

# **SOUTHCO UTILITY**

**Office of the Superintending Engineer, Electrical Circle, Aska**

## **TENDER DOCUMENT**

**E - TENDER NOTICE NO. 07/18-19,  
ELEPHANT CORRIDOR -SOUTHCO UTILITY/ASKA CIRCLE/TRUNKEY**

**Dt. 15.12.2018**

**FOR**

**System Strengthening Work In Elephant Corridor Area, On  
'Trunkey' Basis**

- 1) Issue of online tender documents (bid sheets):- From dt- 15.12.2018 up to 27.12.2018 (1.00 PM)
- 2) Last date of submission of online tender: - Up to dt.- 27.12.2018 (5.00 PM)
- 3) Submission of Tender (Hard Copy) - Up to dt- 28.12.2018 (1.00 PM)
- 4) Opening of Techno-commercial bid (Part-I): - On Dt. 28.12.2018 on or after 3.00 PM

**SOUTHCO UTILITY**  
**Office of the Superintending Engineer,**  
**Electrical Circle, Aska**  
**At –College Square, PO- Nuagam-761111(GM).**  
**Email id- circlehead.aska@southcoodisha.com.**

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**E - TENDER NOTICE NO. 07/18-19, ELEPHANT CORRIDOR -SOUTHCO UTILITY/ASKA**  
**CIRCLE/TRUNKEY, Dt. 15.12.2018.**

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**SOUTHCO UTILITY**  
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L.No.:-

Date:-

**E - TENDER NOTICE NO. 07/18-19, ELEPHANT CORRIDOR/ SOUTHCO UTILITY/ASKA CIRCLE/TRUNKEY, dated 15.12.2018** for and on behalf of SOUTHCO UTILITY, the undersigned invites online tender on two part bidding system from qualified and eligible bidders, who comply with the terms and conditions as mentioned in the Tender Document for the following works to be executed in its licensed area in the State of Odisha.

SI No	Name of the work	Estimated cost (in Lakhs)	Earnest money deposit	Non refundable cost of bid documents including GST @ 12%	Non refundable cost of tender processing fees including GST @18%
1	System strengthening work in elephant corridor & elephant movement ares under Buguda Sub-division.	7.01	7012/-	4480/-	827/-

Any addendum / corrigendum to this e-Tender Notice shall be uploaded in the **website** only.

- 1) Issue of online tender documents (bid sheets):- From dt- 15.12.2018 up to 27.12.2018 (1.00 PM)
- 2) Last date of submission of online tender: - Up to dt.- 27.12.2018 (5.00 PM)
- 3) Submission of Tender (Hard Copy) - Up to dt- 28.12.2018 (1.00 PM)
- 4) Opening of Techno-commercial bid (Part-I): - On Dt. 28.12.2018 on or after 3.00 PM

The interested bidders would be required to enrol themselves on the tender portal [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO). Complete set of bidding documents are available in [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) portal from Dt.16.12.2018 onwards (as per the e-tender schedule). Interested bidders may visit SOUTHCO's official web site [www.southcoodisha.com](http://www.southcoodisha.com) or [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) for detail specification.

The bidders can view the tender documents from [www.southcoodisha.com](http://www.southcoodisha.com) website free of cost.

(i) The bidders who want to submit bid shall have to pay the tender cost (non-refundable which is inclusive GST @ 12%) as per above table for different packages in the form of Demand draft only, drawn in **favour of “Administrator, SOUTHCO Utility Aska Circle expenditure Account”, payable at Aska.**

(ii) The bidders shall have to submit the non-refundable tender processing fee as per above table for different packages (including GST @ 18 %) in form of **e-payment** mode only.

**(NOTE: For tender processing fee to K.S.E.D.C. Ltd. Bangalore, the bidder can use various modes of e-payment facility available through Tender wizard Portal, i.e. by Credit Card, Debit Card, Net Banking).**

(iii)The bidders shall scan the Demand Draft / Bank guarantee, towards **EMD** and **Tender Cost** against the tender and upload the same in the prescribed form in .pdf or .jpg format in addition to sending the original as stated above.

(iv) The prospective bidders are advised to register their user ID, Password, company ID from website [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) by clicking on hyper link “**Register Me**”.

(v) Any clarifications regarding the scope of work and technical features can be had from the undersigned during office hours.

NB: All subsequent addendum/Corrigendum to the tender shall be hoisted in SOUTHCO’s official web site [www.southcoodisha.com](http://www.southcoodisha.com) and [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) only.

**For detail procedure to be followed for submission of Bid, please refer Clause No. 8 & 9 of ITB (page no.11 to 13).**

SOUTHCO Utility reserves the right to alter the tendered quantity and reject / accept any or all tenders or split the tender among tenders without assigning any reason thereof.

**(Superintending Engineer)  
Electrical Circle, Aska  
SOUTHCO Utility**

**C.C. to:-**

1. All Executive Engineers under this circle for information & wide circulation under their jurisdiction.
  2. All Circle Heads under Southco Utility.
  3. GM-Cum-Nodal Officer, Southco Utility, Ganjam District.
  4. GM(Govt. Prject, Safety &IT)-Cum-Nodal Officer, Southco Utility
  5. GM (Fin), Southco Utility
  6. Sr.General Manager, Southco Utility
  7. Chief Operating Officer, Southco Utility
  8. Authorized Officer, Southco Utility
- for kind information.

## **SECTION – I**

### **INVITATION FOR BIDS (IFB)**

**E - TENDER NOTICE NO. 07/18-19,  
ELEPHANT CORRIDOR -SOUTHCO UTILITY/ASKA CIRCLE/TRUNKEY, Dt. 15/12/2018.**

1.0 **SOUTHCO Utility** invites E Tenders from reputed Electrical Contractors with required license for carrying out various Electrical Installation works on 'Turnkey' basis in the jurisdiction of SOUTHCO Utility. The bidder must fulfill all the qualification requirements as specified in clause 3.0 stated below.

2.0 **SCOPE OF WORK.**

Installation of intermediate 11 KV RS Joist poles with all accessories in the locations as per Annexure-(A).

3.0 Bidders to be considered as eligible (to bid) should meet the following qualifications;

(a) Bidder must quote for the entire quantum of works as specified.

(b) The bidder should have installed and commissioned at least 01(one) K.M. of 11 KV line in respect to qualifying criteria (**work experience**).

**“The bidder must have executed the quantum of work as mentioned above during the last three financial years preceding to the year of tender notification and should have successful operation of minimum period of one year. Bidder must enclose copies of the relevant work orders along with client certified copies of Final Invoices and/or Performance Certificates dully signed by the competent authority of the client and/or Final Inspection certificate issued by Electrical Inspector in proof of having executed the desired quantum of works during the last three financial years.”**

(c) The minimum average Annual Turnover of the bidder in any best one financial year out of last five financial years **should not be less than 50% of the estimated value** of work as quoted by the bidder.

(d) Bidder shall be financially sound and stable having liquid assets as stated in the enclosed format and/or access to credit facility of not less than one fifth of estimated cost of the work for which he has submitted the bid.

**NB: 1) Only cash at bank / in hand & fixed deposit mentioned in the audited balance sheet of last FY shall be considered for accessing the Liquid Asset.**

**2) The average unutilized credit limit during the month prior to the month of bidding shall be considered to access the credit facility.**

(e) The bidders who have earlier failed to execute the work order(s) of SOUTHCO UTILITY shall not be eligible to participate in this tender.

(f) SOUTHCO UTILITY reserves the right to waive minor deviation, if they do not materially affect the capacity of the bidder to perform the contract.

3.0 The tender documents can be downloaded from any of the following websites [www.southcoodisha.com](http://www.southcoodisha.com) and [www.tenderizard.com/SOUTHCO](http://www.tenderizard.com/SOUTHCO). Tender papers are downloaded from these websites, and the bidder has to enclose a Demand Draft assign to each package as

per tender notice towards non-refundable cost of bid documents, drawn on any Scheduled bank in favour of “ADMINISTRATOR, SOUTHCO UTILITY Aska Circle expenditure Account payable at Aska.

**4. E.M.D & TIME SCHEDULES:**

SL. NO.	DESCRIPTION	SCHEDULE
1	Cost of Tender document	<i>Assign to each package as per Tender Notice.</i> (To be paid in shape of DD, in favour of “Administrator, SOUTHCO Utility Aska Circle expenditure Account, payable at Aska)
2	Bid security (EMD)	As mentioned in Tender Notice at page -3 in shape of DD in favour of “Administrator, SOUTHCO Utility Aska Circle expenditure Account, payable at Aska or in shape of BG in favour of “Administrator, SOUTHCO Utility Aska Circle expenditure Account, encashable at Aska branch of BG issuing Bank.
3	Tender processing fee	<i>As mentioned in Tender Notice at page -4. (To be paid to K.S.E.D.C.Ltd, Bangalore on e-payment mode. <b>NOTE: For tender processing fee the bidder can use various modes of e-payment facility available through Tender wizard Portal, i.e. by Credit Card, Debit Card, Net Banking).</b></i>
4	Issue of bid document	FROM : Dt. <b>15.12.2018 up to 27.12.2018 (1.00 PM)</b>
5	Last date of submission of online tender	Up to Dt. <b>27.12.2018 (5.00 PM)</b>
6	Last date and time of receipt of bid. (Hard Copy)	ON Dt. <b>28.12.2018 UP TO 01.00 PM</b>
7	Opening of Techno-commercial bid (Part-I)	ON Dt. <b>28.12.2018 on or after 03.00 PM</b>

5.0 All correspondence with regard to the above shall be made to the following address:

**Office of the Superintending Engineer, Electrical Circle,Aska.  
At-College Square, Po-Nuagam-761111, Aska(GM), Odisha.  
Email: - circlehead.aska@southcoodisha.com**

## **SECTION – II**

### **INSTRUCTION TO BIDDERS (ITB)**

**E - TENDER NOTICE NO. 07/18-19, ELEPHANT CORRIDOR -SOUTHCO  
UTILITY/ASKA CIRCLE/TRUNKEY, Dt. 15.12.2018.**



1. **SOURCE OF FUNDS:**

- 1.1 SOUTHCO Utility hereinafter referred to as the “Owner” is desirous of executing the work for **“System Strengthening Works in Elephant Corridor & Elephant Movement Areas on ‘trunkey’ basis** under SOUTHCO Utility from the funds available under **“Elephant Corridor”** scheme.

2. **SCOPE OF WORK:**

Installation of intermediate 11 KV RS Joist pole with all accessories.

3.0 **DISCLAIMER:**

- 3.1 This Document includes statements, which reflect various assumptions, which may or may not be correct. Each Bidder should conduct its own estimation and analysis and should check the accuracy, reliability and completeness of the information in this Document and obtain independent advice from appropriate sources in their own interest.
- 3.2 Neither Owner nor its employees will have any liability whatsoever to any Bidder or any other person under the law or contract, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage whatsoever which may arise from or be incurred or suffered in connection with anything contained in this Document, any matter deemed to form part of this Document, provision of Services and any other information supplied by or on behalf of Owner or its employees, or otherwise arising in any way from the selection process for the Supply & Erection / provision of Services for the Project.
- 3.3 Though adequate care has been taken while issuing the Bid document, the Bidder should satisfy him that documents are complete in all respects. Intimation of any discrepancy/ doubt shall be sent to the Owner address for speedy response.
- 3.4 This document and the information contained herein are **Strictly Confidential** and are for use of only the person (s) to whom it is issued/ downloaded from the website. It may not be copied or distributed by the recipient to third parties (other than in confidence to the recipient’s professional advisors).

4 **COST OF BIDDING:**

The Bidder shall bear all costs associated with the preparation and submission of its Bid and **SOUTHCO Utility** will in no case be responsible or liable for those costs.

5. **BIDDING DOCUMENTS:**

- 5.1 The Scope of Work, Bidding Procedures and Contract Terms are described in the Bidding Documents. In addition to the covering Letter accompanying Bidding Documents, the Bidding documents include:

- (a) Invitation of Bids (IFB) - Section –I
- (b) Instruction to Bidders (ITB) - Section –II
- (c) General Conditions of Contract (GCC) - Section –III
- (d) Technical Specification - Section –IV
- (e) Annexure - Section –V

- 5.2 The Bidder is expected to examine the Bidding Documents, including all Instructions, Forms,

Terms and Specifications. Failure to furnish all information required in the Bidding documents or submission of a Bid not substantially responsive to the Bidding Documents in every respect will / may result in the rejection of the Bid.

## 6. **AMENDMENT OF BIDDING DOCUMENTS:**

- 6.1 At any time prior to the deadline for submission of Bids, the **Owner** may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by way of issuing a corrigendum/addendum.
- 6.2 The corrigendum/ Addendum shall be part of the Bidding Documents, and it will be notified on the website only. Interested bidders may visit SOUTHCO's website [www.southcoodisha.com](http://www.southcoodisha.com) or [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) for detail enquiry.
- 6.3 In order to afford prospective Bidders reasonable time in which to take the amendment into account in preparing of their Bids, the **Owner** may, at its discretion, extend the deadline for the submission of Bids.

## 7. **LANGUAGE OF BID:**

The Bid, prepared by the Bidder, and all correspondence and documents relating to the Bid exchanged by the Bidder and the **Owner**, shall be written in the English Language. Any printed literature furnished by the Bidder may be written in another Language, provided that the literature is accompanied by an English translation, in which case, for purposes of interpretation of the Bid, the English translation shall govern.

## 8.0 **SUBMISSION OF BID:-**

### 8.1 **MODE OF SUBMISSION OF BID:-**

The bidder shall submit the bid in Electronic Mode only i.e. in [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) portal. The bidder must ensure that the bids are received in the specified website of the SOUTHCO by the date and time indicated in the Tender notice. Bids submitted by telex/telegram will not be accepted.

- 8.2 The SOUTHCO Utility reserves the right to reject any bid, which is not submitted in electronic mode and according to the instruction, stipulated above.

### 8.3 **The tenders are required to be submitted online in Two Parts.**

#### 8.4 **First Fill up through online (Techno-commercial Part)**

##### 8.4.1

- (i) The Electronic Form/Template of the bid (Techno –Commercial bid), as available on the portal, shall be duly filled.
- (ii) Attachments –Scanned copy of documents in support of meeting the minimum qualifying requirement of the tender (both technical and financial, files named as 1.pdf to .....).

#### **Second Fill up through online (Price Bid)**

8.4.2 The Electronic Form/Template of the Price bid (as available on the portal) shall be duly filled up in the xls. Format and uploaded in the website only. **(No need to submit Hard copy of price bid).**

## 8.5 **PARTICIPATION IN e-TENDER:-**

### **ACQUISITION OF DIGITAL SIGNATURE CERTIFICATE**

- (i) For all the users it is mandatory to procure the Digital Signatures of Class III only.
- (ii) Bidders / Contractors are requested to follow the below steps for registration.

### **REGISTRATION IN TENDER WIZARD PORTAL**

- (i) Log in [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) Click “Register”, fill the online registration Form.
- (ii) Payment for an amount of Rs. 2290/- shall be made to KSEDCL, Bangalore for vendor registration in tender wizard portal in e-payment mode only.  
The bidders/supplier who have already registered in e-tendering site of SOUTHCO, they need not to pay the registration amount to KSEDCL again for this tender.
- (iii) As soon as the verification is being done the e-tender user id will be enabled/provided.

## 9.0 **ON LINE REQUEST FOR e-tender DOCUMENTS.**

9.1 After viewing Tender Notification in [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) if bidder intends to participate in tender, he has to use his e-tendering User Id and Password which has been received after registration and acquisition of DSCs (Digital signature certificate). If any Bidder wants to participate in the tender he has to follow the instructions given below.

- (i) Insert the PKI (which consist of your Digital Signature Certificate) in your System. (Note: Make sure that necessary software of PKI be installed in your system).
- (ii) Click / Double Click to open the Microsoft Internet Explorer (This icon will be located on the Desktop of the computer).
- (iii) Go to Start > Programs > Internet Explorer. Type [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) in the address bar, to access the Login Screen.
- (iv) Enter e-tender User Id and Password, click on “Go”. Click on “Click here to login” for selecting the Digital Signature Certificate. Select the Certificate and enter DSC Password. Re-enter the e- Procurement User Id Password
- (v) Click “Un Applied” to view / apply for new tenders.

