100%	Test certificate conforming to IS 1576	R	R
		10.2	Dimension	Sample Basis				R	R
		10.3	Physical Properties (Density , Tensile strength compressibility, oil absorption Shrinkage)	Measurement				R	R
11	Kraft paper	11.1	Thickness, Min	Measurement	As per IS 8570	100%	Test certificate conforming to IS 8570	R	R
		11.2	Finish	visual				R	R
		11.3	Density Kg/ cm 2	Chemical				R	R
		11.4	Oil absorption %	Chemical				R	R
		11.5	Electrical Strength (BDV)	Electrical				R	R
		11.6	Tensile Strength , Min	Physical				R	R
		11.7	Ageing in air %	Physical				R	R
		11.8	Conductivity of aqueous extract ,mS/m	Chemical				R	R
		11.9	PH of Aqueous extract %	Chemical				R	R
		11.10	Moisture content %	Electrical				R	R
		11.11	Mineral Ash %	Chemical				R	R
12	Rubberised cork sheet / Gasket	12.1	Thickness, Min	Measurement	8 mm	100%	Test certificate conforming to is 4253 / TS	R	R
		12.2	Tensile Strength , Min	Mechanical	15.8 kg/cm 2			R	R
		12.3	Hardness, IRHD	Mechanical	70 +/- 5			R	R
		12.4	Dimensional Change , Max	Mechanical	1.50%			R	R
		12.5	Resistance to Liquid Max	Chemical	15%			R	R
		12.6	Compressibility ,	Mechanical	25-35 %			R	R
		12.7	Chloride content Max	Chemical	0.20%			R	R
		12.8	Sulphate Content, Max	Chemical	0.20%			R	R
		12.9	Recovery, Min	Mechanical	80%			R	R
		12.10	Flexibility	Mechanical	As per IS 4253			R	R
		12.11	Compression set at 110 deg. C for 24 hrs % , Max	Mechanical	85			R	R
		12.12	PH Value of water extract	Chemical	IS:4253-II			R	R
13	MS Sheet	13.1	Chemical Composition	Measurement	As per 2062	100%	Test report conforming to the IS 2062	R	R
		13.2	Mechanical Properties	Measurement				R	R
		13.3	Dimension verification	Measurement				R	R
14	TANK		Inside dimension	Measurement	As Per GTP/ TS	100%	As Per GTP/ TS	R	R
			Length	Measurement				R	R
			Width	Measurement				R	R
			Height	Measurement				R	R
			Outside dimension	Measurement				R	R
			Length	Measurement				R	R
			Width	Measurement				R	R
			Height	Measurement				R	R
			Thickness of Side Wall:	Measurement				R	R
			Top cover:	Measurement				R	R
			Bottom plate	Measurement				R	R
			No. of stiffeners	Measurement				R	R
			Vertical	Measurement				R	R
			Horizontal	Measurement				R	R
			Dimensions of stiffeners	Measurement				R	R
			Vertical	Measurement				R	R



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<b>TECHNICAL BOOKLET</b>		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 212 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		2.2	Stack Width	Measure by Tap Scale & Outer Dia. caliper	0 defects		10% =W 100%= R	P	R/W	
		2.3	Core Dia.					P	R/W	
		2.4	Window Height					P	R/W	
		2.5	Limb Centre					P	R/W	
3	Heating/De hydration	3.1	Temperature	Visually Check by Thermometer	Voltage upto 33 KV- 500 M ohms Voltage upto 11 KV- 750 M ohms	IR Value Inspection file	100%	P	R	
		3.2	Min. Insulation Resistance	Check with IR Tester				P	R	
4	Oil Filtration	4.1	BDV	BDV Test	Avg. BDV Should greater than 60 KV	Oil Inspection File	100%	P	R/W	
5	Tank Up	5.1	Leakage Test	Through Compress Air	No Leakage	Test report conforming to the TC / Approved drawing / GTP	10% =W 100%= R	P	R/W	
		5.2	Dimension (.mm)	Measure by tap Scale	As per Specification			P	R/W	
		5.3	Thickness of Top Bottom and side sheet mm					P	R/W	
		5.4	Paint shade and Thickness	Visually Check	As per Specification			P	R/W	
		5.5	No Radiator , size , Fins					P	R/W	
		5.6	oil level	Thickness testing	Above 30 deg. mark of oil level			P	R/W	
		5.7	Pressure Test and Vacume Test	Check with pressure gauge	As per Specification			P	R/W	
		5.8	Provision for lifting lugs	Visual				P	R/W	
		5.9	Conservator volume (Conservator and Tank)	Measurement	P			R/W		
		5.10.	BDV of oil	Electrical	Above 60 KV rms			P	R/W	
5.11.	Type of Gasket joint at corner	Physical	As per Specification	P	R/W					
6	Gate and Globe valve	6.1	Material	Physical	As per Specification	Test certificate conforming to IS -778/ Technical Specification	100%	P	R/W	
		6.2	Size	Physical	As per Specification			P	R/W	
		6.3	Pressure test for body and Seat	Physical	As per IS 778			P	R/W	
7	Oil Level Gauge	7.1	Operational Check	Physical	As per Specification	Test report conforming to the TC / Approved drawing / GTP	100%	P	R/W	
		7.2	Calibration Certificate	Physical	As per Specification			P	R/W	
8	CT	8.1	Accuracy, Ratio, Over voltage, Inter turn test ,knee point voltage, Exciting current, sec wending resistance for PS class CT	Measurement	As per Tech Specification	TC conforming to TS/ Approved Drg.	100%	P	R/W	knee point voltage should be reviewed
		8.2	IR Test and Polarity test	Electrical	AS per IS 2705			100%	P	
9	OTI and WTI	9.1	Operational Check	Physical	As per Specification	TC conforming to TS/ Approved Drg.	100%	P	R/W	
		9.2	HV Test	Electrical	2 KV for 1 Min			P	R/W	
		9.3	Calibration Certificate	Physical	As per bidders data			P	R/W	
10	Buchholz Relay	10.1	Operational Check	Physical	As per Specification	Test certificate conforming to IS 3637 / TS	100%	P	R/W	
		10.2	Routine and Acceptance Test	Electrical	As per 3637			P	R	
11	MOG	11.1	Operational Check	Physical	As per Specification	TC conforming to TS/ Approved Drg.	100%	P	R/W	
		11.2	HV Test	Electrical	2 KV for 1 Min			P	R/W	
		11.3	Calibration Certificate	Physical	As per bidders data			P	R	
12	Pressure relief valve	12.1	HV Test	Electrical	2 KV for 1 Min	TC conforming to TS/ Approved Drg.	100%	P	R/W	
		12.2	Operational Check	Physical	As per Specification			P	R/W	
		12.3	Leakage Test	Physical	No Leakage			P	R/W	
13	Cooling fan and motor	13.1	Dimension	Physical	As per approved GTP and Drawing	TC conforming to IS 2312/ Approved Drg.	100%	P	R/W	
		13.2	Operational Check	Physical	As per Specification			P	R/W	
		13.3	Routine and Acceptance Test	Electrical	As per IS 2312			P	R	
14	OLTC	14.1	Dimension	Measurement	As per approved GTP and Drawing	TC conforming to IS 8468 / Approved Drg.	100%	P	R/W	
		14.2	Operational Check	Physical	As per Specification			P	R/W	
		14.3	Routine and Acceptance Test	Electrical	As per 8468			P	R	
15	Marshalling Box	15.1	Dimension	Measurement	AS per Drawing	As per conforming to TS	100%	P	R/W	
		15.2	HV Test	Electrical	2 KV for 1 Min			P	R/W	
		15.3	Operational Check	Physical	As per Specification			P	R/W	
		15.4	Test for Enclosure protection	Physical	IP 55			P	R	
		15.5	Paint shade thickness and peel off	Measurement	As per Specification			P	R/W	
<b>C.</b>	<b>Process Description:-</b>	<b>Final Inspection</b>				<b>W-Witness, P-Perform, R-Review</b>				<b>Remarks</b>
<b>Sl. No.</b>	<b>Equipment/ Operation</b>		<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>		
1	Routine Test	1.1	Measurement of Winding Resistance	Electrical	As per approved GTP/TS	Test report Conforming to AS per IS 2026/Approved GTP and Drawing/Technical Specification	Every Transformer	P	R/W	
		1.2	Measurement volt Ratio, polarity, and vector group	Electrical	As per Tech Specification/TS			P	R/W	
		1.3	Measurement of no load losses and magnetizing current at rated frequency and 90%, 100%, 112.5% and 120% of rated voltage.	Electrical	As per approved GTP/TS			P	R/W	
		1.4	Insulation resistance	Electrical	As per approved GTP/TS			P	R/W	



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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
Document No.		TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.		02	Page <b>213</b> of <b>259</b>	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi	

2	Acceptance Test	1.5	Dielectric Test	Electrical	As per IS 2026/TS	Test report Conforming to AS per IS 2026/Approved GTP and Drawing/Technical Specification	Every Transformer	P	R/W
		1.6	Test on OLTC	Electrical	As per IS 2026/TS			P	R/W
		1.7	Measure of zero sequence impedance on three phase transformer.	Electrical	As per IS 2026/TS			P	R/W
		1.8	Oil Pressure Test a pressure of 0.35Kg/cm <sup>2</sup> for 8 hrs.	Mechanical	As per IS 2026/TS			P	R/W
		1.9	Bushing test for power factor and capacitors	Electrical	As per Tech Specification/TS			P	R/W
		2	Test on CT's and for resistance, image coil for winding temperature indicator shall be checked for ratio test & knee pt. voltage Test,(Only Knee point voltage Test Documents review)	Electrical	As per Tech Specification/TS			P	R/W
		2.1	Determination of capacitance and Dissipation factor between winding earth & between wdgs.	Electrical	As per Tech Specification/TS			P	R/W
		2.2	Magnetic balance test	Electrical	As per IS 2026/TS			P	R/W
		2.3	Measurement of magnetising current at low voltage	Electrical	As per IS 2026/TS			P	R/W
		2.4	Vacuum test on Transformer Tank and radiators.	Mechanical	As per IS 2026/TS			P	R/W
		2.5	Physical verification of complete transformer with all assembly including rollers, cable box , radiators etc.	Visual	As per IS 2026/TS			P	R/W
		2.6	Total losses comprise of no load loss load loss	Electrical	AS per Drawing /TS			P	R/W
		2.7	Voltage regulation at unity, 0.9 & 0.8 lagging power factor.	Electrical	As per IS 2026/TS			P	R/W
		2.8	Measurement of acoustic noise level	Electrical	As per approved GTP/TS			P	R/W
		2.9	Measurement of power taken by fan	Electrical	As per approved GTP/TS			P	R/W
		2.10	Functional test on auxiliary equipment (i. Test on OTI and WTI ii. High Voltage test on insulation test for Auxiliary Wiring)	Electrical	As per IS 2026/TS			P	R/W
		2.11	Test on oil filled Transformer	Electrical	As per Tech Specification			P	R/W
		a.	Dielectric Strength of oil	Electrical	60 KVrms			P	R/W
		b.	Water content	Physical	30 ppm			P	R/W
		c.	Dielectric Dissipation factor (tan delta) at 90 deg. C	Electrical	As per Tech Specification			P	R/W
		d.	Resistivity	Electrical	As per IS 2026			P	R/W
		2.12	Induced over voltage withstand test	Electrical	IS 2026 (Part 3)			P	R/W
		2.13	Separate Source voltage withstand test	Electrical	IS 2026 (Part 3)			P	R/W
		2.15	Absorption index i.e insulation resistance for 15 seconds and 60 seconds (R 60/ R 15 ) and polarization index i.e Insulation Resistance for 10 minutes and one minute (R 10 mt / R 1 mt).	Electrical	As per Tech Specification			P	R/W
		2.16	Tan delta measurement and capacitance of each winding to earth (with all other windings earthed) & between all windings connected together to earth.	Electrical	As per Tech Specification			P	R/W
		2.17	Measurement of neutral unbalance current which shall not exceed 2% of the full rated current of the transformer	Electrical	As per Tech Specification			P	R/W
		2.1	At least 10% transformer of the offered lot (minimum of one) shall be subjected to all the tests mentioned under the section "ROUTINE Test" in presence of TPCODL representative at the place of manufacture before dispatch without any extra charges. The testing shall be carried out in accordance with IS: 2026.	Electrical	As per Tech Specification			P	W
2.2	At Final inspection, the incoming raw material and its movement/consumption record in the related jobs of TPCODL will be verified by inspecting officer. In case of any deviation or no availability of such records, the offered lot may get rejected	Electrical	As per Tech Specification	P	W				
2.3	At stage inspection -Checking of weight, dimensions, fitting and accessories, tank sheet thickness, oil quantity, material finish and workmanship, physical verification of core coil assembly and measurement of flux density on one unit of each rating of the offered lot with reference to the GTP and contract drawings	Electrical	As per Tech Specification	P	W				
2.4	The painted surface shall pass the Cross Adhesion Test (IS1180 part 1 clause no. 21.4.d).	Electrical	As per Tech Specification	P	W				
2.5	Oil Leakage test for acceptance shall be conducted at pressure of 0.35kg/sq.cm for one hour as per IS 2026	Mechanical	AS per approved GTP / Tech Spec	P	W				
2.6	Checking of weight, Dimension, Fitting & accessories ,tank sheet thickness, Oil Quantity, Material, Finish and Workmanship.	Mechanical	AS per approved GTP / Tech Spec	P	W				
2.7	Physical verification of core coil assembly	Physical	AS per approved GTP / Tech Spec	P	W				

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<b>Document Title</b>		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
<b>Document No.</b>	TPCODL-ENGG. -001			<b>Issue Date: 23.08.2022</b>	
<b>Revision No.</b>	02			<b>Page 214 of 259</b>	
<b>Prepared by:</b> Engineering & Quality Dept	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Rajkumar Rastogi		

3	Type Test	2.8	Flux density measurement	Mechanical	As per IS 2026	Test report Conforming to AS per IS 2026/Approved GTP and Drawing/Technical Specification	1 no of each Rating.	P	W	Operation Test should be performed in routine as well as acceptance test.
		2.9	Pressure and Vacuum Test (Vacuum test without Radiator)		As per IS 2026			P	W	
		2.10.	Air pressure test		As per IS 2026			P	W	
		2.11	Temperature rise Test (on one unit of first lot against every release order / PO for each rating, for further lots, TPCODL also reserves the right to perform Temperature rise if required) [As per IS 2026 (Part 2) Clause no.4]	Electrical	As per IS 2026			P	W	
		3.1	Measurement of winding resistance	Electrical	AS per approved GTP / Tech Spec			P	R	
		3.2	Measurement of volt, Ratio, and vector group	Electrical	AS per approved GTP / Tech Spec			P	R	
		3.3	Measurement of impedance voltage / Short ckt impedance and Load loss	Electrical	AS per approved GTP / Tech Spec			P	R	
		3.4	Measurement of no load losses and current	Electrical	AS per approved GTP / Tech Spec			P	R	
		3.5	Insulation Resistance	Electrical				P	R	
		3.6	Dielectric Test	Electrical				P	R	
		3.7	Temperature rise Test for determining the maximum temperature rise after continuous full load run. The ambient temperature and time should be stated in the test certificate	Electrical				P	R	
		3.8	Test on On load Tap changer	Electrical				P	R	
		3.9	Short ckt withstand test	Electrical				P	R	
3.10.	Test on comply IP 55 on marshalling box and cable box	Electrical		P	R					
3.11	Lighting impulse voltage test with chopped wave	Electrical	AS per IS 2026/TS	P	R					
4.2	Operational Test on NIDS			P	R					
4.3	Temperature rise test including DGA (DGA shall be done before & after the heat run test).	Electrical		P	R					
4.4	Impulse Test (Including chopped wave on all the three limbs of HV & LV).	Electrical		P	R					
4	Special Test	4.1	Dielectric special tests [see IS 2026 (Part 3)]	Electrical	As Per IS 2026	Test report Conforming to AS per IS 2026/Approved GTP and Drawing/Technical Specification	1 no of each Rating.	P	W	
		4.2	Determination of capacitances windings-to earth, and between windings	Electrical				P	W	
		4.3	Determination of transient voltage transfer characteristics	Electrical				P	W	
		4.4	Measurement of zero-sequence impedance(s) on three-phase transformers	Electrical				P	W	
		4.5	Short-circuit withstand test	Electrical				P	W	
		4.6	Determination of sound levels	Electrical				P	W	
		4.7	Measurement of the harmonics of the no-load current	Electrical				P	W	
		4.8	Measurement of the power taken by the fan and oil pump motors	Electrical				P	W	
4.9	Measurement of insulation resistance to earth of the windings, and/or measurement of dissipation factor (tan δ) of the insulation system capacitances. (These are reference values for comparison with later measurement in the field. No limitations for the values are given here.	Electrical		P	W					
5	Name plate and marking	5.1	AS per approved GTP / Tech Spec	Visual	AS per approved GTP / Tech Spec	AS per approved GTP / Tech Spec	100%	P	R	

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<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 215 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
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54.14 33kV Outdoor VCB

		<b>TP Central Odisha Distribution Limited</b> <b>(A Tata Power &amp; Odisha Govt. joint venture)</b>							
		<b>Quality Assurance Plan for 33 KV Out door VCB</b>							
Doc. Title		Quality Assurance Plan for 33 KV Out door VCB						Issue Date: 04.02.2022	
Doc. No.		TPCODL-EQ-MQAP-14						Other detail:	
Rev. No.		0							
Prepared By: Parikshit Panday		Reviewed By : Phiroj Kumar Uttaray Approved By: Pourush Garg				Issued By: Rajkumar Rastogi			
A.	Process Description:-	Raw Material Inspection				W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility	
								BA	TPCODL
1	Porcelain Insulator	1.1	Visual Inspection	Visually Check	As per IEC 62155	Test certificate conform to IEC 62155	100%	R	R
		1.2	Dimensional Check	Measurement				R	R
		1.3	Routine Hyd. Test (chamber insulator )	Mechanical				R	R
		1.4	Routine 4 Way bend test (support insulator)	Mechanical				R	R
		1.5	Ultrasonic Test	Mechanical				R	R
		1.6	Dye Penetration/porosity test	Mechanical				R	R
		1.7	Burst pressure test for chamber insulator	Mechanical			One Sample	R	R
		1.8	Bending test till breakage for support insulator	Mechanical				R	R
		1.9	Routine electrical Test	Electrical				100%	R
2	Holding lathes and levers	2.1	Dimension check	Measurement	As Per Approved GTP/Drawing/TS/Relevant IS	As Per Approved GTP/Drawing/TS/Relevant IS	100%	R	R
		2.2	Chemical Analysis	Chemical			One Sample	R	R
		2.3	Hardness	Mechanical			100%	R	R
3	Interrupter (If applicable)	3.1	Visual Inspection	Visually Check	As Per Approved GTP/Drawing/TS/Relevant IS	As Per Approved GTP/Drawing/TS/Relevant IS	100%	R	R
		3.2	Dimension	Measurement				R	R
		3.3	Material	Visually Check				R	R
		3.4	Mechanical Properties	Mechanical				R	R
		3.5	Pressure Test (For encloser)	Mechanical				R	R
		3.6	Silver Plating thickness	Measurement				R	R

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<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 216 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
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		3.7	Visual Inspection of interrupter parts like Nozzle, Fixed arcing contact, tulip arcing contact Etc.	Visually Check				R	R
		3.8	Type Test	Electrical			1 no of each Rating.	R	R
4	Mechanism Housing	4.1	Visual inspection	Visually Check	As Per Approved GTP/Drawing/TS/Relevant IS	As Per Approved GTP/Drawing/TS/Relevant IS	100%	R	R
		4.2	Material type	Visually Check				R	R
		4.3	Dimensional Check	Measurement				R	R
		4.4	Mechanical Properties	Mechanical			1 no of each Rating.	R	R
5	Closing and Opening Spring	5.1	Visual Inspection	Visually Check	As Per Approved GTP/Drawing/TS/Relevant IS	As Per Approved GTP/Drawing/TS/Relevant IS	100%	R	R
		5.2	Dimensions Check	Visually Check				R	R
		5.3	Hardness	Measurement				R	R
		5.4	Material type	Mechanical				R	R
		5.5	Load Deflection	Mechanical				R	R
		5.6	Magnetic Particle Test	Mechanical				R	R
6	Coils	6.1	Appearance and finish	Visually Check	As Per Approved GTP/Drawing/TS/Relevant IS	As Per Approved GTP/Drawing/TS/Relevant IS	100%	R	R
		6.2	Resistance	Electrical				R	R
		6.3	HV Test	Electrical				R	R
		6.4	Insulation Resistance	Measurement				R	R
7	Auxiliary Switches	7.1	Visual Inspection	Visually Check	As Per Approved GTP/Drawing/TS/Relevant IS	As Per Approved GTP/Drawing/TS/Relevant IS	100%	R	R
		7.2	Mechanical inspection (Operating torque, mechanical operation test )	Measurement				R	R
		7.3	Electrical test (NO-NC configuration, contact resistance / MV drop ,HV test , Insulation resistance )	Electrical				R	R
8	Others Parts (Density monitor, 'O' ring )	8.1	Visual inspection	Visually Check				R	R
9	Pressure gauge	9.1	Visual inspection	Visually Check				R	R
10	Spring charging Motor	10.1	Visual inspection	Visually Check	As Per Approved GTP/Drawing/TS/Relevant IS	As Per Approved GTP/Drawing/TS/Relevant IS	100%	R	R
		10.2	Electrical test (Start up current , continuous current )	Electrical				R	R
11	Control Cubicle	11.1	Visual inspection	Visually Check				R	R
		11.2	colour shade	Visually Check				R	R
		11.3	Coating thickness	Measurement				R	R
12	Panel Wiring block	12.1	Visual inspection	Visually Check				R	R
		12.2	Continuity testing	Electrical				R	R
<b>B.</b>	<b>Process Description:-</b>	<b>Stage Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>				

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<small>TECHNICAL BOOKLET</small>		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 217 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
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1	Measurement of time for closing & tripping	1.1	At 100% Rated Voltage	Electrical	As per TS/ IEC 62271-100	Test certificate conform to IEC 62271-100/TS/approved GTP and Drawing	100%	R	R/W
2	Electrical Sequence Check	2.1	Control Circuit Chk. As per Drg.	Electrical			100%	P	R/W
		2.2	Anti Pumping	Electrical			P	R/W	
		2.3	Other Aux. A.C Circuit Check	Electrical			P	R/W	
3	Wiring Check	3.1	Wiring Check	Electrical			100%	P	R/W
4	Density Monitor Switch	4.1	Verification of Opn. Of density monitor switch	Electrical				P	R/W
5	Coil Resistance measurement	5.1	Coil Resistance measurement	Electrical				P	R/W
6	Mili volt Drop test on pole Column	6.1	Mili volt Drop test on pole Column	Electrical			100%	P	R/W
7	Spring charging Motor	7.1	Spring Charging time & Current	Mechanical				P	R/W
8	Endurance	8.1	Mechanical endurance	Mechanical			M2	100%	P
		8.2	Electrical endurance	Electrical	E2	P	R/W		
		8.3	Restriking class	Electrical	C2	P	R/W		
		8.4	Operation Class	Electrical	S2	P	R/W		
<b>C.</b>	<b>Process Description:-</b>	<b>Final Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>				
<b>Sl. No.</b>	<b>Equipment/ Operation</b>		<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>	
1	Routine Test	1.1	Power frequency voltage withstand dry tests on the main circuit	Electrical	As per approved GTP/TS/Relevant IEC 62271	As per approved GTP/TS/Relevant IEC 62271	100%	BA	TPCODL
		1.2	Voltage withstand tests on control and auxiliary circuits	Electrical				P	R
		1.3	Measurement of the resistance of the main circuit	Electrical				P	R
		1.4	Mechanical operating tests	Electrical				P	R
		1.5	Design and visual checks	Electrical				P	R
		1.6	Measurement of Timing	Electrical				P	R
		1.7	Mechanical operation 1. At 100 % rated voltage 2. At 85 % rated voltage for Closing. 3. At 70 % rated voltage for tripping. 4. At 110 % rated voltage for closing. 5. At 110 % rated voltage for tripping.	Mechanical				P	R
		1.8	2 KV test on control circuit Aux. CKT					P	R
2	Type Test	2.1	Dielectric tests	Electrical	AS per approved GTP / Tech Spec/IEC 62271/IS 13118	AS per approved GTP / Tech Spec/IEC 62271/IS 13118	1 no of each Rating.	P	R
		2.2	Measurement of the resistance of the main circuit	Electrical				P	R
		2.3	Temperature-rise tests	Electrical				P	R
		2.4	Short-time withstand current and peak withstand current tests	Electrical				P	R


<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page <b>218</b> of <b>259</b>
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

3	Acceptance Test	2.5	Lightning Impulse Voltage withstand Test	Electrical	IS 13118 / IEC 62271 - 100	Test report Conforming to IEC 62271-100/TS/Approved GTP and drawing	20%	P	R
		2.6	Mechanical Operating tests	Electrical				P	R
		2.7	Short circuit making and breaking tests	Electrical				P	R
		2.8	Verification of Degree of Protection./Degree of protection IP-55 for control cubicle.	Electrical				P	R
		2.10.	Single phase short making and breaking tests	Electrical				P	R
		2.11	Out of phase making and breaking test	Electrical				P	R
		2.12	Electrical Endurance Tests	Electrical				P	R
		2.13	Double earth fault tests ( As per IEC 62271-100 this test applicable for Non effectively earthed neutral system)	Electrical				P	R
		2.14	Capacitive Current switching tests/Capacitor Switching Duty Test for Single Bank of 5 MVAR capacity	Electrical				P	R
		2.15	Duty Cycle Test	Electrical				P	R
		3.1	a) One minute power frequency dry withstand test on main circuits	Electrical				P	W
		3.2	b) One minute power frequency dry withstand test on aux. circuits	Electrical				P	W
		3.3	c) Measurement of the resistance of the main circuit	Electrical				P	W
		3.4	d) Operation test (on no load)	Electrical				P	W
		3.5	5 close operations at 85% of Rated Voltage & 5 Open Operation at 70% of Rated Voltage	Electrical				P	W
3.6	- 5 Close & 5 open operations at 100% of rated voltage	Electrical	P	W					
3.7	- 5 Close & 5 open operations at 110% of rated voltage	Electrical	P	W					
3.8	5 Close-open Operations at 100% of rated Voltage	Electrical	P	W					
3.9	5 Open-0.3s -Close Operations at 100% of rated Voltage	Electrical	P	W					
3.10.	e) Control Cubicle Functional Test	Electrical	P	W					

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 219 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		3.11	f) Operation of Anti pumping Device	Electrical				P	W
		3.12	g) Tightness Check	Electrical				P	W
		3.13	h) Design and visual check	Electrical				P	W
		3.14	i) Measurement of Timing	Electrical				P	W
4	Name plate and marking	4.1	AS per approved GTP / Tech Spec	Visual	AS per approved GTP / Tech Spec	AS per approved GTP / Tech Spec	100%	P	R

#### 54.15 Potential Transformer

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)								
		<b>QUALITY ASSURANCE PLAN FOR PT</b>								
Doc. Title		Quality Assurance Plan for PT						Issue Date: 08.02.2022		
Doc. No.		TPCODL-EQ-MQAP-15						Other detail:		
Rev. No.		0								
Prepared By: Vaibhav Srivastava		Reviewed By: Phiroj Kr. Uttaray			Approved By: Pourush Garg			Issued By: Rajkumar Rastogi		
A.		Process Description:-			Raw Material Inspection		W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	PT Core	1.1	Dimension	Measurement	As per Drawing	Approved Drawing	10%	P	R	
2	Insulation Paper	2.1	Thickness	Measurement	As per Drawing	Approved Drawing	10%	P	R	
		2.2	BDV	Electrical	As per GTP	Approved GTP	10%	P	R	
3	Transformer Oil	3.1	BDV	Electrical	As per GTP/ IS 335	Approved GTP/ IS 335	10%	P	R	
4	Copper Wire	4.1	Dimension	Measurement	As per Drawing	Approved Drawing	10%	P	R	
		4.2	BDV	Electrical	As Per IS-13730 (Part 0/Sec 1)	IS-13730	10%	P	R	
5	Fabrication tank	5.1	Dimension	Measurement	As per Drawing	Approved Drawing	10%	P	R	
		5.2	Finish	Physical	As per TPCODL Specification	TPCODL Specification	10%	P	R	
6	Hardware fitting	6.1	Dimension	Measurement	As per Drawing	Approved Drawing	10%	P	R	
		6.2	Finish	Physical	As per TPCODL Specification	TPCODL Specification	10%	P	R	
7	Porcelain Insulator	7.1	Dimension	Measurement	As per Drawing	Approved Drawing	10%	P	R	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page 220 of 259	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

B. Process Description:-		Stage Inspection			W-Witness, P-Perform, R-Review					
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Potential Transformer	1.1	Verification of Terminal Marking & Polarity	Physical	As per IS 3156	IS 3156	10%	P	R	
		1.2	Determinations of limits of voltage errors & phase displacement	Measurement	As per IS 3156	IS 3156	10%	P	R	
C. Process Description:-		Routine Tests			W-Witness, P-Perform, R-Review					
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Potential Transformer	1.1	Verification of Terminal Marking & Polarity	Physical	As per IS 3156	IS 3156	100%	P	R	
		1.2	Power Frequency Dry withstand test on Primary Wdg.	Electrical	As per IS 3156	IS 3156	100%	P	R	
		1.3	Power Frequency Dry withstand test on Secondary Wdg.	Electrical	As per IS 3156	IS 3156	100%	P	R	
		1.4	Partial Discharge Test (only for PT with highest system voltage of 72.5KV & above)	Electrical	As per IS 11322	IS 11322	100%	P	R	
		1.5	Determinations of limits of voltage errors & phase displacement	Electrical	As per IS 3156	IS 3156	100%	P	R	
		1.6	Insulation Resistance Test	Electrical	As per IS 3156	IS 3156	100%	P	R	
D. Process Description:-		Type Tests			W-Witness, P-Perform, R-Review					
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Potential Transformer	1.1	Lightning Impulse Voltage Test	Electrical	As per IS 3156	IS 3156	1 No. of each rating	P	R	
		1.2	Power Frequency Wet withstand test on Primary Wdg.	Electrical	As per IS 3156	IS 3156	1 No. of each rating	P	R	
		1.3	Temperature Rise Test	Electrical	As per IS 3156	IS 3156	1 No. of each rating	P	R	
		1.4	Determinations of limits of voltage errors & phase displacement	Electrical	As per IS 3156	IS 3156	1 No. of each rating	P	R	
E. Process Description:-		Final Inspection (Acceptance Tests)			W-Witness, P-Perform, R-Review					
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Potential Transformer	1.1	Physical & Dimensional Check	Physical	As per GTP-Drawing	Approved GTP-Drawing	10%	P	W	
		1.2	Verification of Terminal Marking & Polarity	Physical	As per IS 3156	IS 3156		P	W	
		1.3	Power Frequency Dry withstand test on Primary Wdg.	Electrical	As per IS 3156	IS 3156		P	W	
		1.4	Power Frequency Dry withstand test on Secondary Wdg.	Electrical	As per IS 3156	IS 3156		P	W	
		1.5	Partial Discharge Test (only for PT with highest system voltage of 72.5KV & above)	Electrical	As per IS 11322	IS 11322		P	W	
		1.6	Determinations of limits of voltage errors & phase displacement	Electrical	As per IS 3156	IS 3156		P	W	



<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page 221 of 259	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

2	Marking	4.1	Verification of Marking	Physical	As per IS 3156	IS 3156		P	W	
<b>F. Process Description:-</b>		<b>Packing &amp; Pre-shipment</b>			<b>W-Witness, P-Perform, R-Review</b>					
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
1	Packing & Pre-shipment	1.1	Physical Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R	
		1.3	Packing List Verification.	Measurement	The Packing List should be in complete set as per Inspection Call requirement	Inspection Call Letter	100%	P	R	

### 54.16 Stay Wire

		<b>TP Central Odisha Distribution Limited</b> <b>(A Tata Power &amp; Odisha Govt. joint venture)</b> <b>QUALITY ASSURANCE PLAN for Stay Wire</b>									
Doc. Title		Quality Assurance Plan for Stay Wire									
Doc. No.		TPCODL-EQ-MQAP-16							Issue Date: 08.02.2022		
Rev. No.		0							Other detail:		
Prepared By: Vaibhav Srivastava		Reviewed By: Phiroj Kr. Uttaray			Approved By: Pourush Garg			Issued By: Rajkumar Rastogi			
<b>A. Process Description:-</b>		<b>Raw Material Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>						
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
1	Steel Wire	1.0	Material from approved Vendor	Physical	Raw material to be procured from SAIL, JINDAL, TATA, RINL	Technical Specification	100%	R	R		
		1.1	Surface Finish	Physical	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	IS 2062	100%	R	R		
		1.2	Dimension	Measurement	As per approved drawing	IS 2141/ Technical Specification	100%	R	R		
		1.3	<b>Mechanical Test</b>								
		1.31	Ultimate Tensile Strength	Mechanical	As per IS 2062/ IS 1608	IS 2062/ IS 1608	100%	R	R		
		1.32	Yield Stress	Mechanical				R	R		
		1.33	% Elongation	Mechanical				R	R		
		1.34	Bend Test	Mechanical				R	R		
1.4	Chemical Composition	Chemical	As per IS 2062	IS 2062	100%	R	R				
2	Zinc for Galvanization	2.1	Chemical Composition	Chemical	As per IS 209	IS 209	100%	R	R		
<b>B. Process Description:-</b>		<b>Stage Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>						
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
1	Test on Wires	1.1	Visual Inspection	Visual	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	Technical Specification/ IS 2141	10%	P	R		
		1.2	Dimensional check	Measurement	As per approved drawing	Technical Specification/ IS 2141	10%	P	R		
		1.3	Wrapping Test	Visual	The wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture	Technical Specification/ IS 2141/ IS 1755	10%	P	R		
		1.4	Tensile Test	Measurement	As per approved GTP	Approved GTP	10%	P	R		
2	Checks on Wire during Galvanization	2.1	Degreasing	Chemical	As per IS 2629	IS 2629	10%	P	R		
		2.2	Pickling	Chemical	As per IS 2629	IS 2629		P	R		

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 222 of 259			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		

		2.3	Rinsing	Chemical	As per IS 2629	IS 2629		P	R		
		2.4	Pre-fluxing in Zinc Chloride & Ammonium Chloride	Chemical	As per IS 2629	IS 2629		P	R		
		2.5	Pre-heating	Thermal	As per IS 2629	IS 2629		P	R		
		2.6	<b>Dipping</b>						R		
		2.61	Zinc bath temperature indicator & verification	Physical	As per IS 2629	IS 2629		P	R		
		2.62	Immersion time & withdrawal time	Physical	As per IS 2629	IS 2629		P	R		
		2.63	Quenching & DI chromating	Physical	As per IS 2629	IS 2629		P	R		
3	Galvanization Test on Wires	3	<b>Galvanization check</b>								
		3.1	Visual check	Physical	Heavy Coating as per IS 4826, TPCO-OTH-010	Heavy Coating as per IS 4826, TPCO-OTH-010	10%	P	R		
		3.2	Thickness of Zinc Coating	Measurement				P	R		
		3.3	Uniformity of Zinc Coating	Physical				P	R		
		3.4	Mass of Zinc Coating	Measurement				P	R		
		3.5	Adhesion of Zinc Coating	Physical				P	R		

C.	Process Description:-	Routine Tests				W-Witness, P-Perform, R-Review				
1	Test on GI Wires	1.1	Surface finish & visual check	Physical	The wire shall be circular and free from scale, irregularities, imperfections, flaws, splits, and other defects, which may affect the quality of wire	IS 2141	10%	P	R	
		1.2	Diameter of drawn steel wire	Visual	As per approved GTP	Approved GTP	10%	P	R	
		1.3	Tensile Test	Measurement	As per approved GTP	Approved GTP	10%	P	R	
		1.4	Wrapping Test	Physical	The wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture	IS 280	10%	P	R	
		1.5	Uniformity of Zinc Coating	Physical	As per IS 4826, approved GTP, TPCO-OTH-010	IS 4826, approved GTP, TPCO-OTH-010	10%	P	R	
		1.6	Mass of Zinc Coating	Measurement			10%	P	R	
		1.7	Adhesion of Zinc Coating	Physical			10%	P	R	
2	Test on complete strand of GI Stay Wire	2.1	Breaking Load/ Tensile Test	Measurement	As per IS 2141, approved GTP & TS	IS 2141, approved GTP & TS	10%	P	R	
		2.2	Elongation Test	Measurement			10%	P	R	
		2.3	Lay Ratio	Measurement			10%	P	R	


D.	Process Description:-	Final Inspection (Acceptance Test)				W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
							BA	TPCODL		
1	Test on GI Wires	1.1	Surface finish & visual check	Physical	The wire shall be circular and free from scale, irregularities, imperfections, flaws, splits, and other defects, which may affect the quality of wire	IS 2141	As per IS 2141	P	W	
		1.2	Diameter of drawn steel wire	Visual	As per approved GTP	Approved GTP		P	W	
		1.3	Tensile Test	Measurement	As per approved GTP	Approved GTP		P	W	
		1.4	Wrapping Test	Physical	The wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture	IS 280		P	W	
		1.5	Uniformity of Zinc Coating	Physical	As per IS 4826, approved GTP, TPCO-OTH-010	IS 4826, approved GTP, TPCO-OTH-010		P	W	
		1.6	Mass of Zinc Coating	Measurement				P	W	
		1.7	Adhesion of Zinc Coating	Physical				P	W	
2	Test on complete strand of GI Stay Wire	2.1	Breaking Load/ Tensile Test	Measurement	As per IS 2141, approved GTP & TS	IS 2141, approved GTP & TS	P	W		
		2.2	Elongation Test	Measurement			P	W		
		2.3	Lay Ratio	Measurement			P	W		

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page <b>223</b> of <b>259</b>
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

3	Marking	3.1	Marking on tag attached with Coil	Physical	The size, construction, tensile designation, lay, coating, length, mass, manufacturer's name or trade mark, lot number along with PO/RO No., TPCODL and month & year of mfg. shall be legibly stamped on a suitable tag securely attached with Coils.	Technical Specification/ IS 2141/ GTP		P	W	
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E.		Process Description:-			Packing & Pre-Shipment		W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Packing & Pre-Shipment	1.1	Physical Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R	
		1.3	Packing List Verification.	Measurement	The Packing List should be in complete set as per Inspection Call requirement	Inspection Call Letter	100%	P	R	

54.17 Barbed Wire 

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)								
		<b>QUALITY ASSURANCE PLAN for Barbed Wire</b>								
Doc. Title		Quality Assurance Plan for Barbed Wire								
Doc. No.		TPCODL-EQ-MQAP-17						Issue Date: 08.02.2022		
Rev. No.		0						Other detail:		
Prepared By: Vaibhav Srivastava		Reviewed By: Phiroj Kr. Uttaray			Approved By: Pourush Garg			Issued By: Rajkumar Rastogi		
A.		Process Description:-			Raw Material Inspection		W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Reviewed By:		Issue Date: 23.08.2022	
Revision No.	02	Approved By:		Page 224 of 259	
Prepared by:	Engineering & Quality Dept	Phiroj Uttaray Khajan C. Bhardwaj		Issued By: Rajkumar Rastogi	
		Pourush Garg			

1	Steel Wire	1.0	Material from approved Vendor	Physical	Raw material to be procured from SAIL, JINDAL, TATA, RINL	Technical Specification	100%	R	R		
		1.1	Surface Finish	Physical	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	IS 2062	100%	R	R		
		1.2	Dimension	Measurement	As per approved drawing	IS 2141/ Technical Specification	100%	R	R		
		1.3	<b>Mechanical Test</b>								
		1.31	Ultimate Tensile Strength	Mechanical	As per IS 2062/ IS 1608	IS 2062/ IS 1608	100%	R	R		
		1.32	Yield Stress	Mechanical			100%	R	R		
		1.33	% Elongation	Mechanical			100%	R	R		
		1.34	Bend Test	Mechanical			100%	R	R		
1.4	Chemical Composition	Chemical	As per IS 2062	IS 2062	100%	R	R				
2	Zinc for Galvanization	2.1	Chemical Composition	Chemical	As per IS 209	IS 209	100%	R	R		
<b>B. Process Description:-</b>											
<b>Process Description:-</b>		<b>Stage Inspection</b>				<b>W-Witness, P-Perform, R-Review</b>					
<b>Sl. No.</b>	<b>Equipment/ Operation</b>		<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>		<b>Remarks</b>	
								<b>BA</b>	<b>TPCODL</b>		
1	Test on Wires	1.1	Visual Inspection	Visual	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	Technical Specification/ IS 278	10%	P	R		
		1.2	Dimensional check	Measurement	As per approved drawing/ IS 278	Technical Specification/ IS 278	10%	P	R		
		1.3	Tensile Test (Line Wire)	Measurement	As per Technical Specification/ IS 278	Technical Specification/ IS 278	10%	P	R		
		1.4	Wrapping Test	Visual	The wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture	Technical Specification/ IS 278/ IS 1755	10%	P	R		
2	Test on completed Barbed Wire	2.1	Visual & Dimensional Check	Visual	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	Technical Specification/ IS 278	10%	P	R		
		2.2	Breaking Load Test	Measurement	As per Technical Specification/ IS 2141	Technical Specification/ IS 278	10%	P	R		
3	Checks on Wire during Galvanization	3.1	Degreasing	Chemical	As per IS 2629	IS 2629	10%	P	R		
		3.2	Pickling	Chemical	As per IS 2629	IS 2629		P	R		
		3.3	Rinsing	Chemical	As per IS 2629	IS 2629		P	R		
		3.4	Pre-fluxing in Zinc Chloride & Ammonium Chloride	Chemical	As per IS 2629	IS 2629		P	R		
		3.5	Pre-heating	Thermal	As per IS 2629	IS 2629		P	R		
		3.6	Dipping								
		3.61	Zinc bath temperature indicator & verification	Physical	As per IS 2629	IS 2629		P	R		
		3.62	Immersion time & withdrawal time	Physical	As per IS 2629	IS 2629		P	R		
4	Galvanization Test of Line Wire	4.1	Thickness of Zinc Coating	Measurement	As per IS 278, IS 4826	IS 278, IS 4826	10%	P	R		
		4.2	Uniformity of Zinc Coating	Physical				P	R		
		4.3	Mass of Zinc Coating	Measurement				P	R		
		4.4	Adhesion of Zinc Coating	Physical				P	R		
5	Galvanization Test of Point Wire	5.1	Uniformity of Zinc Coating	Physical	As per IS 278, IS 4826	IS 278, IS 4826	10%	P	R		
<b>C. Process Description:-</b>											
<b>Process Description:-</b>		<b>Routine Test</b>				<b>W-Witness, P-Perform, R-Review</b>					
<b>Sl. No.</b>	<b>Equipment/ Operation</b>		<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>		<b>Remarks</b>	
								<b>BA</b>	<b>TPCODL</b>		
1	Test on completed Barbed Wire	2.1	Visual & Dimensional Check	Visual	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	Technical Specification/ IS 278	10%	P	W		

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page 225 of 259			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		

		2.2	Breaking Load Test	Measurement	As per Technical Specification/ IS 278	Technical Specification/ IS 278	10%	P	W	
2	Test on Line Wires	1.1	Tensile Test	Measurement	As per Technical Specification/ IS 278	Technical Specification/ IS 278	10%	P	W	
		1.2	Wrapping Test	Visual	The wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture	Technical Specification/ IS 278/ IS 1755	10%	P	W	
3	Galvanization Test of Line Wire	4.1	Thickness of Zinc Coating	Measurement	As per IS 278, IS 4826	IS 278, IS 4826	10%	P	W	
		4.2	Uniformity of Zinc Coating	Physical			10%	P	W	
		4.3	Mass of Zinc Coating	Measurement			10%	P	W	
		4.4	Adhesion of Zinc Coating	Physical			10%	P	W	
4	Galvanization Test of Point Wire	5.1	Uniformity of Zinc Coating	Physical	As per IS 278, IS 4826	IS 278, IS 4826	10%	P	W	

D.		Process Description:-		Final Inspection (Acceptance Test)			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
								BA	TPCODL		
1	Test on completed Barbed Wire	2.1	Visual & Dimensional Check	Visual	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	Technical Specification/ IS 278	As per IS 278	P	W		
		2.2	Breaking Load Test	Measurement	As per Technical Specification/ IS 278	Technical Specification/ IS 278		P	W		
2	Test on Line Wires	1.1	Tensile Test	Measurement	As per Technical Specification/ IS 278/ GTP	Technical Specification/ IS 278/GTP		P	W		
		1.2	Wrapping Test	Visual	The wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture	Technical Specification/ IS 278/ IS 1755		P	W		
3	Galvanization Test of Line Wire	4.1	Thickness of Zinc Coating	Measurement	As per IS 278, IS 4826, GTP	IS 278, IS 4826, GTP		P	W		
		4.2	Uniformity of Zinc Coating	Physical				P	W		
		4.3	Mass of Zinc Coating	Measurement				P	W		
		4.4	Adhesion of Zinc Coating	Physical				P	W		
4	Galvanization Test of Point Wire	5.1	Uniformity of Zinc Coating	Physical	As per IS 278, IS 4826	IS 278, IS 4826		P	W		
5	Marking	4.1	Marking on tag attached with Coil	Physical	Every reel of barbed wire shall be marked legibly with the name of the manufacturer, the type of barbed wire, the diameters of the line and point wires, barb spacing, length or mass of the reel, TPCODL and month & year of Mfg.	Technical Specification/ IS 278/GTP		P	W		

E.		Process Description:-		Packing & Pre-shipment			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
								BA	TPCODL		
1	Packing & Pre-shipment	1.1	Physical Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R		
		1.3	Packing List Verification.	Measurement	The Packing List should be in complete set as per Inspection Call requirement	Inspection Call Letter	100%	P	R		

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 226 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

54.18 GI Wire/ Coil Earthing

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)								
<b>QUALITY ASSURANCE PLAN for GI Wire/ Coil Earthing</b>										
Doc. Title		Quality Assurance Plan for GI Wire/ Coil Earthing						Issue Date: 08.02.2022		
Doc. No.		TPCODL-EQ-MQAP-18						Other detail:		
Rev. No.		0								
Prepared By: Vaibhav Srivastava		Reviewed By: Phiroj Kr. Uttaray				Approved By: Pourush Garg		Issued By: Rajkumar Rastogi		
<b>A. Process Description:-</b>										
<b>Raw Material Inspection</b>		<b>W-Witness, P-Perform, R-Review</b>								
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
							BA	TPCODL		
1	Steel Wire	1.0	Material from approved Vendor	Physical	Raw material to be procured from SAIL, JINDAL, TATA, RINL	Technical Specification	100%	R	R	
		1.1	Surface Finish	Physical	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	IS 2062	100%	R	R	
		1.2	Dimension	Measurement	As per approved drawing	IS 2141/ Technical Specification	100%	R	R	
		1.3	<b>Mechanical Test</b>							
		1.31	Ultimate Tensile Strength	Mechanical	As per IS 2062/ IS 1608	IS 2062/ IS 1608	100%	R	R	
		1.32	Yield Stress	Mechanical			100%	R	R	
		1.33	% Elongation	Mechanical			100%	R	R	
		1.34	Bend Test	Mechanical			100%	R	R	
1.4	Chemical Composition	Chemical	As per IS 2062	IS 2062	100%	R	R			
2	Zinc for Galvanization	2.1	Chemical Composition	Chemical	As per IS 209	IS 209	100%	R	R	
<b>B. Process Description:-</b>										
<b>Stage Inspection</b>		<b>W-Witness, P-Perform, R-Review</b>								
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
							BA	TPCODL		
1	Test on Wire before Galvanization	1.1	Visual Inspection	Visual	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	Technical Specification/ IS 280	10%	P	R	
		1.2	Dimensional check	Measurement	As per approved GTP	Technical Specification/ IS 280, approved GTP	10%	P	R	
		1.3	Wrapping Test (for Wire dia less than 5mm)	Physical	The wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture.	IS 280	10%	P	R	
		1.4	Bend Test (for Wire dia greater than or equal to 5mm)	Physical	The wire shall withstand being bent through an angle of 90° round a former of dia equal to twice its own dia without breaking or splitting.	IS 280	10%	P	R	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.		TPCODL-ENGG. -001		Issue Date: 23.08.2022	
Revision No.		02		Page 227 of 259	
Prepared by: Engineering & Quality Dept		Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj		Approved By: Pourush Garg	
				Issued By: Rajkumar Rastogi	

		1.5	Tensile Test	Measurement	As per approved GTP, IS 280	Approved GTP, IS 280	10%	P	R		
2	Checks on Wire during Galvanization	2.1	Degreasing	Chemical	As per IS 2629	IS 2629	10%	P	R		
		2.2	Pickling	Chemical	As per IS 2629	IS 2629		P	R		
		2.3	Rinsing	Chemical	As per IS 2629	IS 2629		P	R		
		2.4	Pre-fluxing in Zinc Chloride & Ammonium Chloride	Chemical	As per IS 2629	IS 2629		P	R		
		2.5	Pre-heating	Thermal	As per IS 2629	IS 2629		P	R		
		2.6	Dipping								
		2.6.1	Zinc bath temperature indicator & verification	Physical	As per IS 2629	IS 2629		P	R		
		2.6.2	Immersion time & withdrawal time	Physical	As per IS 2629	IS 2629		P	R		
		2.6.2	Quenching & Dichromating	Physical	As per IS 2629	IS 2629		P	R		
3	Test on Wire after Galvanization	<b>3</b>	<b>Galvanization Tests</b>				10%				
		3.1	Visual check	Physical	Heavy Coating as per IS 4826, TPCO-OTH-010	Heavy Coating as per IS 4826, TPCO-OTH-010		P	R		
		3.2	Thickness of Zinc Coating	Measurement				P	R		
		3.3	Uniformity of Zinc Coating	Physical				P	R		
		3.4	Mass of Zinc Coating	Measurement				P	R		
		3.5	Adhesion of Zinc Coating	Physical				P	R		

C.		Process Description:-		Routine Tests			W-Witness, P-Perform, R-Review				
1	Test on GI Wires	1.1	Surface finish & visual check	Physical	The wire shall be circular and free from scale, irregularities, imperfections, flaws, splits, and other defects, which may affect the quality of wire	IS 280	10%	P	R		
		1.2	Diameter of drawn steel wire	Visual	As per approved GTP	Approved GTP	10%	P	R		
		1.3	Tensile Test	Measurement	As per approved GTP	Approved GTP	10%	P	R		
		1.4	Wrapping Test (for Wire dia less than 5mm)	Physical	The wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture	IS 280	10%	P	R		
		1.5	Bend Test (for Wire dia greater than or equal to 5mm)	Physical	The wire shall withstand being bent through an angle of 90° round a former of dia equal to twice its own dia without breaking or splitting	IS 280	10%	P	R		
		1.6	Uniformity of Zinc Coating	Physical	As per IS 4826, approved GTP, TPCO-OTH-010	IS 4826, approved GTP, TPCO-OTH-010	10%	P	R		
		1.7	Mass of Zinc Coating	Measurement			10%	P	R		
		1.8	Adhesion of Zinc Coating	Physical			10%	P	R		

D.		Process Description:-		Final Inspection (Acceptance Test)			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks		
							BA	TPCODL			
1	Test on GI Wires	1.1	Surface finish & visual check	Physical	The wire shall be circular and free from scale, irregularities, imperfections, flaws, splits, and other defects, which may affect the quality of wire.	IS 280	As per IS 280	P	W		
		1.2	Diameter of drawn steel wire	Visual	As per approved GTP	Approved GTP		P	W		
		1.3	Tensile Test	Measurement	As per approved GTP	Approved GTP		P	W		
		1.4	Wrapping Test (for Wire dia less than 5mm)	Physical	The wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture	IS 280/ GTP		P	W		
		1.5	Bend Test (for Wire dia greater than or equal to 5mm)	Physical	The wire shall withstand being bent through an angle of 90° round a former of dia equal to twice its own dia without breaking or splitting	IS 280/ GTP		P	W		

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<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 228 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		1.6	Uniformity of Zinc Coating	Physical	As per IS 4826, approved GTP, TPCO-OTH-010	IS 4826, approved GTP, TPCO-OTH-010	P	W		
		1.7	Mass of Zinc Coating	Measurement			P	W		
		1.8	Adhesion of Zinc Coating	Physical			P	W		
2	Marking	2.1	Marking on tag attached with Coil	Physical	Each coil of wire shall be marked legibly on a suitable tag securely attached with Coils with the finish, size of wire, lot number and trade-mark or name of the manufacturer, TPCODL and month & year of mfg.	Technical Specification/ IS 2141/ GTP	As per IS 280	P	W	
<b>E. Process Description:-</b>										
<b>Equipment/ Operation</b>		<b>Packing &amp; Pre-Shipment</b>			<b>W-Witness, P-Perform, R-Review</b>					
<b>Sl. No.</b>	<b>Equipment/ Operation</b>	<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>		<b>Remarks</b>	
							<b>BA</b>	<b>TPCODL</b>		
1	Packing & Pre-Shipment	1.1	Physical Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R	
		1.3	Packing List Verification.	Measurement	The Packing List should be in complete set as per Inspection Call requirement	Inspection Call Letter	100%	P	R	

#### 54.19 Polymer type Lightning Arrester

<b>TPCODL</b>		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)								
<b>QUALITY ASSURANCE PLAN for Polymer type Lightning Arrester</b>										
Doc. Title		Quality Assurance Plan for Polymer type Lightning Arrester (12kV 10 kA)								
Doc. No.		TPCODL-EQ-MQAP-19						Issue Date: 09.02.2022		
Rev. No.		0						Other detail:		
Prepared By: Gaurahari Kuanr		Reviewed By: Phiroj Uttaray			Approved By: Pourush Garg			Issued By: Rajkumar Rastogi		
<b>A. Process Description:-</b>										
<b>Equipment/ Operation</b>		<b>Raw Material Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>					
<b>Sl. No.</b>	<b>Equipment/ Operation</b>	<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>		<b>Remarks</b>	
							<b>BA</b>	<b>TPCODL</b>		
1	Silicone Rubber	1.01	Visual Check	Physical	Smooth, Clean, Free from dust & Colour etc.	TC confirming to TS	100%	P	R	
		1.02	Tensile Strength	Mechanical	As per ASTM D 412	TC confirming to ASTM D 412	100%	R	R	
		1.03	Elongation (% ge)	Mechanical			100%	R	R	