(vi) Click on Request icon for online request. After making the request, bidder has to pay the requisite tender processing fee (as indicated in tender notice Page -3) through **e-payment** facility only available in the portal. Bidders will receive the Tender Documents which can be checked and downloaded by following the below steps.

(vi) Click to view the tender documents which are received by the user. Tender document screen appears.

(vii) Click "Click here to download" to download the documents.

**NOTE: For vendor registration and payment of tender processing fee to KESDCL, the bidder can use various modes of e-payment facility available through Tender wizard Portal, i.e. by Credit Card, Debit Card, Net Banking.**

9.2

### **ONLINE SUBMISSION OF BID**

The bidder has to furnish the **Tender cost, BID SECURITY (EMD) and a set of hard copy of supporting documents uploaded in this tender except bid sheets (.xls)** prior to last date and time of receipt of bids as specified in tender Notice. Tender processing fees is mandatory & to be paid on e-payment mode as stated elsewhere in the document.

### 10.0 **PROPER FILLING UP OF THE PRICE SCHEDULE:**

The bidder should fill up the Techno commercial and price schedule properly and fill in the bid sheets provided in .xls format and up-load the same without changing the file name. The tender may be rejected if the schedule of price is submitted in incomplete form.

**NB: The bid sheets (.xls file) shall be uploaded in [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) portal, prior to online closing of the tender. By no other means (except online) price bid shall be accepted for evaluation of tender.**

(i) After completing all the formalities Bidders will have to submit the tender as specified NIT and they must take care of all instructions. Prior to submission, verify whether all the required documents have been attached and uploaded to the particular tender or not.

**Note down / take a print of bid control number once it displayed on the screen**

(ii) Tender Opening event can be viewed online.

(iii) Competitors bid sheets are available in the website for all participated bidders.

### **NOTES:**

**For any e-tendering assistant contact help desk number, 080- 40482000(Bangalore). SOUTHCO HELP DESK- 09937140591,**

### 11.0 **DEAD LINE FOR SUBMISSION OF BIDS**

Soft copy of the bid shall be uploaded through the portal [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) on or **before the online submission time and date as stipulated in the bidding document**. DD towards Tender cost, DD/BG towards Bid Security & **a set of all required documents (except bid sheets in .xls format)** must be received by SOUTHCO Utility at the address specified not later than the time and date stated in the tender

notification. In the event of the specified date for the submission of bids being declared a holiday for SOUTHCO Utility, the bids will be received on the next working day as per the time indicated in tender notification.

- 12.0 SOUTHCO Utility may, at its discretion, may extend this deadline for submission of bids by amending the Bidding Documents in accordance with ITB for the reasons specified therein at any time prior to opening of bid, in which case all rights and obligations of Employer and bidders will thereafter be subject to the deadline as extended.

### **LATE BIDS**

(i) Soft part of the bid will not be uploaded on the portal after expiry of submission time and the bidder shall not be permitted to submit the same by any other mode. In such case, even if the bidder has submitted the specific documents in hard copy in original (viz., bid security, tender cost & any other document) within the stipulated deadline, its bid shall be considered as late bid. The hard copy submitted [specific documents (viz., bid security, tender cost.)] shall be returned unopened to the bidder.

- 13.0 (ii) Hard copy of the bid security of the bid received by SOUTHCO Utility after the deadline for submission of bid prescribed by the GTCC will be considered as late bid even if the bidder has uploaded the soft part of the bid within the stipulated deadline. In such a case, the soft part of the bid uploaded on the portal shall be sent unopened to "Archive" and shall not be considered at all any further.

### **MODIFICATION AND WITHDRAWAL OF BIDS:-**

Bidder may modify or withdraw its bids through the relevant provisions on the portal [www.tenderwizard.com/SOUTHCO](http://www.tenderwizard.com/SOUTHCO) up to due date and time of submission of bid indicated in tender notification.

The Bidder's modifications shall be done and submitted as follows:

Modified Electronic form of the bid as per the provision of portal therein.

Bidder may withdraw its bid through the relevant provisions of portal only.

**No bid shall be modified/ withdrawn subsequent to the dead line for submission of bids. Withdrawal/modification of bid before the expiry of bid validity shall result forfeiture of Bidder's bid security.**

### **(A) Hard copy of the followings should be submitted with SOUTHCO:**

- (i) Tender Cost
- (ii) Tender processing fee acknowledgement copy.
- (iii) Bid Security (EMD) in shape of DD/BG as described.
- (iv) Self attested copies of Work orders (All pages) as a proof of past Work experience.
- (V) Self attested copy of Labour License.
- (Vi) Self attested copy of Valid electrical (HT) license for electrical works.

- (vii) Self attested copy of performance certificate.
- (viii) Self attested copy of Inspection Report for the work experience submitted.
- (ix) Self attested copy of PAN Card, GSTIN registration certificate.
- (x) Self attested copy of EPF & ESI: Registration along with last month self attested challan copy
- (xi) Self attested copy of Last 3 yrs. Audited annual reports for companies & partnership firm. In case of individuals, Income Tax returns with audited annual P/L & B/S.
- (xii) Self attested copy of GST Registration along with last month self attested Challan copy
- (xiii) All uploaded file except price bid .The same shall be uploaded in www.Tenderwizard. com / SOUTHCO portal only.
- (xiv) Dully filled up formats of bid document in annexure-I, II, VIII & IX and other annexure as per requirement.

**14.0 E.M.D:**

- 14.1 The bidder shall submit E.M.D as a part of the bid in the prescribed manner for the amount mentioned in Clause No.4 of Section –I.
- 14.2 The E.M.D is required to protect the Owner against the risk of bidder’s conduct, which would warrant the security’s forfeiture.
- 14.3 The E.M.D shall be in the following form:

**A/C payee demand draft in favour of “Administrator, SOUTHCO Utility Aska Circle expenditure Account” issued by a Schedule bank payable at Aska.**

**OR**

**Bank Guarantee in favour of “Administrator, SOUTHCO Utility Aska Circle expenditure Account” issued by a Schedule bank encashable at local branch at Aska only. The BG shall be strictly as per the format enclosed at Section – V, Annexure – XI (A).**

**NB: In case of any deficiency such as the ownership of the security bond (other than the issuing bank), deviation from the approved format, absence of signature of witness etc. found in the EMD Bank Guarantee, the same shall be liable for rejection upfront. The bidder will not be given any chance to rectify the same.**

**NB: 1) The validity of EMD BG shall be minimum for 30 days over and above the validity of the tender (180 days) i.e., 210 days from the date of opening of the tender.**

**2) In case of Joint Venture / Consortium, EMD in shape of BG shall be provided by the Lead Partner.**

- 14.4 Unsuccessful bidder’s E.M.D shall be refunded back as promptly as possible, but not later than thirty (30) days after the expiry of the period of bid validity. The successful bidder’s E.M.D shall be discharged upon furnishing of the performance security.
- 14.5 The E.M.D may be forfeited due to following reasons:
  - 1) If the bidder withdraws bid during the period of bid validity specified by the bidder in the bid form.
  - 2) In case the successful bidder fails to sign the contract in specified time and / or fails to submit the requisite performance Bank guarantee.
  - 3) In case of failure to execute the work during the contractual delivery period.

**15.0 BID PRICE:**

- 15.1 Bidders have to quote for the entire quantum of work covered under this specification strictly as per the enclosed .xls format. The total Bid Price shall also cover all the Contractor's obligations mentioned in or reasonably to be inferred from the Bidding Documents in respect of Supply, erection, testing, inspection, Transportation to site/stores, all in accordance with the requirement of Tender Documents. The Bidder shall complete the appropriate Price Schedules enclosed in .xls format stating the Taxable value for each item including Packing & forwarding, freight & insurance, loading & unloading charges but excluding GST and thereby arriving at the total amount before GST. The bidder should also consider the input tax credit available to them while quoting the price. GST should be added at last to arrive the total value of the work as indicated in the price bid. Price evaluation shall be carried out on the basis of total value of work including GST.
- 15.2 In case there is any increase or decrease in the Scope as compared to those mentioned in the IFB, the Contract Price shall be subject to increase or decrease proportionately on pro-rata basis.
- 15.3 Prices quoted by the Bidder shall be "**Firm**" and not subject to any price adjustment during the performance of the Contract. **A Bid submitted with variable Price or an adjustable price clause shall be treated as non-responsive and rejected out rightly.**

**16.0 CONTRACT PRICE:**

The taxable value of supply & erection quoted for the contract shall remain FIRM as per the above parameters and Owner shall not compensate Bidder for any variations. However any variation in the rate of GST within the schedule date of execution of the contract shall be borne by the owner, else the same shall be borne by the bidder.

**17.0 BID CURRENCIES:**

Prices shall be quoted in Indian Rupees Only.

**18.0 VALIDITY.**

The offer shall be valid for a period not less than **90 days** from the date of bid opening (Technical).

**19.0 ALTERNATIVE BIDS:**

Bidders shall submit Bids, which comply with the Tender Documents. **Alternative bids shall not be considered for evaluation.**

**20. ONE BID PER BIDDER:**

Each Bidder shall submit only one Bid either by himself, or as a partner in a Joint Venture/Consortium. A Bidder who submits or participates in more than one Bid for the same, either individually or jointly, will cause all those Bids to be rejected out rightly.

**21. CLARIFICATION OF BIDS:**

To assist in the examination, evaluation and comparison of Bids, the Owner may, at its discretion, ask the Bidder for a clarification of its Bid. All responses to requests for clarification shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted.

**Superintending Engineer  
Electrical Circle, Aska  
SOUTHCO Utility.**

## **SECTION – III**

### **GENERAL CONDITIONS OF CONTRACT (GCC)**

**E - TENDER NOTICE NO. 07/18-19, ELEPHANT CORRIDOR -SOUTHCO  
UTILITY/ASKA CIRCLE/TRUNKEY, Dt. 15.12.2018.**



## 1.0 GENERAL: -

SOUTHCO Utility hereinafter referred to as the "Owner" is desirous of executing the work for "System Strengthening Works in Elephant Corridor & Elephant Movement Areas on 'trunkey' basis under SOUTHCO Utility from the funds available under "Elephant Corridor" scheme.

### 2.0 Scope of Work: -

2.01 The scope shall include supply and installation of all materials & equipments to complete the works as per **Annexure-A**.

2.02 The detailed scope of the work shall include;

- i. Detailed survey of substation, line and preparation of SLD / BOQ to be done by the bidder
- ii. Complete manufacture, including shop testing & supply of materials from the approved vendor (materials which are to be supplied by the bidder) on subsequent approval of the owner (IS and REC standard)
- iii. Packing and transportation from the manufacturer's works to the site.
- iv. Receipt, storage, preservation and conservation of equipment at the site.
- v. Pre-assembly, if any, erection testing and commissioning of all the equipment;
- vi. Reliability tests and performance and guarantee tests on completion of commissioning;
- vii. Loading, unloading and transportation as required.
- viii. LT pole foundation shall be with boulder packing and HT pole foundation with PCC 1:3:6.
- ix. Erection of equipments in Sub-station including civil works.
- x. Trees shall be trimmed/ pruned so as to maintain minimum clearance of 2.6 Metres. between 11 KV bare conductors and trees
- xi. Erection of lines of specified voltage.
- xii. Inspection, Testing, Commissioning of substations and lines / installations
- xiii. Storing before erection
- xiv. Getting the substations & lines inspected as per Elephant Corridor guideline of GoO after completion of work.
- xv. Dismantling of existing electrical structures and return of these dismantled items at the Owner's stores, safe custody of the items and return of unused Owner's supplied materials to the Owner's stores.
- xvi. The poles shall be provided with cement concrete coping of 300 Mm. heights above ground level.
- xvii. Minimum ground clearance shall be 5.5 metres for LT AB Cable and 6.1 metres for HT AB Cable and HT bare conductor.

## 3.0 DEFINITION OF TERMS

- (i) The '**Contract**' means the agreement entered into between the Owner and the Contractor as

per the Contract Agreement signed by the parties, including all attachments and appendices there to and all documents incorporated by reference therein.

- (ii) **'Owner'** shall mean SOUTHCO Utility and shall include its legal representatives, successors and assigns.
- (iii) **'Contractor'** shall mean the Bidder whose bid will be accepted by the Owner for the award of the Works and shall include such successful Bidder's legal representatives, successors and permitted assigns.
- (iv) **'Sub-Contractor'** shall mean the person named in the Contract for any part of the works or any person to whom any part of the Contract has been sublet by the contractor with the consent in writing of the Owner and will include the legal representatives, successors and permitted assigns of such person.
- (v) **'Engineer in Charge'** shall mean the officer appointed in writing by the Owner to act as Engineer from time to time for the purpose of the Contract.
- (vi) **'Specifications'** shall mean the specifications and Bidding Document forming a part of the Contract and such other schedules and drawings as may be mutually agreed upon.
- (vii) **'Site'** shall mean and include the land and other places on, into or through which the works and the related facilities are to be erected or installed and any adjacent land, paths, street or reservoir which may be allocated or used by the Owner or Contractor in the performance of the Contract.
- (viii) **'Inspector'** shall mean the Purchaser or any person nominated by the Owner from time to time, to inspect the equipment; stores or Works under the Contract and/or the duly authorized representative of the Owner.
- (ix) **'Notice of Award of Contract'/'Letter of Award'** shall mean the official notice issued by the Owner notifying the Contractor that his bid has been accepted.
- (x) **'Date of Contract'** shall mean the date on which notice of Award of Contract/ Letter of Award has been issued.
- (xi) **'Performance and Guarantee Tests'**, shall mean all operational checks and tests required to determine and demonstrate capacity, efficiency, and operating characteristics as specified in the Contract Documents.
- (xii) The term **'Final Acceptance'/'Taking Over'** shall mean the Owner's written acceptance of the works performed under the Contract, after successful commissioning/ completion of Performance and Guarantee Tests, as specified in the accompanying Technical Specifications or otherwise agreed in the contract.
- (xiii) **'Commercial Operation'** shall mean the condition of operation in which the complete equipment covered under the Contract is officially declared by the Owner to be available for continuous operation at different loads up to and including rated capacity. Such declaration

by the Owner, however, shall not relieve or prejudice the Contractor of any of his obligations under the Contract.

- (xiv) Words imparting '**Person**' shall include firms, companies, corporations and associations or bodies of individuals, whether incorporated or not.
- (xv) Terms and expressions not herein defined shall have the same meaning as are assigned to them in the Indian Sale of goods Act (1930), failing that in the Indian Contract Act (1872) and failing that in the General Clauses Act (1897) including amendments thereof, if any.
- (xvi) In addition to the above the following definition shall also apply
  - a) '**All equipment and materials**' to be supplied shall also mean '**Goods**'
  - b) '**Constructed**' shall also mean erected and installed.
  - c) '**Contract Performance Guarantee**' shall also mean '**Contract Performance Security**'.

#### **4.0 SUBMISSION OF TENDER: -**

As detailed in ITB

#### **5.0 VALIDITY:-**

The offer shall be valid for a period not less than **90 days** from the date of bid opening.