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		<b>TECHNICAL BOOKLET</b>	
<b>Document Title</b>		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date:</b> 23.08.2022	
<b>Revision No.</b>	02	<b>Page</b> 229 of 259	
<b>Prepared by:</b> Engineering & Quality Dept	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Rajkumar Rastogi

		1.04	Hardness	Mechanical	IS 3400 (Part-2) / ASTM D2240 standard	TC confirming to IS 3400 (Part-2) / ASTM D2240	100%	R	R
		1.05	Tear Strength(kN/m)	Mechanical	As per ASTM D624	TC confirming to ASTM D624	100%	R	R
		1.06	Resistance to Tracking & Erosion	Electrical	(1) No Cracks (2) No tracking / Erosion on the surface of the sample	TC confirming to IEC 60587/ASTMD 624	100%	R	R
		1.07	Dielectric Strength (KV/mm)	Electrical	As per ASTMD 149/IEC 60243	TC confirming to ASTMD 149/ IEC 60243	100%	R	R
		1.08	D.C Volume-Resistivity(Ohm-cm)	Electrical	As per ASTMD 257	TC confirming to ASTMD 257	100%	R	R
		1.09	Silicone content	Physical	As per internal standard procedure	As per internal standard procedure	100%	R	R
		1.10	Specific Gravity	Physical	As per ASTMD 792	TC confirming to ASTMD 792	100%	R	R
2	Core Base material	2.01	Visual	Physical	Smooth, Clean, Free from dust & Colour etc.	TC confirming to Specification	100%	P	R
		2.02	Glass Content	Physical	ISO 3457	TC confirming to ISO 3457	100%	R	R
		2.03	Water Absorption	Physical	ISO 62	TC confirming to ISO 62	100%	R	R
		2.04	Tensile Strength	Mechanical	ISO 527	TC confirming to ISO 527	100%	R	R
		2.05	Flexure Strength	Mechanical	ISO 178	TC confirming to ISO 178	100%	R	R
		2.06	Dielectric Strength (KV/mm)	Electrical	IEC 60243	TC confirming to IEC 60243	100%	R	R
		2.07	Volume resistivity	Electrical	IEC 60093	TC confirming to IEC 60093	100%	R	R
3	Aluminium Disc / Electrode	3.1	Visual Check	Physical	Free from all imperfections, mill scales, slag intrusion, lamination, pitting, rusts, etc.	TC confirming to Specification	100%	P	R
		3.2	Dimension Check	Measurement	As per internal drawing/TS	TC confirming to drawing/TS	100%	P	R
		3.3	Tensile Strength	Mechanical	IS 1608	TC confirming to IS 1608	100%	R	R
		3.4	Chemical composition	Chemical	As per IS 733	TC confirming to IS 733	100%	R	R
4	ZnO Block	4.1	Visual Check	Physical	As per TS	TC confirming to TS	100%	P	R
		4.2	Dimension Check	Measurement	As per Approved drawing	TC confirming to Approved drawing	100%	P	R
		4.3	Measurement of Reference Voltage Test	Electrical	As per approved GTP/ IEC 60099-4/TS	TC confirming to Approved GTP/TS/IEC 60099-4	100%	R	R
		4.4	Residual voltage Test	Electrical			100%	R	R
5	Nut ,Bolts & Washers(SS)	5.1	Visual Check	Physical	As per Specification	As per specification	100%	P	R
		5.2	Dimension Check	Measurement	As per Approved GTP/TS	(1)TC confirming to IS 1367 (2) IS 5369 for Washers	100%	P	R
		5.3	Chemical composition	Chemical	As per Internal Standard	As per Internal Standard	100%	R	R
6	Terminal connector(Al) (if required)	6.1	Visual Check	Physical	As per Approved GTP/TS	TC confirming to TS	100%	P	R
		6.2	Dimension Check	Measurement	As per Approved Drawing	TC confirming to Approved Drawing	100%	P	R
		6.3	Chemical composition	Chemical	As per Internal Standard	As per Internal Standard	100%	R	R
7	Insulating Base	7.1	Visual Check	Physical	As per Approved GTP/TS	TC confirming to TS/GTP	100%	P	R

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>				<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title				<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.				TPCODL-ENGG. -001		Issue Date: 23.08.2022	
Revision No.				02		Page 230 of 259	
Prepared by: Engineering & Quality Dept		Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj		Approved By: Pourush Garg		Issued By: Rajkumar Rastogi	

		7.2	Dimension Check	Measurement	As per Approved Drawing/GTP/TS	TC confirming to Approved Drawing/GTP	100%	P	R	
		7.3	Material(Grade & Colour)	Physical	As per Approved GTP/TS	TC confirming to Approved GTP/TS	100%	R	R	

B.		Process Description:-			Stage Inspection			W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
								BA	TPCODL		
1	Preparation of Core/Module	1.1	Visual Check	Physical	As per Approved GTP/TS	Approved GTP/Drawing/TS/IEC 60099-4)	IS 2500 (Part-I)	P	R		
		1.2	Dimension Check	Measurement	As per drawing			P	R		
2	Silicone Rubber Moulding	2.1	Visual Check	Physical	As per Approved GTP/TS			P	R		
		2.2	Dimension Check	Measurement	As per Approved drawing			P	R		
		2.3	Measurement of Creep age Distance	Measurement				P	R		
3	Assembly of Hardware fittings	3.1	Visual Check	Physical	As per Approved GTP/TS			P	R		
		3.2	Dimension Check	Measurement	As per Approved drawing			P	R		
		3.3	Terminal & Components	Physical	Should be properly fitted			P	R		

C.		Process Description:-			Routine Test			W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
								BA	TPCODL		
1	Routine Tests	1.1	Measurement of reference voltage test	Electrical	As per IEC 60099-4 / TS	IEC 60099-4 / TS	100%	P	R		
		1.2	Residual Voltage Test on complete arrester / Arrester unit	Electrical			100%	P	R		
		1.3	Internal Partial Discharge Test	Electrical			100%	P	R		


D.		Process Description:-			Acceptance Test			W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
								BA	TPCODL		
1	LA	1.1	Visual Inspection	Physical	No damage and loose fitting, free from rust, smoothness check etc.	Approved GTP/TS	IS 3070(Part-3)	P	W		
		1.2	Name Plate Marking Verification	Physical	As per Approved GTP/Drawing /TS	Approved GTP/Drawing /TS		P	W		
		1.3	Verification of components and dimensions.	Measurement	As per Approved GTP/Drawing /TS	Approved GTP/Drawing /TS		P	W		
		1.4	Lightning impulse residual voltage on the complete arrester or arrester unit	Electrical	As per IEC 60099-4 / IS 3070-3/TS	IEC 60099-4 /IS 3070-3/ TS		P	W		
		1.5	Internal Partial Discharge Test	Electrical				P	W		
		1.6	Measurement of Power frequency reference voltage test	Electrical				P	W		


E.		Process Description:-			Type test			W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks	
								BA	TPCODL		
1	Type Test(CPRI/ERDA)	1.01	Insulation Withstand Test	Electrical	As per TS/IEC 60099-4	TS/IEC 60099-4	1 sample per design	P	R		
		1.02	Residual voltage test	Electrical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R		

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page <b>231</b> of <b>259</b>	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

		6.03	Long duration current impulse withstand test	Electrical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	
		6.04	Operating duty test	Electrical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	
		6.05	Power frequency (voltage VS time curve)	Electrical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	
		6.06	Galvanizing Test on exposed steel metal parts(if required/if applicable)	Chemical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	
		6.07	Moisture ingress test and water immersion test	Physical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	
		6.08	Test for Bending moments	Mechanical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	
		6.09	Weather ageing Test	Physical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	
		6.1	Internal Partial Discharge Test	Electrical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	
		6.11	Wet power frequency voltage test	Electrical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	
		6.12	Short circuit test (Low/High Current)	Electrical	As per TS/IEC 60099-4	TS/IEC 60099-4		P	R	

F.		Process Description:-		Packing & Pre-shipment		W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Packing & Pre-shipment	1.1	Visual Verification.	Visual	As per relevant standard/ TS	Relevant standard/ TS	100%	P	R	
		1.2	Quantity Verification.	Measurement	As per relevant standard/ TS	Relevant standard/ TS	100%	P	R	
		1.3	Identification.	Visual	As per relevant standard/ TS	Relevant standard/ TS	100%	P	R	

54.20 1.1 KV Armoured Power Cable 

	<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)		
	<b>QUALITY ASSURANCE PLAN for 1.1 KV XLPE LT Armoured Power Cable</b>		
Doc. Title	Quality Assurance Plan for 1.1 KV XLPE LT Armoured Power Cable		
Doc. No.	TPCODL-EQ-MQAP-20		Issue Date: 09.02.2021
Rev. No.	0		Other details:
Prepared By : Gaurahari Kuanr	Reviewed By: Phiroj Uttaray	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 232 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

A.		Raw Material Inspection			W-Witness, P-Perform, R-Review					
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility			
							BA	TPCODL	Remarks	
1	Aluminium Rod	1.1	Surface Finish	Visual	The conductor shall be smooth and free from surface defects like laps, cracks, kinks, twists, seams, scratches and burns	TS/ GTP	10%	P	R	Make: NALCO,BALCO & Vedanta, HINDALCO only Grade: H2/H4
		1.2	Chemical Composition	Chemical	IS 4026/TS/GTP	IS 4026/TS/GTP	100%	R	R	
		1.3	Diameter	Measurement	IS 5484/TS/GTP	IS 5484/TS/GTP	100%	R	R	
		1.4	Breaking Load / Tensile Test	Mechanical			100%	R	R	
		1.5	Elongation Test before & after ageing	Mechanical			100%	R	R	
		1.6	Resistivity Test	Electrical			100%	R	R	
2	XLPE Insulation	2.1	Surface Finish	Visual	The conductor shall be smooth and free from surface defects	TS	10%	P	R	Make: Dow/Borealis/Hanwa
		2.2	Volume Resistivity	Electrical	1 x 10 <sup>14</sup> ohm-cm, Min at 27 deg.C 1 x 10 <sup>12</sup> ohm-cm, Min at 70 deg.C	TC confirming to IS 7098(Part-2)/TS/GTP	100%	R	R	
		2.3	Tensile strength	Mechanical	12.5 N/mm <sup>2</sup> , Min		100%	R	R	
		2.4	Elongation at break	Mechanical	200 percent , Min		100%	R	R	
		2.51	Ageing in air oven: Tensile strength variation	Mechanical	± 25 % Max		100%	R	R	
		2.52	Ageing in air oven : Elongation variation	Mechanical	± 25 % Max		100%	R	R	
		2.6	Hot set Test	Physical	Elongation under load 175% (max) and permanent elongation (set) after cooling 15% (max)		100%	R	R	
		2.7	Water absorption	Chemical	1mg/cm <sup>2</sup> (max)		100%	R	R	
2.8	Shrinkage	Physical	4% (max)	100%	R		R			
3	Galvanized Steel Wire(Armour)	3.01	Surface Finish	Visual	Free from surface defects like laps, cracks, kinks, twists, seam and other injurious defects	IS:3975/IS:4826/IS:6745/IS:2633/TS/GTP	10%	P	R	Make: TATA Steel, Jindal Steel, SAIL
		3.02	Chemical composition	Chemical	As per IS:3975		100%	R	R	
		3.03	Dimensions (Diameter and thickness)	Measurement			100%	R	R	
		3.04	Tensile Strength	Mechanical			100%	R	R	
		3.05	Torsion Test(for wire)	Chemical			100%	R	R	
		3.06	Wrapping test(for strips)	Mechanical			100%	R	R	
		3.07	Resistivity test	Electrical			100%	R	R	
		3.08	Mass of Zinc Coating	Chemical	As per IS :3975/ IS :4826/IS:6745/IS:2633		100%	R	R	
		3.09	Uniformity of zinc coating	Chemical	As per IS 3975		100%	R	R	
		3.1	Adhesion test	Electrical			100%	R	R	
4	PVC Compound for both Inner Sheath & Outer Sheath (Extruded ST-2 FRLSH type)	4.01	Appearance	Visual	Free from surface defects like laps, cracks, kinks, twists, seam and other injurious defects	TC confirming to IS 5831/TS	10%	P	R	Extruded PVC FRLSH (Flame retardant cables with reduced halogen evolution and smoke) Make: Shakun, Kalpana , KLJ, DCM [ShriRam]
		4.02	Tensile Strength before and after ageing	Mechanical	12.5 N/mm <sup>2</sup> (min) Variation (+/-)25%(max)		100%	R	R	
		4.03	Elongation at break	Mechanical	150 %,Variation (+/-)25%(max)		100%	R	R	
		4.04	Loss of mass in air oven	Chemical	2 mg/cm <sup>2</sup>		100%	R	R	
		4.05	Hot Deformation test (Depth of indentation)	Chemical	50 % (Max)		100%	R	R	
		4.06	Heat shock test (visual examination)	Visual	No signs of cracks or scales		100%	R	R	

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022		
Revision No.	02	Page <b>233</b> of <b>259</b>		
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi	

		4.07	Shrinkage test	Physical	4 % (Max)		100%	R	R	
		4.08	Cold bend test (visual examination)	Visual	No signs of cracks or scales		100%	R	R	
		4.09	Cold impact test (visual examination)	Visual	No signs of cracks or scales		100%	R	R	
		4.10	Colour fastness to daylight exposure	Visual	4 (min)		100%	R	R	
		4.11	Colour fastness to water	Visual	Free from traces of colours		100%	R	R	
		4.12	Thermal stability	Physical	As per IS 5831-1984		100%	R	R	
		4.13	Bleeding and blooming	Chemical	No appreciable staining of indicator compound or filter paper		100%	R	R	
		4.14	Additional test for FR/FRLSH				100%	R	R	
		a.	Oxygen Index	Environment	ASTM 2863	ASTM 2863	100%	R	R	
		b.	Temperature Index	Environment	ASTM 2863	ASTM 2863	100%	R	R	
		c.	Smoke Density Test	Environment	IEC 60754-part1	IEC 60754-part1	100%	R	R	
		d.	Halogen Acid Gas Evolution	Environment	ASTM 2843	ASTM 2843	100%	R	R	
5	Wooden Drum	5.1	Surface Finish	Visual	IS 10418 : 1982	IS 10418 : 1982	10%	P	R	
		5.2	Dimension along with Technical Specification	Measurement	IS 10418 : 1982	IS 10418 : 1982	100%	R	R	
6	Filler Material/Bedding	6.1	Surface Finish	Visual	As per Test Report	As per Test Report	10%	P	R	Non-wicking and non-moisture absorbing Thermoplastic material
7	Colour Pigment	7.1	Colour	Chemical	As per Test Report	As per Test Report	10%	P	R	
<b>B.</b>										
<b>Process Description:-</b>			<b>Stage Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>				
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		
								BA	TPCODL	
1	Wire Drawing	1.1	Surface Finish	Visual	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.	GTP/IS 398 (Part-4) & IS 8130/TS	10%	P	R	
		1.2	Diameter Of Wire	Measurement	GTP/IS 398 (Part-4) & IS 8130 /TS			P	R	
		1.3	Tensile strength	Mechanical				P	R	
		1.4	Resistivity	Electrical				P	R	
		1.5	Chemical Composition	Chemical				P	R	
		1.6	Wrapping Test	Mechanical				The Wire Shall Not Crack or Break	P	R
2	Stranding of Conductor	2.1	No of Strands	Measurement	GTP/IS 398 (Part-4) & IS 8130 /TS	GTP/IS 398 (Part-4) & IS 8130 /TS	10%	P	R	
		2.2	Diameter Of Wire	Measurement				P	R	
		2.3	Lay direction / Lay Length	Measurement				P	R	
		2.4	Conductor dimension	Measurement				P	R	
		2.5	Surface Finish & Winding	Visual				P	R	
		2.6	DC Resistance	Electrical				P	R	
		2.7	Elongation and Breaking load test	Mechanical				P	R	
3	XLPE Insulation	3.1	Thickness	Measurement	Approved GTP/IS 7098(Part-1)/TS	Approved GTP/IS 7098(Part-1)/TS	10%	P	R	
		3.2	Dia/Dimension of core	Measurement				P	R	
		3.3	Core identification	Measurement				P	R	
		3.4	Surface Finish	Visual				P	R	
		3.5	Hot set Test	Thermal				P	R	
		3.6	Volume Resistivity	Electrical				P	R	

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>		
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022		
Revision No.	02	Page <b>234</b> of <b>259</b>		
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi	

		3.7	Colour	Visual				P	R	
		3.8	Tensile Strength and Elongation Test.	Mechanical				P	R	
4	Laying up of cores	4.1	Laying up sequence	Visual				P	R	
		4.2	Core identification	Visual				P	R	1.Coloured strips shall be applied on core for identification of cores in 4C cable 2. For 2C cables, cores shall be identified by insulation coloured Red and Black. 3. For single core cable, natural XLPE Colour with blue PVC outer sheath.
		4.3	Direction of lay	Measurement				P	R	Outermost layer shall have be right-hand lay and successive layer shall be laid with opposite lay
		4.4	Lay length	Measurement				P	R	
		4.5	Dia over laid up Bundle	Measurement				P	R	
		4.6	Number of Cores	Measurement				P	R	
		5	Inner Sheathing	5.1	Surface Finish	Visual			P	R
		5.2	Type of Compound	Chemical			P	R		
		5.3	Minimum thickness of Sheath	Measurement			P	R		
		5.4	Colour	Visual			P	R		
		5.5	Diameter Over sheath	Measurement			P	R		
6	Armouring	6.1	No. of wires/Strips	Measurement				P	R	
		6.2	Dimensions/Diameter of strips/wires	Measurement				P	R	
		6.3	Direction of lay/Lay Length	Visual				P	R	Left handed
		6.4	Coverage	Measurement				P	R	
7	Outer Sheathing	7.1	Surface Finish	Visual				P	R	
		7.2	Type of Compound	Chemical				P	R	
		7.3	Minimum thickness of Sheath	Measurement				P	R	
		7.4	Overall Diameter	Measurement				P	R	
		7.5	Embossing	Visual				P	R	
		7.6	Colour	Visual				P	R	Blue colour
		7.7	Sequential Length Printing	Visual				P	R	
8	Drum for packing	8.1	Painting inside/outside	Visual				P	R	
		8.2	Poly wrapper fitting	Visual				P	R	
		8.3	Nail fixed or bot	Visual				P	R	
		8.4	Outer lagging fitting	Visual				P	R	
		8.5	MS Plate fitting	Visual				P	R	
<b>C.</b>		<b>Process Description:-</b>		<b>Final Inspection</b>		<b>W-Witness, P-Perform, R-Review</b>				
<b>Sl. No.</b>	<b>Equipment/ Operation</b>		<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>		
								<b>BA</b>	<b>TPCODL</b>	
1	Routine Test	1.1	Conductor Resistance Test	Electrical	IS 8130/TS/GTP		100%	P	R	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>	
<b>Document Title</b>		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Issue Date:</b> 23.08.2022	
<b>Revision No.</b>	02	<b>Page</b> 235 of 259	
<b>Prepared by:</b> Engineering & Quality Dept	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj	<b>Approved By:</b> Pourush Garg	<b>Issued By:</b> Rajkumar Rastogi

		1.2	High Voltage Test	Electrical	The cable shall withstand a voltage of 3 kV ac (r.m.s) at a frequency of 40 to 60 Hz or a dc voltage of 7.2 kV between conductors for 5 minutes.	IS 8130/IS 7098(Part-1)/TS/GTP		P	R	
2	Acceptance Test	2.01	Tensile test (For Al)	Mechanical	IS 8130/IS 7098(Part-1)/TS	IS 8130/IS 7098(Part-1)/TS/GTP	Sample size as per IS 7098(Part-1)/TS	P	W	
		2.02	Wrapping Test (For Al)	Mechanical				P	W	
		2.03	Conductor Resistance Test	Electrical				P	W	
		2.04	Test for thickness of insulation & sheath	Measurement				P	W	
		2.05	Hot set test for insulation	Chemical				P	W	
		2.06	Tensile strength & elongation at break test for insulation & sheath	Mechanical				P	W	
		2.07	High Voltage test	Electrical	The cable shall withstand a voltage of 3 kV ac (rms) at a frequency of 40 to 60 Hz or a dc voltage of 7.2 kV between conductors for 5 minutes.			P	W	
		2.08	Insulation resistance(Volume resistivity)	Electrical	1 x 10 <sup>14</sup> ohm-cm, Min at 27 deg.C 1 x 10 <sup>12</sup> ohm-cm, Min at 70 deg.C			P	W	
		2.09	Annealing test (For Cu) (if required)	Mechanical	TS/GTP/IS 7098-1	TS/GTP/IS 7098-1	P	W		
		2.1	Cold impact test on outer sheath	Chemical			P	W		
		2.11	<b>Test on GI Armour</b>		TS/Approved GTP/IS 3975	TS/Approved GTP/IS 3975	P	W		
		a.	Dimensional test on armour wires	Measurement			P	W		
		b.	Tensile Strength	Mechanical			P	W		
		c.	Elongation at break	Mechanical			P	W		
		d.	Uniformity of zinc coating on armour wires	Chemical			P	W		
		e.	Mass of Zinc coating	Chemical			P	W		
		f.	Resistivity	Electrical			P	W		
		2.12	<b>Additional test for FR/FRLSH Cables</b>				P	W		
		a.	Oxygen index test	Environment	ASTM D-2863/TS/GTP/IS 7098-1	ASTM D-2863/TS/GTP/IS 7098-1	P	W		
		b.	Temperature index test	Environment	ASTM D-2863/TS/GTP/IS 7098-1	ASTM D-2863/TS/GTP/IS 7098-1	P	W		
c.	Flammability test on outer sheath	Environment	IS 10810-53/TS/GTP/IS 7098-1	IS 10810-53/TS/GTP/IS 7098-1	P	W				
d.	Flame Retardant Test	Environment	IS 10810-61/TS/GTP/IS 7098-1	IS 10810-61/TS/GTP/IS 7098-1	P	W				
e.	Halogen Acid Gas Evolution	Environment	IEC 60754-part1/TS/GTP/IS 7098-1	IEC 60754-part1/TS/GTP/IS 7098-1	P	W				
2.13	Embossing and printing/Stencils on drums & Cable	Visual	TS/Approved GTP/IS 7098-1	TS/Approved GTP/IS 7098-1	P	W				
3	Type Test (CPRI/ERDA)	3.1	<b>Test on Conductor</b>				One sample of each rating	P	R	
		a.	Tensile test	Mechanical	IS 8130/TS	IS 8130/TS	P	R		
		b.	Wrapping Test	Mechanical			P	R		
		c.	Conductor Resistance Test	Electrical			P	R		
		3.2	<b>Test on Armouring wires</b>		IS 3975(1999)/TS/Approved GTP	IS 3975(1999)/TS/Approved GTP	P	R		
		a.	Dimensions	Measurement			P	R		
		b.	Tensile Strength	Mechanical			P	R		
		c.	Elongation at break	Mechanical			P	R		
		d.	Torsion test for Round wires	Mechanical			P	R		
		e.	Uniformity of Zinc Coating	Chemical			P	R		
f.	Mass of Zinc coating	Chemical	P	R						

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>			
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			Issue Date: 23.08.2022
Document No.		TPCODL-ENGG. -001		Page 236 of 259	
Revision No.		02		Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	
Prepared by: Engineering & Quality Dept		Approved By: Pourush Garg		Issued By: Rajkumar Rastogi	

		g.	Resistivity	Electrical				P	R						
		h.	Winding test for Round wires	Chemical				P	R						
		3.3	<b>Test for thickness of insulation &amp; sheath</b>	Measurement	IS 7098 (Part-1)/Approved GTP/TS	IS 7098 (Part-1)/Approved GTP/TS		P	R						
		3.4	<b>Physical Test for Insulation</b>			IS 7098(Part-1)/TS/Approved GTP		P	R						
		a.	Tensile strength and elongation at break	Mechanical	12.5 N/sq. mm 200 % (max)			P	R						
		b.	Ageing in air Oven					P	R						
		i.	Tensile strength variation	Chemical	25% (max)			P	R						
		ii.	Elongation variation	Chemical	25% (max)			P	R						
		c.	Hot set Test					P	R						
		i.	Tensile strength variation	Chemical	25% (max)			P	R						
		ii.	Elongation variation	Chemical	25% (max)			P	R						
		d.	Shrinkage test	Physical	4 % (max)			P	R						
		e.	Water absorption(Gravimetric)	Chemical	1 mg/cm <sup>2</sup> (max)			P	R						
		3.5	<b>Physical test for outer sheath</b>		IS 7098(Part-1)/TS/Approved GTP			P	R						
		a.	Tensile strength and elongation at break	Mechanical				P	R						
		b.	Ageing in air Oven	Chemical				P	R						
		c.	Loss of mass in air oven	Chemical				P	R						
		d.	Shrinkage test	Physical				P	R						
		e.	Hot Deformation test	Electrical				P	R						
		f.	Heat shock test	Physical				P	R						
		g.	Thermal stability test	Mechanical				P	R						
		3.6	Insulation resistance(Volume resistivity)	Electrical	1 x 10 <sup>14</sup> ohm-cm, Min at 27 deg.C 1 x 10 <sup>12</sup> ohm-cm, Min at 70 deg.C			P	R						
		3.7	High Voltage Test	Electrical	The cable shall withstand a voltage of 3 kV ac (rms) at a frequency of 40 to 60 Hz or a dc voltage of 7.2 kV between conductors for 5 minutes.			P	R						
		3.8	<b>Additional test for FR/FRLSH Cables</b>					P	R						
		a.	Oxygen index test	Environment	ASTM D-2863/TS/GTP/IS 7098-1	ASTM D-2863/TS/GTP/IS 7098-1		P	R						
		b.	Temperature index test	Environment	ASTM D-2863/TS/GTP/IS 7098-1	ASTM D-2863/TS/GTP/IS 7098-1		P	R						
		c.	Flammability test on outer sheath	Environment	IS 10810-53/TS/GTP/IS 7098-1	IS 10810-53/TS/GTP/IS 7098-1		P	R						
		d.	Flame Retardant Test	Environment	IS 10810-61/TS/GTP/IS 7098-1	IS 10810-61/TS/GTP/IS 7098-1		P	R						
		e.	Halogen Acid Gas Evolution	Environment	IEC 60754-part1/TS/GTP/IS 7098-1	IEC 60754-part1/TS/GTP/IS 7098-1		P	R						
4	Wooden Drums	4.1	Painting inside/outside	Visual				P	R						
		4.2	Stencils/Marking on drums	Visual	Approved GTP/IS 7098(Part-1)/TS	Approved GTP/IS 7098(Part-1)/TS	100%	P	R						
<b>D.</b>		<b>Process Description:-</b>				<b>Packing &amp; Pre-shipment</b>					<b>W-Witness, P-Perform, R-Review</b>				
<b>Sl. No.</b>	<b>Equipment/ Operation</b>		<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>							
								<b>BA</b>	<b>TPCODL</b>						
1	Packing & Despatch Check For Identification & Packing	1.1	Reference to the Standard	Visual	TS/ Approved GTP	TS/ Approved GTP	100%	P	R						
		1.2	Manufacturer Name	Visual				P	R						
		1.3	Type of cable	Visual				P	R						
		1.4	Voltage Grade	Visual				P	R						
		1.5	Number of cores	Visual				P	R						
		1.6	Nominal Cross section area of conductor	Visual				P	R						



<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL BOOKLET	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page <b>237</b> of <b>259</b>	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

		1.8	Marking of P.O	Visual				P	R	
		1.9	Direction of Rotation	Visual				P	R	
		1.10.	Length of Conductor	Visual				P	R	
		1.11	Gross Weight	Visual				P	R	
		1.12	Net Weight	Visual				P	R	
		1.13	Initial Length	Visual				P	R	
		1.14	Final Length	Visual				P	R	
		1.15	Country of Manufacture	Visual				P	R	
		1.16	Month & Year of Manufacture	Visual				P	R	
		1.17	IS certification Mark	Visual				P	R	

### 54.21 Control Cable

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)									
		<b>QUALITY ASSURANCE PLAN for Control cable</b>									
Doc. Title		Quality Assurance Plan for Control cable						Issue Date: 24-04-2022			
Doc. No.		TPCODL-EQ-MQAP-21						Other detail:			
Rev. No.		0									
Prepared By: Parikshit Panday		Reviewed By: Phiroj Kr. Uttaray				Approved By: Pourush Garg		Issued By: Parveen Verma			
A.		Raw Material Inspection			W-Witness, P-Perform, R-Review						
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks		
1	CU Wire	1.1	Diameter / Dimension	Measurement	IS: 8130/1984 /TS/Approved GTP and Drawing/Relevant standard	IS: 8130/1984 /TS/Approved GTP and Drawing/Relevant standard	10%	R	R		
		1.2	Conductor Resistance at 20°C					Electrical	R	R	
		1.3	Resistivity					Electrical	R	R	
		1.4	Annealing Test for Cu.	Physical				R	R		
2	Insulation/PVC Compound	2.1	Make	Mechanical	IS: 5831/1984 /TS /Approved GTP and Drawing/Relevant standard	IS: 5831/1984 /TS /Approved GTP and Drawing/Relevant standard	R	R			
		2.2	Specific gravity				Mechanical	R	R		
		2.3	Visual Check	Visual			R	R			
		2.4	T.S.& Elongation at break before & after ageing	Mechanical			R	R			
		2.5	Loss of mass in air oven	Electrical			R	R			

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page <b>238</b> of <b>259</b>	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

3	Sheath FRLS / PVC Compound	2.6	Thermal Stability	Visual	ASTM D-2863/TS/ Approved GTP and Drawing /Relevant standard	ASTM D-2863/TS/ Approved GTP and Drawing /Relevant standard	R	R	
		3.1	Loss of mass in air oven	Measurement			R	R	
		3.2	T.S.& Elongation at break	Measurement			R	R	
		3.3	Thermal Stability	Measurement			R	R	
		3.4	Oxygen index test	Measurement			R	R	
		3.5	Temp. Index	Measurement			R	R	
		3.6	Smoke Density Test	Measurement			R	R	
4	G.I. Armoured Wire	3.7	Halogen Acid gas generation Test	Measurement	IS: 3975/ TS /Approved GTP and Drawing/ Relevant standard	IS: 3975/ TS /Approved GTP and Drawing/ Relevant standard	R	R	
		4.1	Tensile strength & %Elongation	Mechanical			R	R	
		4.2	Resistivity	Electrical/			R	R	
		4.3	Dimension	Mechanical			R	R	
		4.4	Torsion/Winding	Mechanical			R	R	
		4.5	Weight of Zinc Coating	Chemical			R	R	
<b>B. Process Description:-</b>		<b>Stage Inspection</b>				<b>W-Witness, P-Perform, R-Review</b>			
1	Conductor Stranding & Shaping	1.1	Stranding sequence	Visually	IS:8130/1984/ & IS:1554(Pt-I)88/ TS /Approved GTP and Drawing /Relevant standard	IS:8130/1984/ & IS:1554(Pt-I)88/ TS /Approved GTP and Drawing /Relevant standard	R	R	
		1.2	No. of strand	Counting			R	R	
		1.3	Diameter of each strand	Measurement			R	R	
		1.4	Surface condition	Visually			R	R	
		1.5	Winding condition	Visually			R	R	
		1.6	Conductor resistance	Electrical			R	R	
2	Insulation	2.1	Insulation thickness	Measurement	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	R	R	
		2.2	Centre	Visually			R	R	
		2.3	Colour	Visually			R	R	
		2.4	Finish	Visually			R	R	
		2.5	Spark test	Electrical			R	R	
		2.6	I. R. at room temperature in water	Electrical			R	R	
		2.7	Winding condition	Visually			R	R	
3	Laying	3.1	Sequence of core	Visual	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	R	R	
		3.2	Direction of laying	Visual			R	R	
		3.3	Diameter over laid up cores	Measurement			R	R	
		3.4	Circularity of cable	Visual			R	R	
		3.5	Winding condition	Visual			R	R	
4	Inner Sheathing	4.1	Thickness of inner sheath	Measurement	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	R	R	
		4.2	Diameter over inner sheath	Measurement			R	R	
		4.3	Colour	Visual			R	R	
		4.4	Centre	Visual			R	R	
		4.5	Surface condition of inner sheath	Visual			R	R	
5	Armouring	5.1	No. of wire	Measurement	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	R	R	
		5.2	Size of wire	Measurement			R	R	
		5.3	Lay Direction	Measurement			R	R	
6	Outer Sheathing	6.1	Diameter over sheath	Measurement	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	IS:1554(Pt-I)88/ TS /Approved GTP and Drawing / Relevant standard	R	R	
		6.2	Thickness of sheath	Measurement			R	R	
		6.3	Centre	Visual			R	R	
		6.4	Surface finish	Visual			R	R	
		6.5	Embossing	Visual			R	R	

<b>B. Process Description:-</b>		<b>Final Inspection</b>				<b>W-Witness, P-Perform, R-Review</b>						
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks			
							BA	TPCODL				
1	Routine Test	1.1	Conductor Resistance	Electrical	IS:1554(Pt-I)88/TS/Approved GTP and Drawing /	100%	P	R/W				
		1.2	High Voltage test at room temperature	Electrical					IS:1554(Pt-I)88/TS/Approved GTP and Drawing	100%	P	R/W
2	Acceptance Test	2.1	Dimension	Measurement	IS:1554(Pt-I)88/TS/Approved GTP and Drawing/Relevant standard	IS:1554(Pt-I)88/TS/Approved GTP and Drawing	IS:1554(Pt-I)88	P	W			
		2.2	Conductor Resistance	Electrical						P	W	
		2.3	Annealing Test for Copper	Mechanical						P	W	
		2.4	Thickness of insulation	Measurement						P	W	
		2.5	Thickness of sheath	Measurement						P	W	
		2.6	Tensile Test (for aluminium)	Measurement						P	W	
		2.7	Wrapping Test (for aluminium)	Measurement						P	W	
		2.8	Volume Resistivity (IR Test)	Electrical						P	W	
		2.9	Tensile strength & Elongation at break of insulation & sheath	Mechanical						P	W	
		2.10	H. V. test at room temperature	Electrical						P	W	
3	Type Test	3.1	Tests on Conductor - Conductor Resistance test	Electrical	As per TS /Relevant	One Sample	P	R				
		3.2	Test for round steel wires/armouring wires	Mech.					P	R		

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b> <b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 239 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		3.3	Test for thickness of insulation and sheath(outer and inner)	Measurement	As per TS /Relevant standard / Approved GTP and Drawing	standard / Approved GTP and Drawing	P	R		
		3.4	Physical test for insulation & outer sheath	Physical and measurement			P	R		
		3.5	i. Tensile strength and elongation at break				P	R		
		3.6	ii. Ageing in air oven				P	R		
		3.7	iii. Hot deformation				P	R		
		3.8	iv. Shrinkage test				P	R		
		3.9	v) Loss of mass in air oven				P	R		
		3.10	vi) Heat shock test				P	R		
		3.11	vii) Thermal stability				P	R		
		3.12	Insulation Resistance test				Electrical	P	R	
		3.13	High voltage test (water immersion test) – AC & DC				Electrical	P	R	
		3.14	High voltage test at room temperature	Electrical/ Mech.			P	R		
		3.15	Flammability test	Measurement			P	R		
		4	FRLS tests(Outer sheath):	4.1			Oxygen index test	Measurement	P	R
4.2	Temp. Index			Measurement	P	R				
4.3	Flame Retardant Test on single & Bunched Cable			Measurement	P	R				
4.4	Smoke Density Test			Measurement	P	R				
4.5	Halogen acid gas evaluation Test			Measurement	P	R				
4.6	Flammability Test			Measurement	P	R				
5	Test on G.I. Armoured Wire	5.1	Tensile strength & %Elongation	Measurement	P	R				
		5.2	Resistivity	Measurement	P	R				
		5.3	Dimension	Measurement	P	R				
		5.4	Torsion/Winding	Measurement	P	R				
		5.5	Weight of Zinc Coating	Measurement	P	R				
		5.6	Uniformity of zinc coating	Measurement	P	R				

D.		Packing & Pre-shipment			W-Witness, P-Perform, R-Review				
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
							BA	TPCODL	
1	Marking	<p>Drum: Wooden drums shall be of good quality. It shall be free from any damages &amp; sharp edges of nails/ hardware inside the drums. A protective covering of polymeric sheet shall be applied inside the drum before winding the cable on the drum.</p> <p>The drum shall carry the following information stencilled on both sides of the drum:</p> <p>a) Manufacturer's name b) Type of Cable c) Voltage Grade d) Number of cores e) Nominal Cross sectional Area f) Length of the cable on the drum g) Number of lengths on the drum (If more than one) h) Direction of the rotation of the drum i) Gross mass j) ISI Certification mark</p> <p>The following details shall be embossed on the outer sheath of the cable at regular intervals every meter.</p> <p>a) Manufacturer's name b) Voltage grade c) Number of cores, size, type d) FRLSH e) Property of TATA POWER CODL, ODISHA f) IS Reference g) ISI Mark h) PO Number i) Material code j) Year of manufacturing k) Sequential length marking shall be provided on the outer sheath of the cable by printing.</p>	Visual	As per TS/ Approved GTP and Drawing	As per TS/ Approved GTP and Drawing	IS:1554(Pt-I)88	P	W	
2	Packing & Pre-shipment	2.1 Verification.	Visual	As per relevant standard/ Technical Specification	Relevant standard/ Technical Specification	100%	P	R/W	

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page 240 of 259	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

		2.2	Packing List Verification	Measurement	The Packing List should be in complete set as per Inspection Call requirement.	Inspection Call Letter	100%	P	R/W	
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54.22 11KV and 33 KV AL HT XLPE Armoured Cable

		<b>TP Central Odisha Distribution Limited</b> (A Tata Power & Odisha Govt. joint venture)								
<b>QUALITY ASSURANCE PLAN for 11 KV &amp; 33 kV AL HT XLPE Armoured Cable</b>										
Doc. Title:		Quality Assurance Plan for 11 KV & 33 kV AL HT XLPE Armoured Cable							Customer: TP Central Odisha Distribution Ltd.	
Doc No		TPCODL-EQ-MQAP-22					Issue Date: 23.03.2022			
Name of item:		11 KV & 33 kV AL HT XLPE Armoured Cable					Issued By: Mr. Rajkumar Rastogi			
Prepared By : Gaurahari Kuanr		Reviewed By: Mr. Phiroj Uttaray Approved By: Mr. Pourush Garg					Issued By: Mr. Rajkumar Rastogi			
A.	Process Description:-	Raw Material Inspection			W-Witness, P-Perform, R-Review					
Sl. No.	Equipment/ Operation	Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility			Remarks
1	Aluminium Rod	1.1	Surface Finish	Visual	The conductor shall be smooth and free from surface defects like laps, cracks, kinks, twists, seams, scratches and burns	TS/ GTP	100%	P	R	<b>Make:</b> NALCO,BALCO & Vedanta, HINDALCO only <u>Grade: H2/H4</u>
		1.2	Chemical Composition	Chemical	IS 4026/TS/GTP	IS 4026/TS/GTP	100%	R	R	
		1.3	Diameter	Measurement	IS 5484/TS/GTP	IS 5484/TS/GTP	100%	R	R	
		1.4	Breaking Load / Tensile Test	Mechanical			100%	R	R	
		1.5	Elongation Test before & after ageing	Mechanical	IS 5484/TS/GTP	IS 5484/TS/GTP	100%	R	R	
		1.6	Resistivity Test	Electrical			100%	R	R	
2	Semiconducting Tape & Compound for Screening	2.1	Surface Finish	Visual	Interfacial region between conductor screen & insulation shall be uniform. Protrusion/convolution/other defects are not acceptable in the region.	IS 7098(Part-2)/TS/Approved GTP	100%	R	R	<b>Make:</b> Dow/Borealis/Hanwa only <b>Note:</b> Both XLPE & Semi conductive compounds shall be
		2.2	Thickness of semiconducting tape	Measurement	TS/Approved GTP		100%	R	R	

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		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 241 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		2.4	Type of Material	Visual	Semiconducting tape & semiconducting compound shall be suitable for the operating temp. of the cable & compatible with the conductor/insulating material.		100%	R	R	used from same raw material supplier.
3	XLPE Insulation	3.1	Surface Finish	Visual	The conductor shall be smooth and free from surface defects	TS	100%	P	R	<b>Make:</b> Dow/Borealis/Hanwa only <b>Note:</b> Both XLPE & Semi conductive compounds shall be used from same raw material supplier.
		3.2	Volume Resistivity	Electrical	1 x 10 <sup>14</sup> ohm-cm, Min at 27 deg.C 1 x 10 <sup>12</sup> ohm-cm, Min at 70 deg.C	TC confirming to IS 7098(Part-2)/TS/GTP	100%	R	R	
		3.3	Tensile strength	Mechanical	12.5 N/mm <sup>2</sup> , Min		100%	R	R	
		3.4	Elongation at break	Mechanical	200 percent , Min		100%	R	R	
		3.51	Ageing in air oven: Tensile strength variation	Mechanical	± 25 % Max		100%	R	R	
		3.52	Ageing in air oven : Elongation variation	Mechanical	± 25 % Max	100%	R	R		
		3.6	Hot set Test	Physical	Elongation under load 175% (max) and permanent elongation (set) after cooling 15% (max)	100%	R	R		
		3.7	Water absorption	Chemical	1mg/cm <sup>2</sup> (max)	100%	R	R		
		3.8	Shrinkage	Physical	4% (max)	100%	R	R		
4	Armour (Aluminium)	4.01	Surface Finish	Visual	Free from surface defects like laps, cracks, kinks, twists, seam and other injurious defects	IS:3975/IS 8130/TS/GTP	100%	P	R	<b>Make:</b> NALCO, BALCO, HINDALCO/VEDANTA only (H4 Grade Al wires)
		4.02	Chemical composition	Chemical	As per IS:3975/IS 8130		100%	R	R	
		4.03	Dimensions (Diameter and thickness)	Measurement			100%	R	R	
		4.04	Tensile Strength	Mechanical			100%	R	R	
		4.05	Torsion Test(for wire)	Chemical			100%	R	R	

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page 242 of 259	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

		4.06	Wrapping test(for strips)	Mechanical			100%	R	R	
		4.07	Resistivity test	Electrical			100%	R	R	
5	Extruded Insulation Screen (bonded type) with semiconducting water swellable tape & Annealed Copper Tape	5.01	Surface Finish	Visual	Free from surface defects like laps, cracks, kinks, twists, seam and other injurious defects	TS/Approved GTP	100%	R	R	
		5.02	Thickness of semiconducting water swellable tape & annealed copper tape	Measurement	As per TS/Approved GTP	TS/Approved GTP	100%	R	R	
		5.03	Type of Material	Visual	As per TS/Approved GTP	TS/Approved GTP	100%	R	R	
6	PVC Compound for both Inner Sheath & Outer Sheath	6.01	Appearance	Visual	Free from surface defects like laps, cracks, kinks, twists, seam and other injurious defects		100%	P	R	
		6.02	Tensile Strength before and after ageing	Mechanical	12.5 N/mm <sup>2</sup> (min) Variation (+/-)25%(max)		100%	R	R	
		6.03	Elongation at break	Mechanical	150 %, Variation (+/-)25%(max)		100%	R	R	
		6.04	Loss of mass in air oven	Chemical	2 mg/cm <sup>2</sup>	TC confirming to IS 5831/TS	100%	R	R	
		6.05	Hot Deformation test (Depth of indentation)	Chemical	50 % (Max)		100%	R	R	
		6.06	Heat shock test (visual examination)	Visual	No signs of cracks or scales		100%	R	R	
		6.07	Shrinkage test	Physical	4 % (Max)		100%	R	R	
		6.08	Cold bend test (visual examination)	Visual	No signs of cracks or scales		100%	R	R	

**Make: Shakun, Kalpana, KLI, DCM ShriRam**  
**Note:**  
 1. For PVC Outer Sheath: Extruded ST-2 PVC FRLSH type compound (Flame retardant cables with reduced halogen evolution and smoke) along with Lead Naphenate additive as termite & rodent repellent  
 2. For PVC inner Sheath: Black coloured PVC type ST-2 Compound

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022			
Revision No.	02	Page <b>243</b> of <b>259</b>			
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi		

		6.09	Cold impact test (visual examination)	Visual	No signs of cracks or scales		100%	R	R		
		6.10	Colour fastness to daylight exposure	Visual	4 (min)		100%	R	R		
		6.11	Colour fastness to water	Visual	Free from traces of colours		100%	R	R		
		6.12	Thermal stability	Physical	As per IS 5831-1984		100%	R	R		
		6.13	Bleeding and blooming	Chemical	No appreciable staining of indicator compound or filter paper		100%	R	R		
		6.14	Additional test for FR/FRLSH								
		a.	Oxygen Index	Environment	ASTM 2863	ASTM 2863	100%	R	R		
		b.	Temperature Index	Environment	ASTM 2863	ASTM 2863	100%	R	R		
		c.	Smoke Density Test	Environment	IEC 60754-part1	IEC 60754-part1	100%	R	R		
		d.	Halogen Acid Gas Evolution	Environment	ASTM 2843	ASTM 2843	100%	R	R		
		6.15	Additional test for Co-extruded Cable								
		a.	Carbon Content	Chemical	IS 7098(Part-1)/TS/Approved GTP	IS 7098(Part-1)/TS/Approved GTP	100%	R	R		
		b.	Type of Material	Visual	HDPE ST-7 type	TS/Approved GTP	100%	R	R		
		7	Iron Drum	7.1	Surface Finish	Visual	IS 10418 : 1982	IS 10418 : 1982	100%	R	R
		7.2		Dimension along with Technical Specification	Measurement		IS 10418 : 1982		100%	R	R
8	Seal End Cap	8.1	Type of Material	Visual	Adhesive coated polyolefin heat shrinkable	TS/Approved GTP	100%	R	R		
9	Colour Pigment	9.1	Colour	Chemical	As per Test Report	As per Test Report	One Sample from Each LOT	R	R		
<b>B.</b>	<b>Process Description:-</b>		<b>Stage Inspection</b>			<b>W-Witness, P-Perform, R-Review</b>					

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<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 244 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		
								BA	TPCODL	Remarks
1	Wire Drawing	1.1	Surface Finish	Visual	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.	IS 398 (Part-4)/IS 8130 /TS/Approved GTP	10%	P	R	
		1.2	Diameter Of Wire	Measurement	IS 398 (Part-4)/IS 8130 /TS/Approved GTP			P	R	
		1.3	Tensile strength	Mechanical				P	R	
		1.4	Resistivity	Electrical				P	R	
		1.5	Wrapping Test	Mechanical	The Wire Shall Not Crack or Break			P	R	
2	Stranding of Conductor	2.1	No of Strands	Measurement	IS 398 (Part-4)/IS 8130 /TS/Approved GTP	IS 398 (Part-4)/IS 8130 /TS/Approved GTP	10%	P	R	
		2.2	Diameter Of Wire	Measurement				P	R	
		2.3	Lay ratio/Lay direction / Lay Length	Measurement				P	R	
		2.4	Conductor dimension	Measurement				P	R	
3	Conductor Screening (Semi conducting compound)	3.1	Surface Finish	Visual	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.	IS 7098(Part-2)/TS/Approved GTP	10%	P	R	
		3.2	Thickness	Measurement	IS 7098(Part-2)/TS/Approved GTP			P	R	
4	XLPE Insulation	4.1	Surface Finish	Visual	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.	IS 7098(Part-2)/TS/Approved GTP	10%	P	R	
		4.2	Radial Thickness	Measurement	IS 7098(Part-2)/TS/Approved GTP			P	R	
		4.3	Dia/Dimension of core	Measurement				P	R	
		4.4	Core identification (if required)	Measurement				P	R	
		4.5	Hot set Test	Thermal				P	R	



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		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 245 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

5	Insulation Screening (Semi-conducting compound Non metallic)	5.1	Surface Finish	Visual	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.	IS 7098(Part-2)/TS/Approved GTP	P	R	
		5.2	Thickness	Measurement	IS 7098(Part-2)/TS/Approved GTP		P	R	
6	Insulation Screening (Water swellable Tape)	6.1	Surface Finish	Visual	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.	IS 7098(Part-2)/TS/Approved GTP	P	R	
		6.2	Thickness	Measurement	IS 7098(Part-2)/TS/Approved GTP		P	R	
7	Insulation Screening (Copper Tape-metallic)	7.1	Surface Finish	Visual	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.	IS 7098(Part-2)/TS/Approved GTP	P	R	
		7.2	Thickness	Measurement	IS 7098(Part-2)/TS/Approved GTP		P	R	
8	Laying of Cores	8.1	Core identification (if required)	Visual	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R	
		8.2	Core laying Sequence	Visual			P	R	
		8.3	Direction of Lay	Visual			P	R	
		8.4	Lay Ratio/ Lay Length	Measurement			P	R	
		8.5	Dia over laid up Core	Measurement			P	R	
		8.6	No. of cores	Measurement			P	R	
9	Inner Sheathing	9.1	Surface Finish	Visual	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.	IS 7098(Part-2)/TS/Approved GTP	P	R	
		9.2	Type of Compound	Chemical	IS 7098(Part-2)/TS/Approved GTP		P	R	

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		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 246 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		9.3	Minimum thickness of Sheath	Measurement			P	R	
		9.4	Colour	Visual			P	R	
		9.5	Diameter Oversheath	Measurement			P	R	
10	Armouring	10.1	No. of wires/Strips	Measurement	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R	
		10.2	Dimensions/Diameter of strips/wires	Measurement			P	R	
		10.3	Direction of lay/Lay Length	Visual			P	R	
		10.4	Coverage	Measurement			P	R	
11	Outer Sheathing	11.1	Surface Finish	Visual	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R	Free from surface like laps, cracks, kinks, twists, seam and other injurious defects.
		11.2	Type of Compound	Chemical			P	R	
		11.3	Minimum thickness of Sheath	Measurement			P	R	
		11.4	Overall Diameter	Measurement			P	R	
		11.5	Embossing	Visual			P	R	
		11.6	Colour of outer sheath	Visual			P	R	
		11.7	Sequential Length Printing	Visual			P	R	
12	Drum for packing	12.1	Painting inside/outside	Visual	IS 10418 : 1982/TS/Approved GTP	IS 10418 : 1982/TS/Approved GTP	P	R	
		12.2	Polywrapper fitting	Visual			P	R	
		12.3	Nail fixed or bolt	Visual			P	R	
		12.4	Outer lagging fitting	Visual			P	R	
		12.5	MS Plate fitting	Visual			P	R	

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Document Title		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>	
Document No.	TPCODL-ENGG. -001	Issue Date: 23.08.2022	
Revision No.	02	Page 247 of 259	
Prepared by: Engineering & Quality Dept	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi

C.		Process Description:-			Final Inspection		W-Witness, P-Perform, R-Review			
Sl. No.	Equipment/ Operation		Characteristics	Type of Check	Acceptance Criteria	Reference Document	Sample Size	Responsibility		Remarks
								BA	TPCODL	
1	Routine Test	1.1	Conductor Resistance Test	Electrical	IS 7098(part-2) /TS/Approved GTP	IS 8130/ IS 7098(part-2) /TS/Approved GTP	100%	P	R	
		1.2	Partial Discharge Test	Electrical	IS 7098(part-2) /TS/Approved GTP			P	R	
		1.3	Resistance test for Al Armour	Electrical	IS 7098(part-2) /TS/Approved GTP			P	R	
		1.4	High Voltage Test with Power Frequency	Electrical	The cable in a dum shall withstand a voltage of 21kV ac (rms) & 63 kV ac(rms) between conductors at a frequency of 40 to 60 Hz for 5 minutes for 11kV & 33 kV Cable respectively.			P	R	
D.		Process Description:-			Acceptance Test		W-Witness, P-Perform, R-Review			
1	Test on Conductor	1.1	Conductor resistance test	Electrical	IS 10810(Part-5)/TS/Approved GTP	IS 10810(Part-5)/TS/Approved GTP	Sampling as per IS 7098(part-2)	P	W	
		1.2	Test for non conductivity of water swellable tape/yarn of conductor	Electrical	TS/Approved GTP	TS/Approved GTP		P	W	
		1.3	Visual inspection for conductor cleanliness	Visual	Check for presence of any Aluminium dust	As per TS/Approved GTP		P	W	
		1.4	Conductor water penetration test	Visual	ICEA T-31-610	As per Approved GTP/TS/ICEA T-31-610		P	W	

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		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 248 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

<b>2</b>	<b>Test on Conductor Screen</b>	2.1	Thickness of semiconducting tape over conductor	Measurement	TS/Approved GTP	TS/Approved GTP	P	W
		2.2	Test for conductivity of semi-conducting tape over conductor	Electrical	TS/Approved GTP	TS/Approved GTP	P	W
		2.3	Resistivity of extruded semi-conducting conductor screen	Electrical	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	W
		2.4	Thickness of extruded semi-conducting conductor screen	Measurement	TS/Approved GTP	TS/Approved GTP	P	W
<b>3</b>	<b>Test on Insulation</b>	3.1	Tensile strength & Elongation at break (before ageing)	Measurement	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	W
		3.2	Insulation thickness	Measurement	TS/Approved GTP	TS/Approved GTP	P	W
		3.3	Eccentricity and Ovality of insulation	Measurement	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	W
		3.4	Hot set test	Chemical	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	W
		3.5	Volume resistivity(IR Test)	Electrical	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	W

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		<b>TECHNICAL BOOKLET</b>			
<b>Document Title</b>		<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
<b>Document No.</b>	TPCODL-ENGG. -001	<b>Reviewed By:</b> Phiroj Uttaray Khajan C. Bhardwaj		<b>Approved By:</b> Pourush Garg	<b>Issue Date:</b> 23.08.2022
<b>Revision No.</b>	02				<b>Page</b> 249 of 259
<b>Prepared by:</b> Engineering & Quality Dept					<b>Issued By:</b> Rajkumar Rastogi