#### **6.0 PRICE:-**

The Bidder shall complete the appropriate Price Schedules enclosed in .xls format stating the Taxable value for each item including Packing & forwarding, freight & insurance, loading & unloading charges but excluding GST and thereby arriving at the total amount before GST. The bidder should also consider the input tax credit available to them while quoting the price. The taxable value so quoted for the Contract shall remain FIRM as per the above Parameters and Owner shall not compensate Bidder for any variations. However any variation in the rate of GST within the schedule date of execution of the contract shall be borne by the Owner, else the same shall be borne by the bidder. **GST should be added at last to arrive the total value of the work as indicated in the price bid. Price evaluation shall be carried out on the basis of total value of work including GST.**

#### **7.0 OPENING OF THE BID: -**

- 7.01 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 persons not officially concerned with such process. Any effort by a Bidder to influence the Owner's processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

#### **8.0 EVALUATION OF BIDS & AWARD OF CONTRACT:**

- 8.01 To assist in the examination, evaluation and comparison of Bids, the Owner may, at its discretion, ask the Bidder for a clarification of its Bid. All responses to requests for clarification shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted.
- 8.02 Owner will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bids are generally in order.
- 8.03 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price per item will be corrected. If there is a discrepancy between the Total Amount and the sum of the total price per item, the sum of the total price per item shall prevail and the Total Amount will be corrected.
- 8.04 Prior to the detailed evaluation, Owner will determine the substantial responsiveness of each Bid to the Bidding Documents including production capability and acceptable quality of the Goods offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Bidding Documents without material deviation.
- 8.05 The Owner's evaluation of a Bid will take into account, in addition to the Bid price, the following factors, in the manner and to the extent indicated in this Clause:
- (a) Work Schedule
  - (b) Deviations from Bidding Documents
- 8.06 The Owner will award the Contract to the successful Bidder whose Bid has been determined to be the lowest - evaluated responsive Bid, when the lowest bidder is not ready and/or capable to undertake the entire work envisaged, then the Owner may explore the possibility of the execution of works through other bidders if they are willing to execute at L<sub>1</sub> rate. Such exploration shall be carried out in a sequential order starting with L<sub>2</sub> bidder then with L<sub>3</sub> bidder and so on.
- 8.07 In case of omission of any item in the price bid or the price for the item has not been quoted by the firm, then zero cost shall be loaded to the bid and the contract shall be awarded with zero cost that means the firm will have to bear the cost of that item entirely as the item price shall be considered as inclusive anywhere in other items. The bidder shall have to give an undertaking to the effect that prices for any item not quoted shall be treated as free supply or to be done free of cost.

**9.0 EARNEST MONEY DEPOSIT (EMD):-**

9.01 The Tender must be accompanied by Earnest Money Deposit as described in the Tender Notice in shape of Bank Guarantee issued by a Scheduled Bank (valid for 30 days beyond the validity of bid) only and en-cashable at Aska or in shape of Demand Draft drawn on any scheduled bank in favour of “ADMINISTRATOR SOUTHCO UTILITY Aska Circle expenditure account.” payable at Aska. **Bids without EMD deposit will be rejected out rightly.** The Bank Guarantee for EMD shall be strictly as per the format (Annexure – as enclosed) prescribed by the Owner. In case of any deficiency such as the ownership of the security bond (other than the issuing bank), deviation from the approved format, absence of signature of witness etc. found in the EMD Bank Guarantee, the same shall be liable for rejection upfront. The bidder will not be given any chance to rectify the same.

**NB:** 1) **The validity of EMD BG shall be minimum for 30 days over and above the validity of the tender (90 days) i.e., 120 days from the date of opening of the tender.**  
2) **In case of Joint Venture / Consortium, EMD in shape of BG shall be provided by the Lead Partner.**

9.02 No adjustment of any previous deposit or any amount payable from Purchaser shall be entertained for EMD. EMD amount so submitted shall not carry any interest payable to the bidder.

9.03 The Earnest Money so deposited shall be forfeited:

(a) if the Bidder:

i) withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or

(b) in the case of a successful Bidder, if the Bidder fails:

(i) to sign the Contract, or

(ii) to furnish the required Contract Performance Bank Guarantee.

9.04 The EMD of unsuccessful bidders shall be returned within 30 days from the date of finalization of the order.

#### **10.0 OWNER’S RIGHT TO VARY QUANTITIES AT TIME OF AWARD:**

While placing orders and / or during execution of contract, Owner reserve the right to increase or decrease the quantity of goods and services specified in the Schedule of Requirement up to **20%** of the tender quantity without any change in price or other terms and conditions.

#### **11.0 INSPECTION AND TESTING:-**

1. As & when required, the new electrical installation works are to be inspected by electrical inspector for judging the safety & technical features.
2. In the interest of quality & safety installation a 3rd party inspection of the works is suggested as & when required.
3. The copy of inspection reports of DISCOM officials/ Electrical Inspectors/ DFOs shall be sent to the concerned Collectors with a copy to Energy Department, Govt. Of Odisha.
4. DISCOM authorities shall intimate concerned Electrical Inspector for inspection of the work in the elephant corridor in presence of DFO/ Representative of DFO and DISCOM authorities.
5. The major materials such as RS Joist poles, Conductor, AB Cable shall be inspected by the Owner or any authorized representative of the Owner or jointly by the Owner/Owners Authorized Representatives and outsource independent third party agencies as per relevant ISS at the Contractor's or its Sub-Vendors manufacturing works. All other minor materials shall be inspected by the Owner or any authorized representative of the Owner only. They shall give the advance notice in writing about the place of Inspection and or testing at least 15 days before the schedule date on which the materials will be ready for Inspection & Testing.
6. The Engineer-in-charge shall be entitled at all reasonable times during installation to inspect / examine and test the materials at the contractor's store / erection site about workmanship of the materials to be supplied under this contract. If the said materials are being manufactured in other premises, the contractor shall provide unhindered clearance, giving full rights to the purchaser to inspect, examine and test as if the materials were being manufactured in his premises. Such inspection / examination and testing shall not relieve the contractor of his obligations to execute the contract by letter and spirit. The contractor shall give the purchaser advance notice in writing of the Date and the Place at which the materials will be ready for testing. The inspecting officer coordinating office for the entire work shall be the Owner's authorized representative.

## **12.0 COMPLETION AND COMPLETENESS OF THE EQUIPMENT:-**

- 12.01 Time being the essence of the contract; the work shall be completed within 01 **(One)** months from the date of issue of work order.
- 12.02 The work shall be treated as complete item wise when one item shall be complete in all respects with all mountings, fixtures and standard accessories which are normally supplied even though not specifically detailed in the specification. No extra payment shall be payable for such mounting, fittings, fixtures and accessories which are needed for safe operations of the equipment as required by applicable code of the country though this might not have included in the contract.

12.03 All similar components and/or parts of similar equipment supplied shall be inter-changeable with one another. Various equipments supplied under this contract shall be subject to Owner's approval.

12.04 Purchaser however reserves the right to re-schedule the completion period, if required.

**13.0 REJECTION OF MATERIALS: -**

In the event of the materials supplied by the contractor and/or the installation works are found to be defective in quality and the workmanship is poor or otherwise not in conformity with the requirements of the contract specification as per section-IV (Technical specification), Owner shall reject such materials / services and ask the contractor in writing to replace / rectify the defects. The contractor on receipt of such notification shall rectify or replace the defective materials and/or re-install the work already executed, free of cost to the Owner. If the contractor fails to do so the Purchaser may at his option take the following actions which could be on concurrent basis.

- A) Replace or rectify such defective materials and recover the extra cost so involved plus 25% from the Contractor.
- B) Terminate the contract for balance supply and erection with enforcement of penalty as per contract.
- C) Acquire the defective materials at reduced price considered acceptable under the circumstances.
- D) Forfeit the Contract Performance Bank Guarantee.

**14.0 EXPERIENCE OF BIDDERS: -**

The bidders are required to furnish information regarding their experience on the following aspects as per format provided in Section – IV, Annexure VII (A) & (B):

- i. Description of similar type of work with same or higher voltage level executed during the last three years with the name(s) of the party(s) to whom / where supplies / erection were made.
- ii. Purchase / work orders details (P.O / W.O No. and date only) executed (construction work) during the last three years along with Electrical inspection report copies and copies of user's performance certificates.

Bids may not be considered if the past performance is found to be un-satisfactory.

**15.0 DEVIATION FROM SPECIFICATION: -**

The bidders are requested to study the specification and the attached drawings thoroughly before tendering so that if they make any deviations, the same are prominently brought on a separate sheet under the headings "Deviations" as per formats provided under Section IV, Annexure – VIII

& IX. All such deviations to the technical & commercial terms of the specification shall be indicated in a separate list as indicated above. In absence of such deviation schedule, it will be presumed that the bidder has accepted all the conditions stipulated in the tender specification, not withstanding any deviations mentioned elsewhere in the Bid. However the acceptance of deviation is not binding on the Owner.

**16.0 CONTRACTOR TO INFORM HIMSELF FULLY: -**

The contractor shall examine the instructions, general conditions of the contract, specifications and the schedule of quantity and delivery to satisfy himself as to all the terms and conditions and circumstances affecting the contract price. He shall quote prices according to his own judgment and shall understand that no additional cost except as quoted shall only be considered.

**17.0 PATENT RIGHT: -**

The contractor shall indemnify the Owner against all claims, actions, suits and proceedings for the alleged infringement any patent design or copy right protected either in country of origin or in India by the use of any equipment supplied by the contractor but such indemnity shall not cover any use of the equipment other than for the purpose indicated by or reasonable to be informed from the specification.

**18.0 GUARANTEE PERIOD: -**

18.01 The materials to be supplied by the contractor shall be guaranteed for satisfactory operation against defects in design and workmanship for a period of **24 months** from the date of handing over the completed installations after commercial operation at required voltage level.

18.02 The above guarantee certificate shall be furnished in triplicate to the Owner for his approval. Any defects noticed during the above period should be rectified by the Contractor free of cost to the Utility provided such defects are due to faulty design, bad workmanship or bad materials used on receipt of written notice from the Owner. The Contractor as notified by the Owner shall rectify any such defects within one month failing which the Owner will set right the defects through other agency and recover the cost so incurred either from any pending Invoices or Bank Guarantee.

**19.0 PENALTY FOR DELAY IN COMPLETION OF CONTRACT: -**

19.01 If the contractor fails to complete the works by the scheduled period or any extension granted thereby, the contractor shall be liable for payment of penalty amounting to **0.5% (half percent)** of the contract price per week of un-finished works subject to the maximum of **5% (five percent)** of the total contract price and subject to force majeure conditions. After receipt of LOA, the Contractor shall submit detail work plan through PERT chart/BAR chart with the Owner within 15 days. The penalty for liquidated damage as mentioned above will be levied if any deviation to be schedule on any item of work due to the fault of the contractor is observed.



19.02 Penalty amount can be realized from the proceeds of the Contract Performance Bank Guarantee, if the situation so warrants.

19.03 Extension of delivery period could be with / without levy of penalty with the discretion of Owner.

**20.0 RIGHT OF WAY:**

Right of way issues, if any, arising during execution of the works shall have no liability on the Owner. These issues shall be settled at the sole discretion of the Contractor. The Owner shall however extend all possible help to the Contractor including discussion with the local authorities for early resolution of these issues.

**21.0 CONTRACTOR'S DEFAULT:**

21.01 If the Contractor neglects to execute the works with due diligence and expedition or refuses or neglects to comply with any reasonable order given to him, in writing by the Engineer in connection with the works or contravenes the provisions or the contract, the Owner may give notice in writing to the Contractor to make good the failure, neglect or contravention complained of. Should the Contractor fail to comply with the notice within thirty (30) days from the date of serving the notice, the Owner shall be at liberty to employ other workmen and forthwith execute such part of the works as the contractor may have neglected to do or if the Owner thinks fit, without prejudice to any other right, he may have under the Contract to take the work wholly or in part out of the Contractor's hands and re-contract with any other person or persons to complete the works or any part thereof and in that event the Owner shall have free use of all Contractor's equipment that may have been at the time on the Site in connection with the works without being responsible to the Contractor for fair wear and tear thereof and to the exclusion of any right of the Contractor over the same, and the Owner shall be entitled to retain and apply any balance which may otherwise be due on the Contract by him to the Contractor, or such part thereof as may be necessary, to the payment of the cost of executing the said part of works or of completing the works as the case may be. If the cost of completing of works or executing part thereof as aforesaid shall exceed the balance due to the Contractor, the Contractor shall pay such excess. Such payment of excess amount shall be independent of the liquidated damages for delay which the Contractor shall have to pay if the completion of works is delayed.

21.02 In addition, such action by the Owner as aforesaid shall not relieve the Contractor of his liability to pay liquidated damages for delay in completion of works.

21.03 Such action by the Owner as aforesaid the termination of the Contract under this clause shall not entitle the Contractor to reduce the value of the Contract Performance Guarantee nor the time thereof. The Contract Performance Guarantee shall be valid for the full value and for the full period of the Contract including guarantee.

**22.0 TERMINATION OF CONTRACT ON OWNER'S INITIATIVE:**

- 22.01 Owner reserves the right to terminate the Contract either in part or in full due to reasons other than those mentioned under clause entitled 'Contractor's Default'. The Owner shall in such an event give fifteen (15) days notice in writing to the Contractor of his decision to do so.
- 22.02 The Contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice, make all reasonable efforts to obtain cancellation of all orders and Contracts to the extent they related to the work terminated and terms satisfactory or the Owner, stop all further sub-contracting or purchasing activity related to the work terminated, and assist Owner in maintenance, protection, and disposition of the works acquired under the Contract by the Purchaser. In the event of such a termination the Contractor shall be paid compensation, equitable and reasonable, dictated by the circumstance prevalent at the time of termination to be determined by the arbitrator without stopping the work but to carry out the left over work to other agency.
- 22.03 If the Contractor is an individual or a proprietary concern and the individual or the proprietor dies and if the Contractor is a partnership concern and one of the partners dies then unless the Owner is satisfied that the legal representatives of the individual Contractor or of the proprietor of the propriety concern and in the case of partnership, the surviving partners, are capable of carrying out and in the case of partnership, the surviving partners, are capable of carrying out and completing the Contract the Owner shall be entitled to cancel the Contract as to its uncompleted part without being in any way liable to payment of any compensation to the estate of deceased Contractor and /or to the surviving partners of the Contractor's firm on account of the cancellation of the contract. The decision of the Owner that the legal representatives of the deceased Contractor or surviving partners of the Contractor's firm cannot carry out and complete the contract shall be final and binding on the parties. In the event of such cancellation the Owner shall not hold the estate of the deceased Contractor and/ or the surviving partners of the Contractor's firm liable to damages for not completing the Contract.

**23.0 FORCE MAJEURE: -**

The Contractor shall not be liable for any penalty for delay or for failure to perform the contract for reasons of Force Majeure such as "acts of God, acts of the Public enemy, acts of Govt., Fires, Flood, Epidemics, Quarantine restrictions, Strikes, Freight Embargos and provided that the Contractor shall within ten (10) days from the beginning of such delay notify the Owner in writing of the cause of delay. The Owner shall verify the facts and grant extension as facts justify.

**24.0 EXTENSION OF TIME: -**

If the delivery of the equipments / materials is delayed due to reasons beyond the control of the Contractor, the Contractor shall immediately inform well in advance of his claim for an extension

of time. The Owner on receipt of such notice may agree to extend the contract period as may be reasonable but without prejudice to other terms & conditions of the contract.

**25.0 SAFETY PRECAUTIONS:-**

The agency shall observe all applicable regulations regarding safety at the Site. Any compensation due on account of accident at site shall be to the contractor's account.

**26.0 STORE:-**

Storing of materials from supply to erection shall be arranged by the contractor at his own cost. No compensation shall be made by the Owner for any damage or loss of materials during storing, transit transportation and at the time of erection.

**27.0 INSURANCE: -**

Contractor shall arrange adequate Transit-cum-storage-cum-erection policy and shall submit the copy of the same to the Owner. The policy shall initially remain valid for a period of sixty days over & above of the Contract completion period and shall be extended as required till handing over. Contractor shall be responsible for lodging of claim with the insurer as well as for all required follow up with the insurer for settlement of claim in case of loss/damage/theft of material during transit/storage/erection till the completed works is handed over to the Purchaser and is accepted by the authorized representative of the Purchaser in writing.

Contractor shall also arrange adequate cover for his employees / labourers engaged in the works as well as arrange third party insurance cover to indemnify any possible damages to public at large not connected with the works process. Any claim(s) pertaining to this shall be the responsibility of the Contractor.

The contractor shall undertake free replacement of the materials damaged or lost during transit, which will be intimated by the Consignee within 30 days of receipt of the materials at Owner's stores.

**28.0 PROJECT MANAGER AND ENGINEER IN CHARGE:-**

Executive Engineer, AED-II Division, Kabisuryanagar shall be the Project Manager and Sub Divisional officer, Buguda shall be the Engineer-in-Charge for the entire above project.