		3.6	Void & contamination test on core (by silicon dip method)	Visual	IS 7098 (Part-3)/TS/Approved GTP	IS 7098 (Part-3)/TS/Approved GTP	P	W	
		3.7	Surface smoothness of insulation	Visual	As per Approved GTP/TS	Approved GTP/TS	P	W	
4	Test on Insulation Screen	4.1	Resistivity of insulation screen	Electrical	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	W	
		4.2	Thickness of insulation screen	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W	
		4.3	Visual inspection for any convolution/ protrusion between conductor screen and XLPE insulation, XLPE insulation and insulation screen	Visual	As per Approved GTP/TS	Approved GTP/TS	P	W	
		4.4	Thickness & % Overlapping of semiconducting water swellable tape	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W	
		4.5	Thickness & % Overlapping of copper tape	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W	
5	Test on Inner sheath	5.1	PVC thickness	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W	
		5.2	Colour of inner sheath	Visual	As per Approved GTP/TS	Approved GTP/TS	P	W	
6(a)	Test on Armour (a) For 3 Core Cable	a.1	Tensile test	Mechanical	As per Approved GTP/TS/IS 3175	Approved GTP/TS/IS 3175	P	W	
		a.2	Mass of zinc coating	Chemical	As per Approved GTP/TS/IS 4826	Approved GTP/TS/IS 4826	P	W	

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<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 250 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		a.3	Uniformity of zinc coating	Chemical	As per Approved GTP/TS/IS 3175	Approved GTP/TS/IS 3175	P	W	
		a.4	Adhesion test	Mechanical	As per Approved GTP/TS/IS 3175	Approved GTP/TS/IS 3175	P	W	
		a.5	Diameter and no. of wires	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W	
		a.6	Coverage %	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W	
6(b)	Test on Armour (b) For 1 core cable	b.1	Tensile test	Mechanical	As per Approved GTP/TS/IS 8130	Approved GTP/TS/IS 8130	P	W	
		b.2	Wrapping test	Mechanical	As per Approved GTP/TS/IS 8130	Approved GTP/TS/IS 8130	P	W	
		b.3	Resistance test	Electrical	As per Approved GTP/TS/IS 8130	Approved GTP/TS/IS 8130	P	W	
		b.4	Diameter and no. of wires	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W	
		b.5	Coverage %	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W	
7	Test on Outer Sheath (a) PVC Outer Sheath for normal cable	a.1	Thickness	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W	
		a.2	Tensile strength and Elongation at break (before ageing)	Mechanical	As per Approved GTP/TS/IS 5831	Approved GTP/TS/IS 5831	P	W	
		a.3	Colour of outer sheath	Visual	As per Approved GTP/TS	Approved GTP/TS	P	W	

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		TECHNICAL BOOKLET	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 251 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		a.4	Surface uniformity of outer sheath (on full drum)/ shall be free from any damage void, nick, cavity	Visual	Through rewinding of Drum as per TS	TS	P	W	
		a.5	Presence of lead naphthenate in PVC outer sheath	Chemical	As per Approved GTP/TS	Approved GTP/TS	P	W	
		a.6	Flammability test	Visual	As per Approved GTP/TS/IEC 332(Part-1)/IS 7098(Part-2)	Approved GTP/TS/IEC 332(Part-1)/IS 7098(Part-2)	P	W	
		a.7	Oxygen index	Visual	As per Approved GTP/TS/ASTM 2863/IS 7098(Part-2)	Approved GTP/TS/ASTM 2863/IS 7098(Part-2)	P	W	
		a.8	Temperature index	Visual	As per Approved GTP/TS/ASTM 2863/IS 7098(Part-2)	Approved GTP/TS/ASTM 2863/IS 7098(Part-2)	P	W	
		a.9	Acid gas generation	Visual	As per Approved GTP/TS/IEC 60754/IS 7098(Part-2)	Approved GTP/TS/IEC 60754/IS 7098(Part-2)	P	W	
		a.10	Smoke density	Visual	As per Approved GTP/TS/ASTM 2843/IS 7098(Part-2)	Approved GTP/TS/ASTM 2843/IS 7098(Part-2)	P	W	

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		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 252 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

	<b>Test on Outer Sheath (b) HDPE Outer Sheath for 3 core co-extruded cable (1) Inner layer</b>	1a.1	Thickness	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W		
		1a.2	Tensile strength and Elongation at break (before ageing)	Mechanical	As per Approved GTP/TS/IS 7098(Part-2)	As per Approved GTP/TS/IS 7098(Part-2)	P	W		
		1a.3	Colour	Visual	As per Approved GTP/TS	Approved GTP/TS	P	W		
	<b>Test on Outer Sheath (b) HDPE Outer Sheath for 3 core co-extruded cable (2) Outer layer</b>	2b.1	Thickness	Measurement	As per Approved GTP/TS	Approved GTP/TS	P	W		
		2b.2	Tensile strength and Elongation at break (before ageing)	Mechanical	As per Approved GTP/TS/IS 7098(Part-2)	As per Approved GTP/TS/IS 7098(Part-2)	P	W		
		2b.3	Colour	Visual	As per Approved GTP/TS	Approved GTP/TS	P	W		
		2b.4	Carbon content	Chemical	As per Approved GTP/TS/IS 7098(Part-2)	As per Approved GTP/TS/IS 7098(Part-2)	P	W		
		2b.5	Surface uniformity of outer sheath (on full drum)/ shall be free from any damage void, nick, cavity	Visual	Through rewinding of Drum as per TS	TS	P	W		
	<b>8</b>	<b>Tests for complete cable</b>	8.01	Partial discharge test	Electrical	5 pC		P	W	



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<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page <b>253</b> of <b>259</b>
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		8.02	High voltage test	Electrical	a) For 11 kV Cable, Both 21 kV AC for 5 minutes on complete drum & 25.4 kV AC for 4 Hours on selected sample as per IS 7098 (part 2) b) For 33 kV Cable, Both 63 kV AC for 5 minutes on complete drum & 76 kV AC for 4 Hours on selected sample as per IS 7098 part 2	As per Approved GTP/TS/IS 7098(Part-2)	P	W	
9	Additional Tests	9.01	Raw material consumption	Visual	1. Document Verification as proof to be submitted 2. Invoice to be shown from procurement to consumption	TS	P	W	
		9.02	Colour coding identification over copper screen (for 3C cable)	Visual			P	W	
		9.03	Sequential marking check	Visual			P	W	
		9.04	Cable drum length verification	Visual			P	W	
		9.05	Packaging of cable on cable drum	Visual			P	W	
		9.06	Diameter over outermost sheath of coextruded cable	Measurement		As per Approved GTP/TS	Approved GTP/TS	P	W
		9.07	Weight of outer sheath of coextruded cable/ km	Measurement				P	W

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>	
		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 254 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		9.08	Weight of total HDPE of coextruded cable/ km	Measurement				P	W		
10	Iron Drums	10.1	Painting inside/outside	Visual			100%	P	W		
		10.2	Stencils/Marking on drums	Visual				P	W		
<b>E.</b>	<b>Process Description:-</b>	<b>Type Test (CPRI/ERDA)</b>				<b>W-Witness, P-Perform, R-Review</b>					
1	Type Test on Conductor	1.1	Conductor resistance test	Electrical	As per IS 8130/IS 10810(Part-5)/TS/Approved GTP	IS 8130/IS 10810(Part-5)/TS/Approved GTP		P	R		
		1.2	Conductor water penetration test	Visual	IEC 60502/ICEA T-31-610/TS/Approved GTP	IEC 60502/ICEA T-31-610/TS/Approved GTP		P	R		
2	Type Test on Insulation	2.1	Tensile strength & Elongation at break (before ageing)	Measurement	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	One sample of Each Design( Based on each size & rated voltage)	P	R		
		2.2	Ageing in Air Oven	Visual	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP		P	R		
		2.3	Tensile strength & Elongation at break	Measurement	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP		P	R		
		2.4	Insulation thickness	Measurement	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP		P	R		
		2.5	Eccentricity and Ovality of insulation	Measurement	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP		P	R		
		2.6	Hot set test	Visual	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP		P	R		

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>	
		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 255 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		2.7	Shrinkage Test	Visual	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	R	
		2.8	Gravimetric Test (Water Absorption)	Visual	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	R	
		2.9	Volume resistivity(IR Test)	Electrical	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	R	
3	Type Test on Inner Sheath	3.1	PVC Thickness	Measurement	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	R	
4	Type Test on Extruded Semi-conducting screen	4.1	Volume Resistivity Test of Conductor screen	Electrical	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	R	
		4.2	Volume Resistivity Test of Core Screen	Electrical	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	R	
5	Type Test on Outer Sheath(PVC)	5.01	Flammability test for outer sheath	Visual	IEC 332(Part-1)/TS/Approved GTP	IEC 332(Part-1)/TS/Approved GTP	P	R	
		5.02	Thickness	Measurement	IS 7098 (Part-2)/TS/Approved GTP	IS 7098 (Part-2)/TS/Approved GTP	P	R	
		5.03	Tensile strength & Elongation at break (Before Ageing)	Mechanical	IS 5831/TS/Approved GTP	IS 5831/TS/Approved GTP	P	R	
		5.04	Tensile strength & Elongation at break (After Ageing)	Mechanical	IS 5831/TS/Approved GTP	IS 5831/TS/Approved GTP	P	R	
		5.05	Variation due to Ageing	Measurement	IS 5831/TS/Approved GTP	IS 5831/TS/Approved GTP	P	R	
		5.06	Loss of mass test	Visual	IS 5831/TS/Approved GTP	IS 5831/TS/Approved GTP	P	R	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>	
		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 256 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		5.07	Shrinkage Test	Visual	IS 5831/TS/Approved GTP	IS 5831/TS/Approved GTP	P	R			
		5.08	Hot Deformation test	Measurement	IS 5831/TS/Approved GTP	IS 5831/TS/Approved GTP	P	R			
		5.09	Heat shock test	Visual	IS 5831/TS/Approved GTP	IS 5831/TS/Approved GTP	P	R			
		5.1	Thermal stability	Visual	IS 5831/TS/Approved GTP	IS 5831/TS/Approved GTP	P	R			
		5.11	Oxygen index	Visual	ASTM 2863/IS 7098(Part-2)/TS/Approved GTP	ASTM 2863/IS 7098(Part-2)/TS/Approved GTP	P	R			
		5.12	Temperature index	Visual	ASTM 2863/IS 7098(Part-2)/TS/Approved GTP	ASTM 2863/IS 7098(Part-2)/TS/Approved GTP	P	R			
		5.13	Acid gas generation	Chemical	IEC 60754/TS/Approved GTP	IEC 60754/TS/Approved GTP	P	R			
		5.14	Smoke Density	Visual	ASTM 2843/IS 7098(Part-2)/TS/Approved GTP	ASTM 2843/IS 7098(Part-2)/TS/Approved GTP	P	R			
		6	Type Test on Outer Sheath-HDPE ST 7 (For co-extruded cable)	6.1	Thickness	Measurement	As per TS/Approved GTP	TS/Approved GTP	P	R	
				6.2	Tensile strength & Elongation at break (Before Ageing)	Mechanical	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R	
				6.3	Tensile strength & Elongation at break (After Ageing)	Mechanical	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R	

<b>TPCODL</b> <small>TP CENTRAL ODISHA DISTRIBUTION LIMITED</small>		<b>TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR</b>	
		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 257 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		6.4	Shrinkage Test	Visual	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R	
		6.5	Carbon Black content Test	Chemical	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R	
7	Type Test on Armour for 3 Core Cable(if required)	7.1	Tensile Test	Mechanical	IS 3975/TS/Approved GTP	IS 3975/TS/Approved GTP	P	R	
		7.2	Torsion Test (for wire)	Mechanical	IS 3975/TS/Approved GTP	IS 3975/TS/Approved GTP	P	R	
		7.3	Wrapping Test	Mechanical	IS 3975/TS/Approved GTP	IS 3975/TS/Approved GTP	P	R	
		7.4	Resistance test	Electrical	IS 3975/TS/Approved GTP	IS 3975/TS/Approved GTP	P	R	
		7.5	Mass of zinc coating	Chemical	IS 4826/TS/Approved GTP	IS 4826/TS/Approved GTP	P	R	
		7.6	Uniformity of zinc coating	Chemical	IS 3975/TS/Approved GTP	IS 3975/TS/Approved GTP	P	R	
		7.7	Adhesion test	Mechanical	IS 3975/TS/Approved GTP	IS 3975/TS/Approved GTP	P	R	
8	Type Test on Armour for 1 Core Cable	8.1	Tensile Test	Mechanical	IS 8130/TS/Approved GTP	IS 8130/TS/Approved GTP	P	R	
		8.2	Torsion Test (for wire)	Mechanical	IS 8130/TS/Approved GTP	IS 8130/TS/Approved GTP	P	R	
		8.3	Wrapping Test	Mechanical	IS 8130/TS/Approved GTP	IS 8130/TS/Approved GTP	P	R	
		8.4	Resistance test	Electrical	IS 8130/TS/Approved GTP	IS 8130/TS/Approved GTP	P	R	
9	Type Test on Complete Cable	9.1	Partial discharge test	Electrical	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R	

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		<b>TECHNICAL BOOKLET</b>	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page 258 of 259
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		9.2	Thermal Ageing Test	Visual	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R		
		9.3	Bending Test	Mechanical	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R		
		9.4	Dielectric Power Factor Test	Electrical	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R		
		9.5	High Voltage Test	Electrical	21kV A.C for 5 minutes( for 11 KV Cable) 63 kV A.C for 5 minutes(for 33 kV Cable)	IS 7098(Part-2)/TS/Approved GTP	P	R		
		9.6	Heat Cycle Test	Visual	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R		
		9.7	Impulse Withstand Test	Electrical	IS 7098(Part-2)/TS/Approved GTP	IS 7098(Part-2)/TS/Approved GTP	P	R		
<b>F.</b>	<b>Process Description:-</b>	<b>Packing &amp; Pre-shipment</b>				<b>W-Witness, P-Perform, R-Review</b>				
<b>Sl. No.</b>	<b>Equipment/ Operation</b>		<b>Characteristics</b>	<b>Type of Check</b>	<b>Acceptance Criteria</b>	<b>Reference Document</b>	<b>Sample Size</b>	<b>Responsibility</b>		
								<b>BA</b>	<b>TPCODL</b>	
									<b>Remarks</b>	
1	Packing & Despatch Check For Identification & Packing	1.1	Reference to the Standard	Visual	TS/ Approved GTP	TS/ Approved GTP	100%	P	R	
		1.2	Manufacturer Name	Visual				P	R	
		1.3	Type of cable	Visual				P	R	
		1.4	Voltage Grade	Visual				P	R	
		1.5	Number of cores	Visual				P	R	
		1.6	Nominal Cross section area of conductor	Visual				P	R	
		1.8	Marking of P.O	Visual				P	R	
		1.9	Direction of Rotation	Visual				P	R	
		1.10.	Length of Conductor	Visual				P	R	
		1.11	Gross Weight	Visual				P	R	
		1.12	Net Weight	Visual				P	R	

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		TECHNICAL BOOKLET	
<b>GENERAL TECHNICAL PARTICULARS AND DRAWINGS</b>			
Document Title	TPCODL-ENGG. -001		Issue Date: 23.08.2022
Document No.	02		Page <b>259</b> of <b>259</b>
Revision No.	Reviewed By: Phiroj Uttaray Khajan C. Bhardwaj	Approved By: Pourush Garg	Issued By: Rajkumar Rastogi
Prepared by: Engineering & Quality Dept			

		1.13	Initial Length(bottom)	Visual				P	R	
		1.14	Final Length(Top)	Visual				P	R	
		1.15	Country of Manufacture	Visual				P	R	
		1.16	Month & Year of Manufacture	Visual				P	R	
		1.17	IS certification Mark	Visual				P	R	

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
1	HT Outdoor Type Vacuum Circuit Breaker(VCB)	M/s CG Power & Industrial Solutions Ltd, Maharashtra	A-3, MIDC, Pandavleni, Ambad, Nashik, Maharashtra	Mr. Gaurav Dhikale	9370417581	gaurav.dhikale@cgglobal.com
		M/s ABB INDIA Ltd, Maharashtra	Plot No.34, MIDC Industrial Area,Satpur, Nashik, Maharashtra	Mr. Saibal Majumdar	9007000365	saibal.majumdar@in.abb.com
2	HT Indoor Type Vacuum Circuit Breaker(VCB)	M/s ABB INDIA Ltd, Maharashtra	Plot No.34, MIDC Industrial Area,Satpur, Nashik, Maharashtra	Mr. Saibal Majumdar	9007000365	saibal.majumdar@in.abb.com
		M/s Schneider Electric Infrastructure Ltd,Bhubaneswar	14,Forest Park,Bhubaneswar-751009	Mr. Girija Patnaik	9937062964	girija.patnaik@schneiderelectric.com
3	33 kV Ring Main Unit (With Metering)	M/s Lucy Electric India Pvt Ltd, Maharashtra	H-21, MIDC Ambad, Nashik, Maharashtra	Mr. Pratap Throat	9960867888	Pratap.Thorat@lucyelectric.com
		M/s ABB INDIA Ltd, Maharashtra	Nashik, Maharashtra	Mr. Saibal Majumdar	9007000365	saibal.majumdar@in.abb.com
4	33 kV Ring Main Unit (Without Metering)	M/s Lucy Electric India Pvt Ltd, Maharashtra	H-21, MIDC Ambad, Nashik, Maharashtra	Mr. Pratap Throat	9960867888	Pratap.Thorat@lucyelectric.com
		M/s ABB INDIA Ltd, Maharashtra	Plot No.79,Street No. 17, MIDC Industrial Area,Satpur, Nashik, Maharashtra	Mr. Saibal Majumdar	9007000365	saibal.majumdar@in.abb.com
		M/s SIEMENS Ltd, Goa	L-6,Verna Industrial Estate, Verna Salcete, Goa	Mr. Utpal Roy	9748255175	utpal.roy@siemens.com
		M/s Partha Electricals, Gujrat	E-113, Manjusar G.I.D.C Savli, Industrial Estate, Vadodara, Gujarat	Mr. Jignesh Patel	9879106471	jignesh.patel@parthelectricals.in
5	11 kV Ring Main Unit (With Metering)	M/s Lucy Electric India Pvt Ltd, Maharashtra	H-21, MIDC Ambad, Nashik, Maharashtra	Mr. Pratap Throat	9960867888	Pratap.Thorat@lucyelectric.com
		M/s ABB INDIA Ltd, Maharashtra	Plot No.79,Street No. 17, MIDC Industrial Area,Satpur, Nashik, Maharashtra	Mr. Saibal Majumdar	9007000365	saibal.majumdar@in.abb.com
6	11 kV Ring Main Unit (Without Metering)	M/s Lucy Electric India Pvt Ltd, Maharashtra	H-21, MIDC Ambad, Nashik, Maharashtra	Mr. Pratap Throat	9960867888	Pratap.Thorat@lucyelectric.com
		M/s ABB INDIA Ltd, Maharashtra	Plot No.79,Street No. 17, MIDC Industrial Area,Satpur, Nashik, Maharashtra	Mr. Saibal Majumdar	9007000365	saibal.majumdar@in.abb.com
		M/s SIEMENS Ltd, Goa	L-6,Verna Industrial Estate, Verna Salcete, Goa	Mr. Utpal Roy	9748255175	utpal.roy@siemens.com
		M/s Eaton Power Quality Pvt Ltd,Pondichery	EVR Street, Sedarapet, Pondichery	Mr. Pritam Maiti Mr. Swarnadip Mukherjee	7291029069 9007026607	PRITAMKMaiti@eaton.com swarnadipmukherjee@eaton.com
		Ms C-Sec Technologies Pvt Ltd.	Plot no-10,Sec-11,II E Sidcul, Ranipur Haridwar-249403	Mr. Suhas Aapte	8291706861	sameer.apte@c-sec.co.in
		M/s Partha Electricals, Gujrat	E-113, Manjusar G.I.D.C Savli, Industrial Estate, Vadodara, Gujarat	Mr. Jignesh Patel	9879106471	jignesh.patel@parthelectricals.in
7	HT 630 KVA CSS	M/s Sudhir Power, Haryana	Plot No. 92, Sector - 8, IMT Manesar, Gurgaon – 122 050, Haryana, India	Mr. Amit S Rana	7906917260	amitsrana@sudhirpower.com
		M/s Partha Electricals, Gujrat	E-113, Manjusar G.I.D.C Savli, Industrial Estate, Vadodara, Gujarat	Mr. Jignesh Patel	9879106471	jignesh.patel@parthelectricals.in

N.B : Before placing the order please check the availability of approved GTP of Manufacturer issued from TPCODL



TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
	TRANSFORMER ( All are BIS Level-2 (Old) / Level-1(As per Ammdt.4/2021) except other wise mentioned)					
	11/0.4KV DTR: 25,63,100,250,500 KVA 11/0.240KV DTR: 16 KVA	M/s Alfa Transformers Ltd,Bhubaneswar	Plot No.3337,Mancheswar Industrial Estate,Rasulgarh,Bhubaneswar,Odisha	Mr.Debasish Das	9437007700	debasis.das@alfa.in sales@alfa.in info@alfa.in
	11/0.4KV DTR: 25,63,100,250,500 KVA	M/s Orissa Transformers Pvt. Ltd.,Bhubaneswar	S3/73, Sector-A, Zone-B, Mancheswar Industrial Estate, Bhubaneswar-751010	Mr. Jiban Kumar Badu	9437307224 8328838815	otpljkb@gmail.com
	11/0.4KV DTR: 25,63,100,250,500 KVA	M/s Suvam Transmission Pvt Ltd, Bhubaneswar	Kesura, Jharpada, Bhubaneswar,Odisha	Mr.Harihar Parida	9090968905	stpl.bhubaneswar@gmail.com
	11/0.4KV DTR: 25,63,100,250 KVA 11/0.240KV DTR: 16 KVA	M/s Gram Tarang Employability Training Services Pvt Ltd, Khurda	Jatani, Khurda,Odisha	Mr. Manoj Kumar Nayak	9338123532	manoj.nayak@gramtarang.org.in
	11/0.4KV DTR: 25,63,100,250 & 500 KVA	M/s Orissa Engineering Udyog Pvt. Ltd,Jagatpur,Cuttack	At-S3/17,Jagatpur Industrial Estate,Phase-3,Jagatpur,Cuttack,Odisha	Er. W. Z. Khan	9861050293 9238412786	oeu_wzk2003@yahoo.com oeu.groups@gmail.com
	11/0.4KV DTR: 25,63,100,250 KVA	M/s Power Line Transformer Pvt Ltd,Bhubaneswar	Mancheswar,Bhubaneswar	Mr.K C Mishra	9437025806	powerline.bbsr@gmail.com
	11/0.4KV DTR: 25,63,100 KVA 11/0.240KV DTR: 16 KVA	M/s Powertech & Technology,Cuttack	IDCO Plot No.80/O,Phase-III ,New I.E,Jagatpur,Cuttack,Odisha	Mr.Debasis Bhoi	9437120176 9437339639	powertechtechnology25@gmail.com
	11/0.4KV DTR: 25,63,100,250 KVA 11/0.240KV DTR: 16 KVA	M/s Om Sai Transformer Pvt Ltd,Cuttack	D2/2 & D2/3 , Old Industrial Estate,Jagatpur,Cuttack	Mr.Bijay Kishore Nanda	9861062611 9437312568	ommsaitransformers2007@gmail.com
	11/0.4KV DTR: 25,63,100 KVA	M/s Apolo Transformer,Cuttack	Balisahi,Khapuria(OGP),Cuttack	Mr.Samir Mohan Das	9439551221 9437027885	apolotransformer@gmail.com
	11/0.4KV DTR: 25,63,100 KVA	M/s Genmart Transformer,Cuttack	Imam Nagar,Cuttack	Mr.B.P.Mishra	9716164645 8368852984	genmartctc2019@gmail.com
	11/0.4KV DTR: 25,63,100 KVA	M/s Akhandalamani Electricals & Constructions, Cuttack	Kuspangi,Cuttack, Odisha	Mr. Prabhat Kumar Rout	9438873224	pravat@aecinfrastructure.com
	11/0.4KV DTR: 25,63,100 ,500 KVA 11/0.4KV DTR: 250 KVA(EEL-3(Old) / EEL-2(As per Ammdt.4/2021) 11/0.240KV DTR: 16 KVA	M/s Skylight Transformer,Cuttack	Plot No.51,Immam Nagar, Salipur, Bhairapur, Jagatpur, Cuttack, Odisha	Mr.C K Pradhan	9437644889 9337269896	skylight.odisha@gmail.com
	11/0.4KV DTR: 25,63,100,250,500 KVA	M/s J B Electricals,Dhenkanal	31 & 33 Kathagada,Anand Nagar,Dhenkanal	Mr.Ananta Charan Baral	8895353125 9861163657	jb.electricals14@yahoo.in anantacharanbaral2019@gmail.com
	11/0.4KV DTR: 25,63 & 250 KVA	M/s Siva Transformer,Talcher,Angul	At- Remuan, Po- Hatatata, Talcher , Dist-Angul(Odisha) Pin-759100	Mr.Siva Sekhar Sahoo	9437040182, 7381040188	sivatransformer2013@gmail.com
	11/0.4KV DTR: 25,63,100,250,500 KVA 11/0.240KV DTR: 16 KVA	M/s Bright Transformers Pvt Ltd,Bhubaneswar	I51, Sector-A, Zone-B, Industrial Estate,Mancheswar,Bhubaneswar,Odisha	Mr.Trilochan Lenka Mr.Ajay Chhualsingh	9437317639 7609866088	btplbbsr10@gmail.com
	11/0.4KV DTR: 25,63,100,250 KVA	M/s Kapilas Transformers,Dhenkanal	At : Asanabahal, Po : Barada, Dist : Dhenkanal, Odisha	Mr. Bipin Bihari Nayak	9938501617 9439580031	kapilastransformer14@gmail.com
	11/0.4KV DTR: 25,63,100,250 KVA 11/0.240KV DTR: 16 KVA	M/s Orissa Industrial Equipments Pvt. Ltd.,Bhubaneswar	Plot no S/72,Sec A, Zone A, Mancheswar Industrial State ,Bhubaneswar,Odisha	Mr. Jiban Kumar Badu	9437307224	oieplsb@gmail.com
	11/0.4KV DTR: 25,63,100 KVA	M/S Maa Tarini Electricals & Engineering,Cuttack	IDCO Plot No.50/O,Phase-III ,New I.E,Jagatpur,Cuttack,Odisha	Mr. S Mohapatra	8328920567	maatarinitransformer@gmail.com
	11/0.4KV DTR: 25,63,100 KVA	M/s Bijyanee Transformer, Dhenkanal	At-Banamaliprasad near DPS , Po- Dhenkanal, Dist-Dhenkanal(Odisha) Pin-759001	Mr.Niranjana Biswal	9437292435	bijayeenierprise@gmail.com
	11/0.4KV DTR: 25,63,100 KVA(EEL-3(Old) / EEL-2(As per Ammdt.4/2021) 11/0.4KV DTR: 250,500 KVA	M/s Care Transformer,Bhubaneswar	Plot No 211 (F), Sector- A, Zone -B, Mancheswar Industrial Estate, Bhubaneswar-751010, odisha	Mr.Amiya Ranjan Behera	9861140540	caretransformerbbsr@gmail.com
	11/0.4KV DTR: 25,63,100,500 KVA	M/s Konark Transformer Pvt. Ltd,Cuttack	Plot No 55,Phase-II, New Industrial Estate, Jagatpur, Cuttack,Odisha	Saheduzzaman Khan	9861592825	chandbabu.12@rediffmail.com
8	11/0.4KV DTR: 25,63,100,250 KVA	M/s Maa Ugratara Transformers Pvt Ltd, Khurda	Nizigarh,Kuhuri,Near Tangi,Dist-Khurda,Pin-752027	Mr.Subhasish Pattnaik	9853511278 9861058123	m.ugratara@gmail.com
	11/0.4KV DTR: 100 KVA	M/s Madni Power Transformer & Electricals, Puri	Plot no-920, Near UGS College,Sakhigopal,Puri,Pin-752014.	Mohammad Khan	9861212812	madnipower786@gmail.com
	11/0.4KV DTR: 100 KVA	M/s Lakheswar Transformer & Tradings,Cuttack	Plot No.1640/3340, Kuranga Sasan, Niali, Cuttack	Mr. Pravat Kumar Baral	9337737271 9437035666	ltt20199@gmail.com
	11/0.4KV DTR: 25,63,100,250,500KVA	M/s S K Electricals, Jajpur	Oupada,Panikoili,Jajpur,Odisha	Mr. Saroj Kumar Poi	9338710303	eskelectricals@gmail.com

TPCODL	APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023					Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
	11/0.4KV DTR: 25,63,100,250 KVA	M/s Samleswari Transformers Pvt. Ltd.,Bhadrak	Baradeswar,Kenduapada,Bhadrak,Odisha	Mr. Sumit Jena	7008905880 9853574199	menterprises761@gmail.com
	11/0.4KV DTR: 25,63,100,250 & 500KVA 11/0.240KV DTR: 16 KVA	M/s Microtek Transformers Pvt Ltd, Balasore	Kuruda,(NH-5), Near Kuruda Flyover, Balasore	Mr. Rajiv Shah Mr. Alok Ranjan Mallick	9437066509 9439841872	menterprises761@gmail.com microtek_trans@yahoo.com
	11/0.4KV DTR: 25,63,100 KVA	M/s Fyaro Transformers, Balasore	S-2/10, Industrial Estate, Balasore, Odisha-756001	Mr. S. Acharya	9437061793 9437000919 7008372871	fyarotrans@gmail.com
	11/0.4KV DTR: 25,63,100 KVA	M/s SaiKrupa Transformers, Keonjhar	Tangarpalasa, Ghadaghadi Temple Road, Near Railway Over Bridge, Naranpur, Keonjhar,Odisha	Mr. Uday Kumar Sha	9437157746 7008800796	saikrupatransformers@rediffmail.com
	11/0.4KV DTR: 25,63,100 & 500 KVA	M/s KMR Transformers, Balasore	Plot No 20, Gadiamal, Bahal, Sergarh Balasore, Odisha 756060	Mr. Mahesh Kumar Modi	8917258551 9438590438	kmrtransformer@gmail.com
	11/0.4KV DTR: 25 & 63 KVA	M/s Jagannath Electricals, Bhadrak	At - Erein, Po - Charampa, Dist - Bhadrak	Mr. Madan Lal Agarwal	9437060421 7008605895	madanagarwal51@yahoo.com
	11/0.4KV DTR: 25,63,100,250 KVA	M/s. Lakshmi Transformer Electricals ,Agra	B-8, Site-A, UPSIDC, Sikandra, AGRA-282007	Mr. M.K Bhagel	9927395842 9927395037	lakshmi.transformers@gmail.com
	11/0.4KV DTR: 63,100,250,500 KVA	M/s Nucon Switchgears Pvt Ltd, Ludhiana	D-47, Phase-V, Focal Point, Ludhinana-141 010. (Pb.) India	Mr.Sushil Kumar	9988388387 9891915253	sushil@nucon.co.indavgup@gmail.com
	11/0.4KV DTR: 250,500 KVA	M/s SVASCA Industries Ltd, Haryana	48th Milestone, Delhi Mathura Road, Parithala, Palwal,Haryana-121102	Mr.S C Sharma	9811084747	info@svascaindustries.com
	11/0.4KV DTR: 25,63,100,500 KVA	M/s Synergy Power Equipment Pvt Ltd ,Jamshedpur	Road#17, Jawahar Nagar, Mango, Jamshedpur-831020 Jharkhand	Mrs. Sangeeta Yadav	7485093673	synergypower18@yahoo.com
	11/0.4KV DTR: 250,500 KVA	M/s Telawne Power Equipments Pvt Ltd , Mumbai	R-457, MIDC Rabale,Behind pipeline road,Thane Belapur Road, Navi Mumbai - 400 701	Mr.Aswini Kumar	8698703532	tender@telawne.com
	11/0.4KV DTR: 25,63,250,500 KVA 11/0.240KV DTR: 16,25 KVA	M/s Toshiba T& D Systems(India) Pvt Ltd, Telengana	Rudraram, Patancheru Mandal, Sangareddy District, Telangana-502329	Mr. T Dhanraj	9573377652	srinikhitha.durgempudi@toshiba-tdi.com mahesh.katepalli@toshiba-tdi.com
	11/0.4KV DTR: 25,63,100,500 KVA	M/s Viji Power Transformers Pvt Ltd, Bangalore	Plot No-21, Meheta Industrial Estate, Dasanapura Hobli, Bapagrama Post, Machohalli, Bangalore-560091	Mr.Dinakar B	9900111089 7829975506 7760171114	vijitechdinakar10@yahoo.co.in
	11/0.4KV DTR: 25,63,100,250,500 KVA	M/s Volt Tech Manufacturing Company Ltd, Tamilnadu	Survey No.212/1,212/2,313/3, Pillainakkam Village, Sriperumpudur Taluk, Kancheepuram,Tamilnadu	Mr. R Adalarasan	9360124618 9369361044	transformers@voltechgroup.com
	11/0.4KV DTR: 25,63,100,250 KVA	M/s Siliguri Electric Works Ltd, West Bengal	Khaprail Road,Matigara,Siliguri,Darjeeng,West Bengal	Mr. A Das	9733309977 3532530776	contact.sew@gmail.com
	11/0.4KV DTR: 100 KVA	M/s Marsons Energy Ltd, Jaipur	403, Paradise Garden, A-25 Tilak Nagar, Vidhyalaya Marg, Jaipur-302004	Mr. Kanheya Lal	9829111080 8005861581	info@marsons.co.in
	11/0.4KV DTR: 25,63,100 KVA	M/s Star Delta Transformers Ltd, Bhopal	92-A, Industrial Area Gobindapur, Bhupal-462023(M.P)	Mr. Aman Tiwari	9589436146	star.deltaeng@gmail.com
	11/0.4KV DTR: 100 KVA	M/s Tesla Power Equipments & Projects Pvt Ltd, Bhopal	Plot no.H-147 & I-147,Sector-H,Industrial Area,Govindpura,Bhopal	Mr. Hemant Malviya	9981419641	hemant@teslaindia.co
	11/0.4KV DTR: 25,63,100 KVA, 11/0.240KV DTR: 16 KVA	M/s Vardhman Electromech Pvt Ltd, Jaipur	F-674, Phase-II, RIICO Industrial Area,Sitapura, Jaipur,Rajasthan-302022	Mr. K. P. Shenu	9179320240	kp.shenu@vardhman.net
	11/0.4KV DTR: 25,63,100,250,500 KVA	M/s Jay Bee Industries	Village Batwal, Tehsil raipur Rani, Dist Panchkula -Haryana	Mr. Sunil Soni	9971001211	Nitesh.soni@rhineenergy.com
9	HT Polymer Pin & Disc Insulator	M/s Rashtriya Electricals & Engineering Corporation Pvt Ltd,Ghaziabad	C-2-3,Sector-A-3,Tronica City, Ghaziabad,Uttar Pradesh	Mr.Sanjeev Goyal Mr.Lalit	8048409175 8860040606	lalit@rashtriyaelectrical.com
		M/s Hindustan Chemicals, Khurja, UP	NH-91,G.T Road,Near Telephone Exchange,Khurja,Uttar Pradesh-203131	Mr.Shomil Gupta	9690011869 9837057759	sales@hindustanchemicals.com
		M/s Hobb International,Howrah	Jalan Complex,Howrah,West Bengal	Mr.Pratik Hore Mr.Vedant Balasaria	8017733646 9830079313	
		M/s Scenario Powertech Pvt Ltd,Gujrat	Survey No.82/P.Gambhirpura,Vavdi-Harsol Road,Talod,Sabarkantha,Gujarat,India-383305	Mr.Ketul Patel Mr.Yashdip Patel	9925246612 9898137221	ketul@scenariopower.com scenario.power@gmail.com
		M/s Adinath Industries, Rajasthan	Plot No. E-45(G-2), RICCO Ind. Area,Khushkhara, Bhiwadi, Dist. Alwar, Rajasthan- 301019 (INDIA)	Mr. BN Patra Mr.Arnab Mitra	9937091838 9830195664	indianpower123@gmail.com arnab.adinathindus@gmail.com

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
		M/s Prime Insulators Pvt Ltd, Gujarat	Ceramic Zone, Block no. 134/P2,Dalpur, TA Prantij, Sabarkantha, Gujarat, INDIA (383 120).	Mr.Mohan Krishna	9925237312 9879521374	info@primeinsulators.com, sales@primeinsulators.com
		M/s Imperial Porcelain Pvt Ltd, Rajasthan	E 247-248,248A, IGC Khara, Khara, Bikaner, Rajasthan, India - 334601	Mr. Anand Lahoti Mr.Mukesh Joshi	9001091705 9001091707	polymer@imperialceramics.in
		M/s Ele Chem Systems Pvt. Ltd, Punjab	Plot No:- 524-525, Phase - IX, Industrial Area, Mohali, Punjab-160062 ( India) <b>Authorized Distributors:</b> 1. M/s Samal Industries, Khurda Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	M/s Neha 1. Mr. Prakash Samal	8872080082 1. 9437231336	elesystems1@gmail.com elechemindia123@gmail.com 1. samalindustries1234@gmail.com
		M/s Prithvi Industries Pvt. Ltd., Howrah	PB Samaddar Industrial Area,Vill: Ruia, Mouza:Popatulia, 24 North Parganas, Kolkata, West Bengal-700119	Mr. Sanjib Kumar Pal	9438344128	inquiry.prithvi@gmail.com
10	12KV, 10KA Polymeric Lighting Arrestor	M/s Elektrolites Power Pvt Ltd, Jaipur	E-148 to 150,RIICO Industrial Area,Bagru,Jaipur,Rajasthan-302007	Ms.Alisha Garg	8696948980	alisha.garg@elektrolites.com
		M/s ELPRO International Ltd, Pune	Near Chaphekar Chowk,Chinchwad Gaon, Opposite Annapurna Hotel, Pune,Maharashtra	Mr. Satish Kale	8879113397	mkt@elpro.co.in mkt.mov@elpro.co.in
		M/s New Aquaria Electeck Pvt. Ltd., Telangana	Plot No.30,Kucharam Industrial Park,Toopran,Mandal,Medak,Telangana	Mr.Karthik C Mr.Raghabendra	8806667604 9538880209	sales@newaquariaelecteck.com raghu@newaquariaelecteck.com
			<b>Authorized Distributors:</b> 1. M/s Samal Industries, Khurda Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	1. Mr. Prakash Samal	1. 9437231336	1. samalindustries1234@gmail.com
		M/s LAMCO Industries Pvt Ltd, Hyderabad	B-38 39 & 40,Industrial Estate,Sananthnagar,Hyderabad, Andhra Pradesh-500018	Ms.Lavanya	8096080080	lavanya.g@lamcoindia.com info@lamcoindia.com
		M/s Oblum Electrical Industries Pvt Ltd, Hyderabad	A-16&17,Assisted Private Industrial Estate,Balanagar,Hyderabad,Telangana-500037	Mr.Prasanna	9666218445	sales@oblum.co.in technical@oblum.co.in prasanna@oblum.co.in
		M/s Raychem RPG Pvt Ltd., Gujarat	Kanjari,Jyoti Compound,Nr Halol GIDC,Panchmahal,Gujarat	Mr.Rahul Biswas Mr.Mehul Patel	9771427299 9724304622	rahul_biswas@raychemrpg.com
		M/s Rashtriya Electricals & Engineering Corporation Pvt Ltd,Ghaziabad, UP	C-2-3,Sector-A-3,Tronica City, Ghaziabad,Uttar Pradesh	Mr.Sanjeev Goyal Mr.Lalit	08048409175 8860040606	lalit@rashriyaelectrical.com
		M/s Hindustan Chemicals,Khurja, UP	NH-91,G.T Road,Near Telephone Exchange,Khurja,Uttar Pradesh-203131	Mr. Shomil Gupta	9690011869 9837057759	sales@hindustanchemicals.com
		M/s Orange Power T&D Equipments(P) Ltd, Bangalore	# 2, SSI Area, 1st Cross,Rajaji Nagar,Bangalore, Karnataka	Mr. Chetan Bhurat	9980533011	sales@orangepower.co.in
M/s SHREE RADHE INDUSTRIES	Plot no -86, Alindra GIDC, Manjusar, Ta-Savli, Dist-Vadodara-391775, Mob: 9879978170	1. Mr. Anurag Jha	6351323319 9983520057	sales@shreeradheindustries.com		
11	30KV, 10KA Polymeric Lighting Arrestor	M/s Engineer Enterprise, Rajasthan	F-112, RIICO Industrial Area Extn.,Phase-2, Bagru, Jaipur, Rajasthan	Mr. Hari	8058191595	marketing@eenterprise.in
		M/s Oblum Electrical Industries Pvt Ltd, Hyderabad	A-16&17,Assisted Private Industrial Estate,Balanagar,Hyderabad,Telangana-500037	Mr.Prasanna	9666218445	sales@oblum.co.in technical@oblum.co.in prasanna@oblum.co.in
		M/s New Aquaria Electeck Pvt. Ltd., Telangana	Plot No.30,Kucharam Industrial Park,Toopran,Mandal,Medak,Telangana	Mr.Karthik C Mr.Raghabendra	8806667604 9538880209	sales@newaquariaelecteck.com raghu@newaquariaelecteck.com
			<b>Authorized Distributors:</b> 1. M/s Samal Industries, Khurda Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	1. Mr. Prakash Samal	1. 9437231336	1. samalindustries1234@gmail.com
		M/s SHREE RADHE INDUSTRIES	Plot no -86, Alindra GIDC, Manjusar, Ta-Savli, Dist-Vadodara-391775, Mob: 9879978170	1. Mr. Anurag Jha	6351323319 9983520057	sales@shreeradheindustries.com
M/s Orange Power T&D Equipments(P) Ltd, Bangalore	1 st Cross Small Scale Industrial Area, Rajajinagar, Bangalore -560010 Phone-23356615 .	Mr. Chetan Bhurat	9980533011	orange.power@rediffmail.com		

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
12	11 KV Polymer type AB Switch	M/s Ultima Switchgears Ltd.,Noida	F-6/F-7,UPHDC,Surajpur Industrial Area,Greater Noida,UP-201336	Mr.Vansh Parmar	9582221901 9953233568	vdp@ultimaswitchgear.com
		M/s High Tension Electrical Equipments Pvt. Ltd,Howrah	101, C Road, Belgachia, Dasnagar,Howrah, West Bengal	Mr.Kaushik Das	9831906005	comm1@hightension.in
		M/s Sigma Power Industries, Cuttack	Plot no-18, Low Laying Area, Industrial Estate, Khapuria, Madhupatna, Cuttack, 753010, Odisha	Mr. Debankar Biswal	9755550290	sigmapower2020@gmail.com
		M/s Samal Industries, Khurda	Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	Mr. Prakash Samal	9437231336	samalindustries1234@gmail.com
		M/s Indian Power Industries, Cuttack	Jhikiria, 42 Mouza, Cuttack, Odisha- 754112	Mr. Bholanath Patra	9937091838 7978602614	indianpower123@gmail.com
		M/s National Casting & Engineering Co., Cuttack	Nayabazar, Cuttack, Odisha- 753004	Mr. Amit Dingal Mr. Salil Kumar Dingal	9937444762 7008811568	salil_switchgear@rediffmail.com nccc1986@gmail.com
		M/s Pramoda Engineering Works	S3/12, Phase-2,New industrial Estate,Jagatpur,Cuttack, Pin 754021 odisha.	Mr. Rakhesh malla.	9078071194/9437975180	pramodaengineeringworks@yahoo.in
		M/s Indian Metal Industries, Cuttack	53, Dingal Badi, Cuttack, Gosala Road, PO-Nayabazar, Odisha	Mr. Samir Kumar Dingal Mr. Santanu Dingal	7008696247 9853786663	dingal007@gmail.com
13	33 KV Polymer type AB Switch	M/s Sigma Power Industries, Cuttack	Plot no-18, Low Laying Area, Industrial Estate, Khapuria, Madhupatna, Cuttack, 753010, Odisha	Mr. Debankar Biswal	9755550290	sigmapower2020@gmail.com
		M/s Samal Industries, Khurda	Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	Mr. Prakash Samal	9437231336	samalindustries1234@gmail.com
		M/s Indian Power Industries, Cuttack	Jhikiria, 42 Mouza, Cuttack, Odisha- 754112	Mr. Bholanath Patra	9937091838 7978602614	indianpower123@gmail.com
		M/s National Casting & Engineering Co., Cuttack	Nayabazar, Cuttack, Odisha- 753004	Mr. Amit Dingal Mr. Salil Kumar Dingal	9937444762 7008811568	salil_switchgear@rediffmail.com nccc1986@gmail.com
		M/s Pramoda Engineering Works	S3/12, Phase-2,New industrial Estate,Jagatpur,Cuttack, Pin 754021 odisha.	Mr. Rakhesh malla.	9078071194/9437975180	pramodaengineeringworks@yahoo.in
		M/s Indian Metal Industries, Cuttack	53, Dingal Badi, Cuttack, Gosala Road, PO-Nayabazar, Odisha	Mr. Samir Kumar Dingal Mr. Santanu Dingal	7008696247 9853786663	dingal007@gmail.com
14	11 KV Polymer type HG Fuse	M/s Samal Industries, Khurda	Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	Mr. Prakash Samal	9437231336	samalindustries1234@gmail.com
		M/s Indian Power Industries, Cuttack	Jhikiria, 42 Mouza, Cuttack, Odisha- 754112	Mr. Bholanath Patra	9937091838 7978602614	indianpower123@gmail.com
		M/s National Casting & Engineering Co., Cuttack	Nayabazar, Cuttack, Odisha- 753004	Mr. Amit Dingal Mr. Salil Kumar Dingal	9937444762 7008811568	salil_switchgear@rediffmail.com nccc1986@gmail.com
		M/s Indian Metal Industries, Cuttack	53, Dingal Badi, Cuttack, Gosala Road, PO-Nayabazar, Odisha	Mr. Samir Kumar Dingal Mr. Santanu Dingal	7008696247 9853786663	dingal007@gmail.com
		M/s Sigma Power Industries, Cuttack	Plot no-18, Low Laying Area, Industrial Estate, Khapuria, Madhupatna, Cuttack, 753010, Odisha	Mr. Debankar Biswal	9755550290	sigmapower2020@gmail.com
		M/s Pramoda Engineering Works	S3/12, Phase-2,New industrial Estate,Jagatpur,Cuttack, Pin 754021 odisha.	Mr. Rakhesh malla.	9078071194/9437975180	pramodaengineeringworks@yahoo.in
		M/s Kishan Enterprises	115, Mahatma Gandhi Road, Kolkata 700007	Mr. Kishan Jhunjhunwala	7044360716 / 9831163516	kishanenterprises@hotmail.com

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
15	33 kV Isolator 400/630/800/1250A with & without Earth Switch	M/s Ruma Isolator Company, Howrah	At: 6"Q" Road, Howrah	Md Aslam Parvez	9830221661	rumaisolatorco@gmail.com
		M/s. High Tension Electrical Equipments Pvt. Ltd,Howrah	101, C Road, Belgachia, Dasnagar,Howrah, West Bengal	Mr.Kaushik Das	9831906005	comm1@hightension.in
		M/s Panchkari Kayal & Co, Howrah	Balitikuri, Surkumill, Howrah, West Bengal-711113	Mr. Sandip Hazra	9831429252 8585068611	info.panchkari@gmail.com
16	11kV Isolator 400/630/800/1250A with & without Earth Switch	M/s Ruma Isolator Company, Howrah	At: 6"Q" Road, Howrah	Md Aslam Parvez	9830221661	rumaisolatorco@gmail.com
		M/s Panchkari Kayal & Co, Howrah	Balitikuri, Surkumill, Howrah, West Bengal-711113	Mr. Sandip Hazra	9831429252 8585068611	info.panchkari@gmail.com
		M/s Ultima Switchgears Ltd.,Noida	F-6/F-7,UPIIDC,Surajpur Industrial Area,Greater Noida,UP-201336	Mr.Vansh Parmar	9582221901 9953233568	vd@ultimaswitchgear.com
17	LT XLPE AB Cable	M/s Paramount Communications Ltd,Haryana	Plot No.37,Industrial Estate,Dharuhera,Rewari,Haryana-123106	Mr.Manoj Verma	9958898025	manoj@paramountcables.com
		M/s Laser Power & Infra Pvt Ltd,Howrah	AT/P.O. : NH-6, Polypark, Dhulagore, Howrah-711302	Mr. Aniruddha Banerjee Mr.Sujib Goswami	9674763567 9674761456	lab.poly2016@gmail.com sales@laserpowerinfra.com
		M/s Dynamic Cables Ltd, Jaipur	F-260, Road No. 13, VKIA, Jaipur - 302013	Mr.S. Kadam	9001096020	info@dynamiccables.co.in
		M/s Havells India Pvt. Ltd,Rajasthan	Plot no. A/461-462 & SP-215,204 & 204(A), Matsya Industrial Area, Alwar, Rajasthan	Mr.Rudra Prasad Jena Mr.Barun Mishra	9937051045 8018041545	rudraprasad.jena@havells.com barun.mishra@havells.com
		M/s Lumino Industries Ltd,Howrah	Biprannapara, Jalan Complex,Domjur,Howrah,West Bengal	Mr.Tapas Debnath Mr.Vikash singh	9674755236 9674344474	susant@luminoindustries.com abajaj@luminoindustries.com
		M/s Pobon DPC & Cables Pvt. Ltd, Balasore	Nayakbanda, Bidu, Soro, Balasore,Odisha	Mr. Chandra Sekhara Mohanty	9777277719	pobondpccables@gmail.com
		M/s. Gupta power Infrastructure Ltd,Khurda	F/9, IID Centre,Khurda, Odisha-752054	Mr.Mridul Tyagi Mr.Sandeep Kumar Mr. Deabrata Parida	9821762282 8130388990 9937937659	mridul.tyagi@guptapower.com sandeep@guptapower.com deabrata.parida@guptapower.com
			Authorized Distributors: Ms Dadaji Infratrading PVT LTD.	Mr. Radhakanta Samanta	9938252401 7008069663	Dadaji.infratrading@gmail.com
M/s Polytech Wire and Cables Pvt. Ltd, Rourkela	Gurundia, Lathikata, Rourkela, Sundergarh, Odisha	Mr. Biswajit Pattanaik	8260500168 9776685251	polytechwireandcable@gmail.com		
	Authorized Distributors: Ms Samal Industries	Mr. Prakash chandra Samal	9437231336	samalindustries1234@gmail.com		

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023	
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID	
18	1.1KV PVC Insulated Cable and Control Cable	M/s Sterlite Technologies Ltd,Mumbai	9B & 9C, 9th Floor, South Tower, Godrej One, Pirojshanagar, Vikhroli (East), Mumbai - 400079	Mr.Asish Goyal		ashish.goyal@stl.tech	
		M/s Finolex Cables Limited,Bhubaneswar	677, Rudrapur, NH-16, PO: Pahal, Opp Kali Mandir, Bhubaneswar - 752101, Orissa		0674-2602971922 0674-2971188	florissa@finolex.com	
		M/s Universal Cables Limited,Madhya Pradesh	Birla Vikas,Satna,Madhya Pradesh-485005	Mr.A.Bose			kolkata@unistar.co.in sales@unistar.co.in
		M/s Gloster Cables Ltd,Telangana	310/E, NH 44, Kallakal Village, Manoharbad (Mnd), MEDAK, Telangana 502336	Mr. Rajesh Kumar Dutta (Cable Division)		9327239364	rkdutta@glostercable.com marketing@glostercable.com
		M/s Cords Cable Industries Ltd,Rajasthan	A-525,RIICO Industrial Area,Chopanki,Bhiwadi,Alwar, Rajasthan-301019	Mr.Niloy Chakraborty		9831066950	ccil@cordscable.co nc@cordscable.com
		M/s KEI Industries Ltd.,Alwar	SP 919,920,922 RIICO Industrial Area,Phase-3,Bhiwadi,Alwar,Rajasthan 301019	Mr. Chittrak Sardar		99030 27514	bhavana.patil@kei-ind.com chittrak.sardar@kei-ind.com
		M/s Crystal Cable Industries Ltd,Kolkata	32,Ganesh Chandra Avenue,Kolkata,West Bengal-700013				office@crystalcable.in
		M/s. Gupta power Infrastructure Ltd,Khurda	F/9, IID Centre,Khurda, Odisha-752054	Mr.Mridul Tyagi Mr.Sandeep Kumar Mr. Debabrata Parida		9821762282 8130388990 9937937659	mridul.tyagi@guptapower.com sandeep@guptapower.com debabrata.parida@guptapower.com
			Authorized Distributors: Ms Dadaji Infratrading PVT LTD. ( 1.1KV PVC Insulated Cable )	Mr. Radhakanta Samanta		9938252401 7008069663	Dadaji.infratrading@gmail.com
		M/s Havells India Pvt. Ltd,Rajasthan	Plot no. A/461-462 & SP-215,204 & 204(A), Matsya Industrial Area, Alwar, Rajasthan	Mr.Rudra Prasad Jena Mr.Barun Mishra		9937051045 8018041545	nudraprasad.jena@havells.com barun.mishra@havells.com
		M/s KEC International Ltd.,Mysore	Mysore,Karnataka	Mr.Satish Tomar		8212402401	tomarsk@kecprg.com powercables@kecprg.com
		M/s Daksha Cable Industries Pvt Ltd(DCD),Mumbai	A-143,Govt Industrial Estate,Charkop Kandivali(West),Mumbai				dakshacables@hotmail.com
		M/s V-Guard Industries Ltd.,Bhubaneswar	42/962, Vennala High school Road, Kochi				mail@vguard.in
		M/s GEMSCAB Industries Ltd,Rajasthan	Plot No.SP-1192 L&K,Phase-4,RIICO Industrial Area,Bhiwadi,Alwar,Rajasthan				gemscab@vsnl.com sureshchandra@gemscab.com
		Mohta Electro system,Gujurat	M/s Mohta Electric & Engineering Co.A-5, 3rd Floor, Safal Profitiare,Corporate Road, Prahlad Nagar,Ahmedabad - 380 051,Gujarat			794032 2212 794032 2213	info@mohtaelectric.com
		M/s Torrent Cables Ltd, Gujrat	PELICAN Building, 6th Floor,GCCI Compound Ashram Road,Ahmedabad, Gujarat - 380009	Mr. S.C. Palekar (VP-Operation)		7930001067	sushampalekar@torrentcables.com
		M/s Thermo Cables Ltd, Hyderabad	28, Nagarjuna Hills,Punjagutta,Hyderabad-500 082			9339336204	kolkata@thermocables.com info@thermocables.com
		M/s Paramount Communications Ltd,Haryana	Plot No.37,Industrial Estate,Dharuhera,Rewari,Haryana-123106	Mr.Manoj verma		9958898025	manoj@paramountcables.com
		M/s Radiant Cables,New Delhi	RADIANT INFO SOLUTIONS PVT. LTD. Y-53, Ground Floor,Okhla Industrial Area, Phase2,New Delhi-110020				info@radiant.in
		M/s Ravin Cables Ltd,Mayurbhanj	Hamilton Gardens Baripada, Dist. Mayurbhanj Orissa - 757001	Mr.Santosh George			santosh.george@ravingroup.com ho@ravincables.com
M/s Laser Power & Infra Pvt Ltd,Howrah	AT/P.O. : NH-6, Polypark, Dhulagore, Howrah-711302	Mr. Aniruddha Banerjee Mr.Sujib Goswami		9674763567 9674761456	lab.poly2016@gmail.com sales@laserpowerinfra.com		
M/s Nicco Corporation Limited,Mayurbhanj	Hamilton Gardens,Baripada,Mayurbhanj,Odisha-757001	Mr.V R Moza		06792-252454 06792-252434	niccomkt@niccocal.com vrmoza@niccocal.com		