**29.0 CONTRACT PERFORMANCE BANK GUARANTEE:-**

29.01 Within 15 days of issue of the Work Order or Letter of Award, whichever is earlier, the Contractor shall submit Contract Performance Bank Guarantee issued by a scheduled Bank, in favour of the Owner, covering 10% of the total value of the work order,

29.02 The said Bank Guarantee shall be prepared in the prescribed proforma as attached in Section IV, Annexure - III. The Bank Guarantee furnished shall be executed on Non-judicial Stamp paper

worth of Rs 100/- (Rupees Hundred only), purchased in the name of the issuing bank, as per the prevalent rules. **The Bank Guarantee so provided shall be en-cashable on the Aska branch of the issuing Bank.**

29.03 The Contract Performance Bank Guarantee shall remain valid for a period not less than 90 days over and above the guarantee period, basing on stipulated completion period in the W.O. towards security and acceptance thereof, failing which the work orders (W.O) will be liable for cancellation without any further notice with forfeiture of E.M.D.

29.04 No interest shall be allowed by the Owner on the above Performance Security Deposit.

**29.5 If the Contractor fails to submit the required CPBG, the required CPBG amount shall be recovered from the contractor @ 10% from each RA bills.**

**Note: In case of joint venture/consortium Performance Bank Guarantee shall be provided by the Lead Partner @ 10% and additional 1% by each JV Partner(s).**

### **30.0 TERMS OF PAYMENT:**

30.01 90% (Ninety percent) of contract price on pro-rata basis along with taxes and duties shall be paid progressively (after necessary advance adjustment with interest as applicable) for each completed items of work certified by the Jr. Manager, Asst. Manager/SDO concerned against each calendar month by first week of the succeeding months along with utilization certificate. No payment shall be released if the accounts for utilization of materials **unless** follow with proper certification by the concerned Jr. Manager, Asst. Manager/SDO within 30 days of submission of claim subject to certification by Owner's Engineer-in-charge on the basis of check points involved in such items of work.

30.02 Balance 10% (Ten percent) of contract price shall be paid after completion of all works, envisaged under this package including any additions and alterations, testing & commissioning, return of dismantled materials/ un-used free supply material, taking over certificate and entire stretch is fully ready for commercial operation. The payments shall be subjected to clearance from electrical inspectorate.

### **31.0 PAYING OFFICER:**

DDO AED-II Division shall be the paying authority for the above work..

### **32.0 OWNER'S RIGHTS: -**

The Owner reserves the right to accept any bid or reject any or all bids or cancel / withdraw invitation of bid or to vary the quantity for placement of order without assigning any reason to such decision. Such decision by the Owner shall bear no liability.

### **33.0 DISTINCT MARK ON EQUIPMENT AND MATERIALS:**

All the major equipments and materials required for the works shall have distinct mark of the manufacturer either by way of punching on metal part(s) and /or in built during casting and /or painting as per common practice. This should be clearly visible in day light in naked eyes.

### **34.0 DISPUTE RESOLUTION AND JURISDICTION: -**

- (a) Any disputes arising out of this contract shall be referred to the Authorised Officer, Southco Utility who shall decide the case as sole Arbitrator.
- (b) For the purpose of dispute resolution, this agreement shall be governed by the provision of Arbitration and Conciliation Act, 1996.
- (c) All disputes shall be subjected to exclusive jurisdiction of the Courts at Berhampur and the writ jurisdiction of Hon'ble High Court of Odisha at Cuttack.

### **35.0 TRANSFER AND SUB-LETTING**

The Contractor shall not sublet, transfer, assign or otherwise part with the Contract or any part thereof, either directly or indirectly, without prior written permission of the Owner.

### **36.0 SUBMITTALS REQUIRED AFTER AWARD OF CONTRACT**

36.01 Within 30 days of the effective date of contract the contractor shall provide three copies of an outline program of production, inspection, testing, delivery, survey, erection, pre-commissioning and commissioning in chart form. Included in the program will be the detailed schedule of drawing to be submitted.

36.02 The periodic progress report as required by the Owner shall be submitted by the contractor as per the format prescribed by the Engineer in Charge.

### **37.0 APPROVAL PROCEDURE OF SUB VENDORS & DRAWINGS OF BOUGHT OUT MATERIALS**

Three copies of all drawings, GTP, QAP shall be submitted for approval as per REC standard / corresponding IS and three copies for any subsequent revision.

### **38.0 TAKING OVER**

38.1 Upon successful completion of all the tests to be performed at site on equipment / materials supplied, erected and commissioned by the contractor, the supply engineer shall issue to the contractor a taking over certificate as a proof of the final acceptance of the equipment / materials on a written request within 10 days of commercial operation. Such certificate shall not be unreasonably withheld nor will the engineer delay the issuance thereof on account of minor omission or defects, which do not affect the commercial operation and / or cause any serious to

the equipment/material. The conditional Taking over Certificate can be issued if any minor omission or defects pointed by the Engineer-in-Charge/Supervising Officer/Electrical Inspector. The Contractor should rectify those defects within a month of conditional T.O.C failing which Owner will rectify those by replacing those materials or engaging other agencies. The amount so involved will be fully recovered from the Contractor's bill. Such certificate shall, however, not relieve the contractor of any of his obligations which otherwise survive by the terms & conditions of the contract after issuance of such certificate.

38.2 For the satisfaction of Owner about quality, the Owner shall have unreserved right for arrangement of testing of equipment/ materials and the complete system independently by self or any other agency chosen by the Owner. The contractor is expected to agree and extend necessary help during such test if necessary.

**39.0 LATENT DEFECT WARRANTY**

39.1 The period of latent defect warranty in terms of this bidding documents, shall be limited to one (01) years from the date of completion of Guarantee period.

**40.0 INDEMNIFY**

40.1 The Contractor, its successor and assignee shall indemnify the Owner, its successor and assignee from all current & future liabilities that may arise out of Turn Key Contract(s) entered into between the Owner & the Contractor under this Elephant corridor scheme. The Owner in term shall indemnify the GoO & GRIDCO.

**Superintending Engineer  
Electrical Circle, Aska  
SOUTHCO Utility.**

## **SECTION - IV**

### **ANNEXURE**

**E - TENDER NOTICE NO. 07/18-19, ELEPHANT CORRIDOR -SOUTHCO**

**UTILITY/ASKA CIRCLE/TRUNKEY, Dt. 15.12.2018.**

**BID PROPOSAL LETTER**

**Electrical Installation of Works under SOUTHCO UTILITY**

Bidder's Name and Address:

(in case of JV/Consortium, Name of JV/Consortium)

Bid Proposal Reference:

Person to be contacted:

Designation:

Telephone No. :

E-mail:

Fax No. :

**To,**

**Superintending Engineer  
Electrical Circle, Aska**

Dear Sir,

We the undersigned bidder have read and examined the detailed specification and bidding documents for execution of various electrical installations works and do herewith submit our bid for the following packages:

<b>Sl. No.</b>	<b>Name of the Owner</b>	<b>Name of the Package</b>	<b>Estimated Cost (Rs. in Cr.)</b>

We declare the following:

**1.0 PRICES AND VALIDITY:**

- 1.01 All the prices and price components stated in our bid proposal are firm and not subject to any price adjustment, in line with the bidding documents. All the prices and other terms and conditions of this proposal are valid for a period of 180 days from the date of opening of the bids. We further declare that prices stated in our proposal are in accordance with "Instructions to Bidders" of bidding documents.
- 1.02 We do hereby confirm that our bid prices as quoted in attached Schedules include all import duties and levies including license fees lawfully payable by us on imported items and other taxes, duties and levies applicable on bought – out components, materials, equipment and other items and confirm that any such taxes, duties and levies additionally payable shall be to our account.



- 1.03 We confirm that the GST on Works Contract, Turnover Tax or any other similar taxes under the GST Act, as applicable, are included in our quoted bid price and there shall not be any liability on this account to the Purchasers. We understand that Owner shall, deduct such taxes at source as per the rules and issue TDS Certificate to us.
- 1.04 We confirm that, in our Bid Price, we have considered GST in line with lawful prevalent practice.
- 1.05 Price components of various items are indicated in the B.O.Q. for the respective works.
- 1.06 We further declare that while quoting the price, the input tax credit as per relevant Government policies wherever applicable, have been taken into account.
- 1.07 We, having studied the bidding document in three volumes relating to taxes & duties and hereby, declare that if any income tax, charge on income tax or any other corporate tax is attracted under the law, we agree to pay the same.
- 1.08 We are aware that the Price schedules do not generally give a full description of the supplies to be made and work to be performed under each item and we shall be deemed to have read the Technical Specifications and other bidding documents and drawings to ascertain the full scope of work included in each item while filling in the related and prices. We agree that the entered rates and prices shall be deemed to include the full scope as aforesaid, including overheads and profits.
- 1.09 We understand that in the price schedule, if there is discrepancy between the unit price and total price, the same shall be corrected as per relevant provisions.
- 1.10 We declare that prices for items left blank in the schedules will be deemed to have been included in other items. The TOTAL for each schedule and the TOTAL of Grand summary shall be deemed to be the total price for executing the facilities and sections thereof in complete accordance with the contract, whether or not each item has been priced.

**2.0 CONSTRUCTION OF THE CONTRACT**

- 2.01 We declare that we are making the offer on the basis of indivisible supply-cum- Erection contract on a single source responsibility basis.

**3.0 BID SECURITY (EMD)**

We are enclosing Bank Draft / Bank Guarantee No. \_\_\_\_\_ dtd. \_\_\_\_\_ Amounting to Rs. ----  
 ----- (Rupees \_\_\_\_\_ only) issued by  
 Bank -----branch, payable on Berhampur towards Bid Security against our  
 above Bid. The Bid Security amount has been computed by adding the Estimated Cost of the  
 package no.s ----- for which we are submitting our bid.

**4.0 EQUIPMENT PERFORMANCE GURANTEE**

We declare that the ratings and performance figures of the equipment to be furnished and erected by us are guaranteed. The Guaranteed particulars of different equipments are enclosed along with our bid.

**5.0 BID PRICING**

We further declare that the prices stated in our proposal are in accordance with your 'Instruction of Bidders of Conditions of Contract, Volume-1 of the bid documents.

**6.0 PRICE ADJUSTMENT**

We declare that all the prices and price components stated in our offer are on FIRM price basis.

**7.0 QUALIFICATION**

We confirm having submitted the Qualification Data in original plus one copy, as required by you under clause 3.0 'Invitation for Bids'. Further we have filled in the information for qualification requirements. In case you require any further information in this regard, we agree to furnish the same in time.

**8.0 DEVIATIONS**

8.01 We declare that the contract shall be executed strictly in accordance with the specifications and documents except for the variations and deviations all of which have been detailed out exhaustively in the following schedules, irrespective of whatever has been stated to the contrary anywhere else in our proposal.

- a) Commercial Deviations Schedule
- b) Cost of withdrawal of Deviations on Critical
- c) Technical Deviation Schedule

8.02 We confirm that specified stipulation of following critical clauses is acceptable to us and no deviations/exceptions are taken on any account whatsoever in the following clauses:

- (a) Payment Terms :
- (b) Bid Guarantee :
- (c) Contract Performance Guarantee :
- (d) Liquidated Damages for delay :
- (e) Prices and Price Adjustment :
- (f) Guarantee / Warrantees :

8.03 Further, we agree that the additional conditions, deviations, if any, found in our bid proposal documents other than those stated in attached Deviation Schedules, save that pertaining to any rebates offered, shall not be given effect to.

**9.0 ADDITIONAL INFORMATION**

We have included with this proposal additional information listed. We further confirm that such additional information does not imply any additional deviation beyond those covered in

appropriate schedules and in case of any contradiction between these additional information and other provisions of Bid, the latter prevail.

**10.0 GURANTEE DECLARATION**

We guarantee that the equipment offered shall meet the rating and performance requirements stipulated in this specification. The Guarantee Declaration which shall attract levy of liquidated damages for non-performance is indicated in the relevant schedule.

**11.0 BOUGHT-OUT AND SUB-CONTRACTED ITEM**

We are furnishing herewith at appropriate Schedule, the detail of all major item of supply amounting to more than 10% of our Bid Price, which were propose subletting giving detail of the name of sub-contractor/sub-vendor and quantity for each item.

**12.0 WORK SCHEDULE**

If this proposal is accepted by you, we agree to submit engineering data, provide services and complete the entire work from time to time, in accordance with schedule indicated in the proposal. We fully understand that the time schedule stipulated in this proposal is the essence of the contract, if awarded. The completion schedule of the various major key phases of the work is indicated in the designated schedule.

**13.0 CONTRACT PERFORMANCE GUARANTEE**

We further agree that if our Bid is accepted we shall provide an irrevocable Bank guarantee towards Contract Performance Guarantee, of value equivalent to ten percent (10%) of the Contract Price initially valid up to the end of ninety (90) days after the end of the contract warranty period in the form of Bank Guarantee in your favour within 15 (fifteen) days from the date of 'Notice of Award of Contract' or placement of Work Order whichever is earlier.

**14.0 CHECK LIST**

We have included a check list duly filled in Schedule. We understand that only this check list, commercial and technical deviation will be read out during the part-I bid opening before the bidders present.

(For Joint Venture/consortium only) We, the Partners of joint venture/ consortium submitting their Bid, do agree and confirm that in case of Award of the Contract on the joint venture, we shall be jointly and severally responsible for the execution of the contract in accordance with contract terms and conditions.

We, hereby declare that only the persons or firms interested in this proposal as principals are named herein and that no other persons or firms other than those mentioned herein have any interest in this proposal or in the contract to be entered into if we are awarded the contract, and that this proposal is made without any connection with any other person, firm or party

likewise submitting a proposal and that this proposal is in all respect for and in good faith, without collusion or fraud.

Dated this .....day of .....20.....

Thanking you,  
Yours faithfully,

(Signature of the Authorized Signatory)

Name .....

Designation .....

Seal of the company.....

(To be signed by lead partner in case of Joint Venture)      Signature of other partner (s) in case of Joint Venture)

Name .....

Designation .....

Date : .....

Place :

(Written power of Attorney of all signatories of the bid to commit the Bidder must be enclosed with the Bid. In case of joint venture, the written Power of Attorney of all signatories from respective partners must be enclosed with the Bid. .

\*\*\* Applicable case of a Bid from Joint Venture of Firms. Further, the Bid must be signed by each partner of the Joint venture.

**ANNEXURE – II**

**DECLARATION FORM**

To,

**Superintending Engineer  
Electrical Circle, Aska**

Sir,

Having examined the above specifications together with the Tender terms and conditions referred to therein

1 – I / We the undersigned do hereby offer to execute the contract covered there on in complete shape in all respects as per the rules entered in the attached contract schedule of prices in the tender.

2 – I / We do hereby under take to have executed the contract within the time specified in the tender.

3 – I / We do hereby guarantee the technical particulars given in the tender supported with necessary reports from concerned authorities.

4 – I / We do hereby certify to have purchased a copy of the tender specifications by remitting Cash / Demand draft & this has been duly acknowledged by you in your letter No.....Dt.....

5 – I / We do hereby agree to furnish the composite Bank Guarantee in the manner specified / acceptable by SOUTHCO Utility & for the sum as applicable to me / us within fifteen days of issue of Letter of intent / Work Order, in the event of Work order being decided in my / us favour , failing which I / We clearly understand that the said LOI / W.O. shall be liable to be withdrawn by the Owner.

Signed this.....Day of.....20....

Yours faithfully

(Signature of Bidder with Seal of Company)

**PROFORMA FOR CONTRACT PERFORMANCE BANK GUARANTEE**

**(To be executed on Rs. 100/- Non-judicial Stamp Paper purchased in the name of the BG Issuing Bank)**

This Guarantee Bond is executed this \_\_\_\_ day of \_\_\_\_\_ by us,  
\_\_\_\_\_  
Bank at \_\_\_\_\_  
P.O. \_\_\_\_\_ P.S. \_\_\_\_\_ Dist \_\_\_\_\_ State \_\_\_\_\_

Whereas SOUTHCO UTILITY ,Head Office: Courtpeta, Berhampur-760004 (here in after called “Owner”) has placed Work Order No. \_\_\_\_\_ Dt. \_\_\_\_\_ (hereinafter called “Agreement”) with M/s \_\_\_\_\_ (hereinafter called “the Contractor”) for supply and installation of \_\_\_\_\_ (description of the works) and whereas Owner has agreed (1) to exempt the Contractor from making payment of performance security deposit, (2) to release 100% payment of the cost of work as per the said agreement and (3) to exempt from performance guarantee on furnishing by the Contractor to Owner a composite Bank Guarantee of the value of 10% (ten percent) of the Contract price of the said Agreement.