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
19	PVC Wire	M/s Havells India Pvt. Ltd,Rajasthan	Plot no. A/461-462 & SP-215,204 & 204(A), Matsya Industrial Area, Alwar, Rajasthan	Mr.Rudra Prasad Jena Mr.Barun Mishra	9937051045 8018041545	rudraprasad.jena@havells.com barun.mishra@havells.com
		M/s. Gupta power Infrastructure Ltd, Khurda	F/9, IID Centre,Khurda, Odisha-752054	Mr.Mridul Tyagi Mr.Sandeep Kumar Mr. Debabrata Parida	9821762282 8130388990 9937937659	mridul.tyagi@guptapower.com sandeep@guptapower.com debabrata.parida@guptapower.com
		M/s Polycab India Ltd,Gujarat	Unit 4, Plot No.105, Halol Vadodara Road,Nurpura, Halol, Panchmahal, Gujarat	Mr.Lalit	9437014212	enquiry@polycab.com info@polycab.com
		M/s Anchor Electricals Pvt Ltd	Steel House, B wing, Plot No. 24, Mahal Industrial Estate, Mahakali Caves Road, Near Paper Box, Andheri, Mumbai-400093, Maharashtra, India	Mr. Kavish Kotian	07045785821	
		M/s Finolex Cables Ltd, Bhubaneswar	677, Rudrapur, NH-16, PO: Pahal, Opp Kali Mandir, Bhubaneswar - 752101, Orissa		0674-2971922, 0674-2971188	felorissa@finolex.com
		L&T		Mr.Atul Singh		atulsingh@Intecc.com
20	AAAC Conductor	M/s APAR Industries Ltd, Gujarat	Plot No.153,157-163,2827,Survey 189/P1,Umbergaon,Valsad,Gujarat-396171	Mr. S K Suman	9967719156 8291664446	shyam.suman@apar.com m.kanakarajan@apar.com
		M/s. Lumino Industries Ltd,Howrah	Biprannapara, Jalan Complex,Domjur,Howrah,West Bengal	Mr.Tapas Debnath Mr.Vikash Singh	9674755236 9674344474	susant@luminoidustries.com abajaj@luminoidustries.com
		M/s Akhandalamani Electricals & Constructions, Cuttack	Kuspangi,Cuttack, Odisha	Mr. Prabhat Kumar Rout	9438873224	pravat@acinfrastructure.com info@accgroup.in
		M/s Pobon DPC & Cables Pvt. Ltd, Balasore(AAAC)	Nayakbanda, Bidu, Soro, Balasore,Odisha	Mr. Chandra Sekhara Mohanty	9777277719	pobondpcables@gmail.com
		M/s Mahavir Transmission Limited, Uttarakhand	A-9,B-4,A-11-13 S, Industrial Estate, Vikasnagar, Dehradun, Uttarakhand 248198	Mr. Akhil Jain	8447813337 9871002668	akhil.jain@mahavirtransmission.com
		M/s Polytech Wire and Cables Pvt. Ltd, Rourkela	Gurundia, Lathikata, Rourkela, Sundergarh, Odisha	Mr. Biswajit Pattanaik	8260500168 9776685251	polytechwireandcable@gmail.com
		Authorized Distributors: Ms Samal Industries	Mr. Prakash chandra Samal	9437231336	samalindustries1234@gmail.com	
21	HT XLPE Insulated Covered AAAC Conductor (11kV)	M/s APAR Industries Ltd, Gujarat	Plot No.153,157-163,2827,Survey 189/P1,Umbergaon,Valsad,Gujarat-396171	Mr. S K Suman	9967719156 8291664446	shyam.suman@apar.com m.kanakarajan@apar.com
		Authorized Distributors: 1. M/s Samal Industries, Khurda Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	Mr. Prakash Samal	9437231336	samalindustries1234@gmail.com	
		M/s KEI Industries Ltd.,Alwar	SP 919,920,922 RIICO Industrial Area,Phase-3,Bhiwadi,Alwar,Rajasthan-301019	Mr. Chitrak Sardar	99030 27514	bhavana.patil@kei-ind.com chittrak.sardar@kei-ind.com
		M/s. Gupta power Infrastructure Ltd, Khurda	F/9, IID Centre,Khurda, Odisha-752054	Mr.Mridul Tyagi Mr. Sandeep Kumar Mr. Debabrata Parida	9821762282 8130388990 9937937659	mridul.tyagi@guptapower.com sandeep@guptapower.com debabrata.parida@guptapower.com
		Authorized Distributors: Ms Dadaji Infratrading PVT LTD.	Mr. Radhakanta Samanta	9938252401 7008069663	Dadaji.infratrading@gmail.com	

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023	
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID	
22	HT XLPE Cable ( 11KV & 33 KV)	M/s Gupta power Infrastructure Ltd,Uttarakhand	132,Nandanagar Industrial Estate,Phase-2,Mahuakherganj,Kashipur,Uttarakhand-244713	Mr.Mridul Tyagi Mr.Sandeep Kumar Mr. Debabrata Parida	9821762282 8130388990 9937937659	mridul.tyagi@guptapower.com sandeep@guptapower.com debabrata.parida@guptapower.com	
			Authorized Distributors: Ms Dadaji Infratrading PVT LTD.	Mr. Radhakanta Samanta	9938252401 7008069663	Dadaji.infratrading@gmail.com	
		M/s KEI Industries Ltd.,Alwar	SP 919,920,922 RIICO Industrial Area,Phase-3,Bhiwadi,Alwar,Rajasthan 301019	Mr. Chitrak Sardar	99030 27514	bhavana.patil@kei-ind.com chitrak.sardar@kei-ind.com	
		M/s GEMSCAB Industries Ltd,Rajasthan	Plot No.SP-1192 L&K,Phase-4,RIICO Industrial Area,Bhiwadi,Alwar,Rajasthan		9212560974	gemscab@vsnl.com sureshchandra@gemscab.com anpathak@gemscab.com	
		M/s Havells India Pvt. Ltd,Alwar(only for 11kV)	Plot no. A/461-462 & SP-215,204 & 204(A), Matsya Industrial Area, Alwar, Rajasthan	Mr.Rudra Prasad Jena Mr.Barun Mishra	9937051045 8018041545	rudraprasad.jena@havells.com barun.mishra@havells.com	
		M/s Dynamic Cables Ltd, Jaipur	F-260, Road No. 13, VKIA, Jaipur - 302013	Mr.S. Kadam	9001096020 9339830586	info@dynamiccables.co.in tenderingdcl@dynamiccables.co.in	
23	HT & LT Cable termination & Jointing kit (Except Touchproof kit)	M/s 3M Electro & Communication India Pvt Ltd,Pune	Plot No.153,157-163,2827,Survey 189/P1,Umbergaon,Valsad,Gujarat-396171	Mr. S K Suman	9967719156 8291664446	shyam.suman@apar.com m.kanakaran@apar.com	
			Authorized Distributors: 1. M/s Samal Industries, Khurda Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	Mr. Prakash Samal	9437231336	samalindustries1234@gmail.com	
		M/s Raychem RPG Pvt Ltd.,Gujarat	145,Mumbai-Pune Road,Pimpri,Pune,Maharashtra	Mr.Sujit Kumar Nayak Mr.Abhijit Bhagwat	98306 62725 9850667259	arbhagwat@mmm.com sknayak@mmm.com	
24	Covered Conductor Accessories	M/s Behr Bircher Cellpack BBC India Pvt. Ltd., Haryana	Kanjari,Jyoti Compound,Nr Halol GIDC,Panchmahal,Gujarat	Mr.Rahul Biswas Mr. Saurav Maiti	9771427299 8372801987	rahul_biswas@raychemrpg.com	
			Plot No. 149, EHTP, Phase-5, Sector-56, HSIIDC Kundli, Sonipat, Haryana-131028	Mr. Soman Maitra	9830559759	suman.maitra@cellpack.com	
25	HDPE Pipes	M/s Raychem RPG Pvt Ltd.,Gujarat	M/s Aadi Polyextrusion & Moulding Pvt. Ltd,Cuttack	B 44 & 45, New Industrial Estate, Jagatpur, Cuttack, Odisha	Mr. S Mohanty	9861096647 9439755400	aadi.polyfit@gmail.com orissaplastpipes@rediffmail.com
			M/s ENSTO India Pvt. Ltd, Haryana	IDCO, Plot No. A/12, Sarua Industrial Estate, Sarua, Khurda, Odisha	Mr. Prashant Ku. Mishra	9040088846 8763211377	support@lingarajpipes.com
		M/s Hari Udyog Pvt Ltd, Balasore	Khannagar, Kuruda, Balasore, Odisha	Mr. H.K. Mohanty Mr. Tarun Ray	7894435270 9437963776	hariplaast@hariplaast.com ray.hupl@hariplaast.com hkmohanty@hariplaast.com	
		M/s Valentina Pipes Pvt. Ltd, Bhubaneswar	A/22-23-24, Industrial Estate, Rasulgarh, Bhubaneswar-751010, Odisha	Mr. Nikunj Chhotray Mr. Praddep Pradhan	9437025882 8249322439	lion_nikunj@yahoo.co.in valentinapipespvtltd18@gmail.com	
		M/s Metroplast Industries,Kuruda,Balasore	Kuruda, Near Kuruda Fly Over, NH-16, Balasore-756056, Odisha	Mr. S.K.Tripathy	9338833733 8249386985	metro_plast@yahoo.com sktripathy.279@gmail.com	
		Ms Oriplast LTD.	Alupur, O.T Road, Balasore.	Mr. Alok Dalai	7735732024	alokdalai@oriplast.in	
		M/s Magnum Fibres Pvt. Ltd., Bhubaneswar	Plot No-132-A,Sector-A,Zone-A, Mancheswar Indl. Estate, Bhubaneswar - 751010 (ODISHA)	Mr. Biraja Prasad Acharya Mr. A.P. Malla	9040011139 9040011130	birajaacharya@magnum-india.com malla@magnum-india.com	



TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
26	MCB	L&T		Mr.Atul singh		atulsingh@Intecc.com
		M/s ABB India Ltd,Bhubaneswar	1st Floor,City centre,A-5/1.Sachivalaya Marg,Unit-9,Bhubaneswar-751022			contact.center@in.abb.com
		M/s SIEMENS Ltd,Kolkata	43,Shanti Pally,EM ByPass,Connector,Rashbehari Avenue,Kolkata			adwaita.mukherjee@siemens.com anit.mitra@siemens.com
		M/s Havells India Pvt. Ltd,Uttarakhand	Plot no. 6, Site-4, Sahibabad Industrial Area, Sahibabad, Ghaziabad, UttarPradesh-201010	Mr.Siddhartha Das	9937203309	siddhartha.das@havells.com
		M/s Standard Electricals Ltd,Noida	Global Headquarters , QRG Towers,2D, Sec- 126, Expressway, Noida - 201304 U.P			standard.ho@havells.com
		M/s Schneider Electric Infrastructure Ltd,Bhubaneswar	14,Forest Park,Bhubaneswar-751009	Mr.Girija Patnaik		girija.patnaik@schneiderelectric.com
		Legrand, Kolkata	Bhakta Towers, 2nd & 3rd Floor, Plot No. KB 22, Salt Lake, Sector - 3, KOLKATA - 700 091			
		M/s Crompton Greaves India Ltd,Mumbai	Equinox Business Park, 1st Floor,Tower-3,LBS Marg,Kurla(W),Mumbai-400070	Mr.Thomas Geevarghese Mr.Subhasis	9831038155	nsm@crompton.co.in thomas.geevarghese@cglobal.com
		MERLIN GERIN				
M/s. C & S India Pvt Ltd,Uttarakhand	Plot no.10,Sector-11,IIE,SIDCUL,Ranipur,Haridwar, Uttarakhand-249403	Mr.Gaurav Sharma	9650564714	mvservice@c-sec.co.in		
27	LT ACB/MCCB	L&T		Mr.Atul Singh		atulsingh@Intecc.com
		M/s SIEMENS Ltd,Kolkata	43,Shanti Pally,EM By Pass,Connector,Rashbehari Avenue,Kolkata-700042			adwaita.mukherjee@siemens.com anit.mitra@siemens.com
		MERLIN GERIN				
		M/s GE Power Controls India Pvt Ltd, Bangalore	42/1 & 45/14,Electronic City Phase-2,Bangalore-560100			08041113000
		M/s ABB India Ltd,Bhubaneswar	1st Floor,City centre,A-5/1.Sachivalaya Marg,Unit-9,Bhubaneswar-751022			contact.center@in.abb.com
		M/s Crompton Greaves India Ltd,Mumbai	Equinox Business Park, 1st Floor,Tower-3,LBS Marg,Kurla(W),Mumbai-400070	Mr.Thomas Geevarghese Mr.Subhasis	9831038155	nsm@crompton.co.in thomas.geevarghese@cglobal.com
		M/s Havells India Pvt. Ltd,Uttar Pradesh	Plot no. 6, Site-4, Sahibabad Industrial Area, Sahibabad, Ghaziabad, UttarPradesh-201010	Mr.Siddhartha Das	9937203309	siddhartha.das@havells.com
		M/s. C & S India Pvt Ltd,Uttarakhand	Plot no. 10,Sector-11,IIE,SIDCUL,Ranipur,Haridwar, Uttarakhand-249403	Mr. Gaurav Sharma	9650564714	mvservice@c-sec.co.in
		M/s BCH Electric Ltd, Haryana	20/4, Mathura Road, Faridabad – 121 006 Haryana			marketing@bchindia.com
		M/s ERA Electricals Pvt Ltd,Noida	Plot No.B-200, Phase-II, Noida, Uttar Pradesh, 201305	Mr. Mukesh Gupta Mr.Sachin gupta		
M/s Schneider Electric Infrastructure Ltd,Bhubaneswar	14,Forest Park,Bhubaneswar-751009	Mr. Girija Patnaik		girija.patnaik@schneiderelectric.com		

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
28	Switches	M/s Anchor Electricals Pvt Ltd,Mumbai	Steel House, B wing, Plot No. 24, Mahal Industrial Estate, Mahakali Caves Road, Near Paper Box, Andheri, Mumbai-400093, Maharashtra, India	Mr. Kavish Kotian	07045785821	
		M/s Schneider Electric Infrastructure Ltd,Bhubaneswar	14,Forest Park,Bhubaneswar-751009	Mr. Girija Patnaik		girija_patnaik@schneiderelectric.com
		INDOASIAN , Maharashtra	Indo Asian Building Pvt. Ltd.,Eternity Mall Teen Hath Naka, Lal Bahadur Shastri Rd, Thane West, Thane, Maharashtra 400604			
		M/s Havells India Pvt. Ltd,Ghaziabad	Plot no. 6, Site-4, Sahibabad Industrial Area, Sahibabad, Ghaziabad, UttarPradesh-201010	Mr.Siddhartha Das	9937203309	siddhartha.das@havells.com
		M/s CONA Industries Pvt Ltd, Mumbai	302 Brahans Business Park, Off Mahakali Caves Rd, Andheri East, Mumbai, Maharashtra 400093			
		M/s ABB India Ltd, Bhubaneswar	1st Floor,City centre,A-5/1.Sachivalaya Marg,Unit-9,Bhubaneswar-751022			contact.center@in.abb.com
29	Cable Tie	M/s Mangal Enterprises Ltd, New Delhi	1743/46, 1st Floor,Electrical Market,Bhagirath Palace,Chandini Chowk,Delhi-110006	Mr.Bhuwan Pandey	8800702333	mangalenterprises2011@gmail.com
		M/s Novoflex Marketing Pvt Ltd, West Bengal	Raikva-5th Floor,Unit-6,3A,Ram Mohan Mullick Garden Lane,Kolkata,West bengal-700010	Mr.Vineet Kumar Banka	9903163634	sales@novoflex.in
		M/s Ripkons Tradewings, New Delhi	N1-79,Sector-5,DSHDC,Biswana Industrial Area,New Delhi-110039	Mr.Nilesh Hirani	9810764004	hiranineesh@yahoo.co.in
30	PSC Pole (300 Kg/9 mtr)	M/s Konark Construction & Engineers Ltd,Cuttack	On NH-16,Telengapentha, Cuttack,Odisha	Mr.Priya Ranjan Shial Mr.Giridharilal Halan	9668025336 9437012866	kcel05@hotmail.com
		M/s SR Cementech, Cuttack	Nischint,Benchua,Govindpur Chhak,Tangi,Cuttack,Odisha	Mr.Tarun Agarwal	9583212121	em.rahul@gmail.com
		M/s Divine Concrete Pvt. Ltd, Jajpur	Mandia,Haridaspur,Chandikhoh,Jajpur,Odisha	Mr.S P Sahoo	9437042868	divineconcreteproducts@gmail.com
		M/s BabaAkhandalamani,Bhadrak	Randia,Bhadrak,Odisha	Mr.Chinmay T. Mohapatra	9040045476	babaconcrete17@gmail.com
		M/s Metro Poles,Balasure	Sahada,Sarhaon,Balasure,Odisha	Mr.Rajiv Shah	8249827644	metro_poles@yahoo.com
		M/s Neelachal Enterprises, Chhanpur, Balasure	Bampada, Chhanpur, Balasure, Odisha	Mr. Harish Patel	9437013147	neelcon@gmail.com
		M/s KMR Udyog, Balasure	At- Gadiamal, Po- Bahal, Via- Sergarh, Dist- Balasure, Odisha, Pin-756060	Mr. Mahesh Kumar Modi	9556196809	kmrudyg@gmail.com
		M/s Balaji PSC Poles Industries,Khurda	353/46,Jaydev Vihar,Near Vishnu Priya Appartment, Bhubaneswar, Khurda, Odisha	Mr. S P Mohapatra	9937528888 9437078787	sauriprasad@yahoo.com
		M/s Baba Loknath Pvt Ltd,Khurda	Kuhudi,Khurda	Mr.Bijay Pradhan Mr.Ravi Sharma	9937397199 9861058123	loknathdev@gmail.com
		M/s Laxmi Industries, Khurda	C-35 & C-36, IID Centre, Khurda Industrial Estate,Khurda, Odisha-752055	Mr. Bipin Trivedi	9934316366	laxmi.enterprises@gmail.com
		M/s Omm Concrete Products, Bhubaneswar	Kujimahal, Chandaka, Bhubaneswar, Khurda, Odisha	Mr. K.C.Padhi	9438877282	omconcretes@yahoo.com
		M/s Gayatri Industry,Ganjam	Kalabada, Chikiti, Ganjam, Odisha	Mrs.Subhadra Sahu	9439331387	subhadra.sahu@gmail.com
		M/s Lackeir Stilit Pvt Ltd ,Ganjam	Palurgarh,Rambha,Huma, Ganjam, Odisha	Mr.K Dileswar Rao	9437434611 9337227923	kdr.lackeir@gmail.com
		M/s Sai Saran Concrete, Talcher	Remuan,Hatatota,Talcher,Angul,Odisha	Mr.Shivram Sahoo	7381040188 7381040189	saisaranconcrete48@gmail.com
		M/s Gautam Cements Works Ltd,Jharsuguda	Hirma,Badmal,Jharsuguda,Odisha	Mr.Abhijeet Surana Mr.Nirabh Mehta	9600221111 9165053638	orissapole@gmail.com
		M/s Meco, West Bengal	Bolpur, Birbhum, West Bengal	Munshi Asad Ali	9434762432	asadsppl@gmail.com

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023	
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID	
31	WPB / RSJ Pole (11 & 13 mtr)	M/s Supreme & Co Pvt Ltd & M/s Utkal Galvanizers Ltd,Cuttack	Kapursingh,Oranda,Cuttack, Odisha	Mr. Arun K Das	9938410739 8249608042	ho@utkaldt.in utkalho@gmail.com	
		M/s Reliable Sponge Pvt Ltd, Sundergarh	Unit-3,Sagjore,Balanda,Sundergarh,Odisha	Mr. Pranab Mohanty	9437497402	tlt@reliableispat.com	
			<b>Authorized Distributors:</b> <b>1. M/s Bright Steel,</b> Cuttack Road, Bhubaneswar, Odisha <b>2. M/s S R Cementech, Tangi, Cuttack</b> <b>3. M/s Konark Steel &amp; Pipes,</b> A/16, Industrial Estate, Madhupatana, Cuttack <b>4. M/s Steel Industries of Orissa,</b> 291, Bhomikhal, Cuttack-Puri Road, Bhubaneswar	1. Mr. Virendra Kheria 2. Mr. Tarun Agarwal 3. Mr. Sudhakar Sahoo 4. Mr. Deepak Poddar	1. 9040000500 9078956299 2. 9583212121 3. 9776655862 4. 9437075001	1. brightsteel_bbsr@rediffmail.com sales@brightsteel.co.in 2. em.raahul@gmail.com 3. kspbbsr.1927@gmail.com 4. deepakbbsr@gmail.com	
		M/s New Laxmi Steel & Power Pvt Ltd, Khurda	Plot No.: A/22-25, Sarua Industrial Estate, Khordha, Odisha	Mr. Srikant Samantray Er. Bipin Kumar Buruwal	9437055908 6289715340	1. 9437231336 2. 7381040188      7381040189	newlaxmisteel@gmail.com newlaxmisteelfactory@gmail.com
			<b>Authorized Distributors:</b> <b>1. M/s Samal Industries, Khurda</b> Plot No C/10 and 9/1 IID centre Industrial Estate Khurda <b>2. M/s Sai Saran Concrete, Talcher</b> Remuan,Hatatota,Talcher,Angul,Odisha	1. Mr. Prakash Samal 2. Mr. Shivram Sahoo			
		M/s Swastika Steel & Allied Products Pvt. Ltd., Howrah	AT: 8/1, Nutan Para Road, Liliuah, Howrah, West Bengal- 711204	Mr. Ravinder Sharma	9339775648	rks@swastikasteel.com	
M/s K L Steels Pvt Ltd,Uttar Pradesh	G.T.Bulandshahar Road,Near Lal Kuan,Chippyana,Gautam Budh Nagar,Uttar Pradesh	Mr.Nageshwar Prasad Mr.Jagdeesh Sharma	9810235789 7291992004	mrc@klsnons.in sales.rajusthan@klsnons.in			
M/s Vijay Transmission Pvt Ltd, Raipur	Kanhera,Dharsiva,Ura Acholi road,Raipur, Chhatisgarh	Mr. Abhishek Dwivedi Mr.A Kodape	9753872335 9425503518	abhishekdv@vijaytransmission.com koushals@vijaytransmission.com			
32	Rebar Lacing Pole/H-Pole(14 mtr)	M/s Reliable Sponge Pvt Ltd, Sundergarh	Unit-3,Sagjore,Balanda,Sundergarh,Odisha	Mr. Pranab Mohanty	9437497402	tlt@reliableispat.com	
33	SMC LT Distribution Box	M/s Sanskriti Composites Pvt Ltd, Hooghly	Mollerberh,Bhadua NH-2 Delhi Road,Hooghly,West Bengal	Mr.Aayush Jhunjunwala	9831158358	aayush@sanskriticomposites.com	
		M/s Plasto Tech Industries Pvt Ltd, Pune	Plot No.3413,Talegaon Dhamdhare Talshirur, Pune,Maharashtra-412208	Mr.Jalinder P Bhujbal	8380035350 8380035352	plastotechi@yahoo.com	
		M/s Neelu Packing Industries Pvt Ltd, Uttar Pradesh	B-16,Sector-83,Noida,Uttar Pradesh	Mr.Manas Samal	8800538206	info@neelupacking.net neelupacking@gmail.com	
		M/s Sintex Industries, Ahmedabad	119,Kalasar,Shopping Hub,1st floor,Opposite Sai Baba Temple,Sattadhar,Ahmedabad,Gujarat	Mr.Jigar	9909980572	jigar.brahmbhatt@sintex.co.in	
34	M/S/GI LT Distribution Box	M/s Bose Engineering (India) Pvt Ltd, Kolkata	K-14 Behela Industrial Estate,620 D.H Road,Kolkata,West Bengal-700034	Mr.Anindaya K Bose	9830063810	anind_bose@yahoo.co.in	
		M/s S R Automation Pvt Ltd, Kolkata	Arapanch,Sonarpur,Kolkata,West Bengal-700150	Mr.B Sarkar	9831214861 9903050297	s_r_automation61@yahoo.com sr_automation@rediffmail.com factory@srautomationkolkata.com	
		M/s J D Electrical Products Pvt Ltd,Kolkata	30,Bakrahat Road,Kolkata,Near Hospital Moore,West Bengal-700104	Ms. Rinka Ghosh Mr.Soumya Ghosh	8017024048 9804263626	rinka_ghosh@jde.co.in soumya.ghosh@jde.co.in	
		M/s Arun Enterprises, Sahibabad, New delhi	B-48,site IV,Sahibabad-201010 , Dist -Ghaziabad(UP)	Mr. Nayan Raj / Narendra singh	7042896191 7042896177	mktg2arunenterprises@gmail.com // td@arunenterprises.in // enquiry@arunenterprises.in	

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023	
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID	
35	All GI Channel, Angle , Flat,GI Pipe, V Cross Arm & Clamp, Pole Clamp	M/s Reliable Sponge Pvt Ltd, Sundergarh	Unit-3,Sagjore,Balanda,Sundergarh,Odisha	Mr. Pranab Mohanty	9437497402	tlt@reliableispat.com	
			<b>Authorized Distributors:</b> 1. M/s Bright Steel, Cuttack Road, Bhubaneswar, Odisha 2. M/s S R Cementech, Tangi, Cuttack 3. M/s Konark Steel & Pipes, A/16, Industrial Estate, Madhupatana, Cuttack 4. M/s Steel Industries of Orissa, 291, Bhomikhal, Cuttack-Puri Road, Bhubaneswar	1. Mr. Virendra Kheria 2. Mr. Tarun Agarwal 3. Mr. Sudhakar Sahoo 4. Mr. Deepak Poddar	1. 9040000500 9078956299 2. 9583212121 3. 9776655862 4. 9437075001	1. brightsteel_bbsr@rediffmail.com sales@brightsteel.co.in 2. em.rahul@gmail.com 3. kspbbsr.1927@gmail.com 4. deepakbbsr@gmail.com	
		M/s New Laxmi Steel & Power Pvt Ltd, Khurda	Plot No.: A/22-25, Sarua Industrial Estate, Khordha, Odisha	Mr. Srikant Samantray Er. Bipin Kumar Burnwal	9437055908 6289715340		newlaxmisteel@gmail.com newlaxmisteelfactory@gmail.com
			<b>Authorized Distributors:</b> 1. M/s Samal Industries, Khurda Plot No C/10 and 9/1 IID centre Industrial Estate Khurda 2. M/s Sai Saran Concrete, Talcher Remuan,Hatatota,Talcher,Angul,Odisha	1. Mr. Prakash Samal 2. Mr. Shivram Sahoo	1. 9437231336 2. 7381040188      7381040189	1. samalindustries1234@gmail.com 2. saisanranconcrete48@gmail.com	
		M/s J B Construction & Services, Kendrapara *(33kV & 11kV V-Cross Arm)	Narasinghpur,Gahaga Narasinghpur,Kendrapara,Odisha	Mr. Pratap Ranjan Panda	7978034822		pratap.jbcs@gmail.com
		M/s. High Tension Electrical Equipments Pvt. Ltd,Howrah	101, C Road, Belgachia, Dasnagar,Howrah, West Bengal	Mr. Kaushik Das	9831906005		comm1@hightension.in
		M/s KSE Electricals,Howrah	3rd Main road,NH-6,Begri,Howrah,West Bengal	Mr. Ashis. K Palit	9830547600		mkte@kse.in
		M/s Industrial Forging Industries Pvt Ltd,Howrah	Jalan Complex, Gate No.1, Biparnapara, Howrah,West Bengal	Mr. Amit Daga Mr. Arindam Dutta	9831241956 7685835234		amit@dagagroup.com mpandit@dagagroup.com
		M/s Vijay Transmission Pvt Ltd, Raipur	Kanhera,Dharsiva,Ura Acholi road,Raipur, Chhatisgarh	Mr. Abhishek Dwivedi Mr. A Kodape	9753872335 9425503518		abhishekd@vijaytransmission.com koushals@vijaytransmission.com
		M/s Rahul Electricals,Howrah	P-85/22,Benaras Road,Belgachia,Howrah, West Bengal	Mr. Sachin Giri	7003284140 9836539130		rahulelectricals40@gmail.com
		M/s Jainco Transmission Ltd, Howrah	Jalan Complex, Gate No. 1, Lane No. 7, NH-6, Howrah, West Bengal	Mr. Pratul Ghosh	9831607956		engg@jainco.net
			<b>Authorized Distributors:</b> 1. M/s Samal Industries, Khurda Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	1. Mr. Prakash Samal	1. 9437231336		1. samalindustries1234@gmail.com
M/s Pramoda Engineering Works	S3/12, Phase-2,New industrial Estate,Jagatpur,Cuttack, Pin 754021 odisha.	Mr. Rakesh malla.	9078071194/9437975180		pramodaengineeringworks@yahoo.in		
M/s Rajesh Electricals, Howrah	Salap 1, Kantalia Industrial Complex, Howrah Amta Road, Nibra, Howrah, West Bengal	Mr. Rajesh Punatar	9830169125		rajeshlectricalskol@gmail.com		
36	Hardware fittings,GI Pin,GI HT & LT Stay Set	M/s Jainco Transmission Ltd, Howrah	Jalan Complex, Gate No. 1, Lane No. 7, NH-6, Howrah, West Bengal	Mr. Pratul Ghosh	9831607956	engg@jainco.net	
			<b>Authorized Distributors:</b> 1. M/s Samal Industries, Khurda Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	1. Mr. Prakash Samal	1. 9437231336		1. samalindustries1234@gmail.com
		M/s Industrial Forging Industries Pvt Ltd,Howrah	Jalan Complex, Gate No.1, Biparnapara, Howrah,West Bengal	Mr. Amit Daga Mr. Arindam Dutta	9831241956 7685835234		amit@dagagroup.com mpandit@dagagroup.com
		M/s Pramoda Engineering Works	S3/12, Phase-2,New industrial Estate,Jagatpur,Cuttack, Pin 754021 odisha.	Mr. Rakesh malla.	9078071194/9437975180		pramodaengineeringworks@yahoo.in

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023		
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID		
37	GI Stay Wire ,GI Barbed Wire, GI Earthing Coil,GI Wire	M/s Jainco Transmission Ltd, Howrah	Jalan Complex, Gate No. 1, Lane No. 7, NH-6, Howrah, West Bengal	Mr.Pratul Ghosh	9831607956	engg@jainco.net		
			<b>Authorized Distributors:</b> 1. M/s Samal Industries, Khurda Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	1. Mr. Prakash Samal	1. 9437231336	1. samalindustries1234@gmail.com		
		M/s Industrial Forging Industries Pvt Ltd,Howrah	Jalan Complex, Gate No.1, Biparnapara, Howrah,West Bengal	Mr.Amit Daga Mr.Arindam Dutta	9831241956 7685835234	9831241956 7685835234	amit@dagagroup.com mpandit@dagagroup.com	
		M/s R K Wire Products Ltd, Kolkata	Unit No-VII, 15th Floor,Tower-I, PS Srijan Corporate Park,Plot No G-2, Block-EP & GP, Sector-V, Salt Lake City, Kolkata - 700 091	Mr. Indrajeet Banerjee	9123380881	9123380881	ib@rkwire.com info@rkwire.com	
38	GI Pipe	M/s Tata Iron & Steel Ltd,Jamshedpur	4, Armoury Road, Bistupur, Jamshedpur, Jharkhand, India-831001			ibmd.marketingcomm@tatasteel.com		
		M/s Jindal Steel & Power Ltd,Bhubaneswar	Plot no.3,Forest Park,Bhubaneswar-751009	Mr.Mehul Aggarwal	9812063000 8288063000	9812063000 8288063000	Mehul.aggarwal@jindalsteel.com	
39	GI Bolts & Nuts	M/s Garg Fasteners,Ludhiana	Street No.5,Saheed Bhagat Singh Colony,(Near Swaran Cinema),Sherpur,Ludhiana-141010			garg@gargfasteners.com		
		M/s NEXO Industries Pvt Ltd,Ludhiana	Village Mangarh, Machhiwara Road, Kohara Ludhiana-141 112 (INDIA).		9814022767 9814222767	9814022767 9814222767	info@nexoindia.com	
		M/s G.K. Winding Wires Ltd,Noida	B-20, UPSIDC Industrial Area, Site C, Surajpur, Greater Noida, (U.P)-201306			918744005143	918744005143	bd@gkwinning.com
		M/s Maheswari Fasteners & Bright Pvt. Ltd.,Hyderabad	Plot No. - 152 & 154, IDA Medchal, Medchal, Hyderabad, Telangana - 501401, India			9246887753 9246810800	9246887753 9246810800	maheswarifasteners@gmail.com mktg.mfb@gmail.com
		M/s Agarwal Fasteners Pvt Ltd,Maharashtra	Plot No 11, Manohar Palghar Road, Chahade Village, Saijanpada, Palghar (E), Thane Dist - 401404 , Maharashtra, India	Mr. Arish Malvi		7720010545	7720010545	marketing@aplhome.com
		M/s Techman India Ltd, Chandigarh	Plot No. 163, Phase 2, Industrial Area, Chandigarh-160002, India	Mr. A.L Aggarwal		08043051633	08043051633	
		M/s Millenium structurals (India ) Ltd, Indore	Indore Trade Centre, 3/2, South Tukoganj, Indore-452002, Madhya Pradesh, India	Mr.Datta Hase		09317878877	09317878877	
		M/s Strelling Bolts Pvt. Ltd, Kolkata	1 ,Bonfield Lane, Kolkata, West Bengal			9674161869	9674161869	corporate@sterlingbolts.net
		M/s Pankaj International Ltd, Ludhiana	B-40/III, Phase V, Focal Point, Ludhiana-141010 (INDIA)			09463400401	09463400401	sales@pankajinternational.com quality@pankajinternational.com madhur@pankajinternational.com
		M/s Ravi Engineers Ltd, Punjab	Plot No.179-183, Focal Point, Industrial Area, Amritsar ,Punjab-143001			9814050801 9814111804	9814050801 9814111804	satyam@raviengineers.net
		M/s Precision Industrial Fasteners, Ludhiana	Hara Industrial Estate, Near Sukhmani Kanda, Sua Road, Indl. Area-C, Ludhiana-141014, Punjab, INDIA	Mr.Vekkas Banssal Mr. Sanjay Bansal		9878500193 9878400193	9878500193 9878400193	vekkas@pafnuts.com sanjay@pafnuts.com vekkasbanssal@yahoo.in
		M/s Deepak Fasteners Ltd, Ludhiana	4th Floor, First Mall, Mall Road,Ludhiana - 141001 Punjab, India					sales@deepakfasteners.com
		M/s Fit Right Nut and Bolts Pvt Ltd.,Maharashtra	E-27,Additional Ambermath Industrial Area,Anand Nagar,MIDC,Ambermath,Maharashtra-421506					sales@fitright.co.in
		M/s Bharat Industries, Gujarat	8-A National Highway, Mahendranagar Morbi - 363 642 , Gujarat (India)			98253 34342	98253 34342	info@bharatindustries.co.in
		Karamtara Engineering Pvt Ltd.,Maharashtra	Plot No. A-12, MIDC, Tarapur, District : Palghar,401506, INDIA	Mr.D B Subramanian (Assistant Manager)		02240710000	02240710000	Sales.Fasteners@karamtara.com
M/s Bolt Master India Pvt Ltd, Maharashtra	D- 1, Laghu Udyog Kendra, I.B. Patel Road Goregaon East, Mumbai-400063, Maharashtra, India	Mr.Chirag Gambhira (Business Development Director)		09819057175	09819057175			
M/s J.C. Fasteners Ltd, Haryana	Rohtak, Haryana, India	Mr.Siddhaarth Jain		98966671140	98966671140	siddhaarthji@gmail.com		
M/s Bharati Overseas Ltd, Ludhiana	B-29/6 & 12, N.P.C Transport Lane, Sherpur Chowk, G.T. Road, Ludhiana - 141003 (INDIA)	Mr. Anil Bharti Mr. Sanjeev Bharti		99151 99884 99156 03388	99151 99884 99156 03388	info@bhartioverseas.org admin@bhartioverseas.co.in		

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
	GI Bolts & Nuts	M/s Remax India Fasteners Industries Ltd,Ludhiana	D-62, Focal Point Rd, Phase V, Focal Point, Ludhiana, Punjab -141010	Mr.S. Parminder Singh Mr.S. Manpreet Singh	94170 57262 9501017262	info@remaxbolts.com export@remaxbolts.com
		M/s Forex Fasteners, Ludhiana	Forex Estate, Dehlon Road, Vill. Dhrou, Sahnewal, District Ludhiana-141120, Punjab, India		9855037567	customercare@forex.co.in
		M/s A V Forgings,Punjab	230, Industrial Area, Phase- IX Mohali(Punjab), India	Mr.Vikas Gupta Mr.Anil Goyal	09815354249 09814115092	sales@avforgings.com
		M/s Anshika Fasteners,Maharashtra	216/217 Wanaongri, MIDC Hingna Road, Nagpur, India 440016		9765550134	info@anshikafasteners.com
		M/s Durafast Automatives Pvt Ltd, Andhra Pradesh	Plot No.31, Block-E,Autonagar, Visakhapatnam,Andhra Pradesh,India-530012			rudra.sahoo@aster.in
		M/s Paramhari Engineers Pvt Ltd,Maharashtra	Plot No 6A,Vijay Nagar,Nagpur,Maharashtra-440013			claw@jsuberoi.com
		M/s Turbo Industries Pvt Ltd,Ludhiana	Industrial Area C, Dhandari Kalan, Surjit Cinema Road, Ludhiana-141010, Punjab, India	Mr.Sanjeev Kumar (HOD Design & Works)	08048935178	
		M/s Roshan Impex,Ludhiana	Plot No. 30-31, Street No. 3, Oswal Agro Plot, GT Road, Ludhiana-141003 Punjab-INDIA	Mr. Narinder Singh (Managing Director)	9876036600	md@roshanimpex.in
		M/s Isitva (Fasteners) Pvt Ltd,Hyderabad	Survey No.58, Keesara Road,Nagaram Village,Hyderabad-501 301		040-27127766	info@isitva.in
40	Steel Structure	M/s SAIL India Ltd,Rourkela	SAIL, Rourkela Steel Plant, Rourkela, 769011	Mr.Subhransu Mohanty	9437074007	smohanty@sail.in
		M/s Rashtriya Ispat Nigam Ltd.,Vizag	Visakhapatnam Steel Plant, Visakhapatnam - 530031,Andhra Pradesh	Mr. Ashutosh Verma	9907140015	
		M/s Jindal Steel & Power Ltd,Bhubaneswar	Plot no.3,Forest Park,Bhubaneswar-751009	Mr.Mehul Aggarwal	9812063000 8288063000	Mehul.aggarwal@jindalsteel.com
41	GI Earth Wire	M/s Aarti Steels Ltd.,Cuttack	Ghantikhil ,Mahakalbast,Athgarh,Cuttack (Orissa)		91-671-7161000	info@aartisteelsltd.com
		M/s Kritika Wires (P) Ltd.,Kolkata	No.1A, Bonfield Lane, Bara bazaar,Mezanine Floor,Caning Street,Kolkata, West Bengal, 700001		3322429581	
		M/s UIC Udyog Limited,Kolkata	Anandlok, Block- A, 1st Floor, 227, A.J.C. Bose Road, Kolkata - 700020,West Bengal, India.			info@uicwires.com, sales@uicwires.com
		M/s. Gupta power Infrastructure Ltd,Khurda	F/9, IID Centre,Khurda, Odisha-752054	Mr.Mridul Tyagi Mr.Sandeep Kumar Mr. Debabrata Parida	9821762282 8130388990 9937937659	mridul.tyagi@guptapower.com sandeep@guptapower.com debabrata.parida@guptapower.com
		M/s G.K Winding Wires Ltd,Noida	B-20, UPSIDC Industrial Area, Site C, Surajpur Greater Noida, (U.P) 201306 (India)		8744005143	bd@gkwinning.com
		M/s Balaji Wires Pvt Ltd,Daman	Plot 51 & 52, Bharat Industrial Estate, Bhimpore, Daman 396210		9909952812	hr@balajiwires.in, costing@balajiwires.in
		M/s R K Wire Products Ltd, Kolkata	Unit No-VII, 15th Floor,Tower-I, PS Srijan Corporate Park,Plot No G-2, Block-EP & GP, Sector-V, Salt Lake City, Kolkata - 700 091	Mr. Indrajeet Banerjee	9123380881	ib@rkwire.com info@rkwire.com
		M/s Bajrang Wire Products(India) Pvt Ltd, Jaipur	E - 762(A), Road No. 9F - 1, Vishwakarma Industrial Area, Jaipur - 302 013, INDIA	Mr.Gajendra Maheshwari Mr.Ashish Maheshwari	9414050162 9414052722	enquiry@bajranggroup.com
		M/s Kataria Wires Pvt Ltd,Madhya Pradesh	Kataria Industries Pvt. Ltd.34-38 & 44 Industrial Area, Ratlam - 457001 (MP) - INDIA		9981828377	info@katarigroup.co.in sales@katarigroup.co.in marketing@katarigroup.co.in
		M/s Bharat Wire Ropes Ltd,Mumbai	A - 701, Trade World Building, Kamala Mills, Senapati Bapat Marg, Lower Parel (W), Mumbai			info@bharatwireropes.com
		M/s Ratlam Wires Pvt Ltd,Madhya Pradesh	Plot No. 3, Industrial Estate,, Ratlam-457001, Madhya Pradesh, India	Mr.Jeevan Singh Dhala (Managing Director)	08048987734	
		M/s Tata Iron & Steel Ltd,Jamshedpur	4, Armoury Road, Bistupur,Jamshedpur,Jharkhand			ibmd.marketingcomm@tatasteel.com
		M/s Usha Martin Industries Ltd,Kolkata	2A, Shakespeare Sarani,'Mangal Kalash',Kolkata			marketing-east@ushamartin.com
		M/s Jainco Transmission Ltd, Howrah	Jalan Complex, Gate No. 1, Lane No. 7, NH-6, Howrah, West Bengal	Mr.Pratul Ghosh	9831607956	engg@jainco.net

TPCODL		APPROVED MANUFACTURER-DISTRIBUTOR LIST OF TPCODL ( For New Connection work only) Updated Upto 05.10.2023				Valid Till : 31.10.2023
Sr. No	Description of Material/ Equipment	Manufacturer Name	Contact Address	Contact Person	Contact No.	Email ID
		M/s Ramsarup Industrial Corporation Ltd,Kolkata	7C, Kiran Shankar Roy Road, Hastings Chamber, 1st & 2nd Floor,Kolkata - 700 001			ramsarup@cal2.vsnl.net.in wire@ramsarup.com infra@ramsarup.com
		M/s Manohar Lal Hira Lal Ltd,Ghaziabad	28th KM Stone , Delhi Meerut Road,Duhai,Sainthli, Muradnagar,Ghaziabad ,(U.P) -201206			mhwire@mhwire.com mktg@mhwire.com
42	LT ABC Accessories, IPC (Insulated Piercing connector, Suspension, Dead end etc.)	M/s KSE Electricals,Howrah	3rd Main road,NH-6,Begri,Howrah,West Bengal	Mr.Ashis.K Palit	9830547600	mktg@kse.in
		M/s Jainco Transmission Ltd, Howrah	Jalan Complex, Gate No. 1, Lane No. 7, NH-6, Howrah, West Bengal	Mr.Pratul Ghosh	9831607956	engg@jainco.net
			<b>Authorized Distributors:</b> <b>1. M/s Samal Industries, Khurda</b> Plot No C/10 and 9/1 IID centre Industrial Estate Khurda	Mr. Prakash Samal	9437231336	samalindustries1234@gmail.com
		M/s Raychem RPG Pvt Ltd.,Gujurat	Kanjari,Jyoti Compound,Near Halol GIDC,Panchmahal,Gujarat	Mr.Rahul Biswas Mr.Mehul Patel	9771427299 9724304622	rahul_biswas@raychemrpg.com
		M/s SICAME India Connectors Pvt Ltd,Tamilnadu	473/1(96),Sirkundram Village,Chengalpet Taluk,Kanchipuram,Sirkundram, Tamilnadu-603108	Mr.Mahesh Kumar	9818156021	mahesh.gurjar@sicame.in
		M/s 3M Electro & Communication India Pvt Ltd,Pune	145,Mumbai-Pune Road,Pimpri,Pune,Maharashtra	Mr.Sujit Kumar Nayak Mr.Abhijit Bhagwat	98306 62725 9850667259	arbhagwat@mmm.com sknayak@mmm.com
43	Fire Fighting Equipment	MINIMAX ,Gujurat	Gunnebo India Private Ltd.Plot No. 1302-1306, GIDC Industrial Estate,Panchmahal, Halol - 389350, Gujrat,India			info@minimax.co.in
		M/s Kanadia Fyr Fyter Pvt Ltd,Gujurat	A-110, Kanara Business Centre, B/H Everest Garden, Apartment Laxmi Nagar, Ghatkopar East, Sihar, Bhavnagar-334240, Gujarat, India	Mr.Akash Bhatt	09376717299	
		M/s Ceasefire Industries Pvt Ltd,Noida	Plot No 4, 2nd Floor, Noida-Greater Noida Expy, Sector 135, Noida, Uttar Pradesh- 201304		9540 666 666	response@ceasefire.in
		M/s Aska Equipments Pvt Ltd,New Delhi	R-482,New Rajendra Nagar,Gangaram Hospital Square,Shankar Road,New Delhi-110060			sales@askagroup.com
		M/s Nitin Fire Protection Industries Ltd,Mumbai	501 Delta,Technology Street,Hiranandani Powai,Mumbai,INDIA : 400076			nitinfire@vsnl.com
		M/s Safex Fire Services Ltd,Mumbai	A-202, Dhanraj Industrial Estate, Dhanraj Mill Compound, S. J. Road,Lower Parel (w), MUMBAI 400 013 INDIA			tejas@safexfire.com
		M/s The Zenith Engineers Ltd,West Bengal	Karbala , Sonarpur, Vivekanand College, Narendrapur, Kolkata-700103, West Bengal, India	Mr. Subir Ghosh	08068441113 Dial(425) connected	
44	Bird Cap	M/s.3M Electro & Communication India Pvt Ltd,Pune	145,Mumbai-Pune Road,Pimpri,Pune,Maharashtra	Mr.Sujit Kumar Nayak Mr.Abhijit Bhagwat	9830662725 9850667259	arbhagwat@mmm.com sknayak@mmm.com
		M/s Raychem RPG Pvt Ltd.,Gujurat	Kanjari,Jyoti Compound,Nr Halol GIDC,Panchmahal,Gujarat	Mr.Rahul Biswas Mr.Mehul Patel	9771427299 9724304622	rahul_biswas@raychemrpg.com
45	Bird Guard	M/s Asian Loto Corporation Ltd, Haryana	C-3,1st Floor,Arya Samaj Road,Nehru Ground,N.I.T,Faridabad-121001	Mr.Dipak Arora	9811320275 9599057159	asianloto@asianlotocorporation.com sales@asianloto.com
		M/s Mangal Enterprises Pvt Ltd, Delhi	1743/46, 1st Floor,Electrical Market,Bhagirath Palace,Chandini Chowk,Delhi-110006	Mr.Bhuwan Pandey	8800702333	mangalenterprises2011@gmail.com
		M/s Namdhari Industrial Traders Pvt Ltd,Ludhiana	Latton Dana,Chandigarh Road,Ludhiana-141003	Mr.Gurjeet Singh	9814100398 9592000398	namdhari_ind_traders@yahoo.com sales@namdhariindtraders.com
		M/s Rahul Powertech Engineers Pvt Ltd,Rajasthan	A-807,Phase-2,Industrial Area,Bhilwadi,Alwar,Rajasthan	Mr.Yogendra Jain	9350863924 9810437369	
		M/s Yogeyata Electric,Delhi	361,Rohini,Sector-14,Aggrawal Plaza,Shahabad,Delhi-110033	Mr.Yogesh Singla	8048372221	

## Bill of Quantities

S.No.	Description	UoM	Quantity
<b>A)</b>	<b>Supply of Material (Incl. Contingency, Stock, Storage, Insurance, T&amp;P, Transportation to Site, Unloading etc.)</b>		
A.1)	Design, Supply, Transportation, Insurance, Delivery at site, Unloading, handling, Store of 2 x 33kV Double Circuit Overhead Line as per Technical Specifications and approved drawings. (Note: All metal parts being supplied shall be Hot Dip Galvanized as per TS)		
A.1.1	13 Mtr. Long H Pole	Nos.	293.00
A.1.2	WPB 160x152 (13 Mtr. Long 30.44 Kg/Mtr.)	Nos.	36.00
A.1.3	33kV V Cross Arm (GI) 22Kg Each	Nos.	459.00
A.1.4	Straight Cross Arm Channel 100x50x6 mm, 9.56 Kg/Mtr, each channel length 1.7 Mtr.	Kg	1,950.24
A.1.5	Top Channel 100x50x6mm, 9.56 KG/Mtr, each channel length 3.25 Mtr.	Kg	11,185.20
A.1.6	Top Channel 100x50x6mm, 9.56 KG/Mtr, each channel length 4.3 Mtr.	Kg	8,057.17
A.1.7	Top Channel 75x40x4.8mm, 7.14 KG/Mtr, each channel length 3 Mtr. for Guarding (GI)	Kg	2,570.40
A.1.8	Fish Plate 50x6mm, 2.36 kg/Mtr, each 0.280 mtr. Length	Kg	769.17
A.1.9	Insulator Support Channel 75x40x4.8mm, 7.14 KG/Mtr, each channel length 4.3 Mtr	Kg	982.46
A.1.10	Isolator Support Channel 75x40x4.8mm, 7.14 KG/Mtr, each channel length 4.3 Mtr	Kg	2,456.16
A.1.11	HT MU Mounting Channel 75x40x4.8 mm 7.14 Kg/Meter, each channel length 4.3 Mtr.	Kg	122.81
A.1.12	Cantilever GI Channel for supporting HT MU 75x40x4.8 mm, 810 mm Long	Kg	23.13
A.1.13	Angle for Cantilever arrangement for HT MU 50 x 50 x 6 - 1282 mm Long	Kg	23.08
A.1.14	Double Pole Belting Channel 75 x 40 x 4.8mm, 7.14 KG/Mtr, each channel length 1.96 Mtr.	Kg	1,679.33
A.1.15	Double Pole Belting Channel 75 x 40 x 4.8mm, 7.14 KG/Mtr, each channel length 4.3 Mtr.	Kg	2,087.74
A.1.16	50x50x6mm GI Bracing Angle, 4.5 Kg/mtr, each angle length 3.432 Mtr.	Kg	1,853.28
A.1.17	50x50x6mm GI Bracing Angle, 4.5 Kg/mtr, each angle length 4.927 Mtr.	Kg	1,507.66
A.1.18	Isolator Operating Down Pipe Support Channel 75x40x4.8mm, 7.14 KG/Mtr, each channel length 0.8 Mtr.	Kg	45.70
A.1.19	Down Pipe Diagonal Support Angle, 4.5 KG/Mtr, each angle length 0.388 Mtr.	Kg	13.97
A.1.20	Down Pipe Base Support Angle, 4.5 KG/Mtr, each angle length 0.34 Mtr.	Kg	12.24
A.1.21	Isolator Support side Channel 100x50x6mm, 9.56 KG/Mtr, each channel length 0.5Mtr.	Kg	76.48
A.1.22	Danger Plate	Nos.	313.00
A.1.23	Back Clamp for danger plate 25x3mm flat, 0.59kg/Mtr. Flat of 0.510 Mtr length	Kg	94.18
A.1.24	H.T. stay clamp, 50x8 mm. flat, 3.14Kg/Mtr, 0.511 Mtr. Length (1 Pair = 2 Nos.)	Pair	124.00
A.1.25	HT Stay Set (Complete)	Set	124.00
A.1.26	HT Stay Insulator Type-C (1 Pair = 2 Nos.)	Pair	124.00
A.1.27	7/8 SWG Stay Wire 15 kg/stay	Kg	1,860.00
A.1.28	GI Pipe Earthing 40mm. 3 Mtr long	Nos.	162.00
A.1.29	50x6 mm GI Flat for earthing, 2.36 kg/Mtr.	Kg	2,813.12
A.1.30	Earthing of Support (Coil Type)	Nos.	173.00
A.1.31	No. 8 GI wire (Dia 4.6mm) 0.131 Kg/Mtr. For connecting pole with Coil Earthing	Kg	45.33
A.1.32	No. 8 GI wire 0.131 Kg/Mtr. (For Guarding) Main Stringing	Kg	393.00
A.1.33	No. 10 GI wire 0.082 Kg/Mtr. (For Guarding) For Lacing	Kg	190.65



A.1.34	GI Barbed wire anticlimbing device 3 Kg per Support	Kg	987.00
A.1.35	Back Clamp for anticlimbing device 25x3 mm flat, 0.59kg/Mtr Flat of 0.510 mtr length	Kg	395.98
A.1.36	Lightning Arrester (30kV, 10kA) (Station Class, class-2)	Nos.	72.00
A.1.37	33kV 1250 AMP Double Break (Turn & Twist center rotating) isolator w/o Earth Switch with PI (Polymer)	Set	8.00
A.1.38	33 KV Pin insulator polymer	Nos.	993.00
A.1.39	Non Metallic Ties 33kV (For covered Conductor)	Nos.	987.00
A.1.40	H W Fitting (B&S) 90 KN , 4 Bolt	Nos.	1,032.00
A.1.41	IPC for 148 Sq. mm. AAA Conductor (For Covered Conductor)	Nos.	1,020.00
A.1.42	DISC insulator (B&S) 90 KN Polymer	Nos.	1,032.00
A.1.43	GI Nut, Bolt & Washer of different sizes	Kg	1,690.30
A.1.44	Eye Bolt (236mm, 16mm Dia, 0.479 Kg each) (Guarding)	Nos.	120.00
A.1.45	148 Sq. mm. AAA Conductor (XLPE Covered)	KM	57.47
A.1.46	PG Clamp for 148 Sq. mm AAA Conductor	Nos.	12.00
A.1.47	Black paint	Ltr.	267.00
A.1.48	Yellow Colour Paint for Background	Ltr.	534.00
A.1.49	148 Sq. mm. AAA Conductor (for Jumpering)	KM	0.03
A.2)	2 x 33kV Double Circuit 1C x 400 Sq.mm. Al. XLPE Underground Cables works complete as per Technical Specifications and approved drawings. (Note: All metal parts shall be Hot Dip Galvanized as per TS)		
A.2.1	Design, Supply, Transportation, Insurance, Delivery at site, Unloading, handling, Store of 33kV, 1C x 400 Sq.mm. Al. XLPE insulated UG Cable (Short Circuit Rating 37.7kA and Short Circuit Rating of Armour 27.5kA)	Mtr.	4,200.00
A.2.2	Design, Supply, Transportation, Insurance, Delivery at site, Unloading, handling, Store of O/D Termination kits Heat Shrinkable type suitable for 33kV, 1C x 400 Sq.mm. Al. XLPE insulated UG Cable	Set	60.00
A.2.3	Supply & Erection of GI Pipe of dia. 150mm, Class B (8 Mtrs)	Mtr.	480.00
<b>B) Erection of Material</b>			
B.1)	Check Survey: Preliminary route alignment in respect of the proposed 33KV feeder line has been fixed by the employer subject to alteration of places due to way leave or other unavoidable constraints. However, the contractor shall undertake the check survey before execution. The Survey shall be on the basis of the initial report provided by the employer.	LS	1.00
B.2)	Erection of Pole as per TS, fixing of all accessories complete (including stringing of Insulated Conductor etc), testing, demonstration for acceptance, commissioning, and documentation of 2 x 33kV Double Circuit Overhead Line as per Technical Specifications and approved drawings.		
B.2.1	13 Mtr. Long H Pole	Nos.	293.00
B.2.2	WPB 160x152 (13 Mtr. Long 30.44 Kg/Mtr.)	Nos.	36.00
B.2.3	33kV V Cross Arm (GI) 22Kg Each	Nos.	459.00
B.2.4	Straight Cross Arm Channel 100x50x6 mm, 9.56 Kg/Mtr, each channel length 1.7 Mtr.	Kg	1,950.24
B.2.5	Top Channel 100x50x6mm, 9.56 KG/Mtr, each channel length 3.25 Mtr.	Kg	11,185.20
B.2.6	Top Channel 100x50x6mm, 9.56 KG/Mtr, each channel length 4.3 Mtr.	Kg	8,057.17
B.2.7	Top Channel 75x40x4.8mm, 7.14 KG/Mtr, each channel length 3 Mtr. for Guarding (GI)	Kg	2,570.40
B.2.8	Fish Plate 50x6mm, 2.36 kg/Mtr, each 0.280 mtr. Length	Kg	769.17
B.2.9	Insulator Support Channel 75x40x4.8mm, 7.14 KG/Mtr, each channel length 4.3 Mtr	Kg	982.46
B.2.10	Isolator Support Channel 75x40x4.8mm, 7.14 KG/Mtr, each channel length 4.3 Mtr	Kg	2,456.16

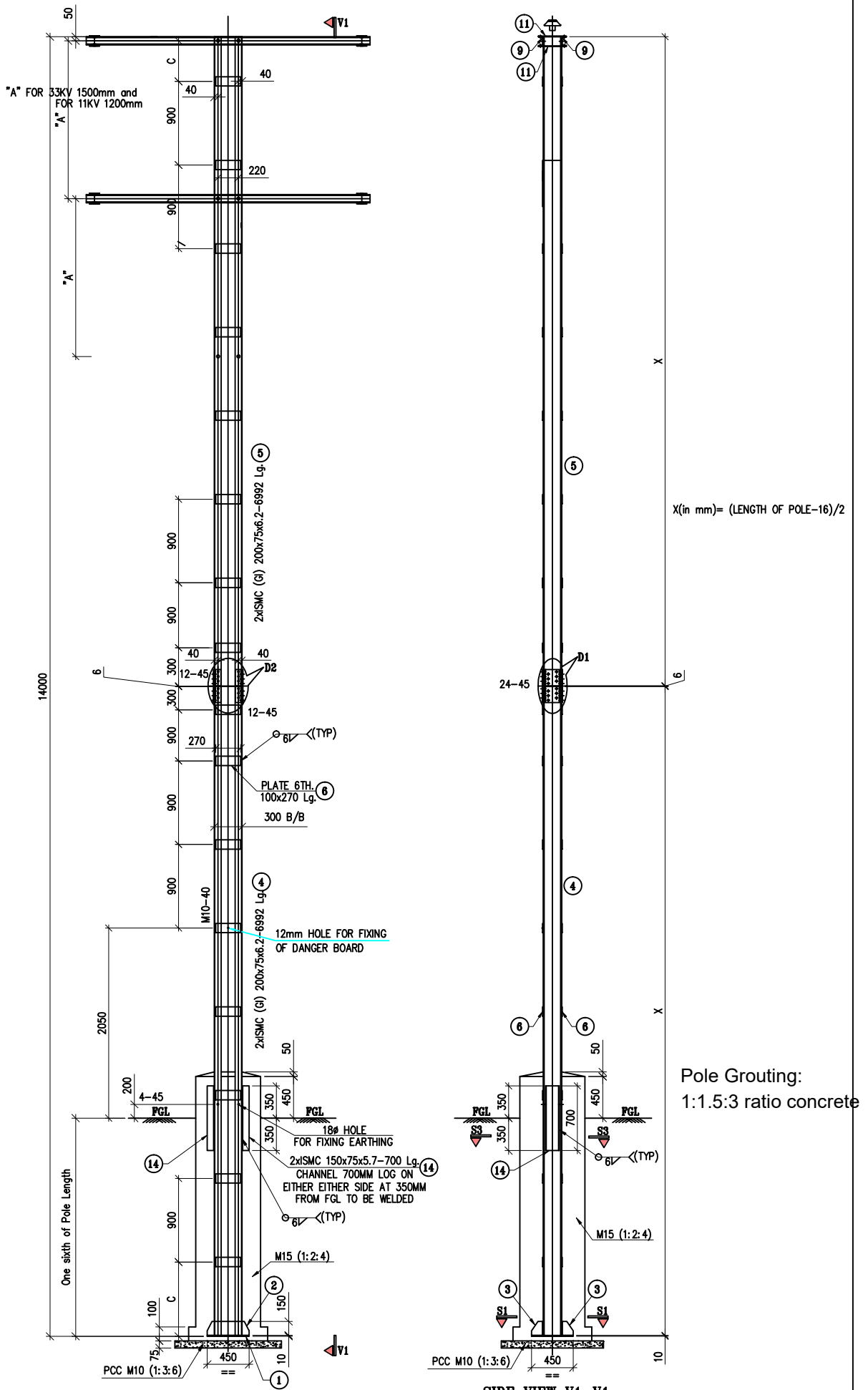
B.2.11	HT MU Mounting Channel 75x40x4.8 mm 7.14 Kg/Meter, each channel length 4.3 Mtr.	Kg	122.81
B.2.12	Cantilever GI Channel for supporting HT MU 75x40x4.8 mm, 810 mm Long	Kg	23.13
B.2.13	Angle for Cantilever arrangement for HT MU 50 x 50 x 6 - 1282 mm Long	Kg	23.08
B.2.14	Double Pole Belting Channel 75 x 40 x 4.8mm, 7.14 KG/Mtr, each channel length 1.96 Mtr.	Kg	1,679.33
B.2.15	Double Pole Belting Channel 75 x 40 x 4.8mm, 7.14 KG/Mtr, each channel length 4.3 Mtr.	Kg	2,087.74
B.2.16	50x50x6mm GI Bracing Angle, 4.5 Kg/mtr, each angle length 3.432 Mtr.	Kg	1,853.28
B.2.17	50x50x6mm GI Bracing Angle, 4.5 Kg/mtr, each angle length 4.927 Mtr.	Kg	1,507.66
B.2.18	Isolator Operating Down Pipe Support Channel 75x40x4.8mm, 7.14 KG/Mtr, each channel length 0.8 Mtr.	Kg	45.70
B.2.19	Down Pipe Diagonal Support Angle, 4.5 KG/Mtr, each angle length 0.388 Mtr.	Kg	13.97
B.2.20	Down Pipe Base Support Angle, 4.5 KG/Mtr, each angle length 0.34 Mtr.	Kg	12.24
B.2.21	Isolator Support side Channel 100x50x6mm, 9.56 KG/Mtr, each channel length 0.5Mtr.	Kg	76.48
B.2.22	Danger Plate	Nos.	313.00
B.2.23	Back Clamp for danger plate 25x3mm flat, 0.59kg/Mtr. Flat of 0.510 Mtr length	Kg	94.18
B.2.24	50x6 mm GI Flat for earthing, 2.36 kg/Mtr.	Kg	2,813.12
B.2.25	Earthing of Support (Coil Type)	Nos.	173.00
B.2.26	No. 8 GI wire (Dia 4.6mm) 0.131 Kg/Mtr. For connecting pole with Coil Earthing	Kg	45.33
B.2.27	No. 8 GI wire 0.131 Kg/Mtr. (For Guarding) Main Stringing	Kg	393.00
B.2.28	No. 10 GI wire 0.082 Kg/Mtr. (For Guarding) For Lacing	Kg	190.65
B.2.29	GI Barbed wire anticlimbing device 3 Kg per Support	Kg	987.00
B.2.30	Back Clamp for anticlimbing device 25x3 mm flat, 0.59kg/Mtr Flat of 0.510 mtr length	Kg	395.98
B.2.31	Lightning Arrester (30kV, 10kA) (Station Class, class-2)	Nos.	72.00
B.2.32	33kV 1250 AMP Double Break (Turn & Twist center rotating) isolator w/o Earth Switch with PI (Polymer)	Set	8.00
B.2.33	33 KV Pin insulator polymer	Nos.	993.00
B.2.34	Non Metallic Ties 33kV (For covered Conductor)	Nos.	987.00
B.2.35	H W Fitting (B&S) 90 KN , 4 Bolt	Nos.	1,032.00
B.2.36	IPC for 148 Sq. mm. AAA Conductor (For Covered Conductor)	Nos.	1,020.00
B.2.37	DISC insulator (B&S) 90 KN Polymer	Nos.	1,032.00
B.2.38	GI Nut, Bolt & Washer of different sizes	Kg	1,690.30
B.2.39	Eye Bolt (236mm, 16mm Dia, 0.479 Kg each) (Guarding)	Nos.	120.00
B.2.40	148 Sq. mm. AAA Conductor (XLPE Covered)	KM	57.47
B.2.41	PG Clamp for 148 Sq. mm AAA Conductor	Nos.	12.00
B.2.42	Black paint	Ltr.	267.00
B.2.43	Yellow Colour Paint for Background	Ltr.	534.00
B.2.44	148 Sq. mm. AAA Conductor (for Jumpering)	KM	0.03
B.3)	Laying, Testing & Commissioning of 2 x 33kV new line by 1C, 400 Sq. mm. AL. XLPE UG Cable		
B.3.1	Erection of O/D Termination Kits Heat Shrinkable Type suitable for 33kV, 1 C, 400 Sq. mm . HT UG Cable Kits.	Set	60.00
B.3.2	Installation, laying, Commissioning & Testing of 33kV, 1C x 400 Sq.mm. XLPE Insulation (extruded type) incl. looping at cable terminations and straight through joints, if applicable	Mtr.	4,200.00

B.3.3	Execution of Horizontal Directional Drilling (HDD) for laying 6 runs of HDPE pipe (110mm dia, PN8 PE80) for the purpose of laying 6 runs of U/G Cable across main roads, railway crossings and other unaccessible places.  <b>Note:</b> This also includes Supply of HDPE Pipe and other allied accessories required for successful execution of the work.	Mtr.	500.00
B.3.4	Laying of 6 runs of HDPE pipe (110mm dia, PN8 PE80) through available Concrete Duct (across Railway Line) for the purpose of laying 6 runs of U/G Cable across the Railway Line.  <b>Note:</b> This also includes Supply of HDPE Pipe and other allied accessories required for successful execution of the work.	Mtr.	200.00
B.3.5	Supply & Erection of Cable Route Marker along the cable route at an interval of 30 Mtrs. With Civil Works	Nos.	23.00
<b>C) Civil Works &amp; allied Erection Works</b>			
C.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 N&B, including allied Civil works i.e. excavation, supply of 0.5 CUM Cement Concrete foundation 1:2:4 ratio (500 x 500 x 800 mm) using 20mm BHG Metal with all labour & material (Excavation of earth will be done of size 500 x 500 x 1500 mm)	Nos.	124.00
C.2)	Construction of Earthing chamber including installation of earthing pipe, making earthing chamber including excavation, soil treatment with bentonite powder, calculation of earth resistance, including installation of 3 Mtr. GI Pipe 40mm / 50 mm incl. welding of GI Flat around pipe.	Nos.	162.00
C.3)	Civil Works for Erection of Pole		
C.3.1	Supply & laying of Concrete for Fixing of Pole (Foundation) - Concrete Ratio 1:1.5:3 (Volume 500mm x 500mm x 2200 mm) = 0.55 Cu Mtr. / Pole	Cu. Mtr.	180.95
C.3.2	Supply & laying of Concrete for Fixing of Pole (Coping) - Concrete Ratio 1:1.5:3 (Volume: 500mm x 500mm x 450 mm) = 0.1125 Cu Mtr. / Pole	Cu. Mtr.	37.01

**Note:** Bidders may consider their Cost towards Liaisoning Charges for obtaining clearances from Government Agencies and Private Land Owners (if any) for successful construction and commissioning of the 33kV Feeders.

However, Bidders should not consider the Statutory Charges / Fees towards obtaining Right of Way (RoW) clearances (i.e., Tree Cutting, Forest Clearance, Road Crossing, Railway Crossing, River Crossing, Nalla Crossing etc.) and statutory Charges (i.e. as per the prevailing Circle Rates) towards obtaining Right of Way (RoW / RoU) clearances for from Private Land Owners (if required), for laying / stringing the 33 kV feeder line, as the same shall be reimbursed separately by TFL to the Bidder on production of legitimate, evident and valid Documentary Proof.

# 14.0M H-PLOE STRUCTURE DESIGN



"C" Length= Refer to the BOQ.

**LEGENDS:-**

- FGL - FINISHED GROUND LEVEL
- TYP. - TYPICAL

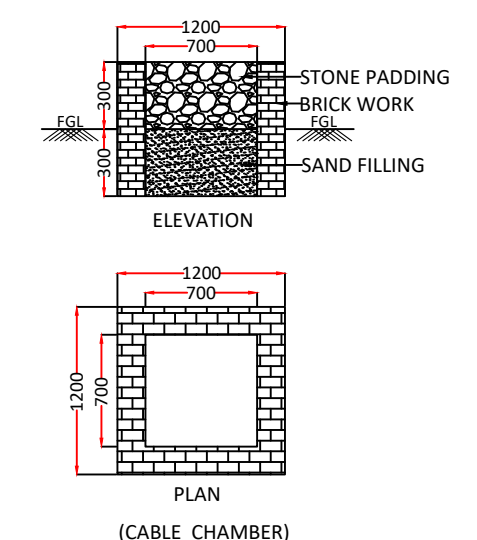
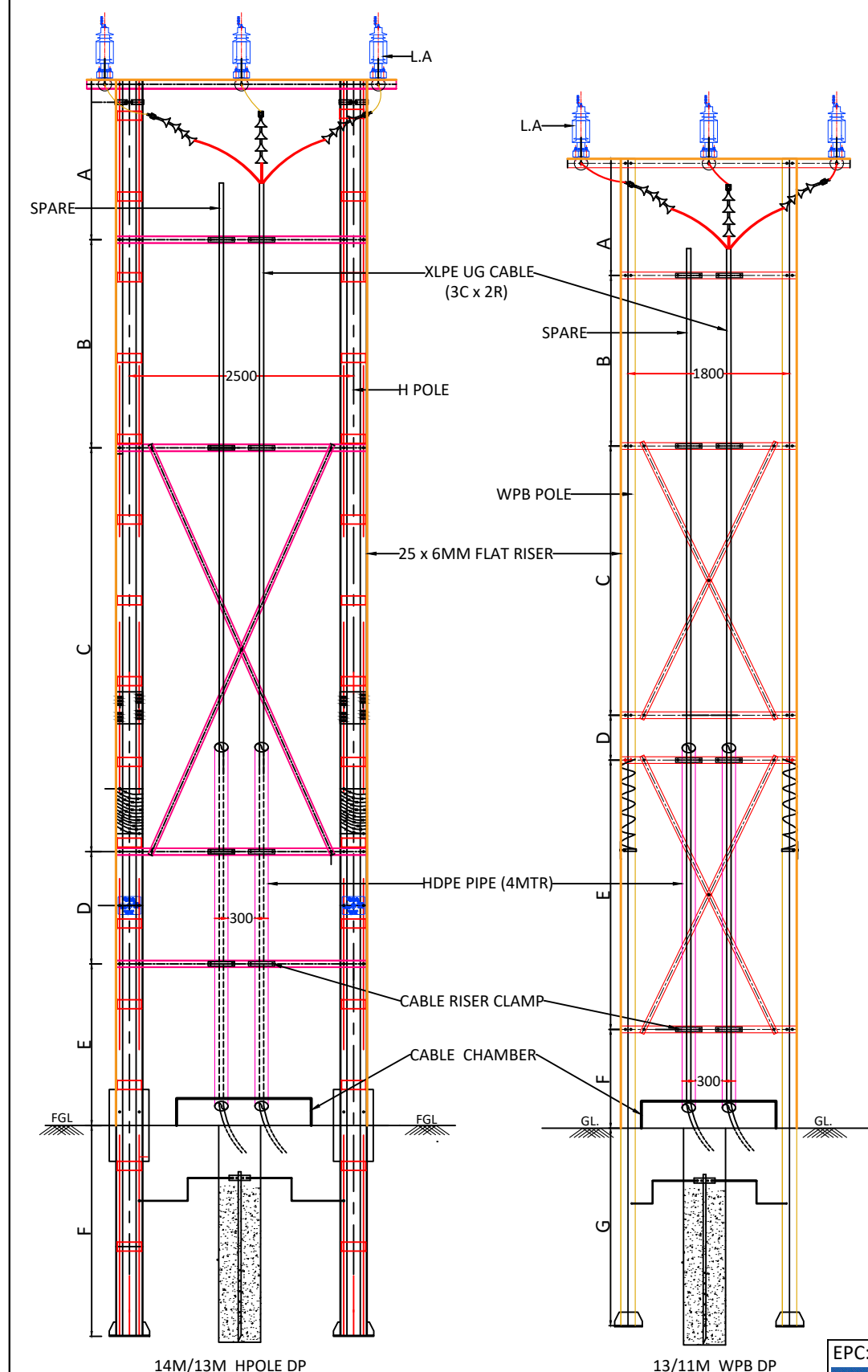
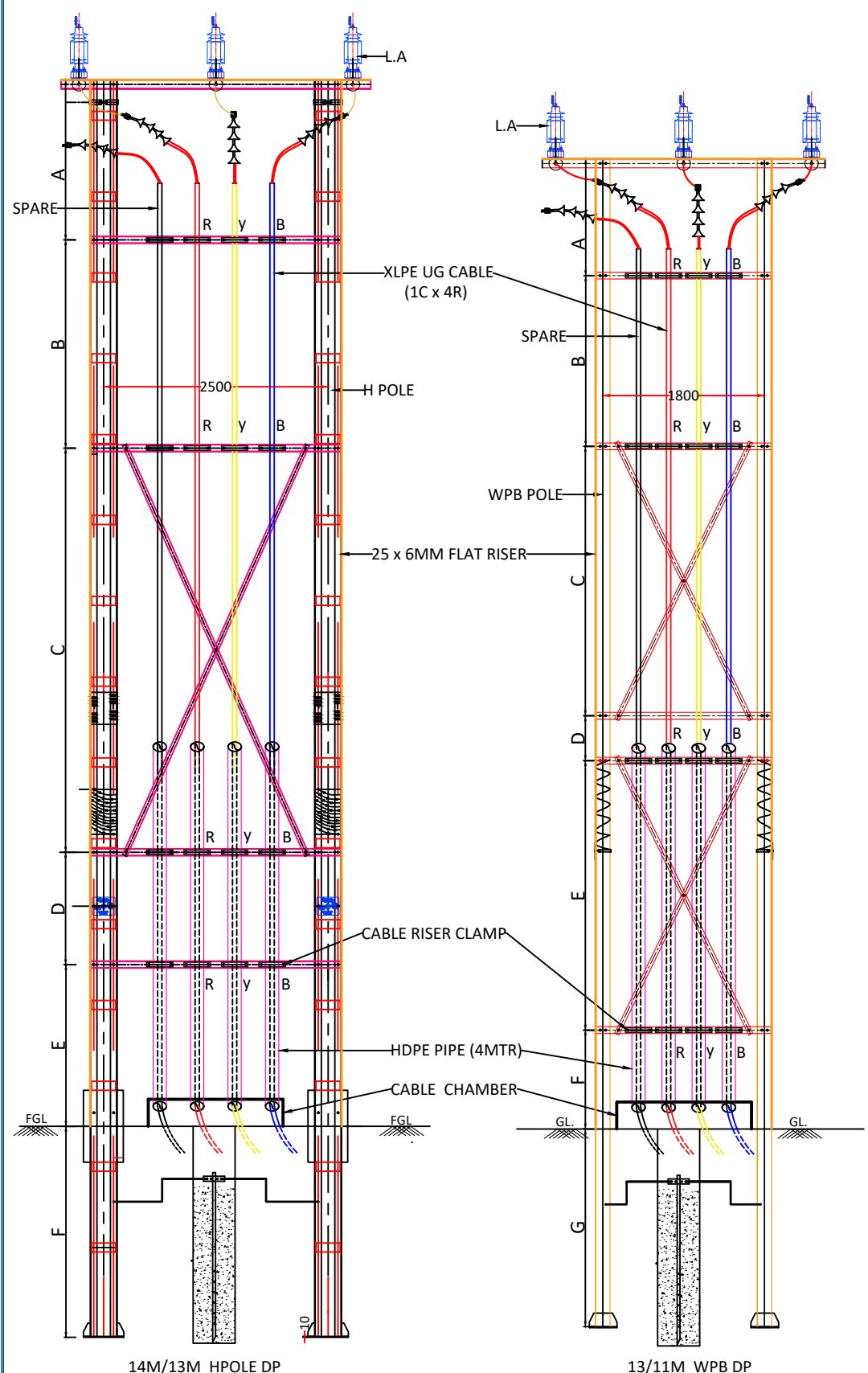




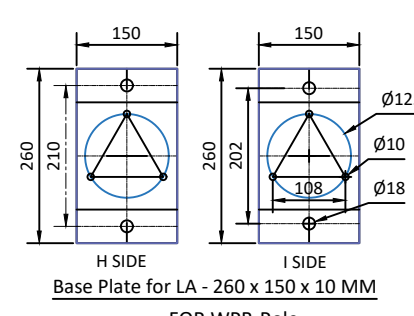
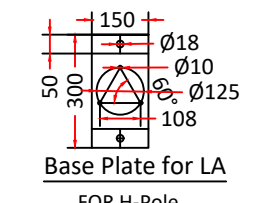
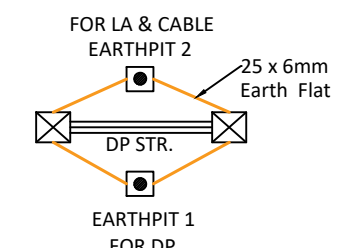
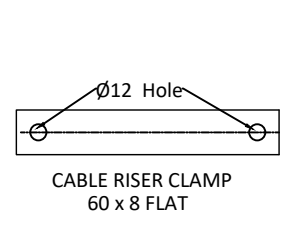
CABLE RISER FOR 1C x 4R XLPE UG CABLE

CABLE RISER FOR 3C x 2R XLPE UG CABLE

DETAILS ARRANGEMENT FOR CABLE RISER								
S.N	POLE DETAILS	A	B	C	D	E	F	G
1	WPB-POLE (13M)	1300	1900	3000	500	3000	1100	2200
2	WPB-POLE (11M)	1200	1000	2300	1000	2300	1400	1800
3	H -POLE (14M)	1782	2318	4500	1250	1800	2350	
4	H -POLE (13M)	2100	2000	4500	1250	1000	2150	



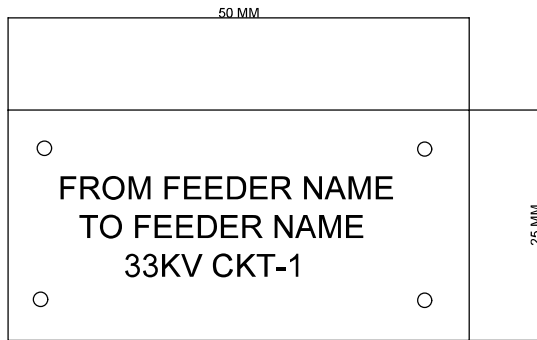
- NOTES:-**
1. ALL DIMENSIONS ARE IN M.M UNLESS OTHERWISE SPECIFIED.
  2. ADDITIONAL CHANNEL ( 75 x 40 x 4.8 )MM MAY BE USED IF REQUIRED.
  3. ALL BOLT HOLES ARE 18MM DIA FOR M16 BOLTS UNLESS NOTED OTHERWISE.
  4. 12MM DIA HOLE FOR M10 BOLTS USED FOR CABLE RISER CLAMPS.
  5. SIZE OF CLAMP, HDPE PIPE DEPENDS ON THE SIZE OF POWER CABLE.
  6. MATERIAL USED FOR CABLE RISER CLAMP SHOULD BE ALUMINIUM.
  7. FOR POLE DETAILS REFEREES TO ORIGINAL APPROVED DRAWING.
  8. ONE SPARE CABLE WILL BE USED FOR BOTH 1C & 3C CABLE.
  9. DIA OF HDPE PIPE SHOULD BE 40% MORE THAN THE OVERALL DIA OF THE CABLE.
  10. SHARP BENDING FOR CABLE LAYING NOT PERMISSIBLE. IT SHOULD BE DONE AS PER 20 D PRINCIPLE.
  11. PROVISION OF CABLE CHAMBER IS USED AT LOWER END OF THE HDPE PIPE TO COVER EXPOSED BENDING PART OF THE POWER CABLE.
  12. MINOR ADJUSTMENTS MAY BE DONE AS PER SITE CONDITION.



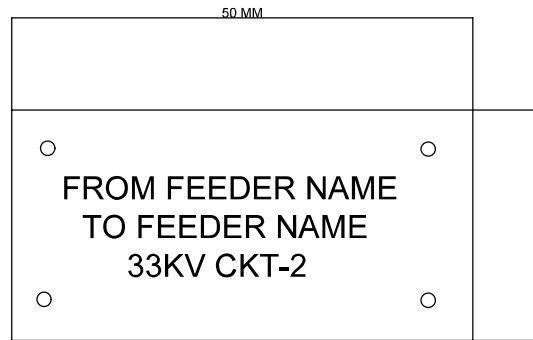
EPC:-  
**TPCODL**  
 TP CENTRAL ODISHA DISTRIBUTION LIMITED

**TATA POWER CENTRAL ODISHA DISTRIBUTION LIMITED**

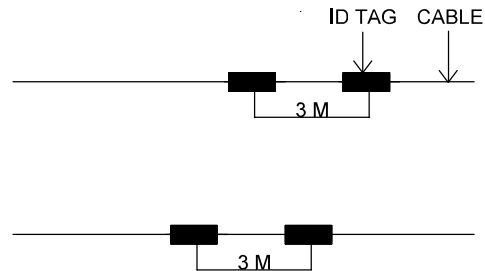
SURVEY & TESTING AGENCY: <b>IDAX CONSULTING &amp; RESEARCH PVT. LTD</b> Plot No.-5016, Duplex-E, Brundaban Enclave, VSS Nagar, Bhubaneswar - 751007, ODISHA	
PROJECT NAME:	DESIGN, ENGINEERING, SUPPLY, ERECTION AND COMMISSIONING OF 33/11 KV SUB-STATION
DRAWING TITLE:	CABLE RISER ON 11M / 13M / 14M WPB POLE & H POLE FOR 33KV & 11KV LINE
DRG. NO	TPCODL / SID / 0066
JOB NO	202303006
SHEET	1/1
DRAWN BY	ER. SAMEER KUMAR SAHOO
CHECKED BY	Er.S.K.SAHOO
DATE	13.07.23
REVISION	01



FOR 3 CORE CABLE



FOR 3 CORE CABLE



ERECTION DIAGRAM (for 3 core twin cable)

PO/RO/SCHEME No. STANDARD

**LEGEND:-**

**IMPORTANT NOTES:-**

1. All Dimensions are in mm.
2. All letters shall be engraved and painted with acrylic exterior grade paint in black colour.
3. The tag shall be tied with cable using 1 sqmm nylon wire.
4. Identification tag to be put on along the cable @ 3m distance at alternate location as shown in the flag.

Material - Aluminium  
Thickness - 2mm  
Distance - 2.5mtr.

**REFERENCES:-**

1. IS 1255: 1983
2. Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010.

**ENVIRONMENTAL NOTES:-**

The utmost care shall be taken to avoid the contamination of the physical and biological components of the earth/atmosphere system (such as leakage of SF6 gas, Spillage of Transformer oil, scrapping of plastic/electronic material etc.) to such an extent that normal environmental processes are adversely affected.

**SAFETY NOTES:-**

1. All safety precautions i.e., usage of PPE's etc, need to be taken care during the installation/construction.
2. Barricades shall be used if found necessary.
3. Warning board to be provided if necessary for safety measures.
4. Statutory measures to be taken for pandemic like covid-19 or others.

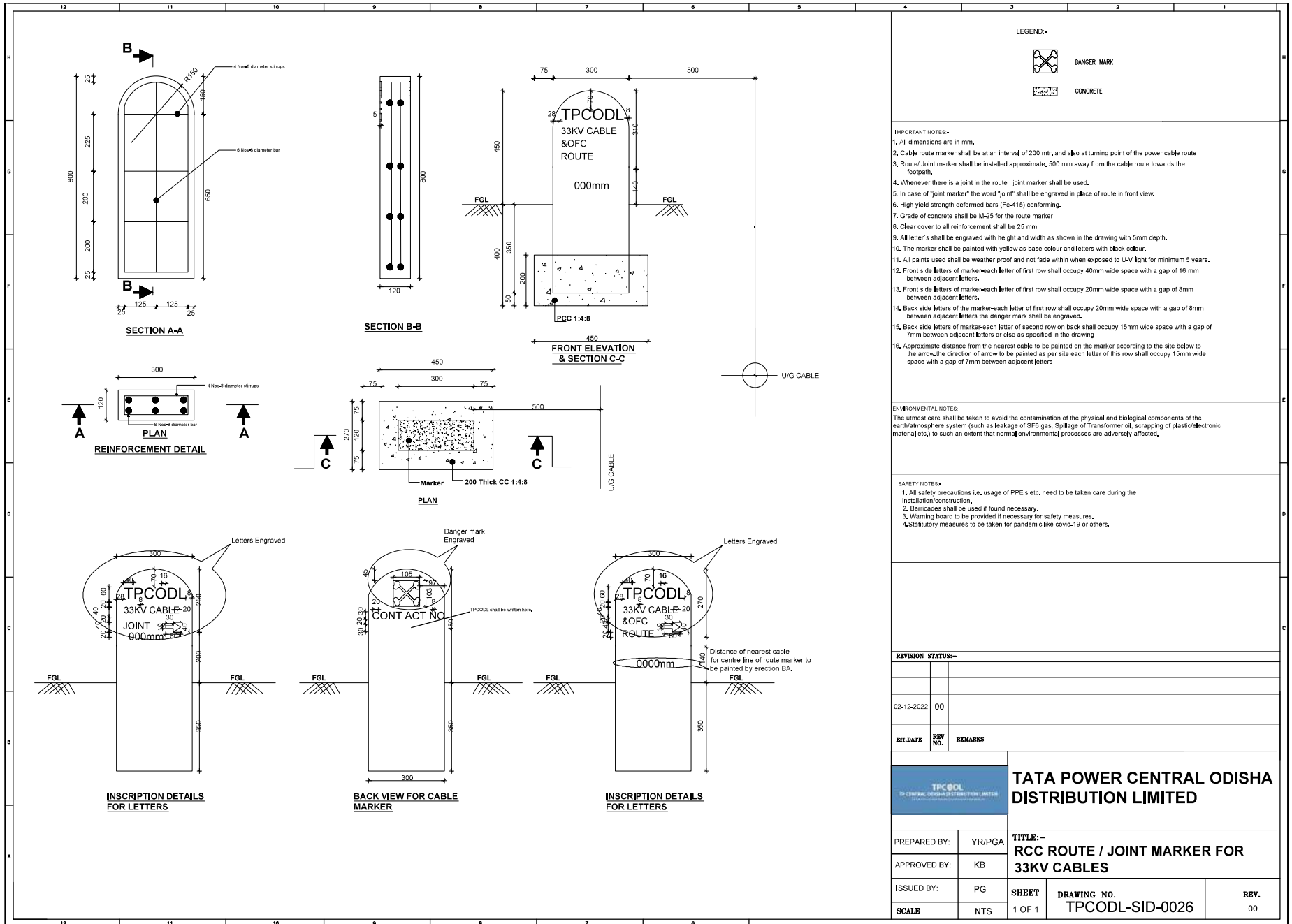
**REVISION STATUS:-**

REV. NO.	REV. DATE	REMARKS
00	02.12.2022	

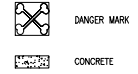
TPC/ODL		TATA POWER CENTRAL ODISHA DISTRIBUTION LIMITED	
PREPARED BY:	YR/PGA	TITLE:- IDENTIFICATION TAG EHV CABLE	
APPROVED BY:	KB		
ISSUED BY:	PG	SHEET	DRAWING NO.
SCALE	NTS	1 OF 1	TPCODL-SID-0024
			REV. 00







LEGEND:-



IMPORTANT NOTES:-

1. All dimensions are in mm.
2. Cable route marker shall be at an interval of 200 mtr, and also at turning point of the power cable route
3. Route/ joint marker shall be installed approximate, 500 mm away from the cable route towards the footpath.
4. Whenever there is a joint in the route, joint marker shall be used.
5. In case of "joint marker" the word "joint" shall be engraved in place of route in front view.
6. High yield strength deformed bars (Fe-415) conforming.
7. Grade of concrete shall be M-25 for the route marker
8. Clear cover to all reinforcement shall be 25 mm
9. All letter's shall be engraved with height and width as shown in the drawing with 5mm depth.
10. The marker shall be painted with yellow as base colour and letters with black colour.
11. All paints used shall be weather proof and not fade within when exposed to UV light for minimum 5 years.
12. Front side letters of marker each letter of first row shall occupy 40mm wide space with a gap of 16 mm between adjacent letters.
13. Front side letters of marker each letter of first row shall occupy 20mm wide space with a gap of 8mm between adjacent letters.
14. Back side letters of the marker each letter of first row shall occupy 20mm wide space with a gap of 8mm between adjacent letters the danger mark shall be engraved.
15. Back side letters of marker each letter of second row on back shall occupy 15mm wide space with a gap of 7mm between adjacent letters or else as specified in the drawing
16. Approximate distance from the nearest cable to be painted on the site below to the arrow the direction of arrow to be painted as per site each letter of this row shall occupy 15mm wide space with a gap of 7mm between adjacent letters

ENVIRONMENTAL NOTES:-

The utmost care shall be taken to avoid the contamination of the physical and biological components of the earth/atmosphere system (such as leakage of SF6 gas, Spillage of Transformer oil, scrapping of plastic/electronic material etc.) to such an extent that normal environmental processes are adversely affected.

SAFETY NOTES:-

1. All safety precautions i.e., usage of PPE's etc. need to be taken care during the installation/construction.
2. Barricades shall be used if found necessary.
3. Warning board to be provided if necessary for safety measures.
4. Statutory measures to be taken for pandemic like covid-19 or others.

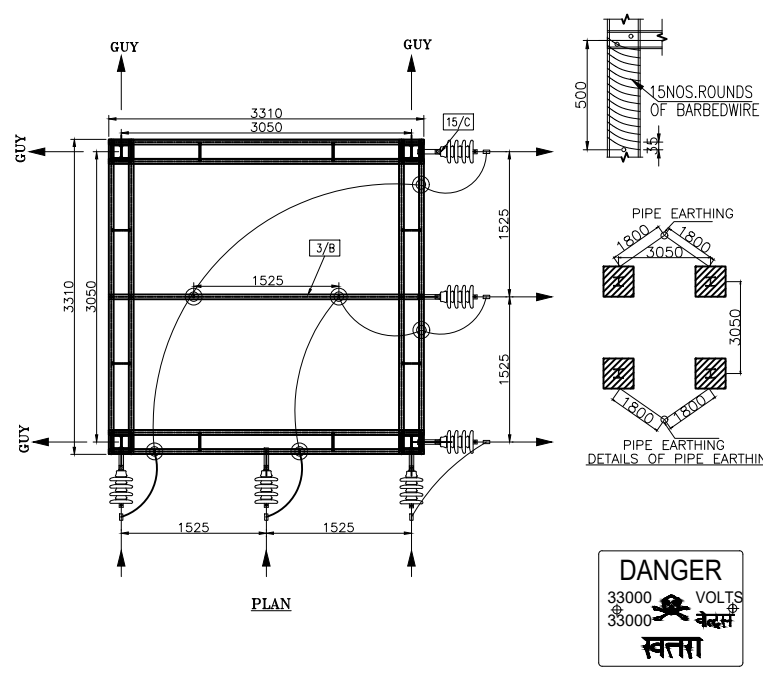
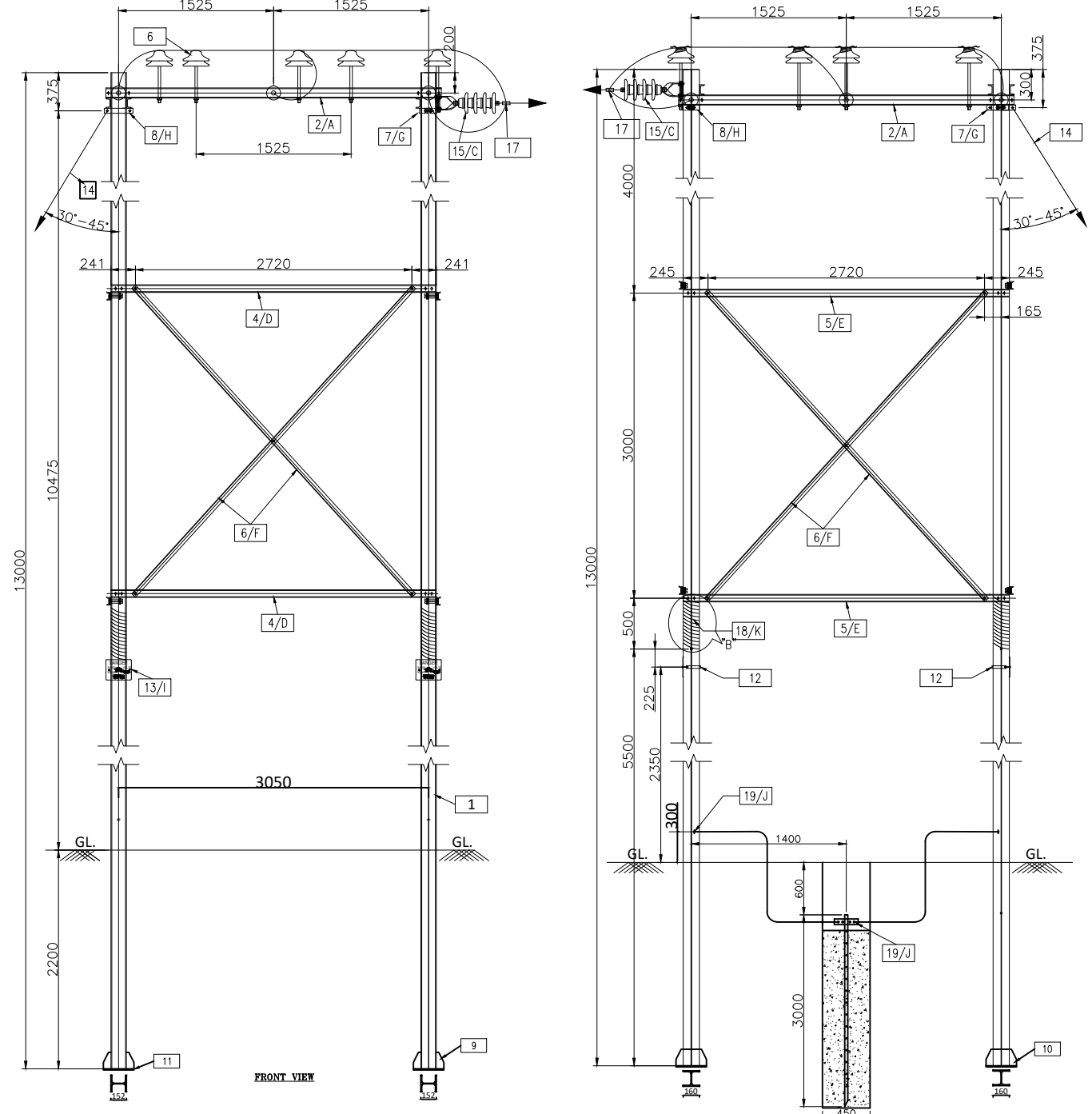
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REV. NO.	REV. DATE	REMARKS
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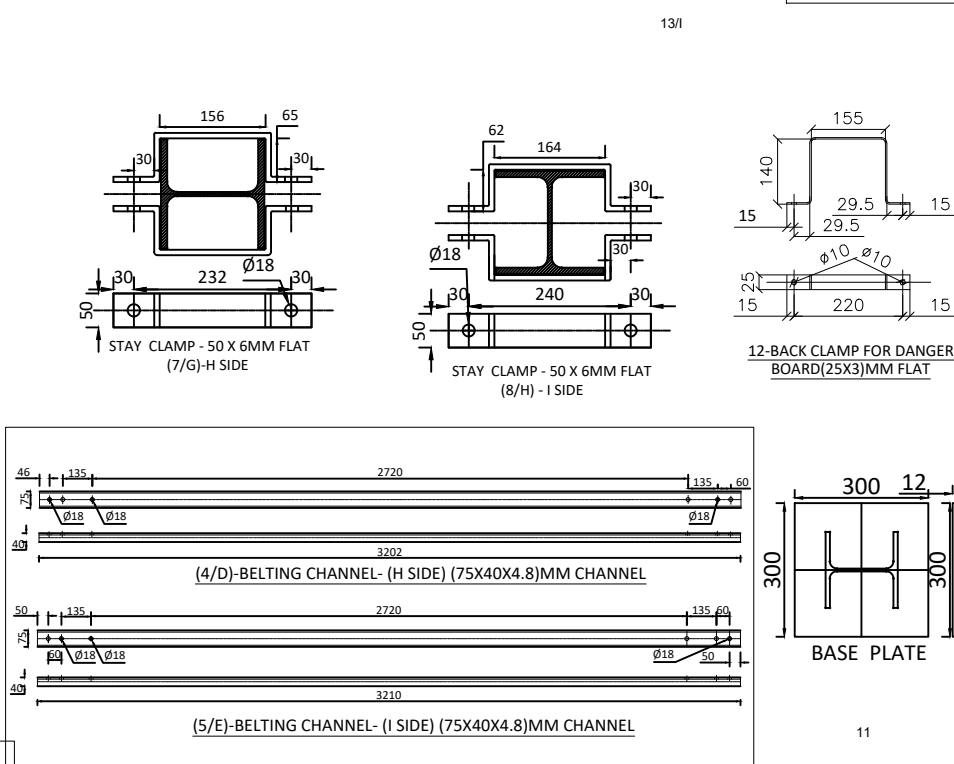
**TPCODL**  
TATA POWER CENTRAL ODISHA DISTRIBUTION LIMITED

**TATA POWER CENTRAL ODISHA DISTRIBUTION LIMITED**

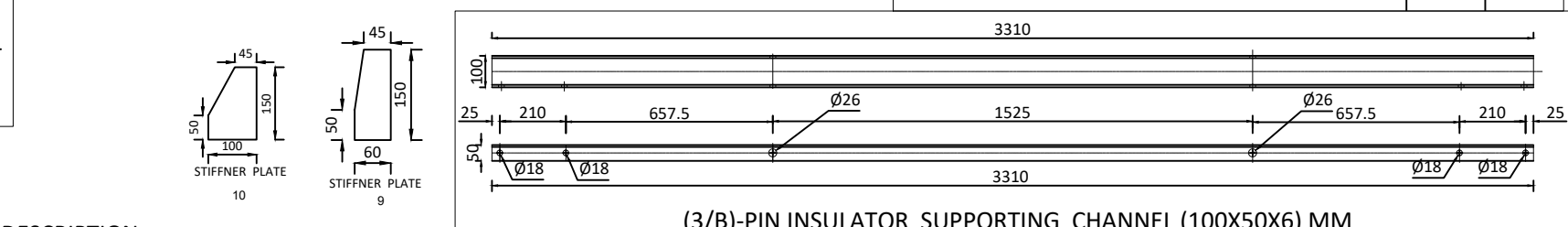
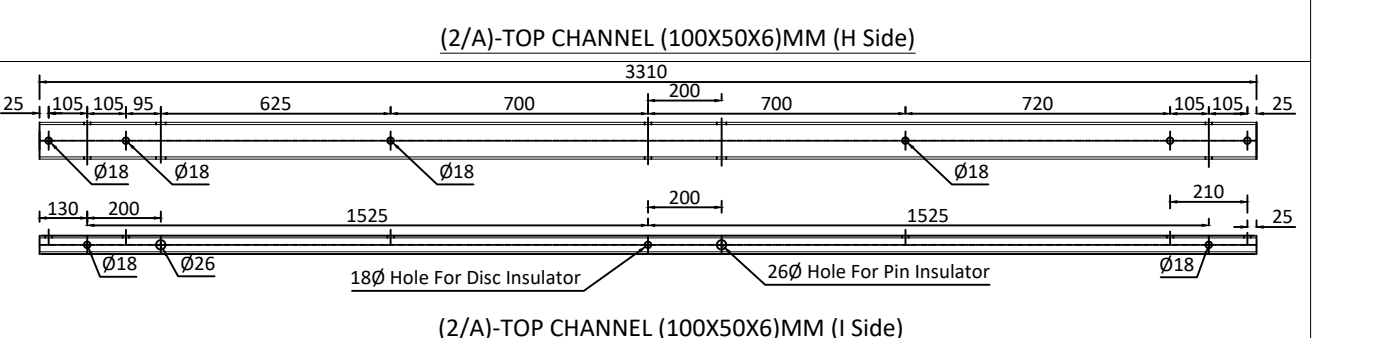
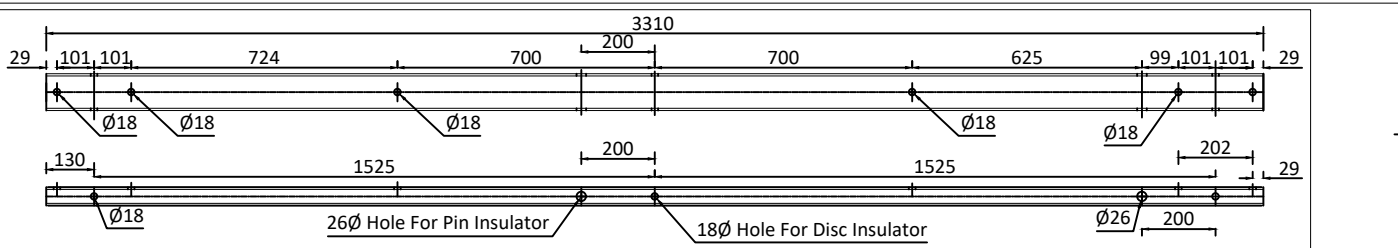
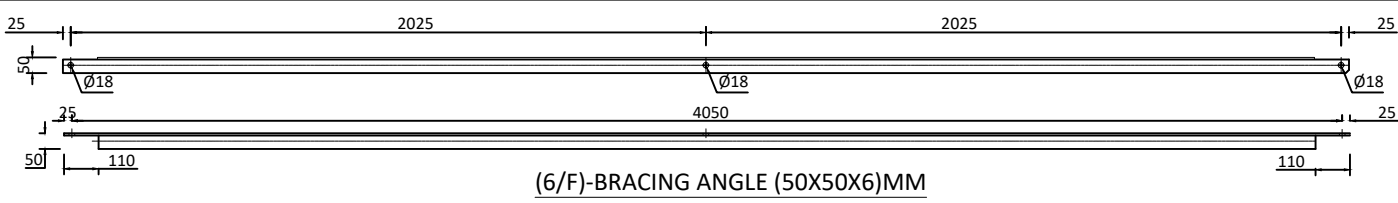
PREPARED BY:	YR/PGA	<b>TITLE:-</b>		
APPROVED BY:	KB	<b>RCC ROUTE / JOINT MARKER FOR</b>		
ISSUED BY:	PG	<b>33KV CABLES</b>		
SCALE	NTS	<b>SHEET</b>	<b>DRAWING NO.</b>	<b>REV.</b>
		1 OF 1	TPCODL-SID-0026	00



S.N	DESCRIPTION	SECTION	MATERIAL	LENGTH	QTY. In Nos.	WT KG / MTR	WT / ITEM IN KG	TOTAL WT. IN KG
1	WPB-POLE	160 X 152	WPB	13000	4	30.44	395.72	1582.88
2	TOP CHANNEL	100 X 50 X 6	CHANNEL	3310	8	9.56	31.643	253.144
3	PIN SUPPORT CHANNEL	100 X 50 X 6	CHANNEL	3310	1	9.56	31.643	31.643
4	BELTING CHANNEL (H)	75 X 40 X 4.8	CHANNEL	3202	4	7.14	22.862	91.448
5	BELTING CHANNEL (I)	75 X 40 X 4.8	CHANNEL	3210	4	7.14	23	92
6	BRACING ANGLE	50 X 50 X 6	ANGLE	4100	8	3.8	15.58	124.64
7	STAY CLAMP (H-SIDE)	50 X 6	FLAT	406	4	2.36	0.958	3.832
8	STAY CLAMP (I-SIDE)	50 X 6	FLAT	408	4	2.36	0.962	3.848
9	STIFFNER PLATE	60X150X6	PLATE		8	47.1	0.423	3.384
10	STIFFNER PLATE	100X150X6	PLATE		8	47.1	0.706	5.648
11	BASE PLATE	300X300X12	PLATE		4	94.2	8.478	33.912
12	BACK CLAMP (DANGER BOARD)	25 X 3	FLAT	524	4	0.59	0.310	1.24
13	DANGER BOARD	200 X 6	FLAT	250	4	9.42	2.355	9.42
14	STAY WIRE - 7/10 SWG				04 NOS.			26
15	DISC INSULATOR				06 SET			
16	PIN INSULATOR				06 NOS.			
17	PG CLAMP				06 NOS.			
18	BARBAID WIRE				04 SET.			
19	PIPE EARTHING				02 NOS.			
TOTAL WEIGHT IN KGS.								2263.039



NUT & BOLT DETAILS					
A	BOLT & NUTS FOR POLE TOP CHANNEL	M16	200	24	8.976
B	BOLT & NUTS FOR PIN MOUNTED CHANNEL	M16	40	4	0.504
C	BOLT & NUTS FOR DISC INSULATOR	M16	150	6	1.8
D	BOLT & NUTS FOR BELTING CHANNEL (H-SIDE)	M16	120	16	4.032
E	BOLT & NUTS FOR BELTING CHANNEL (I-SIDE)	M16	40	16	2.106
F	BOLT & NUTS FOR BRACING ANGLE	M16	40	20	2.52
G	BOLT & NUTS FOR STAY CLAMP (H-SIDE)	M16	75	4	0.72
H	BOLT & NUTS FOR STAY CLAMP (I-SIDE)	M16	75	4	0.72
I	BOLT & NUTS FOR DANGER BOARD	M8	50	8	0.232
J	BOLT & NUTS FOR PIPE EARTHING	M16	40	4	0.504
K	BOLT & NUTS FOR BARBAID WIRE	M16	40	4	0.504
L	SPRING WASHER	M16	-	204	1.836
M	SPRING WASHER	M8	-	16	0.032
N	FLAT WASHER	M16	-	102	1.428
O	FLAT WASHER	M8	-	8	0.04
TOTAL					25.954



- DESCRIPTION:**
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE SPECIFIED
  - ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED
  - SPRING WASHER SHALL CONFORM TO IS-3063.
  - ALL BOLTS NUTS AND LOCK NUTS SHALL CONFORM TO REQUIREMENTS OF INDIAN STANDARD SPECIFICATION IS :1363 / 1367 (LATEST REVISION)
  - ALL PLAIN WASHERS SHOULD CONFORM TO IS -3063.
  - ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED WITH MIN. COATING OF 705 g/Sq.m. AS PER IS:4759 & IS:2633.
  - FASTENING BOLTS & NUTS SHALL BE GALVANIZED AS PER TECHNICAL SPECIFICATION.
  - ALL SPRING WASHERS SHALL BE ELECTRO GALVANIZED AS PER TECHNICAL SPECIFICATION.
  - PLAIN WASHERS SHALL BE HOT DIP GALVANIZED AS PER TECHNICAL SPECIFICATION.
  - ALL BOLT HOLES ARE 18Ø SLOTTED HOLE 24 MM LONG FOR M16 BOLTS UNLESS NOTED OTHERWISE.
  - 2% EXTRA NUTS & BOLTS SHALL BE PROCURED FOR ERECTION.
  - GALVANIZATION WILL BE DONE MINIMUM 100 MICRON.
  - DO NOT SCALE FOLLOW WRITTEN DIMENSIONS ONLY.
  - MATERIAL MAKE -SAIL, JINDAL,TATA
  - IN CASE OF ANY DISCREPANCY IN DIMENSION & LEVEL BETWEEN DRAWING. THE CONTRACTOR SHALL SEEK THE CLARIFICATION BEFORE PROCEEDING.