1. Now, therefore, in consideration of Owner having agreed (1) to exempt the Contractor for making payment of security deposit, (2) to release 100% payment to the Contractor and (3) to exempt from furnishing performance guarantee in terms of the said Agreement as aforesaid, we the \_\_\_\_\_ Bank, Address \_\_\_\_\_ (code No. \_\_\_\_\_) (hereinafter referred to as “the Bank”) do hereby undertake to pay to the Owner an amount not exceeding Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ ) only against any loss or damage caused to or suffered by the Owner by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement.

2. We, the \_\_\_\_\_ Bank do hereby undertake to pay the amounts due and payable under the guarantee without any demur, merely on a demand from Owner stating that the amount claimed is due by way of loss or damage caused to or suffered by Owner by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement or by the reason of any breach by the said Contractor’s failure to perform the said Agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ ) only.

3. We, the \_\_\_\_\_ Bank also undertake to pay to Owner any money so demanded notwithstanding any dispute or dispute raised by the Contractor(s) in any suit or proceeding

instituted/ pending before any court or Tribunal relating thereto our liability under this Agreement being absolute and irrevocable. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such payment.

4. We, the \_\_\_\_\_ Bank further agree that the guarantee herein contain shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and it shall continue to remain in force endorsable till all the dues of Owner under by virtue of the said Agreement have been fully paid and its claim satisfied or discharged or till Purchaser certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharge this guarantee and will not be revoked by us during the validity of the guarantee period.

**Unless a demand or claim under this guarantee is made on us or with our Aska branch at \_\_\_\_\_ (Name, address of the Aska branch and code No.) in writing on or before \_\_\_\_\_ (date) we shall be discharged from all liability under this guarantee thereafter.**

5. We, the \_\_\_\_\_ Bank further agree that Owner shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said Contractor(s) and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance act or omission on part of Owner or any indulgence by Owner to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would but for this provisions have effect of so relieving us.

6. The Guarantee will not be discharged due to change in the name, style and constitution of the Bank and or Contractor(s).

7. We, the \_\_\_\_\_ Bank lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the Owner in writing.

Dated \_\_\_\_\_ the \_\_\_\_\_ day of Two thousand \_\_\_\_\_ .

Notwithstanding anything contained herein above.

Our liability under this Bank Guarantee shall not exceed Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ ) only.

The Bank Guarantee shall be valid up to \_\_\_\_\_ only.

Our ..... branch at Aska (Name & Address of the Aska branch) is liable to pay the guaranteed amount depending on the filing of claim and any part thereof under this Bank Guarantee only and only if you serve upon us at our Aska branch a written claim or demand and received by us at our Aska

branch on or before Dt. \_\_\_\_\_ otherwise bank shall be discharged of all liabilities under this guarantee thereafter.

For \_\_\_\_\_

(Indicate the name of the Bank)

N.B.:

(1) Name of the Contractor:

(2) No. & date of the Work order/ agreement:

(3) Amount of W.O:

(4) Name of Work:

(5) Name of the Bank:

(6) Amount of the Bank Guarantee:

(7) Name, Address and Code No. of the Aska Branch of the Issuing Bank:

(8) Validity period or date up to which the agreement is valid:

(9) Signature of the Constituent Authority of the Bank with seal:

(10) Name & addresses of the Witnesses with signature:

**(11) The Bank Guarantee shall be accepted only after getting confirmation from the issuing Branch & from main branch/specified branch at Aska of issuing Bank**



**LETTER OF COMPLIANCE OF QUALIFYING REQUIREMENT  
(In case of Bidder being a Single Firm)**

To

**Superintending Engineer,  
Electrical Circle, Aska**

Dear Sirs,

I/We ..... (Name of Bidder) are submitting the bid as a single firm. In support of our meeting the Qualifying requirements (QR) for bidders, stipulated in this tender specification, we furnish herewith the details/documents etc. as follows.

**Table – A: Previous Works Experience:**

Package Quoted for	Description of Proposed Works	Tender Qty	Qty Installed & Commissioned					Documents provided in proof of having executed the works during the relevant FY.
			Sl. No.	FY	Name of Client	WO Ref	Qty Installed	

**Table – B: Average Annual Turnover:**

Package Quoted for	Estimated Cost of the Package (Rs. in Lakh)	Annual Turnover Data (Rs. in Lakh)	
		Financial Year	Turnover (Rs. in Lakh)
		Last Three Year preceding to the year of tender	
<b>Total Estimated Cost of the packages quoted for</b>		<b>Average Turnover</b>	

**Table – C: Access to Credit Facility:**

Package Quoted for	Estimated Cost of the Package (Rs. in Lakh)	Liquid Assets as on 30.11.2018		Credit Facility	
		Description	(Rs. in Lakh)	Description	(Rs. in Lakh)
		Cash in Hand		Cash Credit	
		Cash at Bank		LC	
<b>Total Estimated Cost of the packages quoted for</b>		Fixed Deposits		Others (PI Specify)	
<b>One fifth of the total Estimated Cost as above.</b>		<b>Total Liquid Assets</b>		<b>Total Credit Facility</b>	

Note: Continuation sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.

I/We declare that we are fulfilling the qualifying requirements as per clause no. 2.0 of Section – I, Invitation for Bids (IFB).

For & on behalf of ..... (Name of the Bidder).

**DETAILS OF COMMERCIAL DEVIATIONS**

Bidder's Name & Address

To

**Superintending Engineer,  
Electrical Circle, Aska**

Dear Sirs,

**Sub: Commercial Deviation for Construction of Name of the project.**

The following are the Commercial Deviations and variations from and exceptions to the specifications and documents for the subject Project. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents

<b>Volume/Clause</b>	<b>Ref./Page No.</b>	<b>As specified in the Specification</b>	<b>Commercial deviation and variation to the specification</b>

Date: (Signature) .....

Place: (Printed Name) .....

(Designation) .....

(Common Seal) .....

**Note:** 1. Continuation sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.

2. This will be read out during opening of Part-I Bid.

## DETAILS TECHNICAL DEVIATIONS

Bidder's Name &amp; Address

To

**Superintending Engineer,  
Electrical Circle, Aska**

Dear Sirs,

**Sub: Technical Deviation for Construction of ..... (Name of the Project)**

The following are the Technical Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents

Volume/Clause	Ref./Page No.	As specified in the Specification / Relevant ISS	Technical deviation and variation to the specification

Date:

(Signature) .....

Place:

(Printed Name) .....

(Designation) .....

(Common Seal) .....

- Note:** 1. Continuation sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.
2. The deviations and variations, if any, shall be brought out separately for each of the equipment.

**ADDITIONAL INFORMATION**

Bidder's Name & Address

To

**Superintending Engineer,  
Electrical Circle, Aska**

Dear Sirs,

We have enclosed with our proposal the following additional information for the subject, package.

<b>Sl. No</b>	<b>Brief description of Information</b>	<b>Ref.&amp; Page No.</b>

Date: (Signature) .....

Place: (Printed Name) .....

(Designation) .....

(Common Seal) .....

**Note:** Continuation sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.

**BOUGHT OUT & SUB CONTRACTED ITEMS**

Bidder's Name & Address

To

**Superintending Engineer,  
Electrical Circle, Aska**

Dear Sirs,

We hereby furnish the details of the items/sub-assemblies amounting to more than 10% of our bid price, we propose to buy for the purpose of subject package

<b>Sl. No</b>	<b>Item description</b>	<b>Qty. Proposed</b>	<b>Source of Supply</b>
		<b>Be bought/ Sub-contracted</b>	
1.	.....	.....	.....
2.	.....	.....	.....
3.	.....	.....	.....
4.	.....	.....	.....
5.	.....	.....	.....
6.	.....	.....	.....
7.	.....	.....	.....

Date:

(Signature) .....

Place:

(Printed Name) .....

(Designation) .....

(Common Seal)

**WORK COMPLETION SCHEDULE**

Bidder's Name & Address

To

**Superintending Engineer,  
Electrical Circle, Aska**

Dear Sirs,

We hereby declare that the following Work Completion Schedule shall be followed by us for the purpose of subject package

<b>Sl. No</b>	<b>Description of Work</b>	<b>Period in Months( from the date of LOA)</b>
1	Completion of detailed engineering	
2	Procurement of raw materials	
3	Establishment of site office	
4	Erection	
	(a) Commencement	
	(b) Completion	
5	Testing & Pre-commissioning	
	(a) Commencement	
	(b) Completion	
6	Commissioning	

---

Date: (Signature) .....  
Place: (Printed Name) .....  
(Designation) .....  
(Common Seal) .....

**CHECK LIST**

Bidder's Name &amp; Address

To

**Superintending Engineer,  
Electrical Circle, Aska**

Dear Sirs,

<b>Sl. No.</b>	<b>Item Description</b>	<b>Status of the Submission of data</b>	<b>Remarks</b>
1	2	3	4
1.	Bid Guarantee	Yes /No	If yes please give details No, amount, validity & date of issue.
2.	Qualifying Data	Yes /No	
3.	Commercial Deviation	Yes /No	
4.	Technical Deviation	Yes /No	
5.	Cost of withdrawn of deviations	Yes /No	
6.	Bid validity	Yes /No	If yes state here the period.
7.	Period of completion	Yes/No	If, yes please state here the period of completion.
8.	Additional information offered by bidder		State here briefly

**N.B.:-** The contents of this schedule will be read out during opening of Part-I Bid.

.....

**Signature of Bidder****Date & Seal:**



**N.B:-**

1. The bid guarantee one original and one copy shall be furnished in two separate sealed envelope appropriately superscribed thereon.
2. All other schedules, one set original and another copy shall be submitted in two separate sealed envelope (these are to be opened during Part –I bid opening )

Date: (Signature) .....

Place: (Printed Name) .....

(Designation) .....

(Common Seal) .....

**PROFORMA OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT/MATERIAL HANDED OVER BY SOUTHCO FOR PERFORMANCE OF ITS CONTRACT  
(Entire Equipment consignment in one lot)  
(On non-Judicial stamp paper of appropriate Value)**

**INDEMNITY BOND**

**THIS INDEMNITY BOND** is made this ..... day of .....20..... by..... a Company registered under the Companies Act, 1956/ Partnership Firm / Proprietary Concern having its CORPORATE OFFICE at .....(hereinafter called as ‘Contractor’ or “Obligor” which expression shall include its successors and permitted assigns ) in favour of SOUTHCO UTILITY, Head Office: Courtpeta, Berhampur-760004 (here in after called “Owner”)”Which expression shall include its successors and assigns ) :

WHEREAS Owner has awarded to the Contractor a Contract for ..... vide its Letter of Award / Contract No..... dated..... and its Amendment No. .... and Amendment No..... (applicable when amendments have been issued) hereinafter called the “Contract”) in terms of which Owner is required to handover various equipment to the Contractor for execution of the Contract.

And WHEREAS by virtue of Clause No..... of the said Contract, the Contractor is required to executive an Indemnity Bond in favour of Owner for the Equipment/Material handed over to it by Owner for the purpose of performance of the Contract / Erection portion of the Contract (hereinafter called the “Equipment”).

NOW THEREFORE, This Indemnity Bond witnessh as follows:

1. That in consideration of various equipment as mentioned in the Contract, valued at Rs... ..... (Rupees .....) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep Owner indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment as per dispatch title documents handed over to the Contractor duly endorsed in their favour and detailed in the Schedule appended hereto. It is expressly understood by the Contractor that handing over of the dispatch title documents in respect of the said Equipment duly endorsed by Owner in favour of the Contractor shall be construed as handing over of the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipment is trust as a Trustee for and on behalf of Owner.

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit / protection and custody of the Equipment at Owner project Site against all risks, whatsoever, till the Equipment are duly used / erected in accordance with the terms of the Contract and the Plant / Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by Owner. The Contractor undertakes to keep Owner harmless against any loss or damage that may be caused to the Equipment.
3. The Contractor undertakes that the Equipment shall be used exclusively for the performance / execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilized for any other work or purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal / penal consequences .
4. That SOUTHCO Utility is and shall remain the exclusive Owner of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The Equipment shall at all times be open to inspection and checking by Engineer in Charge / Engineer or other employees/agents authorized by him in this regard. Further, Owner shall always be free at all times to take possession of the Equipment in whatever form the Equipment may be, if in its opinion the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor binds himself and undertakes to comply with the direction of demand of Owner to return the Equipment without any demur or reservation.
5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Engineer-in-Charge/Engineer of Owner as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at its own cost and/or shall pay the amount of loss of Owner without demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to Owner against the Contractor under the Contract and under this Indemnity Bond.
6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with terms and conditions of this Bond to the satisfaction of Owner, THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

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

**6.1.1**

**SCHEDULE**

Particulars of the Equipment handed over	Quantity	Particulars of Dispatch Title Documents		Value of the Equipment	Signature of Attorney (authorised representative as a token of receipt)
		RR / GR / No. / Date of Bill of Lading	Carrier		

For an on behalf of M/s.....

**7 WITNESS**

1. 1. Signature ..... Signature .....

2. Name ..... Name .....

3. Address..... Designation .....

Authorised representative \*

2. 1. Signature .....

2. Name .....(Common Seal in case of Company)

3. Address .....

---

\* Indemnity Bonds are to be executed by the authorised person and (i) in case of Contracting Company under common seal of the Company or (ii) having the Power of Attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

**SELF DECLARATION FORM**

Name of the Purchaser: -----

Tender Notice No: -----

Sir,

1. I / we, the undersigned do hereby declare that, I / we have never ever been blacklisted and / or there were no debarring actions against us for any default in supply of material / equipments or in the performance of the contract entrusted to us in any of the Electricity Utilities of India.
2. In the event of any such information pertaining to the aforesaid matter found at any given point of time either during the course of the contract or at the bidding stage, my bid/contract shall be liable for truncation / cancellation / termination without any notice at the sole discretion of the purchaser.

Yours faithfully,

Place-  
Date-

Signature of the bidder  
With seal

(This form shall be duly filled-up and signed by the bidder & submitted along with the original copy of the Bid.)

**ANNEXURE – XIII**

**PROFORMA FOR BANK GUARANTEE FOR EARNEST MONEY DEPOSIT**

**(ON NON-JUDICIAL STAMP PAPER OF Rs.100/-)**

Ref Date Bank Guarantee No:

In accordance with invitation to Tender Notice No.----- Dated ----- of SOUTHCO UTILITY. [herein after referred to as the SOUTHCO] for the execution of \_\_\_\_\_ (name of package)

M/s \_\_\_\_\_ Address \_\_\_\_\_

\_\_\_\_\_ wish/wished to participate in the said tender and as the Bank Guarantee for the sum of Rs. \_\_\_\_\_ [Rupees \_\_\_\_\_ Valid for a period of ..... days (in words) is required to be submitted by the Bidder.

1. We the \_\_\_\_\_ [Indicate the Name of the Bank] [Hereinafter referred to as 'the Bank'] at the request of M/S \_\_\_\_\_ [Herein after referred to as supplier (s)] do hereby unequivocally and unconditionally guarantee and undertake to pay during the above said period, on written request by SOUTHCO an amount not exceeding Rs. \_\_\_\_\_ to the SOUTHCO, without any reservation. The guarantee would remain valid up to 4.00 PM of \_\_\_\_\_ [date] and if any further extension to this is required, the same will be extended on receiving instructions from M/s \_\_\_\_\_ on whose behalf this guarantee has been issued.

2. We the \_\_\_\_\_ [Indicate the name of the bank] do hereby further undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the SOUTHCO stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the SOUTHCO by reason of any breach by the said supplier [s] of any of the terms or conditions or failure to perform the said Bid. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. \_\_\_\_\_ (in wards)

3. We, the \_\_\_\_\_ Bank undertake to pay the SOUTHCO any money so demanded not withstanding any dispute or disputes so raised by the supplier [s] in any suit or proceeding instituted/pending before any Court or Tribunal relating thereto, our liability under this agreement being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the supplier(s) shall have no claim against us for making such payment.

4. We, the \_\_\_\_\_ Bank [Indicate the name of the bank] or our local branch at Bhubaneswar further agree that the guarantee herein contain shall remain in full force and effect during the aforesaid period of ----

----- days and it shall continue to be so enforceable till all the dues of the SOUTHCO under by virtue of the said Bid have been fully paid and its claims satisfied or discharged or till SOUTHCO certifies that the terms and conditions of the said Bid have been fully and properly carried out by the said Supplier [s] and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the \_\_\_\_\_ (date) we shall be discharged from all liability under this guarantee thereafter.

5. We, the \_\_\_\_\_ Bank [Indicate the name of the bank] or our local branch at Bhubaneswar further agree that the SOUTHCO shall have the fullest liberty without our consent and without affecting in any manner our obligations here under to vary any of the terms and conditions of the said Bid or to extend time of performance by the said Supplier [s] from time to time or to postpone for any time or from time to time any of the powers exercisable by the SOUTHCO against the said supplier [s] and to forbear or enforce any of the terms and conditions relating to the said bid and we shall not be relieved from our liability by reason of any such variation, postponement or extension being granted to the said Supplier [s] or for any forbearance act or omission on the part of the SOUTHCO or any indulgence by the SOUTHCO to the said Supplier[s] or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the name, style and constitution of the Bank or the supplier [s].

7. We, the \_\_\_\_\_ Bank or our local branch at Bhubaneswar lastly undertake not revoke this Guarantee during its currency except with the previous consent of the SOUTHCO in writing.

8. We, the \_\_\_\_\_ Bank further agree that this guarantee shall also be invocable at our place of business at Bhubaneswar [**Indicate address & Branch code of local branch at Aska**] in the State of Orissa.

Dated \_\_\_\_\_ Day of 2018.

Witness ((Signature, names & address)

- 1.
- 2

For \_\_\_\_\_ [Indicate the name of Bank]

Power of Attorney No. \_\_\_\_\_

Date: \_\_\_\_\_

SEAL OF BANK

**Note: The non-judicial stamp paper of worth Rs.100/- shall be purchased in the name of the bank, which has issued the bank guarantee.**

**ANNEXURE- XIV**

**FORM OF EXTENSION OF BANK GUARANTEE  
(ON NON-JUDICIAL STAMP PAPER OF Rs.100/-)**

Ref. No. \_\_\_\_\_

Dated: \_\_\_\_\_

**The Administrator,  
SOUTHCO UTILITY, Berhampur**

Dear Sirs,

Sub: Extension of Bank Guarantee No. \_\_\_\_\_ for Rs. \_\_\_\_\_ favouring yourselves expiring \_\_\_\_\_ on account of M/s. \_\_\_\_\_ in respect of contract No. \_\_\_\_\_ dated \_\_\_\_\_ (hereinafter called original bank guarantee).

At the request of M/s. \_\_\_\_\_ we \_\_\_\_\_ bank Branch office at \_\_\_\_\_ having its head office at \_\_\_\_\_ do hereby extend our liability under the above mentioned guarantee No. \_\_\_\_\_ Dated \_\_\_\_\_ for a further period of \_\_\_\_\_ Years/months from \_\_\_\_\_ to expire on \_\_\_\_\_ except as provided above, all other terms and conditions of the original bank guarantee No. \_\_\_\_\_ dated \_\_\_\_\_ shall remain unaltered and binding.

Please treat this as an integral part of the original guarantee to which it would be attached.

Yours faithfully,

For \_\_\_\_\_

Manager/Agent/Accountant

Power of Attorney No. \_\_\_\_\_

Date: \_\_\_\_\_

SEAL OF BANK

Note: The non-judicial stamp paper of worth Rs.100/- shall be purchased in the name of the bank, which has issued the bank guarantee.



## **SECTION - V**

**E - TENDER NOTICE NO. 07/18-19, ELEPHANT CORRIDOR -SOUTHCO  
UTILITY/ASKA CIRCLE/TRUNKEY, Dt. 15.12.2018.**

**TECHNICAL SPECIFICATIONS FOR CONSTRUCTION OF LINES &  
ASSOCIATED MATERIALS.**

### **TECHNICAL SPECIFICATION**

***VOL-I***

***FOR***

**CONSTRUCTION OF NEW 11KV LINES, LT LINES WITH AB  
CABLE.**

## **TECHNICAL SPECIFICATION FOR CONSTRUCTION OF 11KV DISTRIBUTION LINES**

### **1.0 NATURE OF WORK**

The work covered by this Specification is for 11 kV distribution lines as specified herein and in the attached Schedules. The overhead distribution lines will form part of the SOUTHCO's distribution System.

### **1.1 GENERAL PARTICULARS OF THE SYSTEM**

The following are the general particulars governing the design and working of the complete system of which the Works will form a part —

- a) Electrical energy is transmitted from 132/33 KV or from 220/33 KV grid S/S of OPTCL to SOUTHCO's Primary 33/11 KV sub-stations as three-phase supply at a frequency of 50 Hz, and transmitted there from by means of overhead lines.
- b) The system will be in continuous operation during the varying atmospheric and climatic conditions occurring at all seasons.

### **1.2 SCOPE-**

- (A) Construction of 11 KV New Lines.
- (B) Installation of intermediate 11 KV RS Joist poles with replacement of damaged features like cross arms, insulators, hardware's, earthing device, induction of additional supports, rectification of joist poles and change of higher size of conductors etc.
- (C) AB Cabling works.

**Important: The eligible Contractor has to obtain project license from the competent authority in respect of the mentioned works prior to commencement of the works. All the expenses towards the project license and inspection thereof have to be borne by the contractor.**

**All items required for construction of New lines, up gradation or replacement of conductors, AB cabling works with inter posing of poles, repair of old damaged poles, replacement of damaged X-arms, Post insulators with GI pin, replacement of tension fittings with Insulators(70KN or45 KN), Mid-span joint, Al. tape, H/W fittings armoured rods concreting materials etc, along with suspension clamp ,'Eye' hook with shackle insulators, insulation piercing connector and dead end clamps required for AB Cables etc are to be supplied by contractor.**

#### **DISCLAIMER:**

This Document includes statements, which reflect various assumptions, which may or may not be correct. Each Bidder/Bidding Consortium should conduct its own estimation and analysis and should check the accuracy, reliability and completeness of the information in this Document and obtain independent advice from appropriate sources in their own interest.

Neither Purchaser nor its employees will have any liability whatsoever to any Bidder or any other person under the law or contract, the principle of restitution or unjust enrichment or otherwise for any loss, expense or damage whatsoever which may arise from or be incurred or suffered in connection with anything contained in this Documents and mater deemed to form part of this documents, provision of services and any other information supplied by or on behalf of purchaser or its employees, or otherwise arising in any way from the selection process for the supply.

Though adequate care has been take while issuing the Bid document, the Bid document, the Bidder should satisfy itself that documents are complete in all respects. Intimation for any discrepancy shall be given to this office immediately.

## **2.0 SURVEY (detail & check, estimating of quantities & spotting of towers / Poles)**

Walk over survey, Theodolite survey, profile survey (if required) shall have to be carried out to establish the Route alignment by the contractor for new 33 KV, 11 KV lines. If the line is passing in any Municipal/ NAC areas permission from local bodies has to be obtained prior to execution of work. Suitable distance from the side of the road has to be made towards placement of line poles.

### **2.0.1 CHECK SURVEY**

The contractor shall undertake the check survey during execution on the basis of the alignment profile drawing and tower schedule approved by the employer. If during check survey necessity arises for minor change in route to eliminate way leave or other unavoidable constraints, the contractor may change the said alignment after obtaining prior approval from the employer

**2.0.2 GENERAL:** Preliminary route alignment in respect of the proposed 33KV &11KV transmission lines has been fixed by the employer subject to alteration of places due to way leave or other unavoidable constraints. The Right of way shall be solved by the contractor and all expenses there of shall be borne by him. However, SOUTHCO Utility shall render all helps in co-ordination with law and order department for solving the same. Involvement of Forest land should be restricted as far as possible.

**2.0.3** Provisional quantities/numbers of different types of tower structures/Joist poles/PSC poles have been estimated and indicated in the BOQ Schedule given. However final quantities for work shall be as determined by the successful bidder, on completion of the detail survey, preparation of route profile drawing and designing of the different types of tower structures/Joist poles/PSC poles as elaborated in the specification and scope of work.

**2.0.4** The contractor shall undertake detailed survey on the basis of the tentative alignment fixed by the employer. The said preliminary alignment may, however, change in the interest of economy to avoid forest and hazards in work. While surveying the alternative route the following points shall be taken care by the contractor.

- (a) The line is as near as possible to the available roads in the area.
- (b) The route is straight and short as far as possible.

- (c) Good farming areas, religious places, forest, civil and defense installations, aerodromes, public and private premises, ponds, tanks, lakes, gardens, and plantations are avoided as far as practicable.
- (d) The line should be far away from telecommunication lines as reasonably possible. Parallelism with these lines shall be avoided as far as practicable.
- (e) Crossing with permanent objects are minimum but where unavoidable preferably at right angles.
- (f) Difficult and unsafe approaches are avoided.
- (g) The survey shall be conducted along the approved alignment only.
- (h) For river crossing/ Crossing of Nallas : Taking levels at 25 meter interval on bank of river and at 50 meter interval at bed of river so far as to show the true profile of the ground and river bed railway/road bridge, road The levels shall be taken at least 100 m. on either side of the crossing alignment. Both longitudinal and cross sectional shall be drawn preferably to a scale of 1:2000 at horizontal and 1:200 vertical.

After completing the detailed survey, the contractor shall submit the final profile and tower schedule/ pole schedule (with no. of stay or strut) for final approval of the employer. To facilitate checking of the alignment, suitable reference marks shall be provided. For this purpose, concrete pillars of suitable sizes shall be planted at all angle locations and suitable wooden/iron pegs shall be driven firmly at the intermediate points. The contractor shall quote his rate covering these involved jobs.

#### **2.0.5 (a) Optimization of Pole Location**

##### **I. Pole Spotting**

To optimize the line length, the contractor shall spot the poles in such a way so that the line is as close as possible to the straight line drawn between the start & end point of the line.

##### **II. Crossings**

**Road Crossings:-** At all road crossings, the double tension HW fittings should be used. There should absolutely no joints in the conductors in all road, power line and all other major crossing. The ground clearance from the road surfaces under maximum sag condition shall be not less than 8.5mtr over roads. In National High way the minimum height of guarding at the maximum sagging point should be less than 8.5 mts.

**Railway Crossings-** The railway crossing overhead or underground shall be carried out in the manner as approved & prescribed by the railway authorities from time to time.

The crossing shall normally be at right angle to the railway track. In case crossing is required to be done through underground cable, cost of the cable including laying and other accessories shall be in the scope of the contractor. During detailed engineering, the contractor shall submit his proposed

arrangement for each railway crossing to the owner. The approval for crossing railway track shall be obtained by the owner from the Railway Authority.

#### **Power Line Crossings-**

Where the line is to cross over another line of the same voltage or lower voltage, provisions to prevent the possibility of their coming into contact with each shall be made in accordance with the Indian Electricity Rules.

#### **III. Details En-route**

After survey and finalization of route, the contractor shall submit detailed route map for each line. This would be including following details:

All poles on both sides of all the crossings shall be tension poles i.e. disc type insulators shall be used on these poles. At all the crossing described above the contractor shall use protective guarding as per REC Construction Standard A-1 to fulfill statutory requirements for 11 kV & 33 KV trunks & main spur line. 11kV & 33 KV branch spur line, being in the village, protective guarding shall be used wherever it will be required.

Clearance from Ground, Building, Trees etc. – Clearance from ground, buildings, trees and telephone lines shall be provided in conformity with the Indian Electricity Rules, 1956 as amended up to date. The vendor shall select the height of the poles in order to achieve the prescribed electrical clearances.

#### **IV. Final Schedule**

The final schedule including Bill of quantity indicating location of poles specifically marking locations of failure containment pole/structure, DTs 11 KV line sectionalizes, line tapping points; angle of deviation at various tension pole locations, all type of crossings and other details shall be submitted for the approval of the owner. After approval, the contractor shall submit six more sets of the approved documents along with one set in reproducible form to purchaser for record purpose.

#### **V. Danger Boards**

The vendor shall provide & install danger plates on all 33kv,11 kV DP structures , H pole structures and towers besides in all poles where DT is installed. The danger plates shall conform to REC specification No. 57/1993.

#### **VI. Anti-climbing Devices**

The vendor shall provide and install anti-climbing device on all 33kv and 11 kV DP structures, towers and at all poles as per CEA guide line. This shall be done with G.I. Barbed wire or modified spikes as specified. The barbed wire shall conform to IS-278 (Grade A1). The barbed wires shall be given chromatin dip as per procedure laid down in IS: 1340.

## **VII. Fittings Common to all Line**

Pin Insulator Binding: The contractor shall use AL. Binding wire for binding shall be as per REC Construction Standards No. C-5 or better thereof.

Mid Span Compression Joint & Repair Sleeves: The contractor shall supply & install the Mid Span Compression Joint and Repair Sleeves as per IS: 2121 (Part II).

Guy/Stay wire Clamp: The contractor shall supply & install Guy/Stay wire Clamp as per REC Construction Standard G-1 or better here of as specified..

## **VIII. Stay/Guy Sets**

a) The Stay/Guys shall be used at the following pole locations;

At all the tapping points & dead end poles

At all the points where DT is to be installed

At all the points as per REC construction dwg. No. A-10 ( for the diversion angle of 10-60 degree)

At every alternative pole for 11 KV line ( two sets)

Both side poles at all the crossing for road, nallaha, railway crossings etc.

b) The arrangement and number of stay sets to be installed on different pole structures shall be as per REC Construction Standards no. A-23 to A-27, G-5 & G-8. However, this shall be decided finally during erection, as per the advice of Engineer.

c) The stay set to be installed complete in all respect and would broadly consist of following items:

7/10 SWG G.I. Stay wire for 11 kV lines and 7/12 SWG for LT line as per REC Specification No.46/1986 Stay Insulator type A for LT line and type C for 11 kV line as per REC Specification No. 21/1981, Turn Buckle. Anchor rod and plate (Hot Dipped galvanized). Thimbles and Guy Grip Complete stay set shall be as per REC Construction Standards no. G-1. The stay clamp is envisaged as GS structure along with other clamps brackets etc.

## **IX. Erection of stay sets**

The contractor shall install the stay set complete in all respect. This includes excavation of pit in all kinds of soil with PCC in the ratio 1:2:4 as specified which shall be placed in the bottom of the pit.

The rest (upper half) of the pit shall be filled with excavated soil duly compacted layer by layer. An angle between 30 to 45 degrees shall be maintained between stay wire and the pole. The stay wire shall be used with a stay insulator at a height of 5 mts. above ground level with F.I. turn buckle.

## **X. Stringing and Installation of Line with Bare Conductors.**

### **General**

The scope of erection work shall include the cost of all labour, tools and plants such as tension stringing equipment and all other incidental expenses in connection with erection and stringing work.

The Bidders shall indicate in the offer the sets of stringing equipment he would deploy exclusively for work under each package.

The stringing equipments shall be of sufficient capacity to string AAA conductor ACSR conductor.

The Contractor shall be responsible for transportation to site of all the materials to be provided by the Contractor as well as proper storage, insurance etc. at his own cost, till such time the erected line is taken over by the owner.

Contractor shall set up required number of stores along the line and the exact location of such stores shall be discussed and agreed upon with the owner.

### **Insulator Fixing**

Pin insulators shall be used on all poles while strain insulators shall be used on all angle & dead end poles. The special type Pin Insulators should be used for conductors more than 100 mm<sup>2</sup>. Damaged insulators and fittings, if any, shall not be used. Prior to fixing, all insulators shall be cleaned in a manner that shall not spoil, injure or scratch the surface of the insulator, but in no case shall any oil be used for this purpose. Torque wrench shall be used for fixing various line materials and components, such as suspension clamp for conductor, whenever recommended by the manufacturer of the same.

### **Running Out of the Conductors**

The contractor shall be entirely responsible for any damage to the pole or conductors during stringing. The conductors shall be run out of the drums from the top in order to avoid damage to conductor. A suitable braking device shall be provided to avoid damaging, loose running out and kinking of the conductors. Care shall be taken to ensure that the conductor does not touch and rub against the ground or objects, which could scratch or damage the strands.