EPC:-

**TPCODL**  
TP CENTRAL ODISHA DISTRIBUTION LIMITED

**TATA POWER CENTRAL ODISHA DISTRIBUTION LIMITED**

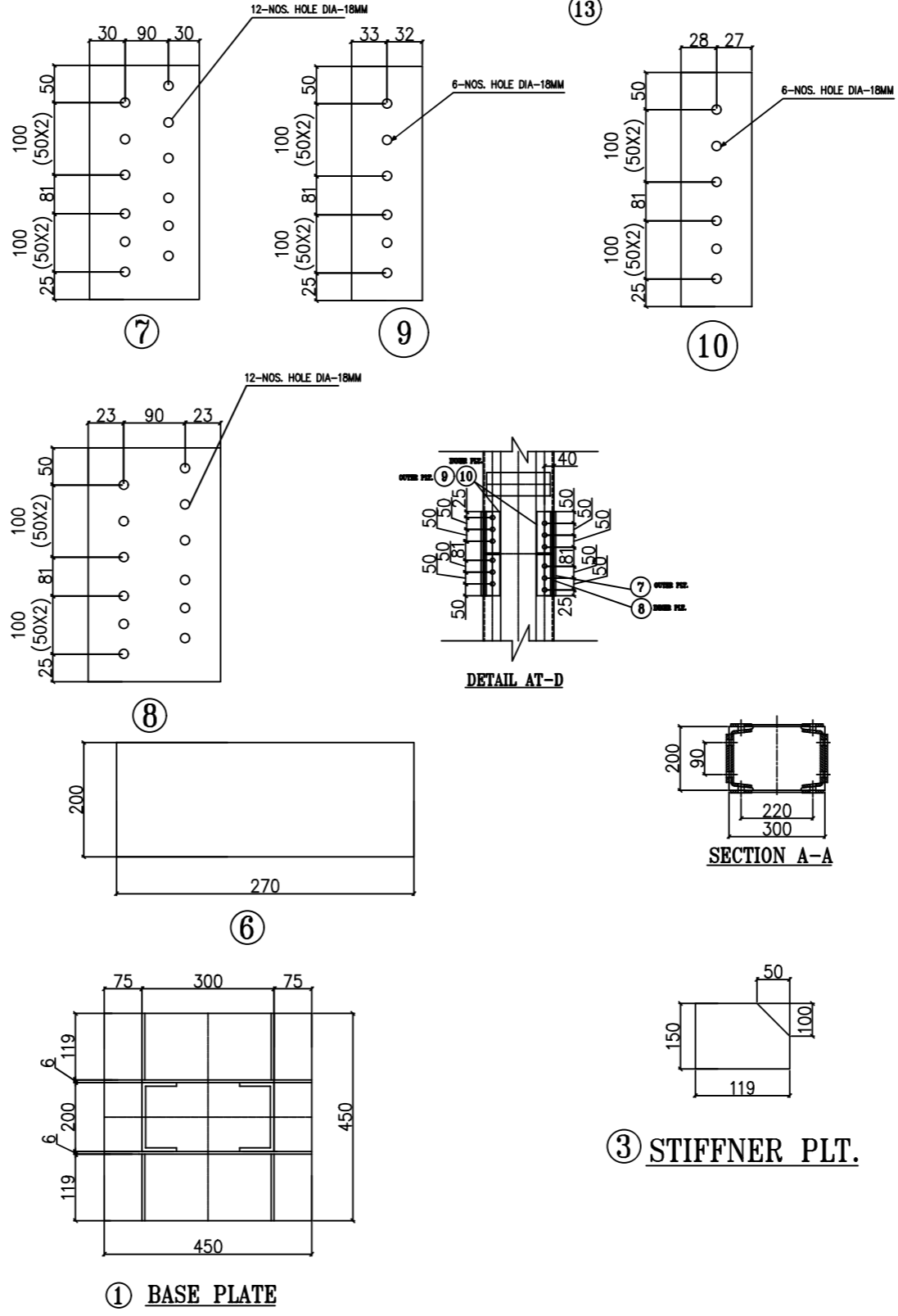
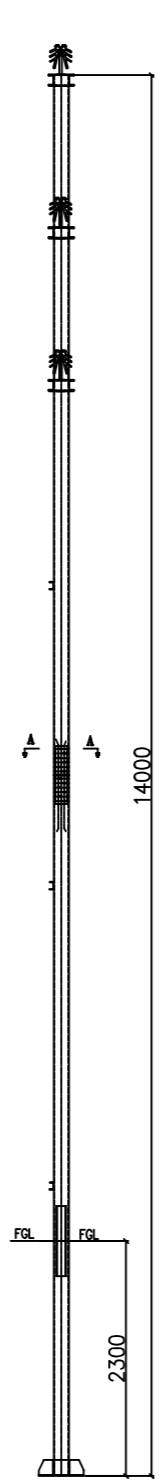
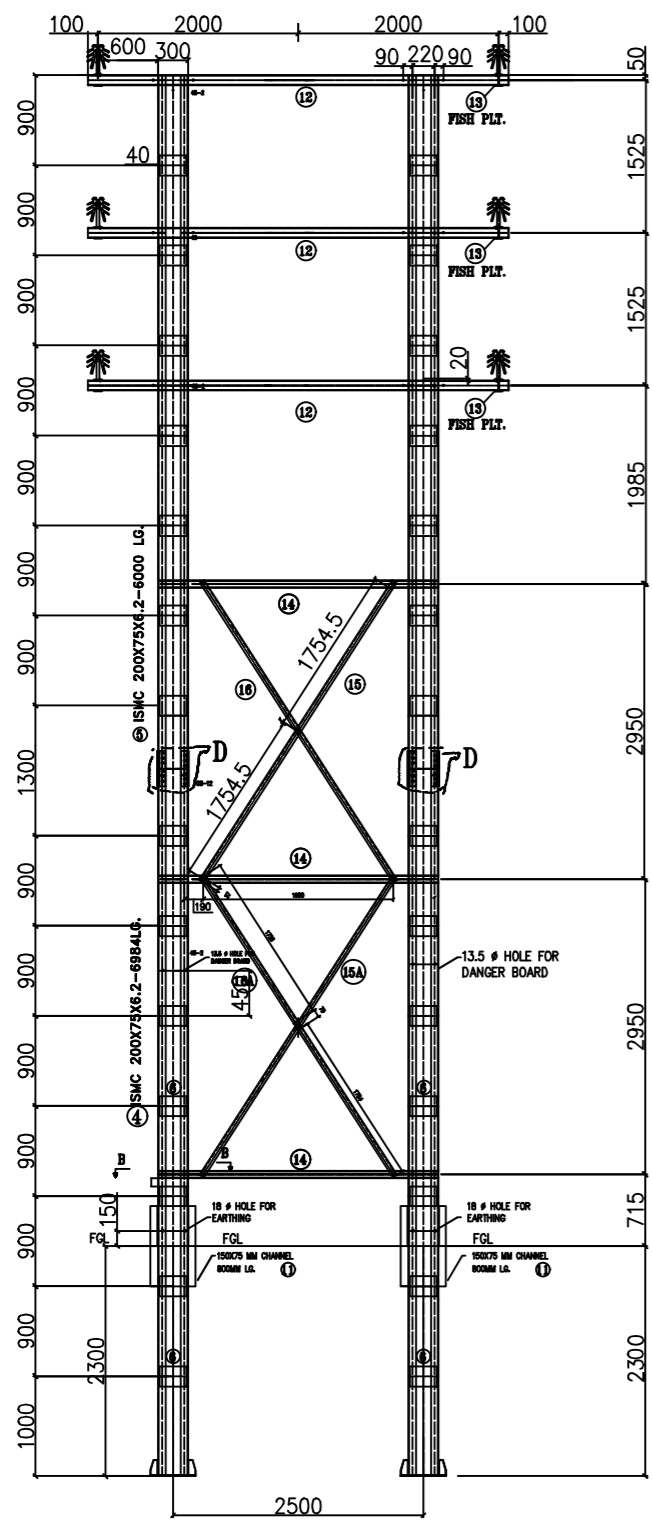
SURVEY & TESTING AGENCY:  
**IDAX CONSULTING & RESEARCH PVT. LTD**  
Plot No.-5016, Duplex-E, Brundaban Enclave, VSS Nagar, Bhubaneswar - 751007, ODISHA

PROJECT NAME: DESIGN, ENGINEERING, SUPPLY, ERECTION AND COMMISSIONING OF 33/11 KV SUB-STATION

DRAWING TITLE: 33KV 13M WPB FP STR.

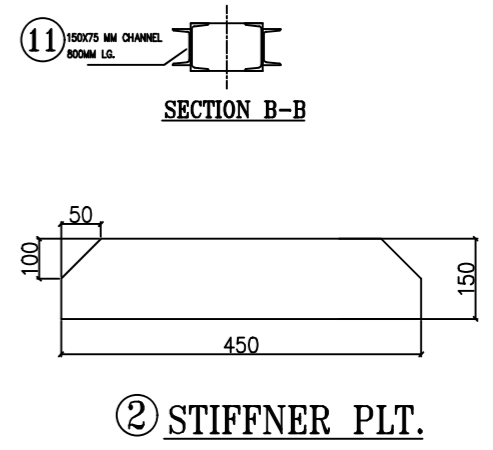
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	ER. SAMEER KUMAR SAHOO	ER. S. K. SAHOO		REVISION	01

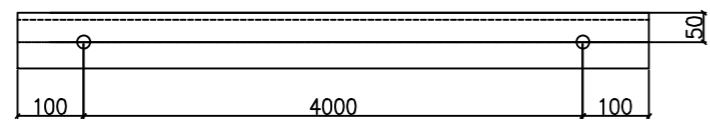
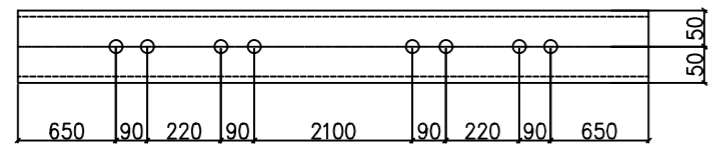
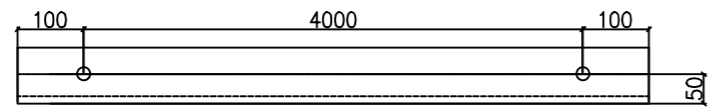




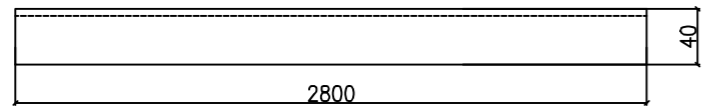
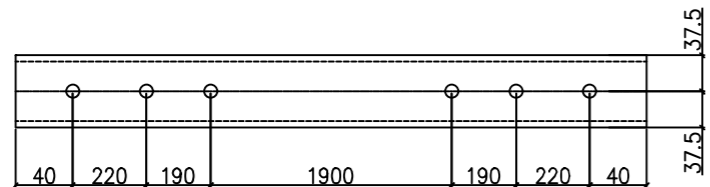
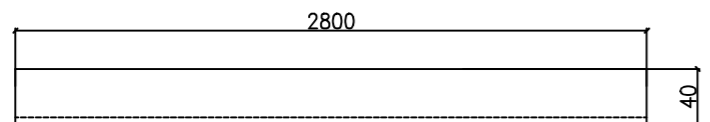
- NOTES:-**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE SPECIFIED.
  2. ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED.
  3. SPRING WASHER SHALL CONFORM TO IS-3063.
  4. ALL BOLTS NUTS AND LOCK NUTS SHALL CONFORM TO REQUIREMENTS OF INDIAN STANDARD SPECIFICATION IS : 1363/1367 (LATEST REVISION)
  5. ALL PLAIN WASHERS SHOULD CONFORM TO IS 2016.
  6. ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED WITH MIN. COATING OF 705 g/Sq.m. AS PER IS:4759 & IS:2633.
  7. FASTENING BOLTS & NUTS SHALL BE GALVANIZED AS PER TECHNICAL SPECIFICATION.
  8. ALL SPRING WASHERS SHALL BE ELECTRO GALVANIZED AS PER TECHNICAL SPECIFICATION.
  9. PLAIN WASHERS SHALL BE HOT DIP GALVANIZED AS PER TECHNICAL SPECIFICATION.
  10. ALL BOLT HOLES ARE 18Ø FOR M16 BOLTS UNLESS NOTED OTHERWISE.
  11. 2% EXTRA NUTS & BOLTS SHALL BE PROCURED FOR ERECTION.
  12. GALVANIZATION WILL BE DONE MINIMUM 100 MICRON.
  13. DO NOT SCALE FOLLOW WRITTEN DIMENSIONS ONLY.
  14. MATERIAL MAKE- SAIL, JINDAL, TATA

BILL OF QUANTITY PER STRUCTURE							
Erection No.	Description	Section	Length (mm)	Qty.	Section wt/m	Weight/ Piece (Kg)	Total Weight (Kg)
1	BASE PLATE	PLATE 10 MM	450X450	2	78.5	15.896	31.79
2	GUSSET PLATE	PLATE 6 MM	150X450	4	47.1	3.179	12.72
3	STIFFNER PLATE	PLATE 6 MM	119X150	8	47.1	0.841	6.73
4	GI H-POLE	ISMC 200x75x6.2	6992	4	22.3	155.922	623.69
5	GI H-POLE	ISMC 200x75x6.2	6992	4	22.3	155.922	623.69
6	LACING PLATE	PLATE 6 MM	200X270	56	47.1	2.54	142.24
7	JOINT PLATE	PLATE 8 MM	150X356	4	2.8	3.353	76.30
8	JOINT PLATE	PLATE 8 MM	136X356	4	62.8	3.04	12.16
9	JOINT PLATE	PLATE 8 MM	65X356	8	62.8	1.453	11.62
10	JOINT PLATE	PLATE 8 MM	55X356	8	62.8	1.230	9.84
11	WELDED ISMC	ISMC 150x75x5.7	800	4	16.8	13.44	53.76
12	ISMC	ISMC 100x50x6	4200	6	9.56	40.2	241.2
13	FISH PLATE	PLATE 8 MM	80X300	12	62.8	1.56	18.72
14	ISMC	ISMC 75x40	2800	3	7.14	19.99	59.97
15,15A	ISA	L50X50X6	3559	2	4.5	16.02	32.04
16,16A	ISA	L50X50X6	3559	2	4.5	16.02	32.04
TOTAL BLACK WEIGHT IN KGS.							1988.51

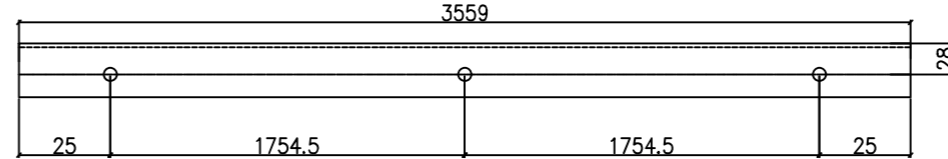
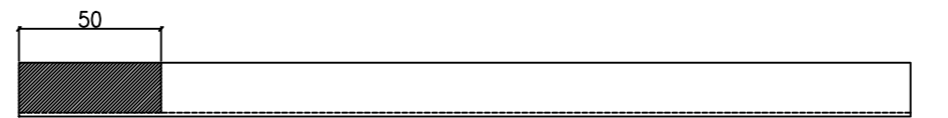




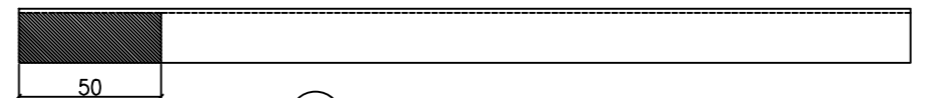
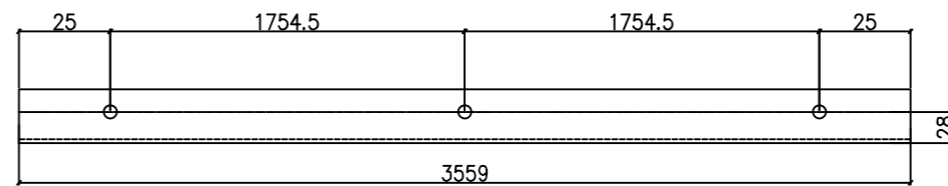
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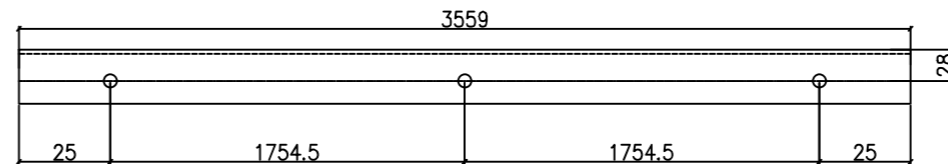
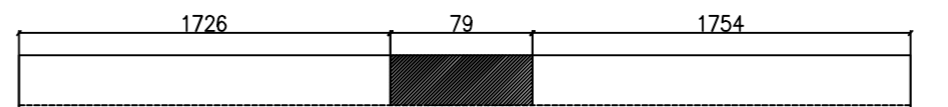
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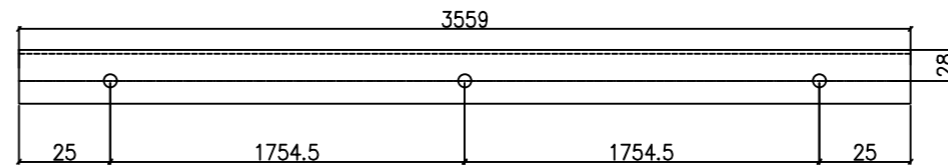
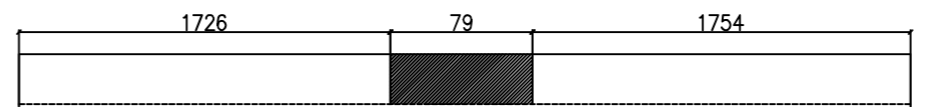
⑮ L50X50X6



⑮A L50X50X6



⑯ L50X50X6



⑯A L50X50X6

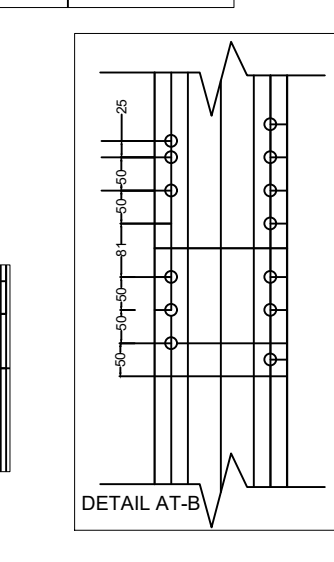
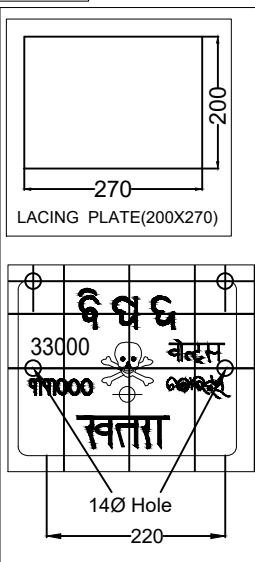
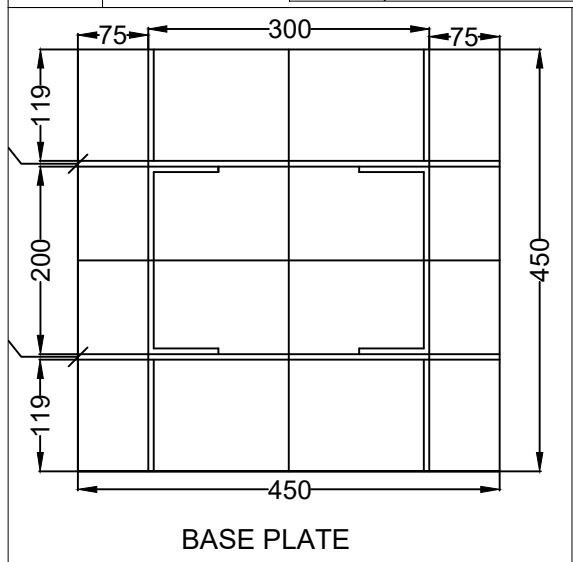
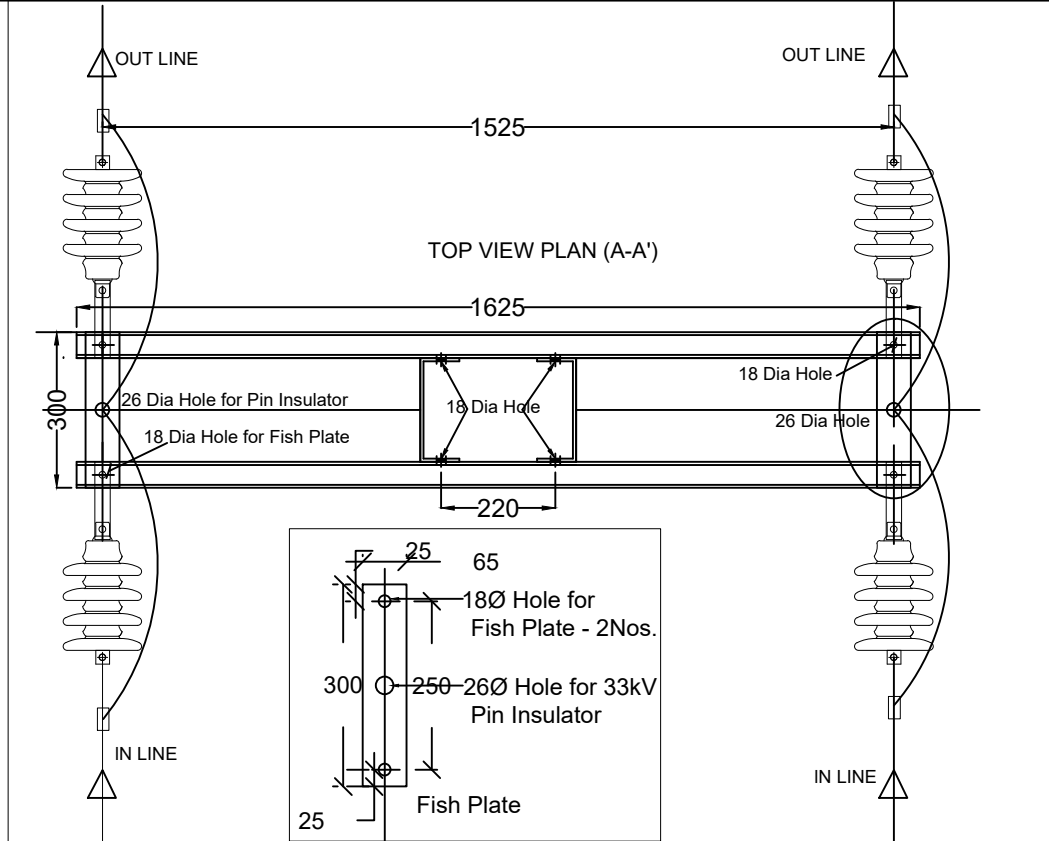
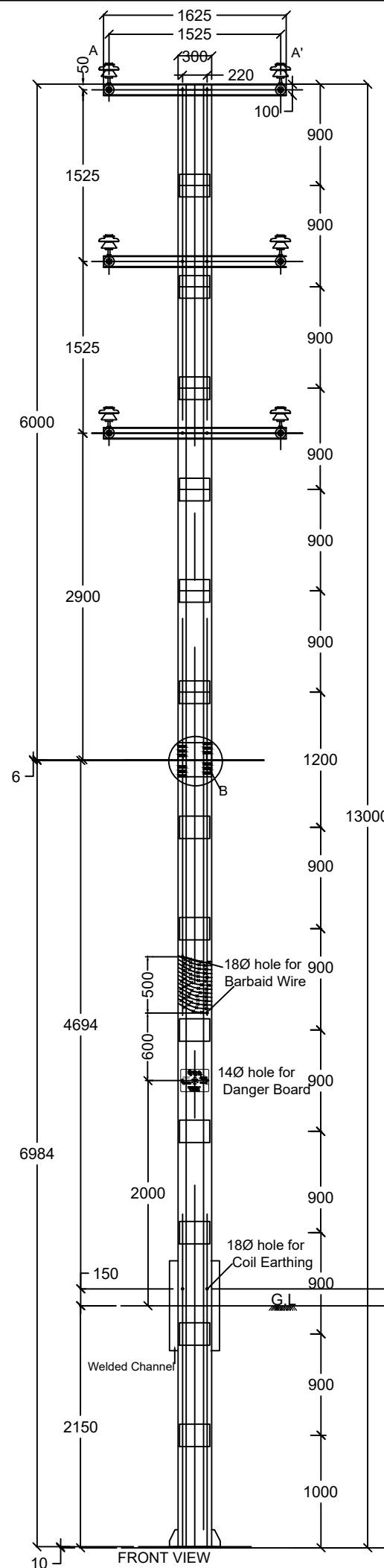
**NOTES:-**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE SPECIFIED.
2. ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED.
3. SPRING WASHER SHALL CONFORM TO IS-3063.
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5. ALL PLAIN WASHERS SHOULD CONFORM TO IS 2016.
6. ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED WITH MIN. COATING OF 705 g/Sq.m. AS PER IS:4759 & IS:2633.
7. FASTENING BOLTS & NUTS SHALL BE GALVANIZED AS PER TECHNICAL SPECIFICATION.
8. ALL SPRING WASHERS SHALL BE ELECTRO GALVANIZED AS PER TECHNICAL SPECIFICATION.
9. PLAIN WASHERS SHALL BE HOT DIP GALVANIZED AS PER TECHNICAL SPECIFICATION.
10. ALL BOLT HOLES ARE 18# FOR M16 BOLTS UNLESS NOTED OTHERWISE.
11. 2% EXTRA NUTS & BOLTS SHALL BE PROCURED FOR ERECTION.
12. GALVANIZATION WILL BE DONE MINIMUM 100 MICRON.
13. DO NOT SCALE FOLLOW WRITTEN DIMENSIONS ONLY.
14. MATERIAL MAKE- SAIL, JINDAL, TATA

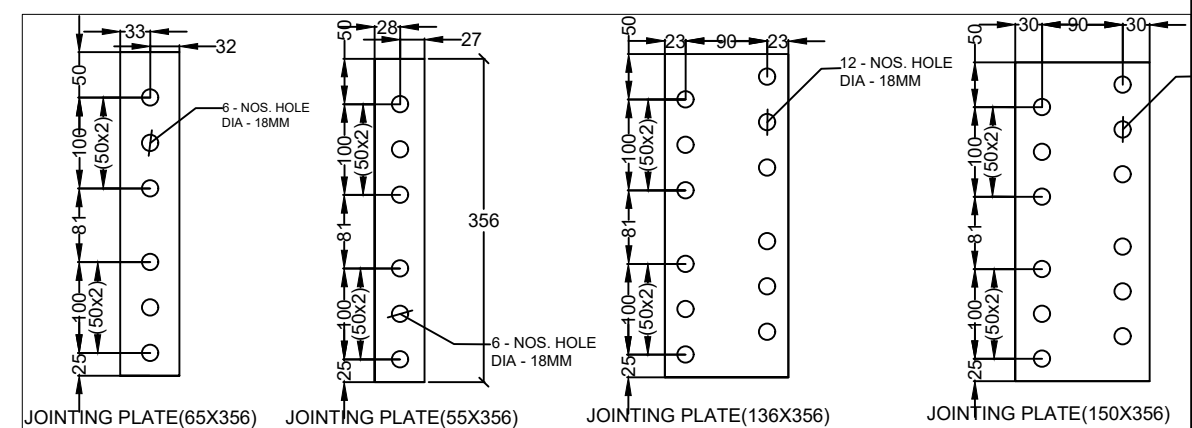
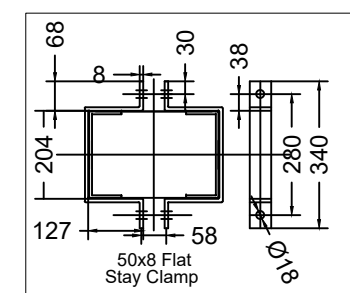
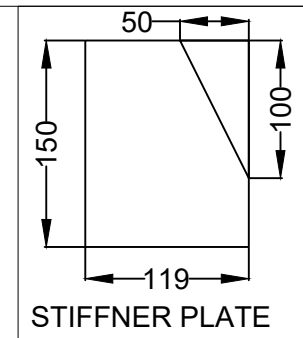
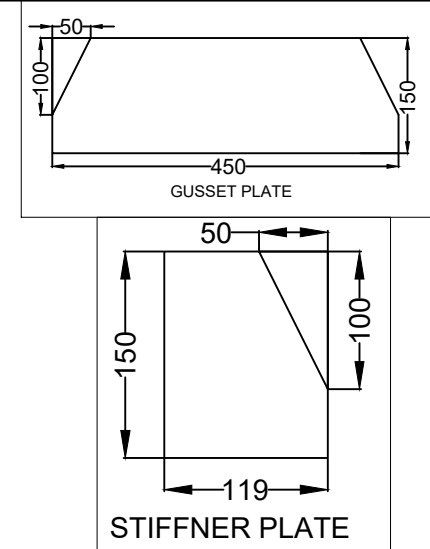








- DESCRIPTION:**
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  3. SPRING WASHER SHALL CONFORM TO IS-3063.
  4. ALL BOLTS NUTS AND LOCK NUTS SHALL CONFORM TO REQUIREMENTS OF INDIAN STANDARD SPECIFICATION IS :1363 / 1367 (LATEST REVISION)
  5. ALL PLAIN WASHERS SHOULD CONFORM TO IS -3063.
  6. ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED WITH MIN. COATING OF 705 g/Sq.m. AS PER IS:4759 & IS:2633.
  7. FASTENING BOLTS & NUTS SHALL BE GALVANIZED AS PER TECHNICAL SPECIFICATION.
  8. ALL SPRING WASHERS SHALL BE ELECTRO GALVANIZED AS PER TECHNICAL SPECIFICATION.
  9. PLAIN WASHERS SHALL BE HOT DIP GALVANIZED AS PER TECHNICAL SPECIFICATION.
  10. ALL BOLT HOLES ARE 180 FOR M16 BOLTS UNLESS NOTED OTHERWISE.
  11. 2% EXTRA NUTS & BOLTS SHALL BE PROCURED FOR ERECTION.
  12. GALVANIZATION WILL BE DONE MINIMUM 100 MICRON.
  13. DO NOT SCALE FOLLOW WRITTEN DIMENSIONS ONLY.
  14. MATERIAL MAKE -SAIL, JINDAL, TATA



BOM OF 33KV DOUBLE CIRCUIT ON 13 M H-POLE WITH 180° C/P

S.N	DESCRIPTION	SECTION	MATERIAL	LENGTH	QTY. In Nos.	WT KG / MTR	WT / ITEM IN KG	TOTAL WT. IN KG
1	GI H-POLE	ISMC 200x75x6.2	CHANNEL	6984	2	22.3	155.74	311.48
2	GI H-POLE	ISMC 200x75x6.2	CHANNEL	6000	2	22.3	133.8	267.6
3	STRAIGHT CROSS ARM	100 X 50 X 6	CHANNEL	1625	6	9.56	15.535	93.21
4	STAY CLAMP	50 X 8	FLAT	594	2	3.097	1.839	3.678
5	FISH PLATE	65 X 6	FLAT	300	12	3.06	0.918	11.016
6	STIFFNER PLATE	119X150X6			4	47.1	0.841	3.364
7	BASE PLATE	450X450X10			1	78.5	15.896	15.896
8	GUSSET PLATE	150X450X6			2	47.1	3.179	6.358
9	LACING PLATE	200X270X6			26	47.1	2.54	66.04
10	JOINT PLATE	150X356X8			2	62.8	3.353	6.706
11	JOINT PLATE	136X356X8			2	62.8	3.04	6.08
12	JOINT PLATE	65X356X8			4	62.8	1.453	5.812
13	JOINT PLATE	55X356X8			4	62.8	1.230	4.920
14	WELDED ISMC	ISMC 150x75x5.7	CHANNEL	800	2	16.8	13.44	26.88
15	DISC INSULATOR				12 SET			
16	PIN INSULATOR				06 NOS.			
17	PG CLAMP				12 NOS.			
18	BARBAID WIRE				01 SET.			
19	DANGER BOARD				01 NOS.			
TOTAL BLACK WEIGHT IN KGS.								829.04

NUT & BOLT DETAILS

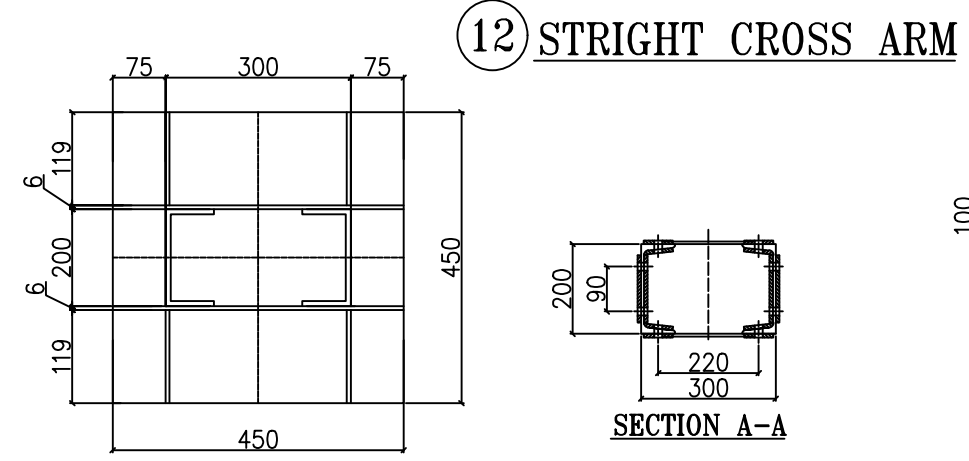
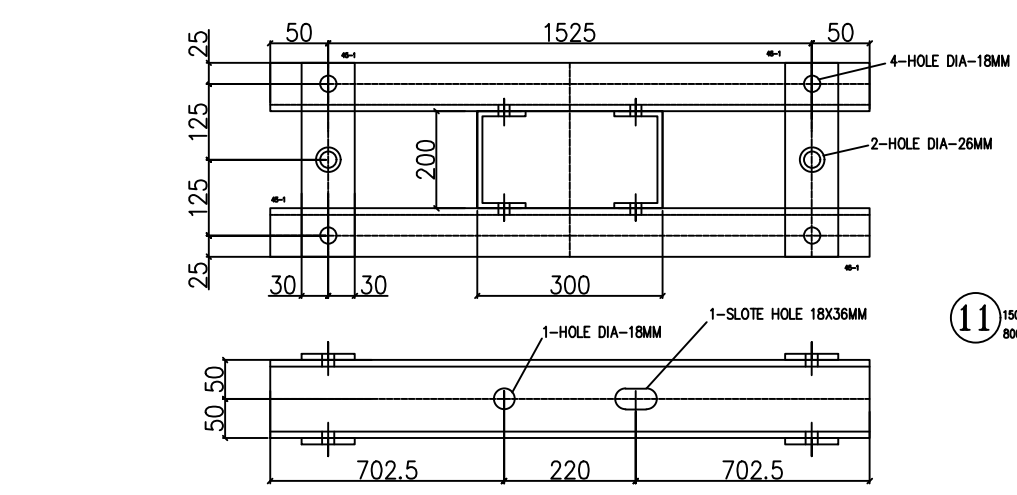
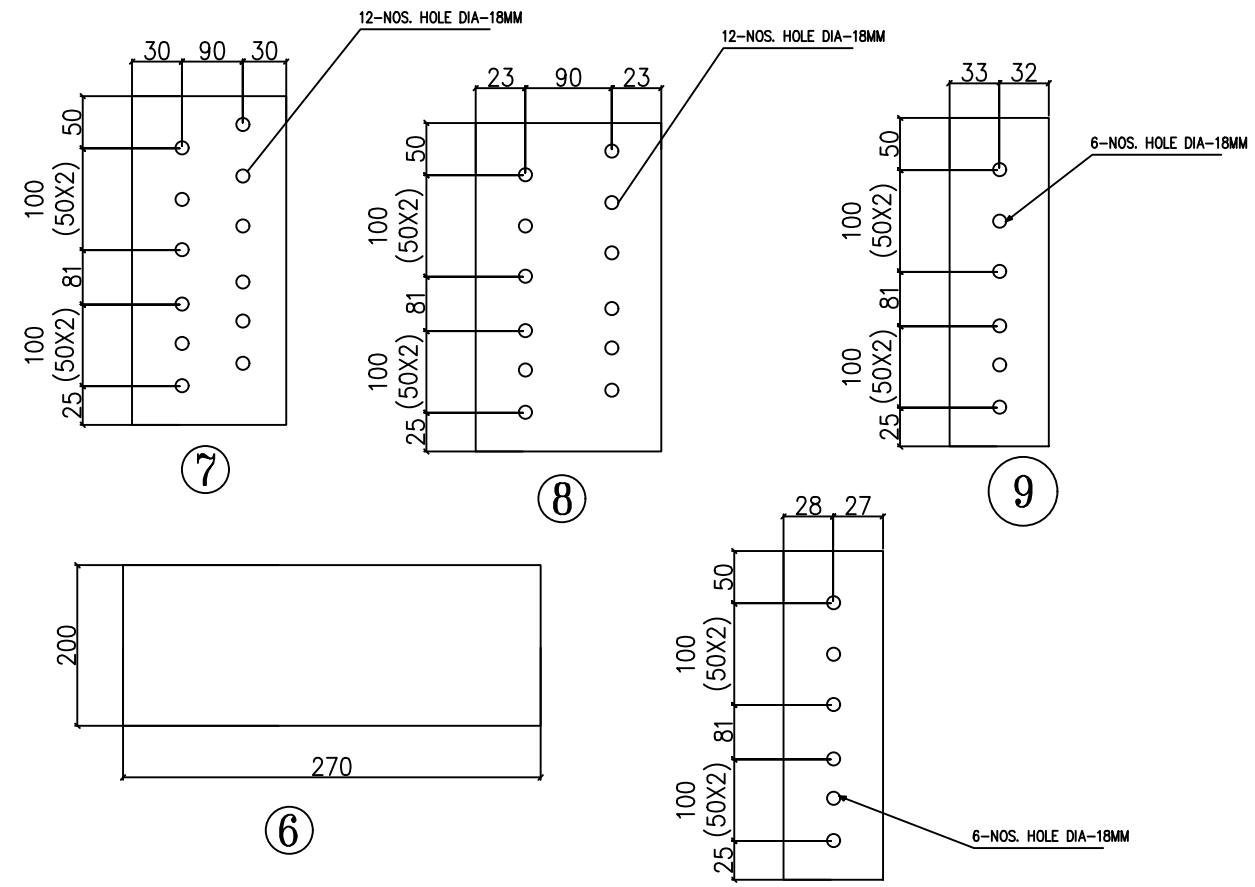
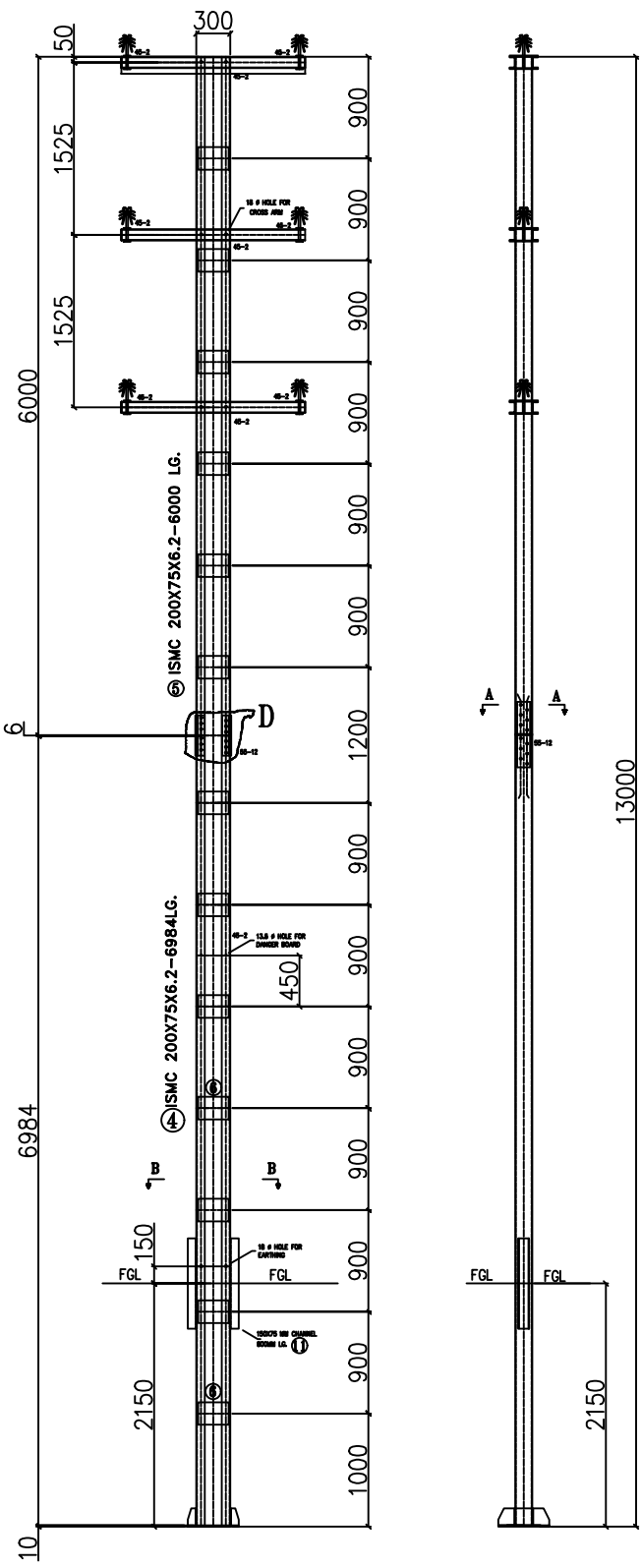
A	BOLT & NUTS FOR STRAIGHT CROSSARM	M16	-	250	6	0.407	2.442
B	BOLT & NUTS FOR JOINTING PLATE	M16	-	50	48	0.123	5.904
C	BOLT & NUTS FOR FISH PLATE	M16	-	150	12	0.258	3.096
D	BOLT & NUTS FOR STAY CLAMP	M16	-	90	2	0.198	0.396
E	BOLT & NUTS FOR DANGER BOARD	M12	-	40	2	0.066	0.132
F	BOLT & NUTS FOR COIL EARTHING	M16	-	40	2	0.123	0.246
G	BOLT & NUTS FOR ANTI CLIMBING DEVICE	M16	-	40	2	0.131	0.262
H	SPRING WASHER	M16	-	-	156	0.009	1.404
I	SPRING WASHER	M12	-	-	4	0.004	0.016
J	FLAT WASHER	M16	-	-	78	0.014	0.702
K	FLAT WASHER	M12	-	-	2	0.006	0.012
TOTAL							14.211

EPC:-  
**TPCØDL**  
 TP CENTRAL ODISHA DISTRIBUTION LIMITED  
**TATA POWER CENTRAL ODISHA DISTRIBUTION LIMITED**

**SURVEY & TESTING AGENCY:**  
**IDAX CONSULTING & RESEARCH PVT. LTD**  
 Plot No.-5016, Duplex-E, Brundaban Enclave, VSS Nagar, Bhubaneswar - 751007, ODISHA

PROJECT NAME: **DESIGN, ENGINEERING, SUPPLY, ERECTION AND COMMISSIONING OF 33/11 KV SUB-STATION**  
 DRAWING TITLE: **33KV DOUBLE CIRCUIT LINE ON SP WITH 180 DEGREE CUT POINT - 13M HPOLE**

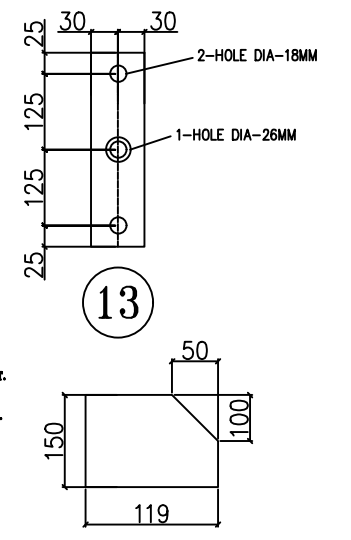
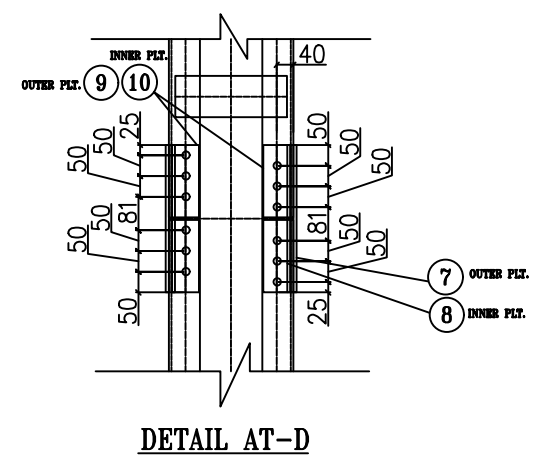
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DRAWN BY	CHECKED BY	DATE	REVISION
ER. SAMEER KUMAR SAHOO	Er.S.K.Barik	05.05.23	02



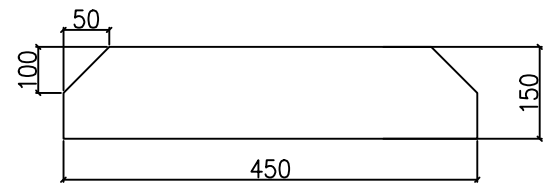
- NOTES:-**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE SPECIFIED.
  2. ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED.
  3. SPRING WASHER SHALL CONFORM TO IS-3063.
  4. ALL BOLTS NUTS AND LOCK NUTS SHALL CONFORM TO REQUIREMENTS OF INDIAN STANDARD SPECIFICATION IS : 1363/1367 (LATEST REVISION)
  5. ALL PLAIN WASHERS SHOULD CONFORM TO IS 2016.
  6. ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED WITH MIN. COATING OF 705 g/Sq.m. AS PER IS:4759 & IS:2633.
  7. FASTENING BOLTS & NUTS SHALL BE GALVANIZED AS PER TECHNICAL SPECIFICATION.
  8. ALL SPRING WASHERS SHALL BE ELECTRO GALVANIZED AS PER TECHNICAL SPECIFICATION.
  9. PLAIN WASHERS SHALL BE HOT DIP GALVANIZED AS PER TECHNICAL SPECIFICATION.
  10. ALL BOLT HOLES ARE 18Ø FOR M16 BOLTS UNLESS NOTED OTHERWISE.
  11. 2% EXTRA NUTS & BOLTS SHALL BE PROCURED FOR ERECTION.
  12. GALVANIZATION WILL BE DONE MINIMUM 100 MICRON.
  13. DO NOT SCALE FOLLOW WRITTEN DIMENSIONS ONLY.
  14. MATERIAL MAKE- SAIL, JINDAL, TATA

BILL OF QUANTITY PER STRUCTURE							
Erection No.	Description	Section	Length (mm)	Qty.	Section wt/m	Weight/ Piece (Kg)	Total Weight (Kg)
1	BASE PLATE	PLATE 10 MM	450X450	1	78.5	15.896	15.896
2	GUSSET PLATE	PLATE 6 MM	150X450	2	47.1	3.179	6.359
3	STIFFNER PLATE	PLATE 6 MM	119X150	4	47.1	0.841	3.364
4	GI H-POLE	ISMC 200x75x6.2	6984	2	22.3	155.74	311.48
5	GI H-POLE	ISMC 200x75x6.2	6000	2	22.3	133.8	267.6
6	LACING PLATE	PLATE 6 MM	200X270	26	47.1	2.54	66.04
7	JOINT PLATE	PLATE 8 MM	150X356	2	62.8	3.353	6.707
8	JOINT PLATE	PLATE 8 MM	136X356	2	62.8	3.04	6.08
9	JOINT PLATE	PLATE 8 MM	65X356	4	62.8	1.453	5.813
10	JOINT PLATE	PLATE 8 MM	55X356	4	62.8	1.230	4.920
11	WELDED ISMC	ISMC 150x75x5.7	800	2	16.8	13.44	26.88
12	STRAIGHT CROSS ARM	ISMC 100x50x5	1625	6	9.56	15.54	93.24
13	FISH PLATE	PLT.-60X8	300	12	62.8	1.13	13.56
TOTAL BLACK WEIGHT IN KGS.							827.94

BILL OF QUANTITY FOR BOLTS, NUTS & WASHERS (GRADE 5.6) PER STRUCTURE (INCLUDE 3% EXTRA)			
SIZE	QTY.	WT./ PCS.(KG)	TOTAL WT.
M16 X 45LG.	38	0.140	5.32
M16 X 55LG.	51	0.156	7.96
M12 X 45LG.	5	0.071	0.36
M16 X 3.5 THK. SP. WASHER	89	0.009	0.801
M12 X 3.5 THK. SP. WASHER	5	0.004	0.02
TOTAL WEIGHT IN KGS =			14.46

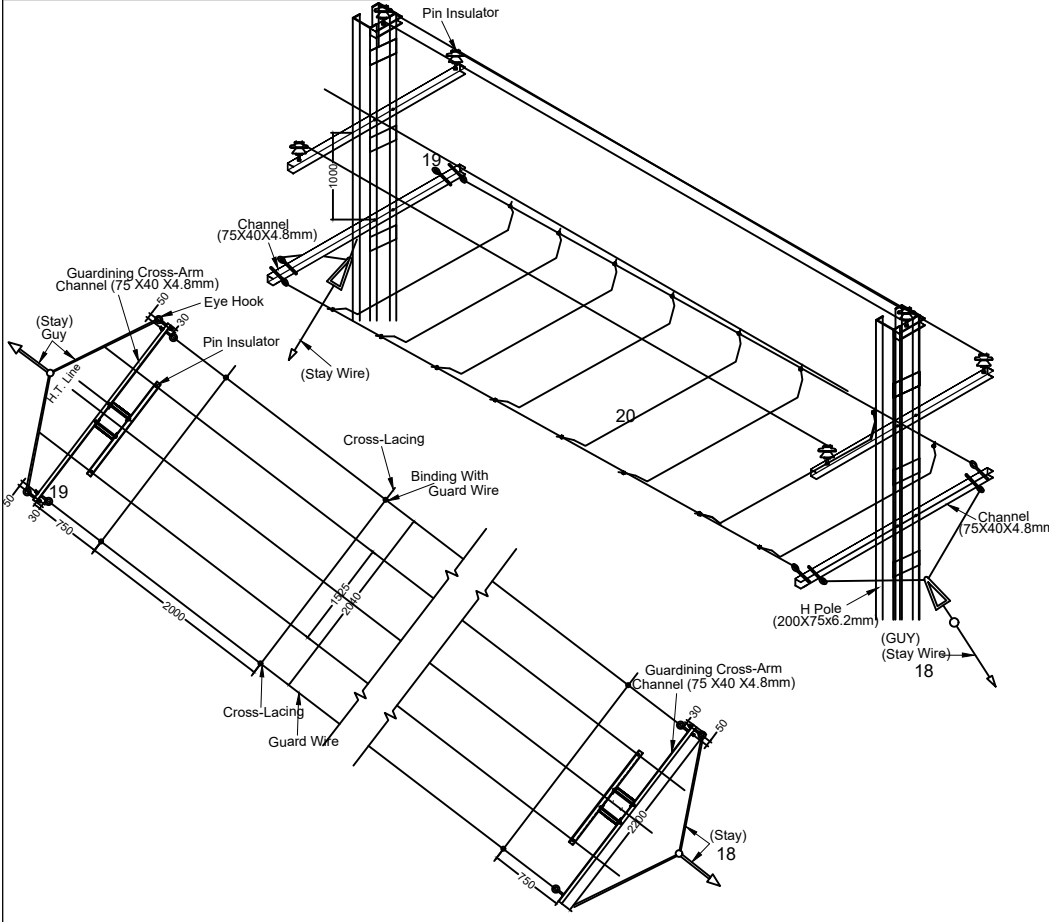
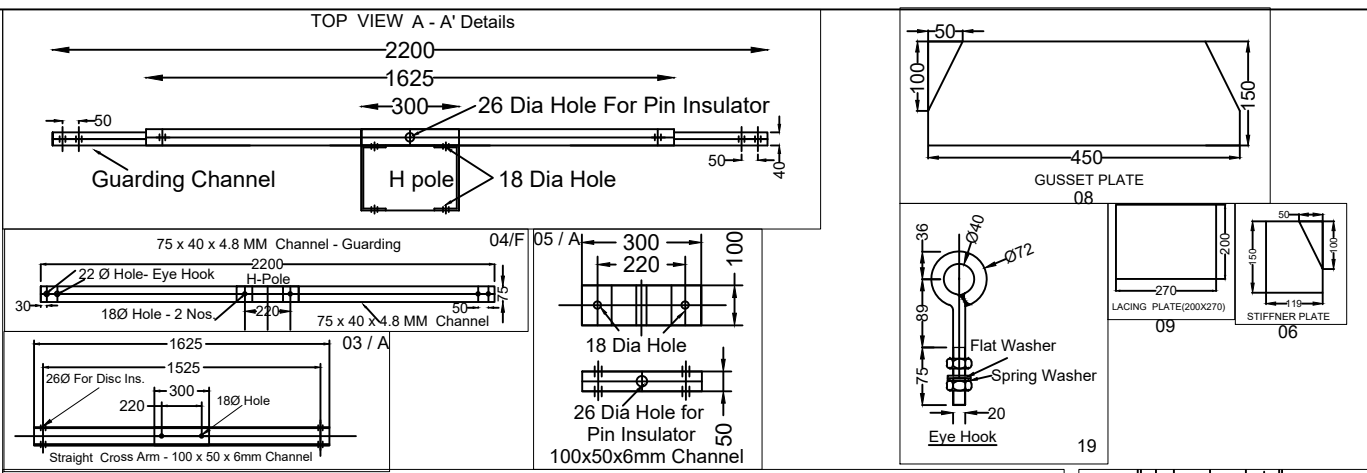
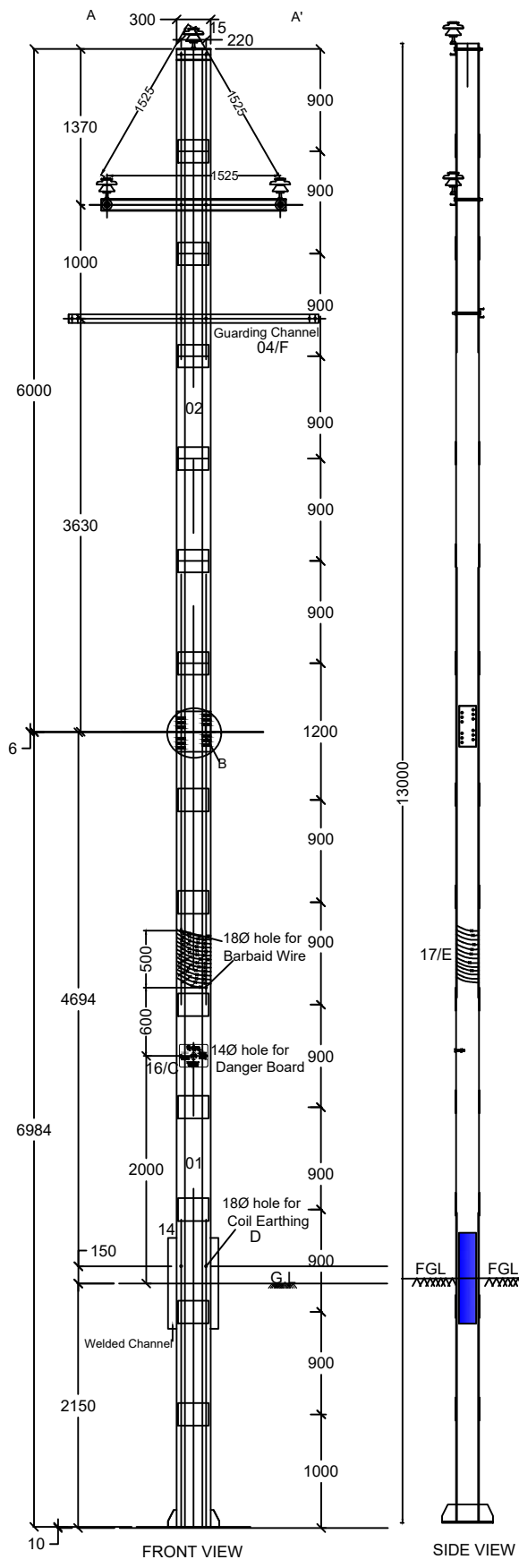


**③ STIFFNER PLT.**



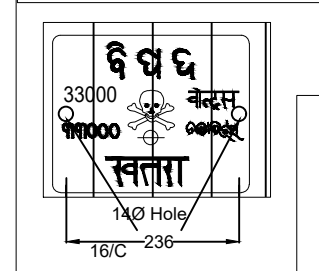
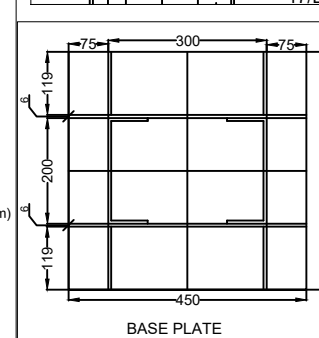
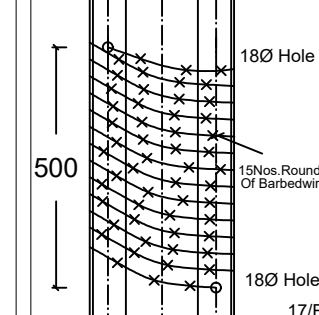
**② STIFFNER PLT.**

TPCODL		TATA POWER CENTRAL ODISHA DISTRIBUTION LTD.	
TP CENTRAL ODISHA DISTRIBUTION LIMITED		TITLE: 33 KV DOUBLE CIRCUIT 13MTR. H-POLE	
DRAWN BY :	PONRAJ G A	DATE	09-08-2022
CHECKED BY :	JEEVAN SANGRAM	DATE	09-08-2022
APPROVED BY :	KHAJAN BHARDWAJ	DATE	09-08-2022
ISSUED BY :	POURUSH GARG	DATE	09-08-2022
DRAWING NO : TPCODL-HVD-0009			



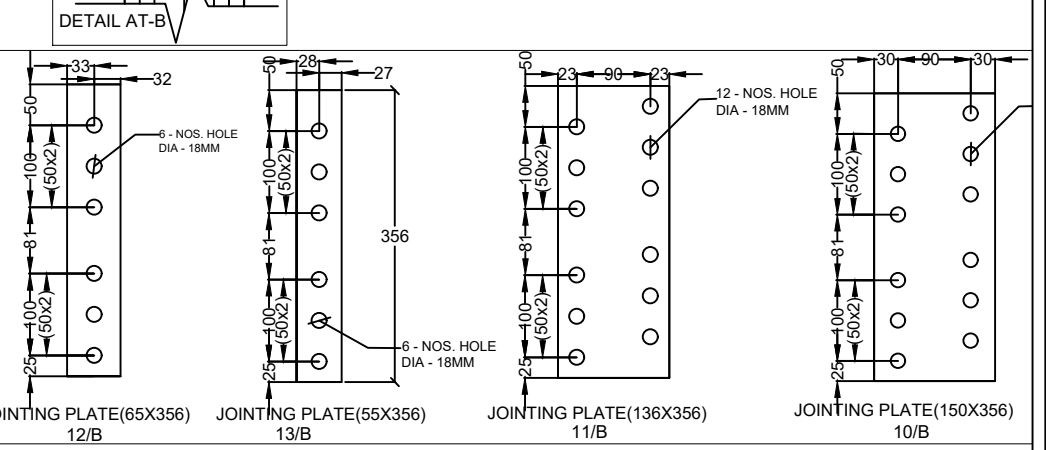
**BOM OF 33KV 13 M S/C H-POLE WITH GUARDING ARRANGEMENT**

S.N	DESCRIPTION	SECTION	MATERIAL	LENGTH	QTY. In Nos.	WT KG / MTR	WT / ITEM IN KG	TOTAL WT. IN KG
1	GI H-POLE	ISMC 200x75x6.2	CHANNEL	6984	2	22.3	155.74	311.48
2	GI H-POLE	ISMC 200x75x6.2	CHANNEL	6000	2	22.3	133.8	267.6
3	STRAIGHT CROSS ARM	100 X 50 X 6	CHANNEL	1625	1	9.56	15.535	15.535
4	GUARDING CHANNEL	75 X 40 X 4.8	CHANNEL	2200	1	7.14	15.708	15.708
5	STRAIGHT CROSS ARM	100 X 50 X 6	CHANNEL	300	1	9.56	2.868	2.868
6	STIFFNER PLATE	119X150X6	PLATE		4	47.1	0.841	3.364
7	BASE PLATE	450X450X10	PLATE		1	78.5	15.896	15.896
8	GUSSET PLATE	150X450X6	PLATE		2	47.1	3.179	6.358
9	LACING PLATE	200X270X6	PLATE		26	47.1	2.54	66.04
10	JOINT PLATE	150X356X8	PLATE		2	62.8	3.353	6.706
11	JOINT PLATE	136X356X8	PLATE		2	62.8	3.04	6.08
12	JOINT PLATE	65X356X8	PLATE		4	62.8	1.453	5.812
13	JOINT PLATE	55X356X8	PLATE		4	62.8	1.230	4.920
14	WELDED ISMC	ISMC 150x75x5.7	CHANNEL	800	2	16.8	13.44	26.88
15	PIN INSULATOR				03 NOS.			
16	DANGER BOARD				01 NO.			
17	BARBAID WIRE				01 SET			
18	GI STAY WIRE - 7 / 10 SWG				02 NOS.			5.5
19	20MM DIA. EYE HOOK WITH 2 NUTS				08 NOS.			
20	GUARD WIRE ( AS REQD.)							
TOTAL BLACK WEIGHT IN KGS.								760.747



**NUT & BOLT DETAILS**

Letter	Description	Material	Quantity	Weight (kg)	Weight per item (kg)	Total Weight (kg)
A	BOLT & NUTS FOR STRAIGHT CROSSARM	M16	4	250	0.407	1.628
B	BOLT & NUTS FOR JOINTING PLATE	M16	48	50	0.123	5.904
C	BOLT & NUTS FOR DANGER BOARD	M12	2	40	0.066	0.132
D	BOLT & NUTS FOR COIL EARTHING	M16	2	40	0.123	0.246
E	BOLT & NUTS FOR BARBAID WIRE	M16	2	40	0.131	0.262
F	BOLT & NUTS FOR GUARDING CHANNEL	M16	2	250	0.407	0.814
G	SPRING WASHER	M16	120	-	0.009	1.08
H	SPRING WASHER	M12	4	-	0.004	0.016
I	FLAT WASHER	M16	60	-	0.014	0.84
J	FLAT WASHER	M12	2	-	0.006	0.012
TOTAL					10.934	



**DESCRIPTION:**

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE SPECIFIED
- ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED
- SPRING WASHER SHALL CONFORM TO IS-3063.
- ALL BOLTS NUTS AND LOCK NUTS SHALL CONFORM TO REQUIREMENTS OF INDIAN STANDARD SPECIFICATION IS :1363 / 1367 (LATEST REVISION)
- ALL PLAIN WASHERS SHOULD CONFORM TO IS -3063.
- ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED WITH MIN. COATING OF 705 g/Sq.m. AS PER IS:4759 & IS:2633.
- FASTENING BOLTS & NUTS SHALL BE GALVANIZED AS PER TECHNICAL SPECIFICATION.
- ALL SPRING WASHERS SHALL BE ELECTRO GALVANIZED AS PER TECHNICAL SPECIFICATION.
- PLAIN WASHERS SHALL BE HOT DIP GALVANIZED AS PER TECHNICAL SPECIFICATION.
- ALL BOLT HOLES ARE 18mm FOR M16 BOLTS UNLESS NOTED OTHERWISE.
- 2% EXTRA NUTS & BOLTS SHALL BE PROCURED FOR ERECTION.
- GALVANIZATION WILL BE DONE MINIMUM 100 MICRON.
- DO NOT SCALE FOLLOW WRITTEN DIMENSIONS ONLY.
- MATERIAL MAKE -SAIL, JINDAL, TATA
- IN CASE OF ANY DISCREPANCY IN DIMENSION & LEVEL BETWEEN DRAWING. THE CONTRACTOR SHALL SEEK THE CLARIFICATION BEFORE PROCEEDING.

**EPC:-**

**TPCODL**  
TP CENTRAL ODISHA DISTRIBUTION LIMITED

**TATA POWER CENTRAL ODISHA DISTRIBUTION LIMITED**

**SURVEY & TESTING AGENCY:**

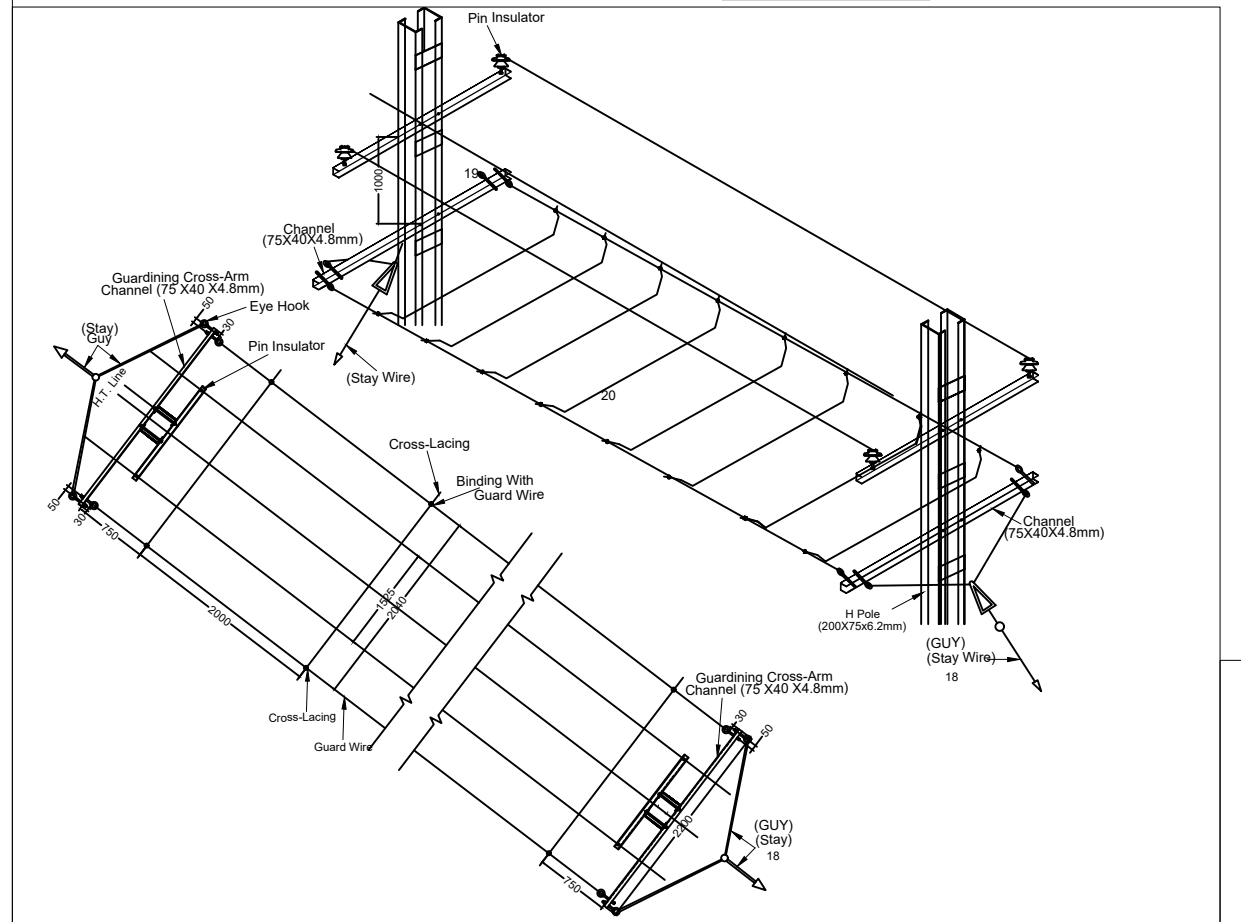
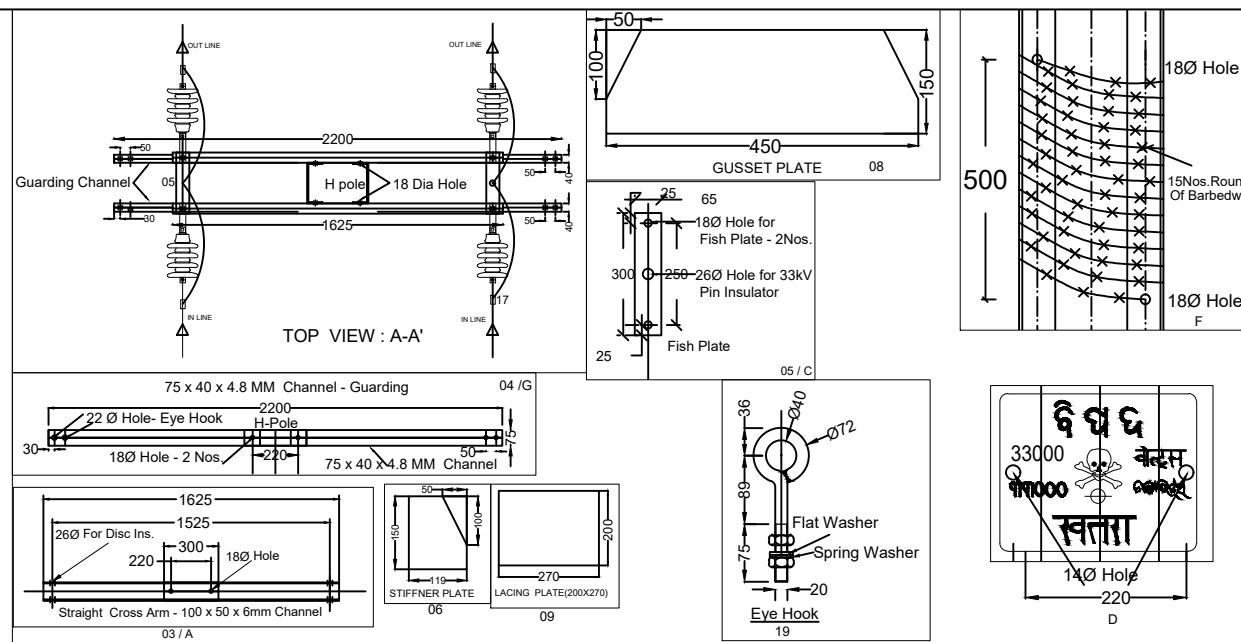
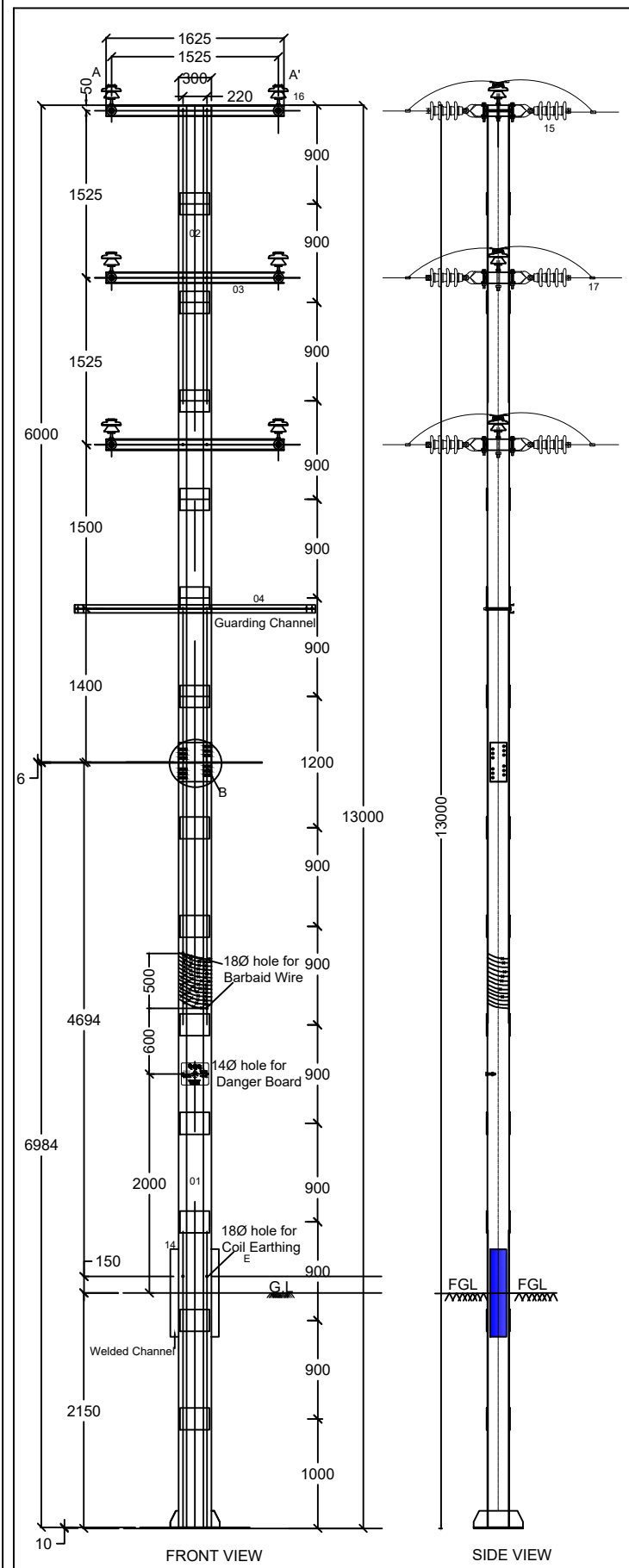
**IDAX CONSULTING & RESEARCH PVT. LTD**

Plot No.-5016, Duplex-E, Brundaban Enclave, VSS Nagar, Bhubaneswar - 751007, ODISHA

**PROJECT NAME:** DESIGN, ENGINEERING, SUPPLY, ERECTION AND COMMISSIONING OF 33/11 KV SUB-STATION

**DRAWING TITLE:** 33KV SINGLE CIRCUIT LINE ON 13M H - POLE WITH GUARDING ARRANGEMENT

DRG. NO	TPCODL - SID - 0054	JOB NO	202210001	SHEET	-1/1
DRAWN BY	ER. SAMBER KUMAR SAHOO	CHECKED BY	Er. S. K. Barik	DATE	08.05.23
				REVISION	01



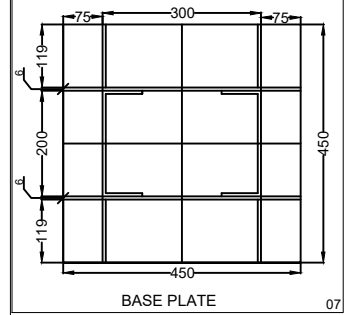
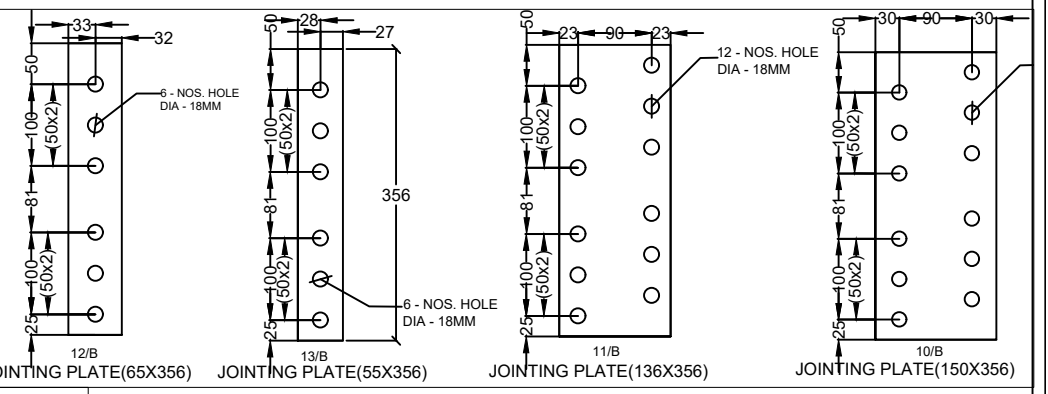
**BOM OF 33KV 13 M H-POLE WITH 180° GUARDING ARRANGEMENT**

S.N	DESCRIPTION	SECTION	MATERIAL	LENGTH	QTY. In Nos.	WT KG / MTR	WT / ITEM IN KG	TOTAL WT. IN KG
1	GI H-POLE	ISMC 200x75x6.2	CHANNEL	6984	2	22.3	155.74	311.48
2	GI H-POLE	ISMC 200x75x6.2	CHANNEL	6000	2	22.3	133.8	267.6
3	STRAIGHT CROSS ARM	100 X 50 X 6	CHANNEL	1625	6	9.56	15.535	93.21
4	GUARDING CHANNEL	75 X 40 X 4.8	CHANNEL	2200	1	7.14	15.708	15.708
5	FISH PLATE	65 X 6	FLAT	300	12	3.06	0.918	11.016
6	STIFFNER PLATE	119X150X6	PLATE		4	47.1	0.841	3.364
7	BASE PLATE	450X450X10	PLATE		1	78.5	15.896	15.896
8	GUSSET PLATE	150X450X6	PLATE		2	47.1	3.179	6.358
9	LACING PLATE	200X270X6	PLATE		26	47.1	2.54	66.04
10	JOINT PLATE	150X356X8	PLATE		2	62.8	3.353	6.706
11	JOINT PLATE	136X356X8	PLATE		2	62.8	3.04	6.08
12	JOINT PLATE	65X356X8	PLATE		4	62.8	1.453	5.812
13	JOINT PLATE	55X356X8	PLATE		4	62.8	1.230	4.920
14	WELDED ISMC	ISMC 150x75x5.7	CHANNEL	800	2	16.8	13.44	26.88
15	DISC INSULATOR				12 SET			
16	PIN INSULATOR				06 NOS.			
17	PG CLAMP				12 NOS.			
18	GI STAY WIRE - 7 /10 SWG				02 NOS.			5.5
19	20MM DIA. EYE HOOK WITH 2 NUTS				08 NOS.			
20	GUARD WIRE (AS REQD.)				02 NOS.			
TOTAL BLACK WEIGHT IN KGS.								846.57

**NUT & BOLT DETAILS**

Code	Description	Size	Qty	Weight (kg)	Total Weight (kg)	
A	BOLT & NUTS FOR STRAIGHT CROSSARM	M16	250	6	0.407	2.442
B	BOLT & NUTS FOR JOINTING PLATE	M16	50	48	0.123	5.904
C	BOLT & NUTS FOR FISH PLATE	M16	150	12	0.258	3.096
D	BOLT & NUTS FOR DANGER BOARD	M12	40	2	0.066	0.132
E	BOLT & NUTS FOR COIL EARTHING	M16	40	2	0.123	0.246
F	BOLT & NUTS FOR BARBAID WIRE	M16	40	2	0.131	0.262
G	BOLT & NUTS FOR GUARDING CHANNEL	M16	250	2	0.407	0.814
H	SPRING WASHER	M16	148		0.009	1.332
I	SPRING WASHER	M12	4		0.004	0.016
J	FLAT WASHER	M16	74		0.014	1.036
K	FLAT WASHER	M12	2		0.006	0.012
TOTAL					15.292	

- DESCRIPTION:**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE SPECIFIED
  2. ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED
  3. SPRING WASHER SHALL CONFORM TO IS-3063.
  4. ALL BOLTS NUTS AND LOCK NUTS SHALL CONFORM TO REQUIREMENTS OF INDIAN STANDARD SPECIFICATION IS :1363 / 1367 (LATEST REVISION)
  5. ALL PLAIN WASHERS SHOULD CONFORM TO IS -3063.
  6. ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED WITH MIN. COATING OF 705 g/Sq.m. AS PER IS:4759 & IS:2633.
  7. FASTENING BOLTS & NUTS SHALL BE GALVANIZED AS PER TECHNICAL SPECIFICATION.
  8. ALL SPRING WASHERS SHALL BE ELECTRO GALVANIZED AS PER TECHNICAL SPECIFICATION.
  9. PLAIN WASHERS SHALL BE HOT DIP GALVANIZED AS PER TECHNICAL SPECIFICATION.
  10. ALL BOLT HOLES ARE 18Ø FOR M16 BOLTS UNLESS NOTED OTHERWISE.
  11. 2% EXTRA NUTS & BOLTS SHALL BE PROCURED FOR ERECTION.
  12. GALVANIZATION WILL BE DONE MINIMUM 100 MICRON.
  13. DO NOT SCALE FOLLOW WRITTEN DIMENSIONS ONLY.
  14. MATERIAL MAKE -SAIL, JINDAL, TATA
  15. IN CASE OF ANY DISCREPANCY IN DIMENSION & LEVEL BETWEEN DRAWING. THE CONTRACTOR SHALL SEEK THE CLARIFICATION BEFORE PROCEEDING.



EPC:-

**TPCODL**  
TP CENTRAL ODISHA DISTRIBUTION LIMITED

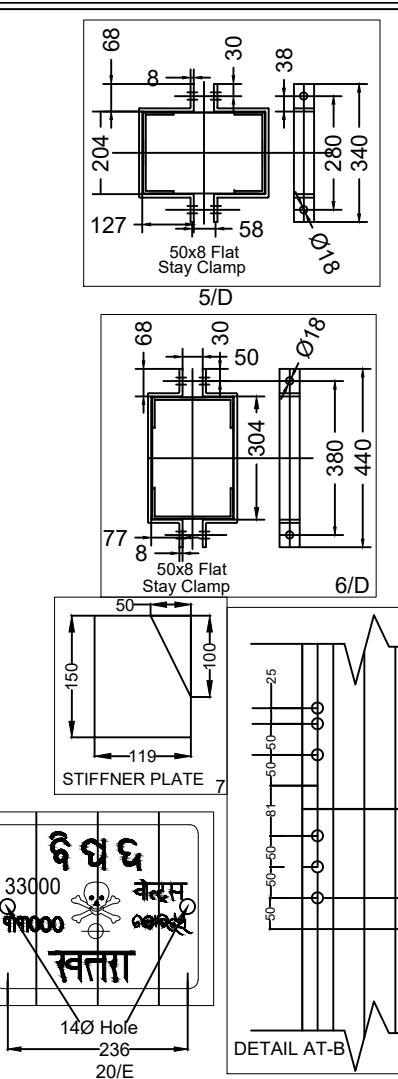
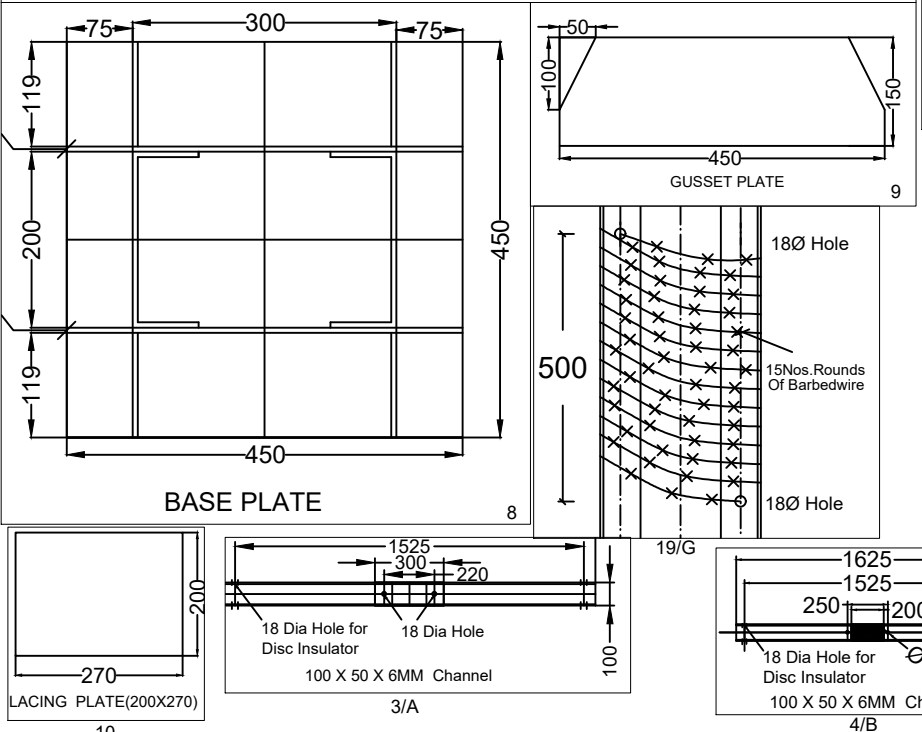
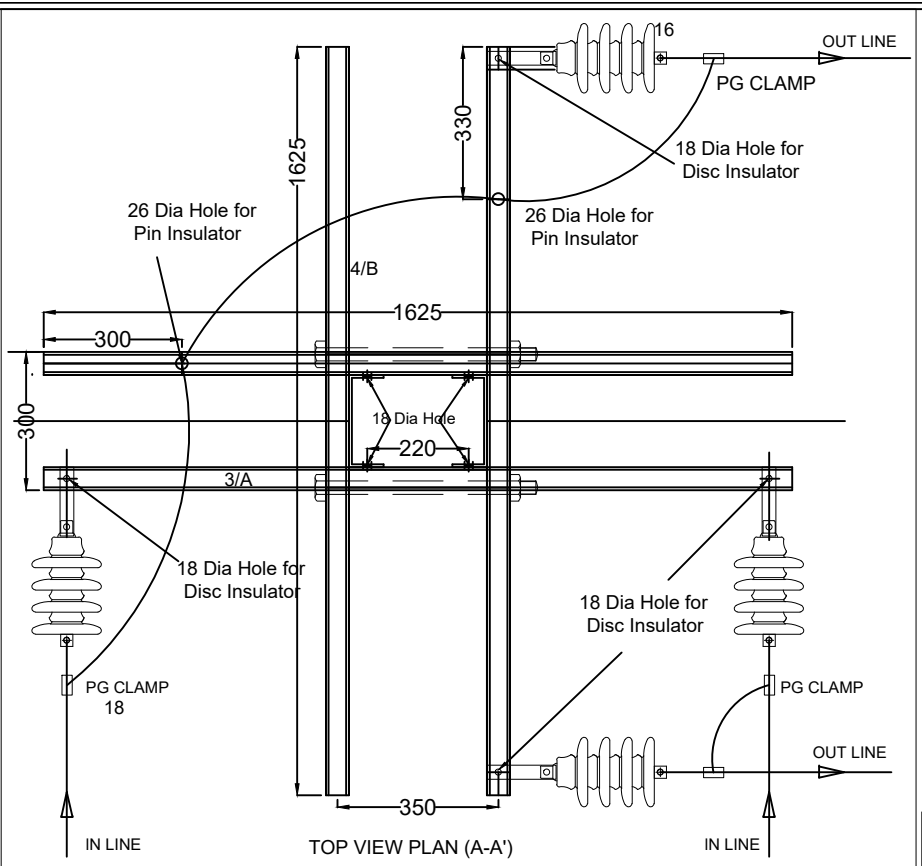
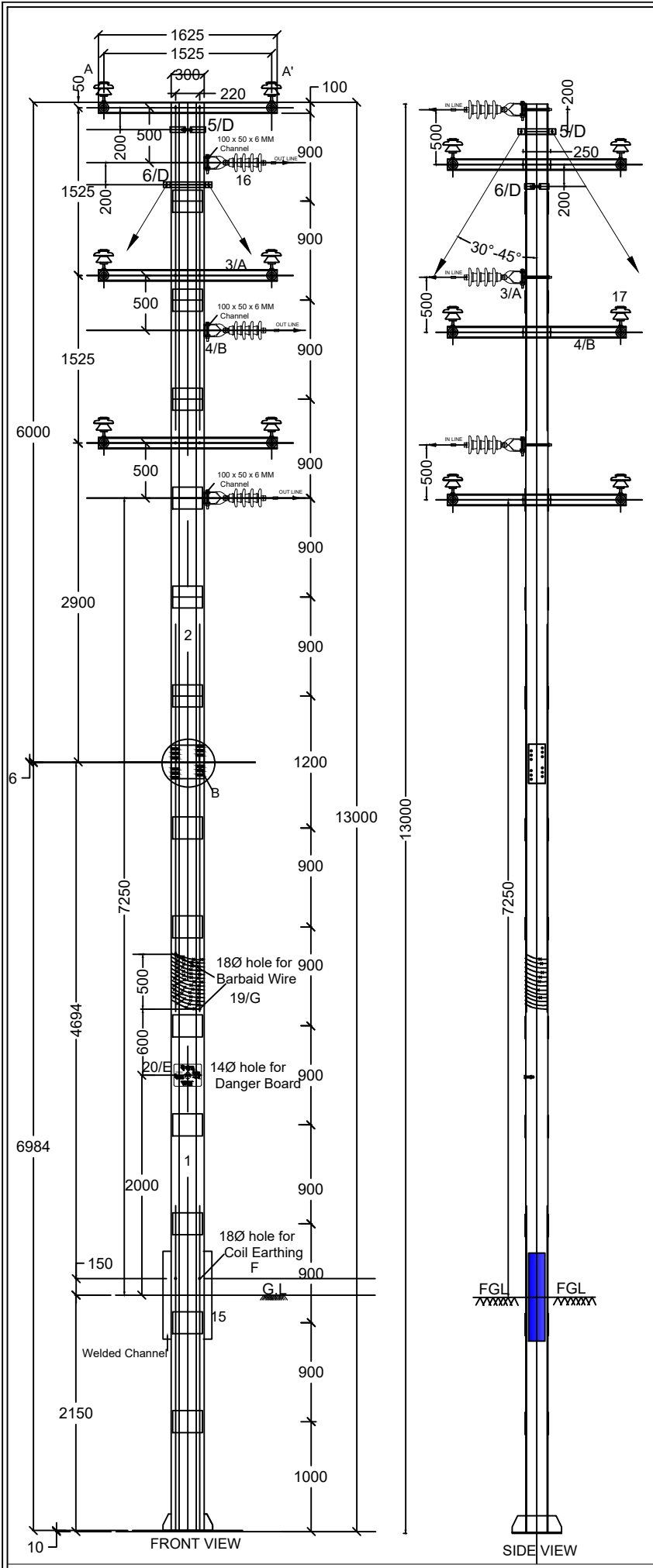
**TATA POWER CENTRAL ODISHA DISTRIBUTION LIMITED**

SURVEY & TESTING AGENCY:  
**IDAX CONSULTING & RESEARCH PVT. LTD**  
Plot No.-5016, Duplex-E, Brundaban Enclave, VSS Nagar, Bhubaneswar - 751007, ODISHA

PROJECT NAME: DESIGN, ENGINEERING, SUPPLY, ERECTION AND COMMISSIONING OF 33/11 KV SUB-STATION

DRAWING TITLE: 33KV DOUBLE CIRCUIT LINE ON 13M H - POLE WITH GUARDING ARRANGEMENT

DRG. NO	TPCODL - SID - 0053	JOB NO	202210001	SHEET -1/1
DRWN BY	ER. SAMEER KUMAR SAHOO	CHECKED BY	Er.S.K.Barik	DATE
				REVISION
				08.05.23 01

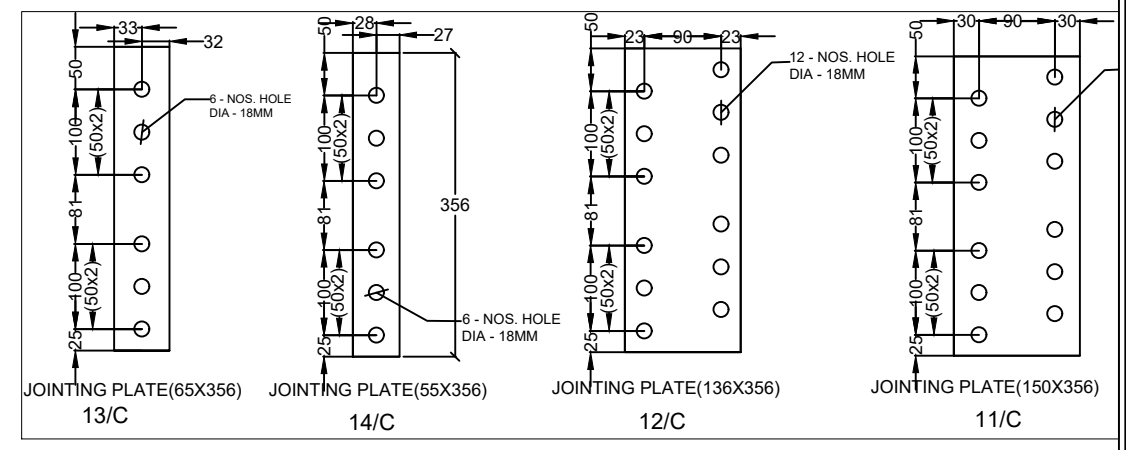


**BOM OF 33KV DOUBLE CIRCUIT ON 13 M H-POLE WITH 90° C/P**

S.N	DESCRIPTION	SECTION	MATERIAL	LENGTH	QTY. In Nos.	WT KG / MTR	WT / ITEM IN KG	TOTAL WT. IN KG
1	GI H-POLE	ISMC 200x75x6.2	CHANNEL	6984	2	22.3	155.74	311.48
2	GI H-POLE	ISMC 200x75x6.2	CHANNEL	6000	2	22.3	133.8	267.6
3	STRAIGHT CROSS ARM	100 X 50 X 6	CHANNEL	1625	6	9.56	15.535	93.21
4	STRAIGHT CROSS ARM	100 X 50 X 6	CHANNEL	1625	6	9.56	15.535	93.21
5	STAY CLAMP (FRONT)	50 X 8	FLAT	594	2	3.097	1.839	3.678
6	STAY CLAMP (SIDE)	50 X 8	FLAT	594	2	3.097	1.839	3.678
7	STIFFNER PLATE	119X150X6	PLATE	4	47.1	0.841	3.364	
8	BASE PLATE	450X450X10	PLATE	1	78.5	15.896	15.896	
9	GUSSET PLATE	150X450X6	PLATE	2	47.1	3.179	6.358	
10	LACING PLATE	200X270X6	PLATE	26	47.1	2.54	66.04	
11	JOINT PLATE	150X356X8	PLATE	2	62.8	3.353	6.706	
12	JOINT PLATE	136X356X8	PLATE	2	62.8	3.04	6.08	
13	JOINT PLATE	65X356X8	PLATE	4	62.8	1.453	5.812	
14	JOINT PLATE	55X356X8	PLATE	4	62.8	1.230	4.920	
15	WELDED ISMC	ISMC 150x75x5.7	CHANNEL	800	2	16.8	13.44	26.88
16	DISC INSULATOR				12 SET			
17	PIN INSULATOR				06 NOS.			
18	PG CLAMP				12 NOS.			
19	BARBAID WIRE				01 SET.			
20	DANGER BOARD				01 NOS.			
							TOTAL BLACK WEIGHT IN KGS.	914.912

**NUT & BOLT DETAILS**

ITEM	DESCRIPTION	SIZE	QTY.	WT. KG	WT. / ITEM IN KG	TOTAL WT. IN KG	
A	BOLT & NUTS FOR STRAIGHT CROSSARM	M16	250	6	0.407	2.442	
B	BOLT & NUTS FOR STRAIGHT CROSSARM	M16	350	6	0.584	3.504	
C	BOLT & NUTS FOR JOINTING PLATE	M16	50	48	0.123	5.904	
D	BOLT & NUTS FOR STAY CLAMP	M16	90	4	0.198	0.792	
E	BOLT & NUTS FOR DANGER BOARD	M12	40	2	0.066	0.132	
F	BOLT & NUTS FOR SOIL EARTHING	M16	40	2	0.123	0.246	
G	BOLT & NUTS FOR BARBAID WIRE	M16	40	2	0.131	0.262	
H	SPRING WASHER	M16	140		0.009	1.26	
I	SPRING WASHER	M12	4		0.004	0.016	
J	FLAT WASHER	M16	70		0.014	0.98	
K	FLAT WASHER	M12	2		0.006	0.012	
						TOTAL	15.55



**DESCRIPTION:**

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE SPECIFIED
- ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED
- SPRING WASHER SHALL CONFORM TO IS-3063.
- ALL BOLTS NUTS AND LOCK NUTS SHALL CONFORM TO REQUIREMENTS OF INDIAN STANDARD SPECIFICATION IS :1363 / 1367 (LATEST REVISION)
- ALL PLAIN WASHERS SHOULD CONFORM TO IS -3063.
- ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED WITH MIN. COATING OF 705 g/Sq.m. AS PER IS:4759 & IS:2633.
- FASTENING BOLTS & NUTS SHALL BE GALVANIZED AS PER TECHNICAL SPECIFICATION.
- ALL SPRING WASHERS SHALL BE ELECTRO GALVANIZED AS PER TECHNICAL SPECIFICATION.
- PLAIN WASHERS SHALL BE HOT DIP GALVANIZED AS PER TECHNICAL SPECIFICATION.
- ALL BOLT HOLES ARE 18Ø FOR M16 BOLTS UNLESS NOTED OTHERWISE.
- 2% EXTRA NUTS & BOLTS SHALL BE PROCURED FOR ERECTION.
- GALVANIZATION WILL BE DONE MINIMUM 100 MICRON.
- DO NOT SCALE FOLLOW WRITTEN DIMENSIONS ONLY.
- MATERIAL MAKE -SAIL, JINDAL,TATA
- IN CASE OF ANY DISCREPANCY IN DIMENSION & LEVEL BETWEEN DRAWING. THE CONTRACTOR SHALL SEEK THE CLARIFICATION BEFORE PROCEEDING.

**EPC:-**  
**TPCODL**  
 TP CENTRAL ODISHA DISTRIBUTION LIMITED

**TATA POWER CENTRAL ODISHA DISTRIBUTION LIMITED**

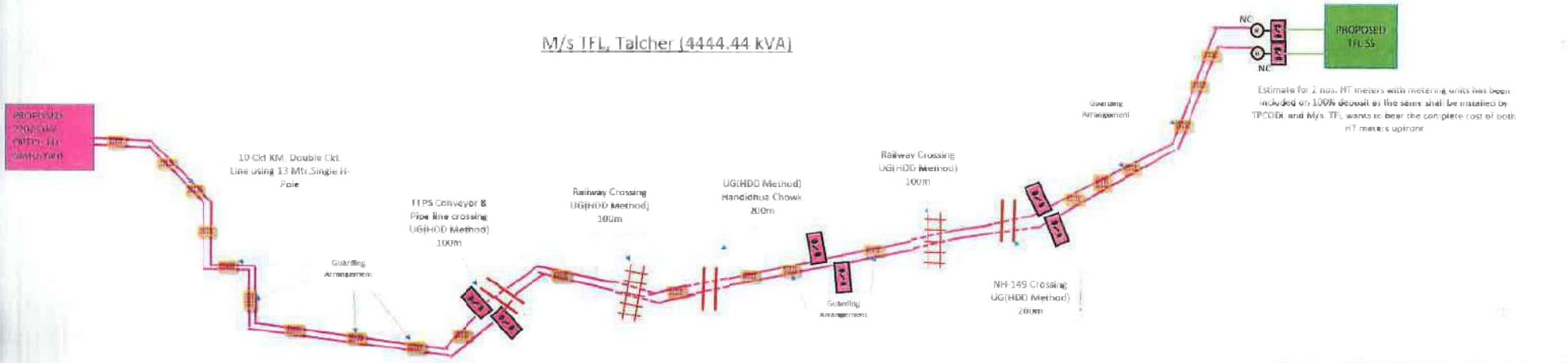
**SURVEY & TESTING AGENCY:**  
**IDAX CONSULTING & RESEARCH PVT. LTD**  
 Plot No.-5016, Duplex-E, Brundaban Enclave, VSS Nagar, Bhubaneswar - 751007, ODISHA

**PROJECT NAME:** DESIGN, ENGINEERING, SUPPLY, ERECTION AND COMMISSIONING OF 33/11 KV SUB-STATION

**DRAWING TITLE:** 33KV DOUBLE CIRCUIT LINE ON SP WITH 90 DEGREE CUT POINT - 13M HPOLE

DRG. NO	TPCODL - SID - 0055	JOB NO	202210001	SHEET	-1/1
	DRAWN BY	CHECKED BY	DATE	REVISION	
	ER. SAMEER KUMAR SAHOO	Er.S.K.Barik	07.05.23	02	

M/s TFL, Talcher (4444.44 kVA)



Estimate for 2 nos. HT meters with metering units has been included at 100% deposit as the same shall be installed by TPCODL and M/s. TFL wants to bear the complete cost of both HT meters upfront.

Prepared By:  
Team Lead (NEG)

*[Signature]*  
Checked By:  
Team Lead (NEG)

*[Signature]*  
Approved By:  
HOD, NEW CONNECTION

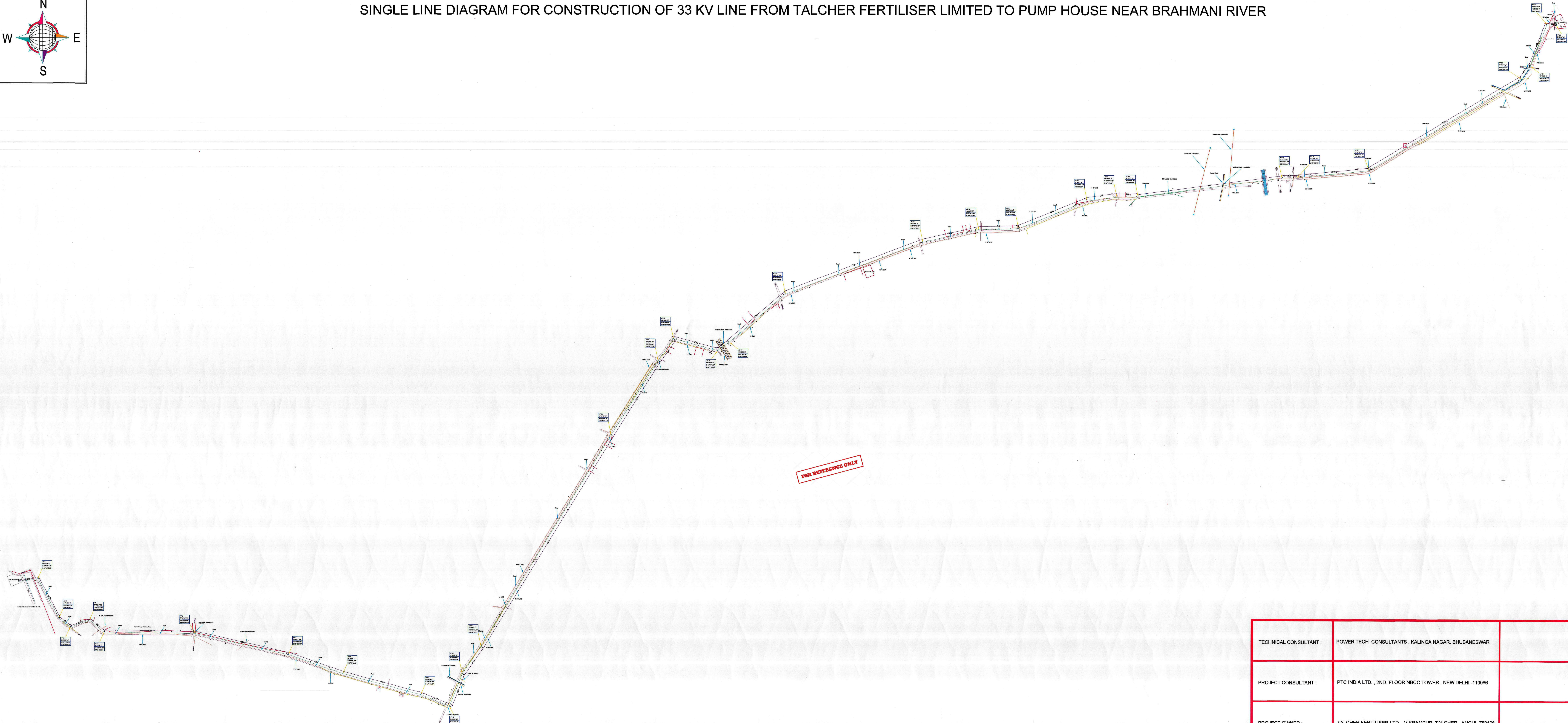
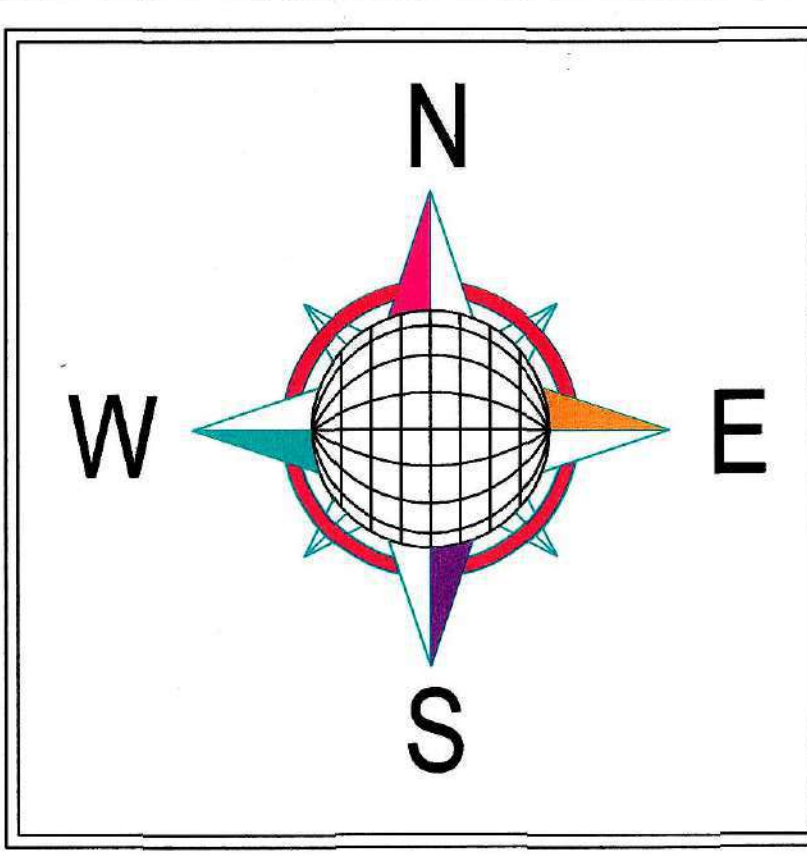
*[Signature]*  
Approved By: 13/10/23  
HOD, NEG

**Legends:**

- Proposed DP with Isolator
- GUARDING
- Proposed DP with MU
- Prop. 159 sqmm XLPE Covered Conductor

**FOR REFERENCE ONLY**

SINGLE LINE DIAGRAM FOR CONSTRUCTION OF 33 KV LINE FROM TALCHER FERTILISER LIMITED TO PUMP HOUSE NEAR BRAHMANI RIVER



FOR REFERENCE ONLY

TECHNICAL CONSULTANT :	POWER TECH CONSULTANTS , KALINGA NAGAR , BHUBANESWAR.	
PROJECT CONSULTANT :	PTC INDIA LTD . , 2ND. FLOOR NBCC TOWER , NEW DELHI -110066	
PROJECT OWNER :	TALCHER FERTILISER LTD . , VIKRAMPUR , TALCHER , ANGUL-759106	

# SUB-SOIL INVESTIGATION REPORT



## NAME OF THE WORK

CONSTRUCTION 33KV LINE FROM GRID SUBSTATION OF  
TALCHER FERTILIZER LTD. TO PUMP HOUSE NEAR  
BRAMHANI RIVER

**FOR REFERENCE ONLY**

Prepared by

**SHREE JAGANNATH CONSULTANCY**

(Approved By the Govt. of Odisha)

Plot No. 44, Laxmi Bihar, Near Sainik School,  
Bhubaneswar, Odisha.