The sequence of running out shall be from the top to down i.e. the top conductor shall be run out first, followed in succession by the side conductors. Unbalanced loads on poles shall be avoided as far as possible.

Wherever applicable, inner phase off-line conductors shall be strung before the stringing of the outer phases is taken up.

When lines being erected run parallel to existing energized power lines, the Contractor shall take adequate safety precautions to protect personnel from the potentially dangerous voltage build up due to electromagnetic and electrostatic coupling in the pulling wire, conductors and earth wire during stringing operations.

The Contractor shall also take adequate safety precautions to protect personnel from potentially dangerous voltage build up due to distant electrical storms or any other reason.

### **Repairs to Conductors**

The conductor shall be continuously observed for loose or broken strands or any other damage during the running out operations. Repair to conductors, if necessary, shall be carried out with repair sleeves and not more than one repair sleeve will be used in one span.

Repairing of the conductor surface shall be carried out free of cost only in case of minor damage, scuff marks, etc. The final conductor surface shall be clean, smooth and free from projections, sharp points, cuts, abrasions etc. After compression the sharp edges must be smoothed by filing.

The Contractor shall be entirely responsible for any damage to the poles, insulators etc during stringing.

### **Stringing of Conductor**

The stringing of the conductor shall be done by the standard stringing method.

The Bidder shall submit complete details of the stringing method for owner's approval. Conductors shall not be allowed to hang in the stringing blocks for more than 96 hours before being pulled to the specified sag.

Derricks/ scaffoldings or other equivalent methods shall be used to ensure that normal services are not interrupted and any property is not damaged during stringing operations for roads, telecommunication lines, power lines and railway lines. However, shut-down shall be obtained when working at crossings of overhead power lines. The contractor shall make specific request for the same to the owner.

### **Jointing**

When approaching the end of a drum length at least three coils shall be left in place when the stringing operations are stopped. These coils are to be removed carefully, and if another length is required to be run out, a joint shall be made as per the recommendations of the accessories manufacturer.

Conductor splices shall not crack or otherwise be susceptible to damage during stringing operation. The Contractor shall use only such equipment/methods during conductor stringing which ensures complete compliance in this regard.

All the joints on the conductor shall be of compression type, in accordance with the recommendations of the manufacturer, for which all necessary tools and equipment like compressors, dies etc., shall be arranged by the contractor. Each part of the joint shall be cleaned by wire brush till it is free of rust or dirt, etc. This shall be properly greased with anti-corrosive compound if recommended by the manufacturer, before the final compression is carried out with the compressors.



All the joints or splices shall be made at least 30 meters away from the pole. No joints or splices shall be made in spans crossing over main roads, railway line and Small River spans. Not more than one joint per conductor per span shall be allowed. The compression type fittings shall be of the self centering type or care shall be taken to mark the conductors to indicate when the fitting is centered properly.

During compression or splicing operation, the conductor shall be handled in such a manner as to prevent lateral or vertical bearing against the dies. After compressing the joint, the Aluminium sleeve shall have all corners rounded; burrs and sharp edges removed and smoothed.

To avoid any damage to the joint, the contractor shall use a suitable protector for mid span compression joints in case they are to be passed over pulley blocks/aerial rollers. The pulley groove size shall be such that the joint along with protection can be passed over it smoothly.

In case of ACSR conductors the filler compound should be used during compression. In case AAAC is used each press should overlap 25% of the previous press.

#### **Tensioning and Sagging Operations:**

The tensioning and sagging shall be done in accordance with the approved stringing charts or sag tables.

The sag shall be checked in the first and the last section span for sections up to eight spans and in one additional intermediate span for sections with more than eight spans. Tensioning and sagging operations shall be carried out in calm weather when rapid changes in temperature are not likely to occur.

#### **Clipping In**

Clipping of the conductors into position shall be done in accordance with the manufacturer's recommendations.

Jumpers at section and angle towers shall be formed to parabolic shape to ensure maximum clearance requirements. Pilot pin insulator shall be used, if found necessary, to restrict jumper swing & to ensure proper clearance to design values.

Fasteners in all fittings and accessories shall be secured in position. The security clip shall be properly opened and sprung into position.

#### **Fixing of Conductors and Earth wire Accessories**

Conductor and earth wire accessories supplied by the Contractor shall be installed by the Contractor as per the design requirements and manufacturer's instructions. While installing the conductor and

earth wire accessories, proper care shall be taken to ensure that the surfaces are clean and smooth and that no damage occurs to any part of the accessories or of the conductors.

**Replacement:**

If any replacements are to be effected after stringing and tensioning or during maintenance e.g. replacement of cross arms, the conductor shall be suitably tied to the pole at tension points or transferred to suitable roller pulleys at suspension points.

**XI. Stringing of Aerial Bunched Cable (ABC)**

**Fixing of Suspension & Tension/ Dead end fittings to the Poles.**

The suspension clamp is to be hung on eye hook/ suspension hook, which is fixed to the pole at a minimum distance of 0.15 mt. from top end of the pole. The messenger wire of bunched cable resting on a pulley is separated from the cable by separating wedges and inserted in the conductor groove of the suspension clamp.

The bolt is tightened to a torque of 20 N after which the pulley and wedges are to be removed. The cable is tied to the messenger wire with nylon tie on both sides of clamps. Pole clamps 50 x 8 mm flat shall be used. Eye hook of 20mm dia MS rod to be used as per the drawing. The pole clamp shall be made to suite the pole width. This shall be installed as per Fig. No. 2 (a) of REC Construction Standard. All ferrous items shall be hot dip galvanized with zinc coating of 610gms / m<sup>2</sup>.

**Fittings & Accessories**

The following hardware fittings and accessories shall be used to install, erect & join the aerial bunched cable.

**a) Suspension Clamp with Eye-Hook** – The Contractor shall install the suspension clamp with eye hook. This hook shall be used to attach the AB cable on the pole by means of a dead end clamp in terminal poles and for attaching a suspension clamp suitable for holding AB cables of size 35mm<sup>2</sup> to 95mm<sup>2</sup> in straight lines and angle up to 90 Deg.-

**b) Suspension fittings & the corresponding eye hook** shall be as per REC Construction Standard No. e – 34. The eye hooks shall be made from minimum 20mm dia MS rods with eye on one end and the other end being suitably flattened with two holes for M16 bolt & nut to fix with the back clamps made from minimum 50x8mm flats as per drawing. The eye hook, back clamp and bolts & nuts are to be hot dip galvanized.

**c) Dead End fittings** shall be bolted type as per REC Construction Standard No. E-35 & the corresponding eye hook shall be as specified above. The dead clamps are to be anchored with the pole with similar arrangement of eye hook & back clamp. In this case, the back clamp shall have two nos. of holes on both sides for M16 bolts. One side of the clamp shall be used for holding the eye hook with dead end clamp and the other side shall be used for anchoring the Stay.

**d) Nylon Tie-** The contractor shall supply nylon ties. These ties shall be used for tying the conductors with the messenger wire to prevent the phase conductors from chatting against suspension clamp. The nylon tie is made of weather resistant black nylon.

**e) Connectors-** The contractor shall supply connector. These shall be used as non-tension aluminium to aluminium connections for conductor joints.

**f) Plastic Covers for Connectors-** The contractor shall install Plastic Covers for Connectors. These covers shall be used with aluminium/aluminium connectors to protect connectors against corrosion caused by climatic conditions.

### **Installation of Cable**

The contractor shall be fully responsible for all activities related to installation of AB cable. His responsibilities consists of handling, pulling, stringing & jointing of the cable and effecting service connection to consumers as per direction of the Engineer-in-charge. The total no. of consumers per KM in urban area and rural area is approximately 200 & 50 nos. respectively. But payment shall be made as per actual use of piercing connectors to effect service connection to the consumers.

### **Handling of AB Cable**

The contractor shall observe following precautions while handling the AB Cable:

The cable drums must be stored and transported in an upright position.

While loading/unloading, the drums shall not be thrown from transport vehicles.

Cable contact with sharp articles shall be avoided.

In order to prevent damage to the insulation, the cable shall not be dragged on the ground. Pulleys shall be used for this purpose.

In order to prevent strands from spreading, always cut the cable with a cutter.

Use nylon ties or electrical tape to prevent the cable from spreading away from messenger wire after the cutting. Staple the end of the cable on to the drum in order to prevent loosening.

Do not remove the protective boards from the cable drum before the cable is pulled off the drum.

While moving the drum by rolling it on ground, always roll the drum in the direction indicated by the arrow on the flange. When pulling the cable, the spinning direction must be opposite.

Do not store the drums on wet soil, sandy or humid places.

Store the accessories in good order for quick easy and correct handling.

### **Pulling the Cable**

The principle is to pull the cable under mechanical tension so that contact with the ground or any other obstacles is avoided. The cable drum should be perfectly in alignment with line to be strung and fixed about 15-20 mts.

From the holding the first pulley. Open the cover of the drum to check and ensure that the insulation is not damaged.

The pulling which is sent up upto the cable drum is about 15-20 mts from the pole holding to the last pulley. The pulleys are directly hung to such hook on the poles. The pulley tandem is to be used on angle poles if the line is deviating more than 60° Pull the guiding rope through all the pulleys.

Normal care shall be taken to assume a smooth passage of whole cable through the pulleys, especially in the first pole and on angle poles. One worker should act s brakeman at the cable drum so that the cable is not loosened during the pulling. One worker should follow the cable going through the pulleys and stop the pulling if anything goes wrong.

### **Stringing Operations.**

The contractor shall follow one of the following methods for stringing.

#### **1. Sag Method**

Fix a dead end clamp on the neutral messenger wire at the pole. The messenger shall be bent behind the clamp to ensure sufficient friction between the messenger and the clamp in the initial stays during stringing.

Bind the conductor together beside the dead end clamp using a nylon tie.

Hand the clamp on the hook at the end pole Rewind simultaneously the slack cable length on the cable drum.

Attach the 'come along' on the neutral messenger wire at the first pole of the line.

Tighten the cable by the shackle or the winch when required sag is obtained.

Hand the dead end clamp on the hook and install it on the neutral messenger.

Remove the come along

Bind the conductors together on the messenger wire using a nylon tie

Check the length of the cable needed and cut it at an appropriate point.

#### **2. Dynamometer Methods**

Start the operation as above up to the stage.

Install the dynamo meter on the come-along

Tighten the cable at the required value by reading the Dynamo meter

Finish the stringing as in the sag method operation.

### **Jointing of Cables**

Jointing of cable shall be in accordance with clause 12.3.3 of IS 1255:1993 and manufacturers special instructions given hereunder. This joining is to be done by skilled personnel.

Cable Damage and Repairs: If the cable is damaged for whatever reasons, it shall be brought to the notice of the engineer and shall not be used without his approval.

No joint or splice shall be made in spans crossings over main roads, small rivers or in tension spans.

Not more than on joint in the cable shall be allowed in one span.

The stringing rate include rates for paving, stringing, clamping, jointing, tensioning and fitting of all necessary accessories.

Insulated piercing connectors suitable for AB cable size from 16mm<sup>2</sup> to 95mm<sup>2</sup> and service connection cable of size 2.5mm<sup>2</sup> to 35mm<sup>2</sup> shall be used for effecting service connections to the consumers.

### **Final Checking, Testing and Commissioning**

After stringing have been done as approved by the engineer, to ensure that everything is complete in all respects, the works shall be thoroughly inspected keeping in view the following main points.

All the bolts and nuts should be of hot dip galvanized materials as per relevant IS.

The stringing of the cable has been done as per the approved sag and desired clearances are achieved.

No damage, minor or major to the cable, messenger wire and accessories

The contractor shall submit a report to the above effect to the Engineer in Charge, who shall inspect and verify the correctness of the report. In case it is noticed that some or any of the above is not fulfilled, the engineer shall get such items rectified by the contractor no extra cost to the purchaser.

After final checking, the line shall be tested for insulation resistance in accordance with IS 1255:1983.

All arrangements for such testing or any other test desired by the Engineer-in-charge shall be done by the contractor and necessary labour, transport and equipment shall be provided by him. Any defect found out as a result of such tests shall be rectified by the contractor, forthwith at no extra cost to the purchaser.

In addition to the above, the contractor shall be responsible for testing and ensuring that the total and relative sags of the cable as within the specified tolerance. Such tests shall be carried out at selected points along the route as required by the Engineer-in-charge and the contractor shall provide all necessary equipment and labour to enable the tests to be carried out. After satisfactory test on the line and approval by the Engineer in Charge, the line shall be energized at full operating voltage before handling over. The cable shall be megger tested before and after jointing. The AB cable shall be tested for.

**i)** Continuity of messenger wire and conductors

**ii)** Absence of cross phasing

**iii)** Insulation resistance to earth

**iv)** Insulation resistance between conductors

**v)** DC Resistance

**vi)** Capacitance

As per IS 1255:1983 of the latest issue and as per manufacturer's instructions.

Sufficient backfilled earth covers each foundation pit and is adequately compacted.

All poles are used strictly according to final approved drawing and are free of any defect or damage whatsoever.

The stringing of the conductors and earth wire has been done as per the approved sag and tension charts and desired clearances as clearly available.

All conductor and messenger wire accessories are properly installed.

All other requirements for completion of works such as fixing of danger plate and anti-climbing device have been fulfilled.

The insulation of the line as a whole is tested by the Contractor through provision of his own equipment, labour etc., to the satisfaction of the owner. Proper earthing of the poles.

#### **HT/LT/Road Crossing Guarding**

The contractor shall provide & install protective guarding as per REC construction standard for both 33 and 11 kV line, The guarding shall be provided at all the crossing i.e. road, telecommunication & power lines, railway line, nallaha etc.

The contractor is required to follow local statutory regulations stipulated in Electricity (Supply) Act 1948, Indian Electricity Rules 1956 as amended and other local rules and regulations referred in these specifications.

#### **Reference Standards**

The codes and/or standards referred to in the specifications shall govern, in all cases wherever such references are made. In case of a conflict between such codes and/or standards and the specifications, latter shall govern. Such codes and/or standards, referred to shall mean the latest revisions, amendments/changes adopted and published by the relevant agencies unless otherwise indicated. Other internationally accepted standards which ensure equal or better performance than those specified shall also be accepted, subject to prior approval by the owner. In case no reference is given for any item in these specifications, latest REC specification & Construction Standards shall be referred to.

#### **2.0.6 SPAN**

1. The span should be as near as possible to the basic design span so that the minimum ground clearance should not less than 7.0 mts in cross country at maximum sag condition. Minimum one cut point has to be provided in every Half Kilometre line.

#### **2.0.7 WAY-LEAVE AND TREE CUTTING**

Way-leave permission which may be required by the contractor shall be arranged at his cost. While submitting final-survey report for approval, proposals for way-leave right of way shall be submitted by the contractor. Employer may extend help to get the permission within a reasonable time as mutually agreed upon for which due notice shall be given by the contractor in such a way so that obtaining permission from appropriate authority do not hinder the continued and smooth progress of the work.

The employer shall not be held responsible for any claim on account of damage done by the contractor or his personnel to trees, crops and other properties.

The contractor shall take necessary precaution to avoid damage to any ripe and partially grown crops and in the case of unavoidable damage, the employer shall be informed and necessary compensation shall be paid by the contractor.

All the documents required for application to the statutory authorities must be prepared by the contractor & submitted to the employer for submission of the application towards approval of Railway Crossing etc. However, the responsibilities lie with the contractor to get the clearance.

Trimming of tree branches or cutting of a few trees en-route during survey is within the scope of survey to be done by the contractor. Contractor shall arrange for necessary way-leave and compensation in this regard. During erection of the line, compensation for tree cutting, damage caused to crops, actual cutting and falling of the trees including way-leave permission for such route clearance shall be arranged by the contractor at his cost. The contractor will identify the number of trees and detail of obstructions to be removed for erection of the line and intimate the employer well in advance in case of any help. Other related works like construction of temporary approach roads, etc. as required, shall be done by the contractor and the same will lie within the scope of contractor's work and such cost shall be considered to be included in the rates quoted by him.

### **3.0 CONDUCTOR**

In normal practice AAA conductors of 55 Sq mm will be used in 11 KV lines.