(An ISO 9001: 2008 Company)

Ph - +91 9438134348

E-mail:- [shreejagannathconsultancy@gmail.com](mailto:shreejagannathconsultancy@gmail.com)





# TABLE OF CONTENT

<u>Sl.No.</u>	<u>PARTICULARS</u>	<u>PAGE</u>
01.	INTRODUCTION	01
02.	SCOPE OF WORK	02
03.	DETAILS OF FIELD WORK	03
04.	LABORATORY TEST	05
07.	DETERMINATION OF SBC	07
08.	BORE-LOG DATA SHEETS	08
09.	GRAIN SIZE ANALYSIS	11
10.	LABORATORY TEST RESULT OF SOIL	14
11.	CALCULATION OF SBC	17

**FOR REFERENCE ONLY**





**SHREE**

(AN ISO

Material

MOB.: 94

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**CONSULTANCY**

9E0012337)

Exploration Regd. No.: 52

Bhubaneswar, Odisha

jagannathconsultancy@gmail.com

Ref. ....

Date. ....

## INTRODUCTION

The **SHREE JAGANNATH CONSULTANCY** was awarded the work of conducting soil Exploration & Testing for the above site for suggesting the foundation types. The scope of work comprised of sinking of Three bore hole of maximum 15.00 mts depth. Based on the above this report presents the Bore Logs, Soil Profile & Laboratory test Results. Based on the Laboratory Test results the bearing capacity & Type of foundation have been obtained.

## OBJECTIVES OF THIS SUB SOIL EXPLORATION

The objective of this Geo-technical investigation is to optimize the Foundation system for proposed Project within the safe bearing capacity of the soil and allowable settlement, it consists of the following

- Determination of type, size and depth of foundation- system by analyzing the soil properties
- To suggest a conclusive recommendation for the type of foundation System to be adopted which would be economically viable and structurally safe for the proposed structures of the projects.

## Limitations of Investigation

The scope of Geo-technical exploration is confined within limitations of the framework of agreement drawn by **SHREE JAGANNATH CONSULTANCY**. All the field and laboratory experiments have been carried out as per the technical specification of the client and the relevant Indian Standard Code of practice. However the directions issued by Engineer-in charge in this respect has been given due emphasis during the sub soil exploration work.



Soil and all types of Material testing laboratory | Sub-soil Exploration | Survey | Hydrographic survey | Preparation of DPR  
Structural Consultancy Plan, Estimation, Design & Architecture | Civil Construction Work & Supervision & I E-Tendering Facilities

Specialist in : All types of PMGSY relating works

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### Scope of work

The scope of work comprises of conducting detail soil investigation, laboratory testing, conducting and estimation of safe bearing capacity for the above proposed work on drilling 3nos boreholes as shown by the Engineer-in charge.

### Nature of investigation work

- ☞ The over all investigation consists of the following:
  - ☞ Visual reconnaissance of the site.
  - ☞ Field Work-Drilling of bore Holes up to the required depth.
  - ☞ Laboratory experiments, determination of soil parameters.
  - ☞ Analysis of field and Laboratory data
  - ☞ Arriving at the conclusive decision on foundation system to be adopted in the present case using Our Engineering judgment, based on the current practice.
- The detailed Geo-technical investigation work that was carried out consists of two parts.

#### 1. Field investigation: It consists of

- ☞ Location of Eight numbers of bore holes with due consultation the authority.
- ☞ Boring / drilling up to 15.00 mtr below N.G.L or refusal.
- ☞ Conducting standard penetration test at the locations pre fixed by the authority.
- ☞ Collection of UDS samples as per IS Specification.
- ☞ Study of site condition and surroundings with regards to the need of the Project.
- ☞ Taking observation of surrounding structure to observe any deficiency in safety.
- ☞ Transportation of all soil samples to laboratory for analysis with proper care.

2. Laboratory investigation: It consists of

(I) For Soil

- ☞ Determination of Bulk density
- ☞ Determination of Moisture content
- ☞ Determination of Grain size analysis.
- ☞ Determination of Shear Strength.
- ☞ Determination of Liquid limit.
- ☞ Determination of Plastic limit
- ☞ Determination of Specific gravity
- ☞ Determinations of DFS

(II) For Rock

- ☞ Determination of compressive strength of rock
- ☞ Determination of Water Absorption of rock
- ☞ Determination of Porosity of rock
- ☞ Determination of Specific Gravity of rock
- ☞ Determination of Density of rock

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### 3. DETAILS OF FIELD WORK

#### 1. SELECTION OF BOREHOLE

Eight numbers of Bore-hole were selected by the Engineer in charge in order to obtain comprehensive sub-soil data for this site with a provision of borings up to 15.00 meters depth or less as required as per IS : 1892 - 1979. For detailed laboratory investigation SPT is conducted @ 1.50 m intervals or at change of soil Strata in different Boreholes and S.P.T soil samples were collected for laboratory analysis. Disturbed representative, soil samples from all the Boreholes were collected at 1.5 m. interval for different tests.

## 2. BORING:

It is the main part of sub soil investigation work as the soil samples were collected for different tests at different levels. The sub-soil exploration work at the proposed site was carried out mechanically using power operated Mechanical boring in hard strata & using diamond cutter as per IS: 1892 - 1979.

## 3. STANDARD PENETRATION TESTS:

Standard penetration test plays a major role in sub soil investigation termination of safe bearing capacity of soil in non cohesive type soil, particularly in non-cohesive granular sandy soil and where the UDS could not be collected either due to high liquidity or non cohesive nature of soil .The SPT tests were conducted as per IS: 9640-1980 & IS: 2131-1981 respectively, in different levels of the bore holes in a continuous manner using spilt-spoon samplers at locations decided by authority. The SPT sampler was lower inside the borehole after drilling the required level and is driven by a 63.50 kg hammer with a free fall of 750 mm. driving 450 mm in three stages 150 mm each and the number of blows for each 150mm penetration for 2nd & 3rd 150 mm drive recorded as "N". Refusal was considered for  $N > 100$ . The details of location of test and SPT value [N] are presented in bore log data annexed separately.

**FOR REFERENCE ONLY**

## LABORATORY TESTS

The laboratory-tests were conducted on selected representative disturbed / undisturbed soil samples collected from different Borehole drilled at the proposed site. The tests include Grain size analysis, Natural moisture content, D.F.S, Specific Gravity and Liquid limit, Plastic limit, Plasticity index, Shear test, and Particles size distribution tests on representative soil sample were also carried out. All the tests conducted confirming to the requirements of I.S specification. The results of all these tests have been annexed separately.

### 1. GRAIN SIZE ANALYSIS:

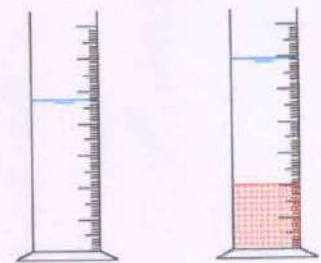
The grain size analysis of different soil samples were done as per the requirement of IS: 2720 (Pt-IV) 1985 - method of test for soil, Grain size analysis. The details of the test results are shown test result sheet separately. The results of grain size analysis are used to classify the soil in various depths of boreholes. The results of all these tests have been annexed separately.

### 2. NATURAL MOISTURE CONTENT:

The natural moisture content was determined from different undisturbed samples of different Boreholes at different depths, as per IS: 2720(Pt-II)-1973: Method of test for soil, determination of Water content. It is used for determining specific gravity, optimum moisture content, S.B.C, settlement of foundation system. The results of all these tests have been annexed separately.

### 3. DETERMINATION OF BULK DENSITY:

The Bulk densities has been determined from different undisturbed samples of different Boreholes at different depths, in the laboratory from the UDS samples at different levels as per IS: 2720(Pt-II)-1973. It is used for determining specific aravity, optimum moisture content, S.B.C, settlement of foundation system.



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4. DETERMINATION OF DRY DENSITY:

The dry density of the UDS / DS samples were determined at the known moisture content and bulk density and is determined on analyzing. It is used for determining specific gravity, optimum moisture content, S.B.C, settlement of foundation system. The test result has been annexed separately.

5. DETERMINATION OF SPECIFIC GRAVITY:

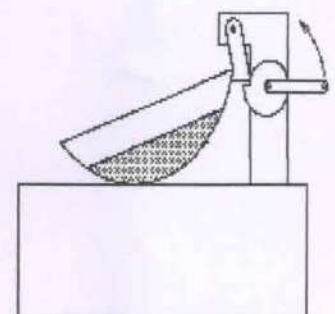
The specific gravity of the UDS / DS samples have been determined at different levels as per IS: 2720(Pt-III)-1980. It is used for determining void ratio, porosity, saturated density, S.B.C, settlement of foundation system. The results of all these tests have been annexed separately.

6. DETERMINATION OF VOID RATIO:

The void-ratio of the UDS / DS samples has been determined at different levels and the results are shown separately. It is used for determining specific gravity, optimum moisture content, S.B.C, settlement of foundation system. The results of all these tests has been annexed separately

7. LIQUID-LIMIT / PLASTIC LIMIT:

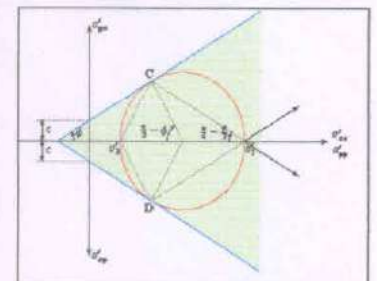
The liquid and plastic limits of soils were other index properties of soil have also been determined as per the relevant as per IS: 2720(Pt-v)-1985 Code of practice. The liquid and plastic limits of soil samples have been determined in the laboratory and it is used for determining S.B.C,



settlement of foundation system etc. The results of all these tests has been annexed separately


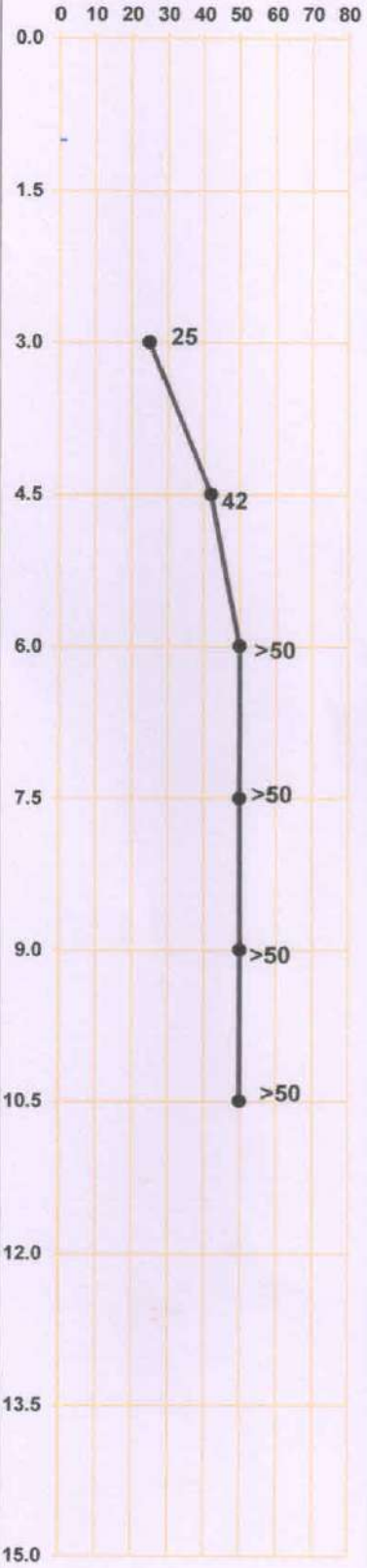


8. DETERMINATION OF SHEARSTRENGTH PARAMETERS:

Unconsolidated and un-drained tests were carried out from soil samples collected as per Pt- X , XI ,XII, XIII,& part-35 of IS: 2720 with three different cell pressures of 0.5, 1.0, 1.5 kg/sq.cm and result are shown separately in tabular and graphical manner. Piston (to apply deviatorory stress)



**Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.**

**BORE - LOG DATA OF BH-01 (FCI PUMP HOUSE)**

Type of soil	Soil Profile	R.L. in mtr	Depth in mtrs.	SPT Value "N" Depth Plot	Type of Sample	Core Recovery (%)	R.Q.D (%)
Sandy-Clay		4.00	0.0		UDS SAMPLE		
			3.0		SPT SAMPLE		
D.I. Rock		11.00	4.5	SPT SAMPLE			
			6.0	SPT SAMPLE		DS SAMPLE	
			7.5	SPT SAMPLE		DS SAMPLE	
			9.0	SPT SAMPLE		DS SAMPLE	
			10.5	SPT SAMPLE		DS SAMPLE	
			12.0	CORE SAMPLE	37	Nil	
Soft Rock		15.00	13.5	CORE SAMPLE	45	Nil	
			15.0	CORE SAMPLE	51	Nil	





**Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.**

**BORE - LOG DATA OF BH-02 (NEAR RAILWAY CROSSING)**

Type of soil	Soil Profile	R.L. in mtr	Depth in mtrs.	SPT Value "N" Depth Plot	Type of Sample	Core Recovery (%)	R.Q.D (%)
Poorly graded Sands			0.0	0			
		2.10	1.5	15	SPT SAMPLE		
Poorly graded Sand with gravel & Clay			3.0	21	SPT SAMPLE		
		4.80	4.5	32	SPT SAMPLE		
			6.0	47	SPT SAMPLE		
D.I. Rock			7.5	>50	SPT SAMPLE		
			9.0	>50	SPT SAMPLE		
		10.500	10.5	>50	SPT SAMPLE		
			12.0		CORE SAMPLE	35	Nil
Soft Rock			13.5		CORE SAMPLE	39	Nil
		15.00	15.0		CORE SAMPLE	52	25



**Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.**

**BORE - LOG DATA OF BH-03 (NEAR BELT CONVEYER)**

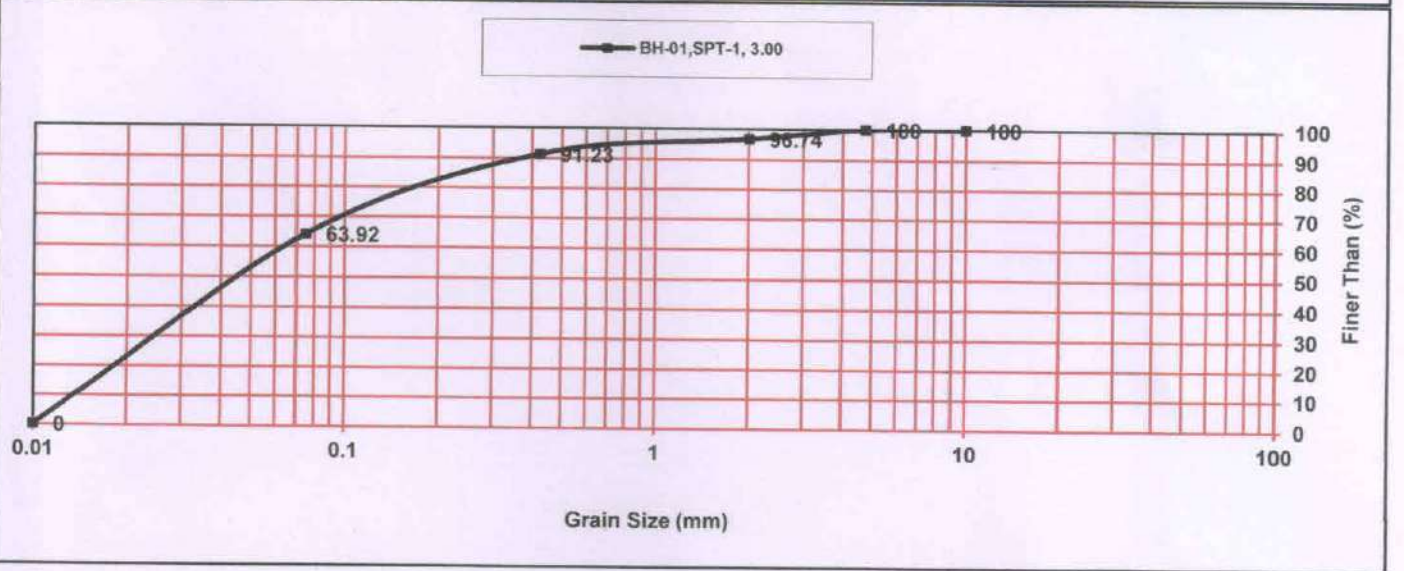
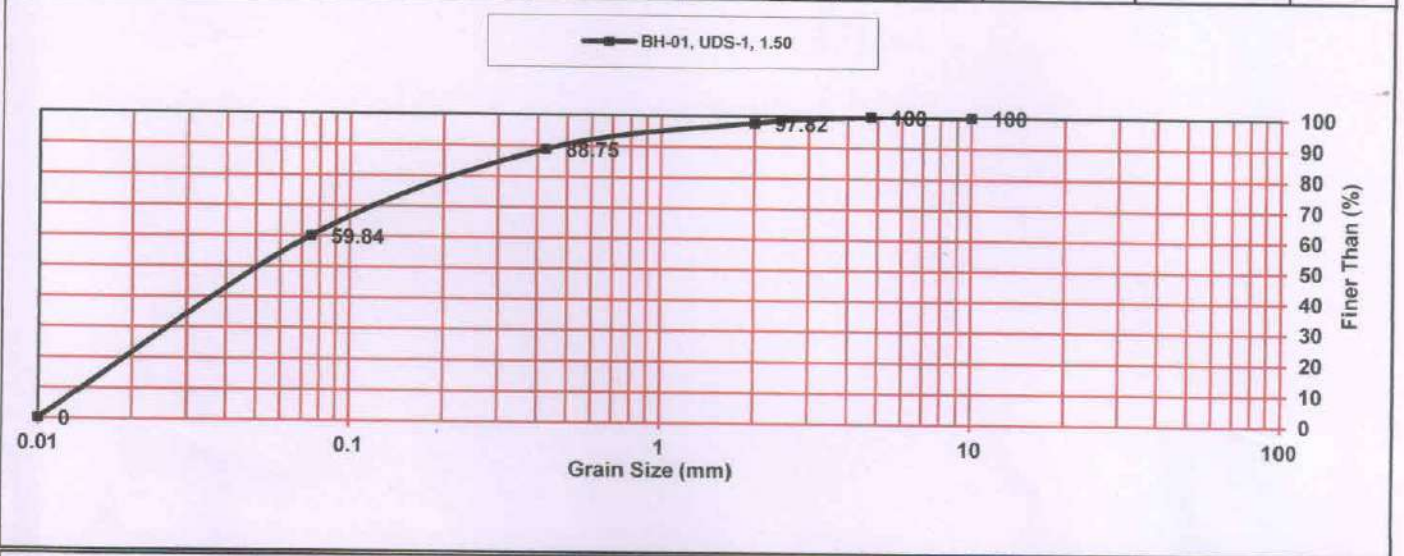
Type of soil	Soil Profile	R.L. in mtr	Depth in mtrs.	SPT Value "N" Depth Plot	Type of Sample	Core Recovery (%)	R.Q.D (%)
Clayey-sand with gravel		1.80	0.0				
			1.5	24	SPT SAMPLE		
Poorly graded Sands		5.00	3.0	>50	SPT SAMPLE		
			4.5	>50	SPT SAMPLE		
D.I. Rock		12.20	6.0	>50	SPT SAMPLE		
			7.5	>50	SPT SAMPLE	DS SAMPLE	
			9.0	>50	SPT SAMPLE	DS SAMPLE	
			10.5	>50	SPT SAMPLE	DS SAMPLE	
			12.0	>50	SPT SAMPLE	DS SAMPLE	
			12.0	>50	SPT SAMPLE	DS SAMPLE	
Soft Rock		15.00	13.5		CORE SAMPLE	28	Nil
			15.0		CORE SAMPLE	48	22



**Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.**

**LABORATORY TEST RESULT OF GRAIN SIZE ANALYSIS**

Sl.No.	Borehole Reference	Sample Depth in Mtr.	% of Passing through I. S. Sieve in mm					
			10.00	4.75	2.00	0.4250	0.0750	0.010
1	BH-01, UDS-1,	1.50	100	100	97.82	88.75	59.84	0
2	BH-01,SPT-1,	3.00	100	100	96.74	91.23	63.92	0



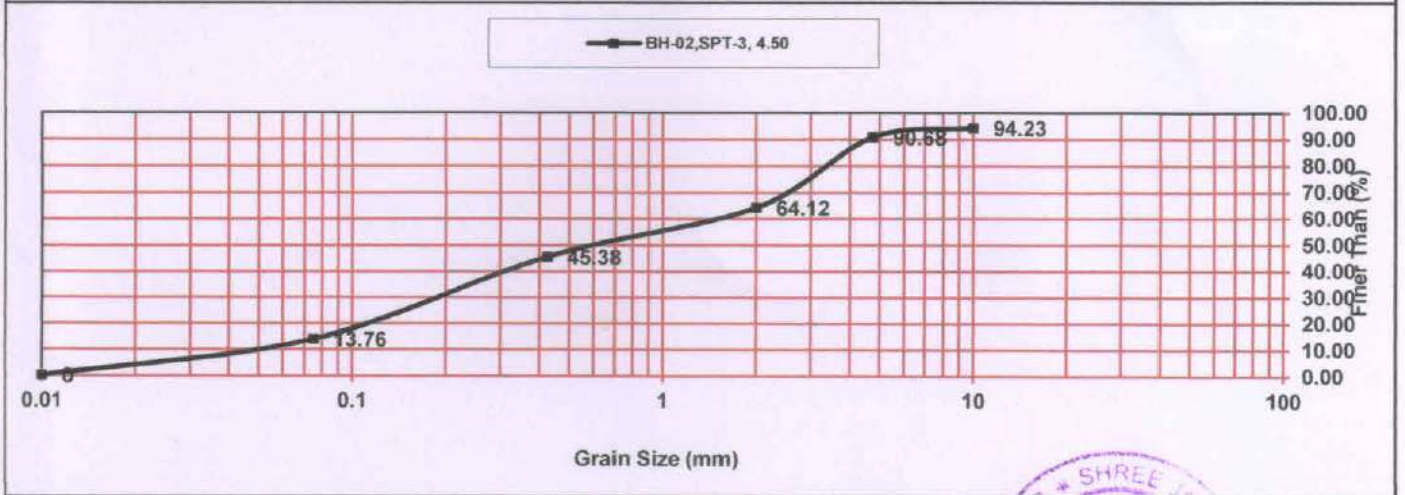
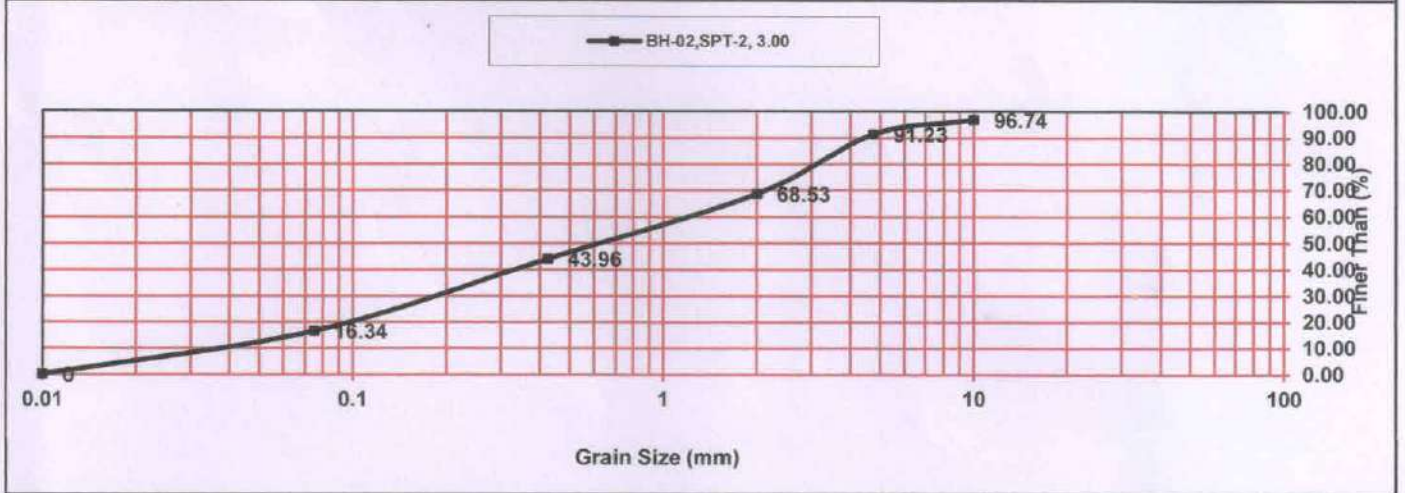
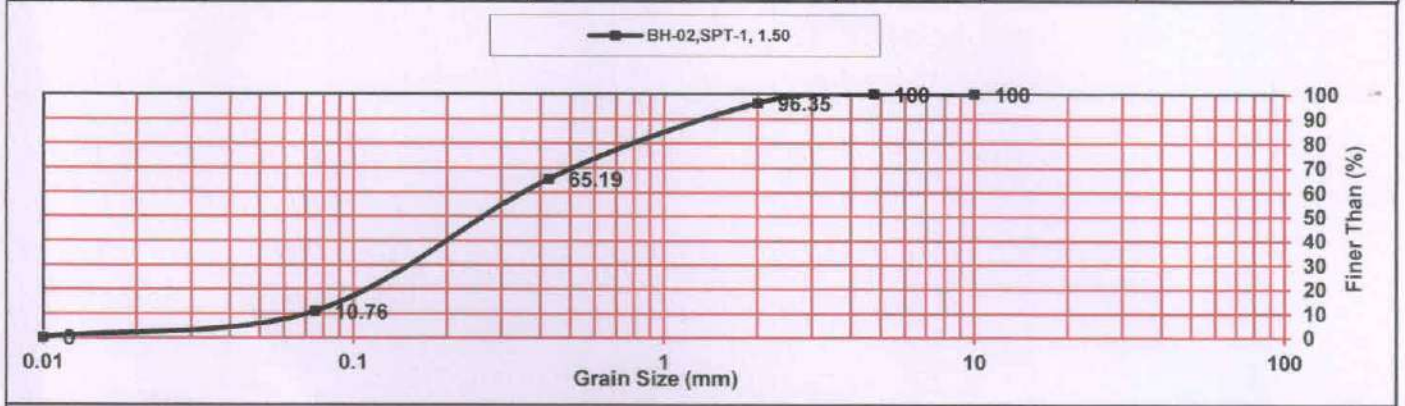
**FOR REFERENCE ONLY**



**Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.**

**LABORATORY TEST RESULT OF GRAIN SIZE ANALYSIS**

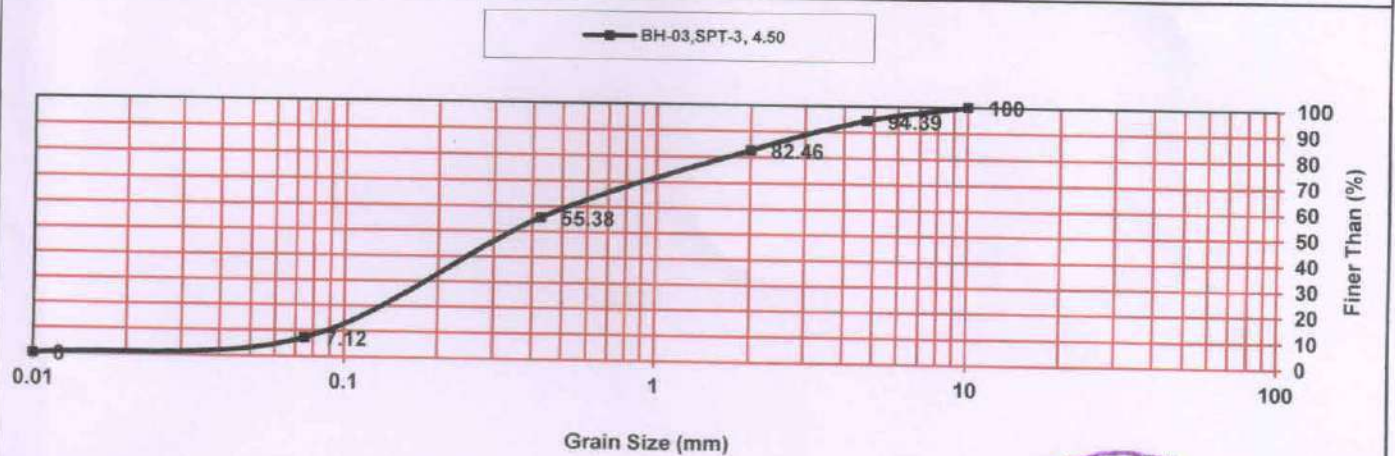
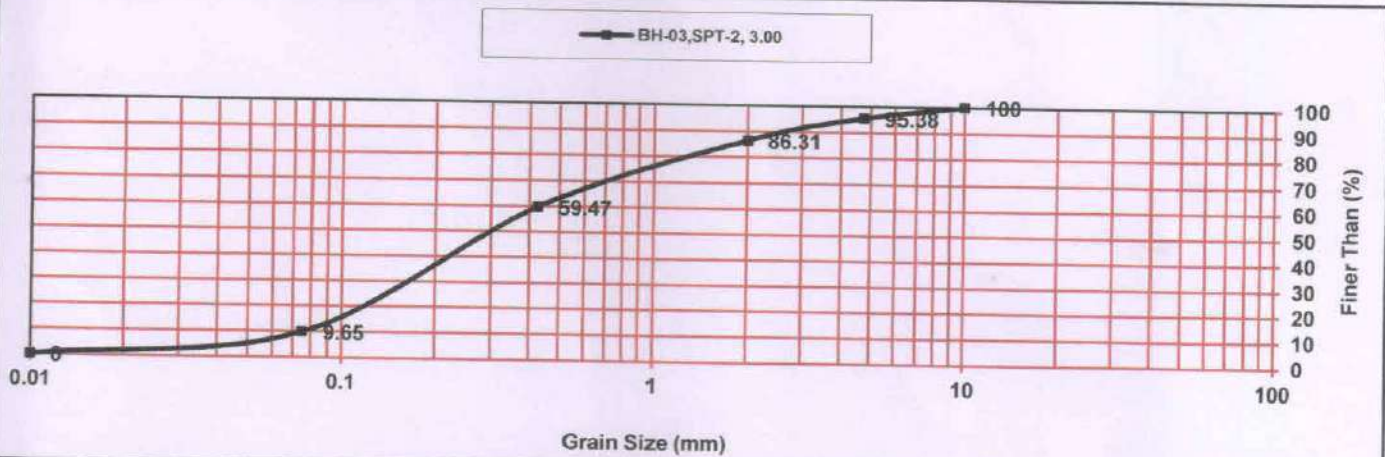
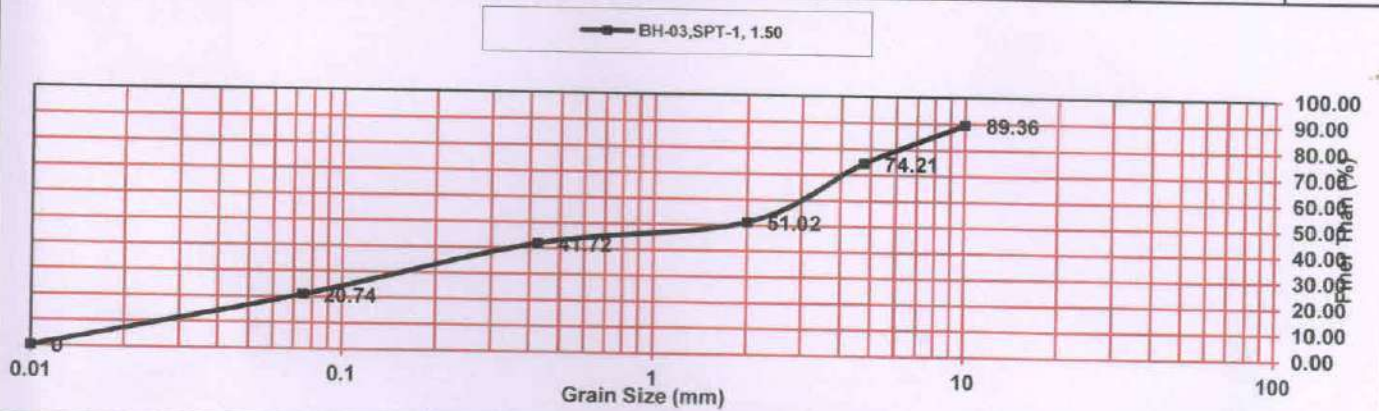
Sl.No.	Borehole Reference	Sample Depth in Mtr.	% of Passing through I. S. Sieve in mm					
			10.00	4.75	2.00	0.4250	0.0750	0.010
1	BH-02,SPT-1,	1.50	100	100	96.35	65.19	10.76	0
2	BH-02,SPT-2,	3.00	96.74	91.23	68.53	43.96	16.34	0
3	BH-02,SPT-3,	4.50	94.23	90.68	64.12	45.38	13.76	0



**Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.**

**LABORATORY TEST RESULT OF GRAIN SIZE ANALYSIS**

Sl.No.	Borehole Reference	Sample Depth in Mtr.	% of Passing through I. S. Sieve in mm					
			10.00	4.75	2.00	0.4250	0.0750	0.010
1	BH-03,SPT-1,	1.50	89.36	74.21	51.02	41.72	20.74	0
2	BH-03,SPT-2,	3.00	100	95.38	86.31	59.47	9.65	0
2	BH-03,SPT-3,	4.50	100	94.39	82.46	55.38	7.12	0



Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.

LABORATORY TEST RESULT OF SOIL SAMPLES

Sl. No.	Borehole Reference	Sample Depth in mtr.	Bulk Density (gm/cc)	Natural Moisture Content (%)	Dry Density (gm/cc)	TRIAxIAL TEST		Atterberg's Limit (%)			Specific Gravity	Void Ratio	DFS (%)
						Cohesion (Kg/Cm <sup>2</sup> )	Angle of Internal Friction (degrees)	LL	PL	PI			
1	BH-01, UDS-1,	1.50	1.865	17.26	1.590	0.35	9.0	41.0	24.0	17.0	2.67	0.679	25
2	BH-01, SPT-1,	3.00	1.871	17.55	1.592	0.51	8.0	43.0	25.0	18.0	2.68	0.684	30
3	BH-01, DS-1,	4.00 to 6.00	1.912	8.45	1.763	-	-	-	-	-	-	-	-
4	BH-01, DS-2,	6.00 to 7.50	1.951	8.12	1.804	-	-	-	-	-	-	-	-
5	BH-01, DS-3,	7.50 to 9.00	1.966	7.63	1.827	-	-	-	-	-	-	-	-
6	BH-01, DS-4,	9.00 to 11.00	1.982	7.12	1.850	-	-	-	-	-	-	-	-
7	BH-01, CS-1,	11.00 to 12.00	2.351	6.59	2.206	-	-	-	-	-	-	-	-
8	BH-01, CS-2,	12.00 to 13.50	2.371	5.42	2.249	-	-	-	-	-	-	-	-
9	BH-01, CS-3,	13.50 to 15.00	2.395	4.23	2.298	-	-	-	-	-	-	-	-



Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.

LABORATORY TEST RESULT OF SOIL SAMPLES

Sl. No.	Borehole Reference	Sample Depth in mtr.	Bulk Density (gm/cc)	Natural Moisture Content (%)	Dry Density (gm/cc)	TRIAxIAL TEST		Atterberg's Limit (%)			Specific Gravity	Void Ratio	DFS (%)
						Cohesion (Kg/Cm <sup>2</sup> )	Angle of Internal Friction (Degree)	LL	PL	PI			
1	BH-02, SPT-1,	1.50	1.821	13.55	1.604	0.00	31.0	-	-	NP	2.66	0.659	-
2	BH-02, SPT-2,	3.00	1.842	14.86	1.604	0.11	24.0	19.0	-	NP	2.67	0.665	-
3	BH-02, SPT-3,	4.50	1.845	13.96	1.619	-	-	18.0	-	NP	2.67	0.649	-
4	BH-02, DS-1,	4.80 to 6.00	1.932	9.12	1.771	-	-	-	-	-	-	-	-
5	BH-02, DS-2,	6.00 to 7.50	1.952	8.45	1.800	-	-	-	-	-	-	-	-
6	BH-02, DS-3,	7.50 to 9.00	1.968	8.13	1.820	-	-	-	-	-	-	-	-
7	BH-02, DS-4,	9.00 to 10.50	1.991	7.65	1.850	-	-	-	-	-	-	-	-
8	BH-02, CS-1,	10.50 to 12.00	2.382	5.45	2.259	-	-	-	-	-	-	-	-
9	BH-02, CS-2,	12.00 to 13.50	2.396	4.12	2.301	-	-	-	-	-	-	-	-
10	BH-02, CS-3,	13.50 to 15.00	2.438	3.68	2.351	-	-	-	-	-	-	-	-



Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.

LABORATORY TEST RESULT OF SOIL SAMPLES

Sl. No.	Borehole Reference	Sample Depth in mtr.	Bulk Density (gm/cc)	Natural Moisture Content (%)	Dry Density (gm/cc)	TRIAxIAL TEST		Atterberg's Limit (%)			Specific Gravity	Void Ratio	DFS (%)
						Cohesion (Kg/Cm <sup>2</sup> )	Angle of Internal Friction (Degree)	LL	PL	PI			
1	BH-03, SPT-1,	1.50	1.840	15.82	1.589	0.16	25.0	22.0	-	NP	2.69	0.693	10
2	BH-03, SPT-2,	3.00	1.835	12.72	1.628	0	32.0	-	-	NP	2.68	0.646	-
4	BH-03, DS-1,	5.00 to 6.00	1.922	8.97	1.764	-	-	-	-	-	-	-	-
5	BH-03, DS-2,	6.00 to 7.50	1.945	8.62	1.791	-	-	-	-	-	-	-	-
6	BH-03, DS-3,	7.50 to 9.00	1.969	7.71	1.828	-	-	-	-	-	-	-	-
7	BH-03, DS-4,	9.00 to 10.50	1.982	7.23	1.848	-	-	-	-	-	-	-	-
8	BH-03, DS-5,	10.50 to 12.00	2.039	6.44	1.916	-	-	-	-	-	-	-	-
9	BH-03, CS-1,	12.00 to 13.50	2.378	4.12	2.284	-	-	-	-	-	-	-	-
10	BH-03, CS-2,	13.50 to 15.00	2.468	3.78	2.378	-	-	-	-	-	-	-	-





**Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.**

Calculation of Safe bearing capacity of Strength Parameter

( AT                      1.50                      M)

**BH-01**

Depth of foundation =1.50m

**SQUARE FOOTING**

Size of footing =2mX 2m

Cohesion C =

Angle of shearing resistance  $\phi =$

$\phi' =$

Void ratio

Specific Gravity

Bulk density  $\gamma =$

Depth of foundation Df =

let us assume width of footing B=

$q = [Df \times (\gamma - 1)] / 1000$

$B\gamma = (B \times \gamma) / 1000$

**Bearing capacity factors**

(From IS : 6403-1981, Table-1)

$\phi$ & $\phi'$	Nc & Nc'	Nq & Nq'	N $\gamma$ & N $\gamma'$
9	7.978	2.290	1.066
6	6.862	1.75	0.604

**Shape Factors ( From IS : 6403-1981, Table-2)**

Sc = 1.3                      Sq = 1.2                      S $\gamma$  = 0.8

**Depth Factors & inclination Factors ( From IS : 6403-1981, Clause-5.1.2.2 & Clause-5.1.2.3)**

$d_c = 1 + 0.2 \times (Df/B) \times \tan(45 + \phi/2) =$

1.176

$d_q = d_\gamma =$

1

$i_c = i_q = i_\gamma =$

1

**Effect of water tables (From IS : 6403-1981 Clause -5.1.2.4)**

w' = 0.5                      **Wt < Df**

**In case of General shear failure for Square footing ( Clause-5.1.2)**

$Qd = cNcScdcic + q(Nq - 1)Sqdqiq + 0.5B\gamma N\gamma S\gamma d\gamma i\gamma W'$

= 4.269                      +                      0.201                      +                      0.08

= 4.550                      Kg/cm<sup>2</sup>

**In case of Local shear failure for Square footing ( Clause-5.1.2)**

$Qd' = (2/3) cNc'Sc'dc'ic' + q(Nq' - 1)Sq'dq'iq' + 0.5B\gamma N\gamma'S\gamma'd\gamma'i\gamma'W'$

= 2.460                      +                      0.117                      +                      0.045

= 2.622                      Kg/cm<sup>2</sup>

**Ultimate bearing capacity obtained by interpolation =qd( From IS : 6403-1981, Table-3)**

qd= 3.309                      Kg/cm<sup>2</sup>

Safe bearing capacity considering factor of safety of 2.50=

1.324                      Kg/cm<sup>2</sup>

=> **SBC** = **13.24 T/m<sup>2</sup>**                      \_ (1)

**FOR REFERENCE ONLY**



## Calculation of Safe bearing capacity of Strength Parameter

( AT                      3.00                      M)

**BH-01**

Depth of foundation = 3.00m

**SQUARE FOOTING**

**Size of footing = 3.00m X 3.00m**

Cohesion C =

Angle of shearing resistance  $\phi =$

$\phi' =$

Void ratio

e =

Specific Gravity

Gs =

Bulk density  $\gamma =$

Depth of foundation Df =

let us assume width of footing B =

$q = [Df \times (\gamma - 1)] / 1000$

$B\gamma = (B \times \gamma) / 1000$

0.51	Kg/cm <sup>2</sup>
8	Degree
5	Degree
0.684	
2.68	
1.871	g/cc
3.00	m
3.00	m
0.261	Kg/cm <sup>2</sup>
0.5613	Kg/cm <sup>2</sup>

Ø < 10

**Bearing capacity factors (From IS : 6403-1981, Table-1)**

Ø & Ø'	Nc & Nc'	Nq & Nq'	Ny & Ny'
8	7.606	2.110	0.912
5	6.49	1.57	0.45

**Shape Factors ( From IS : 6403-1981, Table-2)**

Sc = 1.3                      Sq = 1.2                      Sy = 0.8

**Depth Factors & inclination Factors ( From IS : 6403-1981, Clause-5.1.2.2 & Clause-5.1.2.3)**

$d_c = 1 + 0.2 \times (Df/B) \times \tan(45 + \phi/2) =$

1.23

$d_q = d_\gamma =$  1

$i_c = i_q = i_\gamma =$  1

**Effect of water tables (From IS : 6403-1981 Clause -5.1.2.4)**

w' = 0.5                      Wt < Df

**In case of General shear failure for Square footing ( Clause-5.1.2)**

$Qd = cNcScdcic + q(Nq - 1)Sqdqiq + 0.5B\gamma NySydyiyW'$

= 6.203                      +                      0.348                      +                      0.102

= 6.653                      Kg/cm<sup>2</sup>

**In case of Local shear failure for Square footing ( Clause-5.1.2)**

$Qd' = (2/3) cNc'Sc'dc'ic + q(Nq' - 1)Sq'dq'iq + 0.5B\gamma Ny\gamma Sydyiy'W'$

= 3.546                      +                      0.179                      +                      0.051

= 3.776                      Kg/cm<sup>2</sup>

**Ultimate bearing capacity obtained by interpolation = qd ( From IS : 6403-1981, Table-3)**

qd = 4.729                      Kg/cm<sup>2</sup>

1.891                      Kg/cm<sup>2</sup>

Safe bearing capacity considering factor of safety of 2.50 =

=> SBC

= 18.91 T/m<sup>2</sup>                      (1)

FOR REFERENCE ONLY



**Construction 33KV Line From Grid SubStation of Talcher Fertilizer Ltd. To Pump House near Bramhani River.**

Calculation of Safe bearing capacity of Strength Parameter

( AT                      1.50                      M)

**BH-02**

Depth of foundation =1.50m

**SQUARE FOOTING**

**Size of footing =2mX 2m**

Cohesion C =

0.00      Kg/cm<sup>2</sup>

Angle of shearing resistance  $\phi =$

31      Degree

$\phi > 10$

$\phi' =$

21      Degree

Void ratio

e =

0.659

Specific Gravity

Gs =

2.66

Bulk density  $\gamma =$

1.821      g/cc

Depth of foundation Df =

1.50      m

let us assume width of footing B=

2.00      m

$q = [Df \times (\gamma - 1)] / 1000$

0.123      Kg/cm<sup>2</sup>

$B\gamma = (B \times \gamma) / 1000$

0.3642      Kg/cm<sup>2</sup>

**Bearing capacity factors (From IS : 6403-1981, Table-1)**

$\phi$ & $\phi'$	Nc & Nc'	Nq & Nq'	N $\gamma$ & N $\gamma'$
31	33.336	21.380	27.526
21	16.008	7.252	6.488

**Shape Factors ( From IS : 6403-1981, Table-2)**

Sc =

1.3

Sq =

1.2

S $\gamma$  =

0.8

**Depth Factors & inclination Factors ( From IS : 6403-1981, Clause-5.1.2.2 & Clause-5.1.2.3)**

$d_c = 1 + 0.2 \times (Df/B) \times \tan(45 + \phi/2) =$

1.265

$d_q = d_\gamma =$

1.133

$i_c = i_q = i_\gamma =$

1

**Effect of water tables (From IS : 6403-1981 Clause -5.1.2.4)**

w' =

0.5

W < Df

**In case of General shear failure for Square footing ( Clause-5.1.2)**

$Q_d = q(N_q - 1) S_q d_q i_q + 0.5 B \gamma N_\gamma S_\gamma d_\gamma i_\gamma W'$

=

3.412

+

2.272

=

5.684

Kg/cm<sup>2</sup>

**In case of Local shear failure for Square footing ( Clause-5.1.2)**

$Q_d' = q(N_q' - 1) S_q d_q i_q + 0.5 B \gamma N_\gamma S_\gamma d_\gamma i_\gamma W'$

=

1.047

+

0.535

=

1.582

Kg/cm<sup>2</sup>

**Ultimate bearing capacity obtained by interpolation = qd ( From IS : 6403-1981, Table-3)**

qd = 3.455

Kg/cm<sup>2</sup>

Safe bearing capacity considering factor of safety of 2.50 =

1.382

Kg/cm<sup>2</sup>

=>

**SBC**

= 13.82

T/m<sup>2</sup>

\_(1)

**FOR REFERENCE ONLY**

SHREE JAGANNATH  
BHUBANESHWAR CONSULTANCY  
15/12/22

## Calculation of Safe bearing capacity of Strength Parameter

( AT                      3.00                      M)

BH-02

Depth of foundation = 3.00m

**SQUARE FOOTING**

**Size of footing = 3.00m X 3.00m**

Cohesion C =

0.11      Kg/cm<sup>2</sup>

Angle of shearing resistance  $\phi =$

24      Degree

$\phi > 10$

$\phi' =$

16      Degree

Void ratio

e =

0.665

Specific Gravity

Gs =

2.67

Bulk density  $\gamma =$

1.842      g/cc

Depth of foundation Df =

3.00      m

let us assume width of footing B =

3.00      m

$q = [Df \times (\gamma - 1)] / 1000$

0.253      Kg/cm<sup>2</sup>

$B\gamma = (B \times \gamma) / 1000$

0.5526      Kg/cm<sup>2</sup>

**Bearing capacity factors**

(From IS : 6403-1981, Table-1)

$\phi$ & $\phi'$	Nc & Nc'	Nq & Nq'	$N\gamma$ & $N\gamma'$
24	19.542	9.808	9.782
16	11.75	4.432	3.198

**Shape Factors ( From IS : 6403-1981, Table-2)**

Sc =

1.3

Sq =

1.2

S $\gamma$  =

0.8

**Depth Factors & inclination Factors ( From IS : 6403-1981, Clause-5.1.2.2 & Clause-5.1.2.3)**

$d_c = 1 + 0.2 \times (Df/B) \times \tan(45 + \phi/2) =$

1.308

$d_q = d_\gamma =$

1.154

$i_c = i_q = i_\gamma =$

1

**Effect of water tables (From IS : 6403-1981 Clause -5.1.2.4)**

w' =

0.5

Wt < Df

**In case of General shear failure for Square footing ( Clause-5.1.2)**

$Q_d = cN_c S_{cd} i_{c1} + q(N_q - 1) S_{qd} i_{q1} + 0.5 B \gamma N_\gamma S_\gamma d_\gamma i_\gamma W'$

=	3.655	+	3.081	+	1.248
=	7.984		Kg/cm <sup>2</sup>		

**In case of Local shear failure for Square footing ( Clause-5.1.2)**

$Q_d' = (2/3) cN_c' S_{cd} i_{c1} + q(N_q' - 1) S_{qd} i_{q1} + 0.5 B \gamma N_\gamma S_\gamma d_\gamma i_\gamma W'$

=	1.473	+	1.201	+	0.408
=	3.082		Kg/cm <sup>2</sup>		

**Ultimate bearing capacity obtained by interpolation = qd ( From IS : 6403-1981, Table-3)**

qd =

5.168      Kg/cm<sup>2</sup>

Safe bearing capacity considering factor of safety of 2.50 =

2.067      Kg/cm<sup>2</sup>

=>

SBC

= 20.67      T/m<sup>2</sup>      \_ (1)





Calculation of Safe bearing capacity of Strength Parameter

( AT                      3.00                      M)

**BH-03**

Depth of foundation = 3.00m

**SQUARE FOOTING**

**Size of footing = 3.00m X 3.00m**

Cohesion C =

Angle of shearing resistance  $\phi =$

$\phi' =$

Void ratio

e =

Specific Gravity

Gs =

Bulk density  $\gamma =$

Depth of foundation Df =

let us assume width of footing B =

$q = [Df \times (\gamma - 1)] / 1000$

$B\gamma = (B \times \gamma) / 1000$

0.00	Kg/cm <sup>2</sup>
32	Degree
21	Degree
0.646	
2.68	
1.835	g/cc
3.00	m
3.00	m
0.251	Kg/cm <sup>2</sup>
0.5505	Kg/cm <sup>2</sup>

$\phi < 10$

**Bearing capacity factors (From IS : 6403-1981, Table-1)**

$\phi$ & $\phi'$	Nc & Nc'	Nq & Nq'	N $\gamma$ & N $\gamma'$
32	36.532	24.360	32.652
21	16.008	7.252	6.488

**Shape Factors (From IS : 6403-1981, Table-2)**

Sc = 1.3                      Sq = 1.2                      S $\gamma$  = 0.8

**Depth Factors & inclination Factors (From IS : 6403-1981, Clause-5.1.2.2 & Clause-5.1.2.3)**

$d_c = 1 + 0.2 \times (Df/B) \times \tan(45 + \phi/2) =$

1.361

$d_q = d_\gamma =$  1.18

$i_c = i_q = i_\gamma =$  1

**Effect of water tables (From IS : 6403-1981 Clause -5.1.2.4)**

w' = 0.5                       $Wt < Df$

**In case of General shear failure for Square footing ( Clause-5.1.2)**

$Q_d = q(N_q - 1)S_q d_q i_q + 0.5 B \gamma N_\gamma S_\gamma d_\gamma i_\gamma W'$

= 8.286                      +                      4.242

= 12.528                      Kg/cm<sup>2</sup>

**In case of Local shear failure for Square footing ( Clause-5.1.2)**

$Q_d' = q(N_q' - 1)S_q d_q i_q + 0.5 B \gamma N_\gamma S_\gamma d_\gamma i_\gamma W'$

= 2.218                      +                      0.843

= 3.061                      Kg/cm<sup>2</sup>

**Ultimate bearing capacity obtained by interpolation = qd (From IS : 6403-1981, Table-3)**

qd = 7.971                      Kg/cm<sup>2</sup>

Safe bearing capacity considering factor of safety of 2.50 =

3.189                      Kg/cm<sup>2</sup>

=> **SBC** = **31.89** T/m<sup>2</sup>                      (1)