#### **3.0.1 ROAD CROSSING (Cross country, Village pucca roads)**

At all major road crossings, the angle towers/ poles shall be provided. The ground clearance above the roads should not be less than 8.5 mts. Double tension fittings should be provided in every road crossing span. Guarding should be provided in each road crossing.

#### **3.0.2 POWER LINE CROSSINGS**

Where the lines cross over another line of the same voltage or lower voltage, provisions to prevent the possibility of its coming into contact with other overhead lines shall be made in accordance with the Indian Electricity Rules, 1956 as amended from time to time. All the works related to the above proposal shall be deemed to be included in the scope of the Contractor.

#### **3.0.3 TELECOMMUNICATION LINE CROSSINGS**

- a) The angle of crossing shall be as near to 90 degree as possible. However, deviation to the extent of 20 degree may be permitted under exceptionally difficult situations. The existing line route may be changed where required.
- b) HT line shall be routed with requisite suppression with parallel telecom line to avoid inductance during faults.

### **3.0.4 DETAILS EN -ROUTE**

All topographical details, permanent features, such as trees, telecommunication lines, building etc. 7.5 mtr (33kV) and 3.5 mtr (11kV) on either side of the alignment shall be detailed on the route plan before execution of work. However, any problems arising out of Right of way, shall be taken care of by the Contractor. The owner shall extend all possible Co-operation.

### **3.0.5 CLEARANCE FROM GROUND, BUILDING, TREES ETC.**

**3.0.5.1 Clearance** from ground, buildings, trees and telephone lines shall be provided in conformity with the Indian Electricity Rules, 1956 as amended up to date. The bidder shall select the height of the poles such that all electrical clearances are maintained.

**3.0.5.2 Guarding mesh** shall be used in all electric line / telecom line / road / drain / canal crossing and at all points as per statutory requirements. The bidder shall provide & install anti climbing devices and danger plates on all poles and DT stations. Where there is no such provision in the existing line.

**3.0.5.3 Pole accessories** like danger plates and number plates shall be provided.

### **3.0.6. POLES**

For 11KV and LT lines the conventional PSC poles may be used. All the test on materials and fabrication etc will be as per the relevant Indian standards / REC Specification.

In different crossings the contractor shall take into consideration the prevailing regulations of the respective authorities before finalizing type and location of the towers. While carrying out survey work, the contractor has to collect all relevant data, prepare and submit drawings in requisite number for obtaining clearance from road, aviation, railways, river and forest authorities.

## **4.0 ERECTION WORK**

When the survey is approved, the contractor shall submit to the employer a complete detail schedule of all materials to be used in the line. Size and length of conductor etc. are also to be given in the list. This schedule is very essential for finalizing the quantities of all line materials. The contractor shall furnish the same.

### **4.1 SCHEDULE OF ERECTION PROGRAMME**

After due approval of the detailed and check survey, the contractor shall submit to the employer a complete detailed schedule of erection programme with a Bar-Chart for construction of the lines indicating there in the target date of completion.



## **5.0 CONSTRUCTION OF FOUNDATION FOR PSC POLES**

### **5.0.1 ERECTION OF POLE, CONCRETING OF POLES AND COMPACTION OF SOIL**

Drawing for the excavation of pits, Foundation of both wet and Black cotton soil is enclosed which are to be adopted. If better design with less volume approved or tested by any other distribution agencies will also be acceptable.

**5.0.2** Following arrangement shall be adopted for proper erection of poles wherever necessary and properly compacting of the soil around the base / foot of the poles, under this package.

- (a) Excavation has to done as per the drawing to the required depth and size. After final excavation the pit should be dressed properly so that uneven portion and loose soil should be removed before PCC (M-7.5) of thickness 75 mm is laid. The base footing of the pole concreting RCC (M-15) has to be done by proper alignment and verticality.
- (b) The verticality and leveling of pole/structure should be done by the help of plumbob or with theodolite and leveling instrument.
- (c) **In case of PSC pole GI base plate (450x450x10) mm or RCC Pre –cast slab of size (500 x 500 x 100) mm has to be provided over the Lean concrete.**

### **5.0.3 CEMENT CONCRETE (PLAIN OR REINFORCED), STUB SETTING GROUNDING AND BACK FILLING etc.**

#### **A) Materials**

All materials whether to be consumed in the work or used temporarily shall conform to relevant IS specification, unless stated otherwise, and shall be of the best approved quality.

#### **B) Cement**

Cement to be used in the work under the contract shall generally conform to IS:269/455-1989. Cement bags shall be stored by the contractor in a water tight well ventilated store sheds on raised wooden platform (raised at least 150 mm above ground level) in such a manner as to prevent deterioration due to moisture or intrusion of foreign matter. Cements to be used within three months from the date of manufacture. Sub-standard or partly set cement shall not be used and shall be removed from the site by the contractor at his cost.

**C) Coarse Aggregates** i.e Stone chips or stone ballast. For M15 concrete (mix 1:2:4) the aggregate will be in the ranges from 12mm to 20mm.size and for M7.5 concrete (mix 1:4:8) these will be from 25mm to 40mm size.

#### **D) Pole erection**

- 1. **After proper alignment**, checking of verticality and leveling, the pole or structure should be properly tied before placing of base concrete of required height. Again the verticality and leveling should be checked.
- 2. **The RCC pedestal concrete** (M-15) is to be done by providing good quality of shutters, so that there will no leakage of cement slurry during concreting. The cooping height should be **450 mm/750 mm**

above the existing ground level in urban area and in cultivated lands respectively. The top portion of the cooping should be made tapered.

3. **Above** the cooping 450 mm of pole or structure should be painted with double layer of Black Bituminous paints.
  4. **All the bolted joints** should be tightened properly by providing suitable size GI Bolt Nuts and Spring washers. After completion of erection works all the bolts should be spot welded in order to avoid theft of members.
  5. **The back filling** of locations should be done by using the excavated soil only in layers (each layer should not be more than 500 mm) by putting water and ramming by using wooden rammers. In no case stone of size more than 75mm used for back filling. Back-filling has to be done 75mm above ground level or as specified
  6. **Curing of concrete** should be done for 28 day continuously. Curing should not be done within 24 Hours of concreting.
  7. **All the excess** excavated materials and other unused materials from the concreting site should be disposed of to a suitable site by the contractor.
    - a) Mixer (Running time-2 min.)
    - b) **In case of** hand mixing, 10% extra cement has to be provided. Hand mixing should be done on GI sheet platform only.
    - c) **Poking rod** may be used for compacting in locations at PSC poles only
    - d) **Use of vibrator** for compacting is mandatory.
    - e) **Clean water** (free from saline and alkaline) should be used for concreting.
    - f) **Aggregates** (both coarse and fine) used should be free from foreign materials.
    - g) **Shutters** used should not be removed before 24hrs. of casting.
    - h) **In case of** black cotton soil borrowed earth (morum soil mixed with sand is preferable) may be used for back filling.
    - i) **Sufficient qty. of water** should be sprinkled over backfilled earth and chimney kept wet by using wet gunny bags.
- 5.0.4 All the persons** working on tower shall wear safety helmet, safety belt and safety shoes, Similarly all the persons working on ground shall wear safety helmet and safety shoes.
- 5.0.4.1. If there is any LT/HT** power line near the vicinity of tower erection, necessary shutdown of the power line shall be obtained in writing from the concerned Agency in order to avoid electrical hazards caused by accidental touching of stay/Guy ropes with power line.
- 5.0.4.2 Safety precaution** Safety shall be given utmost importance during stringing. The following need to be ensured.
- 5.0.4.3 Safe working** conditions shall be provided at the stringing site.

**5.0.4.4 Full proof communication** through walky- talkie / mobile phones shall be used in order to avoid any damage to workmen or public on ground.

#### **5.0.5 In case of 11 KV and LT lines (PSC)**

##### **5.0.5 (A)**

**5.0.5.1 All the poles shall be provided with a RCC block base or MS base plate having dimensions as mentioned at 5.0.2 © as per the site requirement to be decided by Engineer in Charge. The decision of Engineer in Charge will be Final.**

**5.0.5.2** The poles shall then be lifted to the pit with the help of wooden supports. The pole shall then be kept in the vertical position with the help of 25 mm (min.) manila ropes, which will act as the temporary anchor. The verticality of the pole shall be checked by spirit level in both longitudinal & transverse directions. The temporary anchor shall be removed only when **poles set properly in the pit for foundation concreting & backfilling with proper compacting the soil. The backfilling should be done in layers (maxm. 0.5 mts at a time with sprinkling of water and by using wooden hammer. No stone more than 75 mm should be used during back filling.**

**5.0.5.3** Suspension type H/W fittings in all tangent locations and Four pair bolted type tension H/W fittings should be used in all new 33&11 Kv lines. 45 KN & 70 KN normal B&S insulators will be used in suspension & tension locations respectively.

**5.0.5.4** Concreting of foundation up to a minimum height of 1.8 mtrs from the bottom of the pit with a circular cross-section of radius 0.25 mtrs. (Volume of 0.3 cu.mtr. per pole) in the ratio of 1:2:4 shall be done at the following locations: The depth has to be increased to 2mtr or as required at site condition if poles more than 11 Mts. are to be used.

i) At all the tapping points and dead end poles.

ii) At all the points as per REC construction dwg. No. A-10 (for the diversion angle of 10-60 degree) or **better there of as per the instruction of Engineer in charge. The decision of Engineer in charge will be final.**

iii) Both side poles at all the crossing for road, Nallaha railway crossings etc.

iv) Where Rail poles, Joist poles, double pole and four pole structures are to be erected.

#### **6.0. Earthing of Support**

**6.0.1** Each pole shall be earthed with coil type earthing as per REC Construction Standard J-1.

**6.0.2** All DP & Four pole structures & the poles on both sides of railway crossing shall be earthed by providing two nos. **pipe earthing as per Drawing provided by SOUTHCO.**

#### **6.0.3 EXTENSION POLE**

Pole with pole extension arrangement up to two **to three** meters (**in case** of 33 KV new **Mini base** GI tower structure) shall be used at low ground level locations for maintaining ground clearance and for road crossings for HT Lines.

## **7.0 PROVISION OF GUYS/STRUT POLES TO SUPPORTS**

**7.0.1** The arrangement for guys shall be made wherever necessary. Strut poles/flying guys wherever required shall be installed on various pole locations as per REC construction standards. In order to avoid guys/ Strut self supported GI poles/ structures may be used.

**7.0.2** In this work anchor type guy sets are to be used. These guys shall be provided at following locations where guys are damaged or not provided.

(i) Angle locations

(ii) Dead end locations

(iii) T-off points

(iv) Steep gradient locations.

(v) Double Pole, & four pole

The stay rod should be placed in a position so that the angle of rod with the vertical face of the pit is  $30^{\circ}$  to  $45^{\circ}$  as the case may be maximum movement for tightening or loosening.

**7.0.3** If the guy wire proves to be hazardous, it should be protected with suitable asbestos pipe filled with concrete of about 2 m length above the ground level, painted with white and black strips so that, it may be visible at night.

**7.0.4** The guy insulator should have a minimum vertical clearance of 3.5 mtr from the ground.

## **8.0 CROSS ARMS**

Cross Arms should be made by using 100x50x6 mm GI. channel. For both 33 KV & 11 KV system. Cross Arms made out of M.S. angle shall not be used.

In tower type poles (GI) all the X-arms are part of the structure.

### **8.0.1 Qualification Criteria of Manufacturer:-**

The prospective bidder may source the above items from manufacturers who must qualify the following requirements:

The manufacturer should have supplied at least 1000 no.s (of each item) to electricity supply utilities / PSUs.

The bidder should enclose Performance Certificates from the above users issued in the name of the manufacturer as proof of successful operation in field.

**a)** Hot Dip Galvanised Cross arms and Pole Top Brackets for both 11KV construction at intermediate and light angle pole shall be fabricated from grade 43A mild steel of channel section and for heavy angle poles, end poles and section poles fabricated from grade 43A mild steel of angle section. The grades of structural steel shall conform to IS – 226: 1975.

**b)** The 11 KV ' V ' Cross arm shall be made out of 100x 50x5.6. mm MS Channel of ( 9.56 kg/mtr weight) .

The Back Clamp for both 11KV shall be made out of 75 x 10 MS Flat and shall be suitably designed to fit PSC Pole 9 Mtr x 300 Kg , 8 Mtr x 200 Kg.

**c)**The Pole Top Bracket (F Clamp) shall be made out of 75 x 10 MS Flat suitably designed to fit PSC Pole 9 Mtr x 300 Kg for 11 KV.

Except where otherwise indicated all dimensions are subject to the following tolerances:

Dimensions up to and including 50mm:+1mm: and dimensions greater than 50mm: +2%

All steel members and other parts of fabricated material as delivered shall be free of warps, local deformation, unauthorized splices, or unauthorized bends. Bending of flat strap shall be carried out cold. Straightening shall be carried out by pressure and not by hammering.

Straightness is of particular importance if the alignment of bolt holes along a member is referred to its edges.

Holes and other provisions for field assembly shall be properly marked and cross referenced. Where required, either by notations on the drawing or by the necessity of proper identification and fittings for field assembly, the connection shall be match marked. A tolerance of not more than 1mm shall be permitted in the distance between the center lines of bolt holes.

The holes may be either drilled or punched and, unless otherwise stated, shall be not more than 2mm greater in diameter than the bolts. When assembling the components force may be used to bring the bolt holes together (provided neither members nor holes are thereby distorted) but all force must be removed before the bolt is inserted. Otherwise strain shall be deemed to be present and the structure may be rejected even though it may be, in all other respects, in conformity with the specification.

The back of the inner angle irons of lap joints shall be chamfered and the ends of the members cut where necessary and such other measures taken as will ensure that all members can be bolted together without strain or distortion. In particular, steps shall be taken to relieve stress in cold worked steel so as to prevent the onset of embitterment during galvanizing.

Similar parts shall be interchangeable.

Shapes and plates shall be fabricated and assembled in the shop to the greatest extent practicable. Shearing flame cutting and chipping shall be done carefully, neatly and accurately. Holes shall be cut, drilled or punched at right angles to the surface and shall not be made or enlarged by burning. Holes shall be clean-cut without torn or ragged edges, and burrs resulting from drilling or reaming operations shall be removed with the proper tool.

Shapes and plates shall be fabricated to the tolerance that will permit field erection within tolerance, except as otherwise specified. All fabrication shall be carried out in a neat and workmanlike manner

so as to facilitate cleaning, painting, galvanizing and inspection and to avoid areas in which water and other matter can lodge.

Contact surfaces at all connections shall be free of loose scale, dirt, burrs, oil and other foreign materials that might prevent solid seating of the parts.

#### **8.0.2 Fabrication has to be made as per drg. of ' V ' X-arm, Back clamp & ' F ' clamp.**

##### **GALVANISING**

All type of cross arms back clamps, F clamps & stay clamps shall be hot dip galvanized, are as following:

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 to Service Condition 4. The zinc coating (610 gms per sq.mt) 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.

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.

Before picking, all welding, drilling, cutting, grinding and other finishing operations must be completed and all grease, paints, varnish, oil, welding slag and other foreign matter completely removed. All protuberances which would affect the life of galvanizing shall also be removed.

**The weight of zinc deposited shall be in accordance with that stated in Standard IS 2629 and shall not less than 0.61kg/m<sup>2</sup> with a minimum thickness of 86 microns for items of thickness more than 5mm, 0.46kg/m<sup>2</sup> (64 microns) for items of thickness between 2mm and 5mm and 0.33kg/m<sup>2</sup> (47 microns) for items less than 2mm thick.**

Parts shall not be galvanized if their shapes are such that the pickling solutions cannot be removed with certainty or if galvanizing would be unsatisfactory or if their mechanical strength would be reduced. Surfaces in contact with oil shall not be galvanized unless they are subsequently coated with an oil resistant varnish or paint.

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.

**In no case the repair of galvanisation on site will be permitted.**

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.

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 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.

### **8.0.3 Fixing of Cross Arms**

After the erection of supports and providing guys, the cross-arms are to be mounted on the support with necessary clamps, bolts and nuts. The practice of fixing the cross arms before the pole erection should be followed.

## **9.0 INSTALLATION OF LINE MATERIALS**

**9.0.1 Insulator and Bindings** - These materials are to be procured from the approved vendors only after type test subsequent to the design approval of Project Manager.

1. Suspension type H/W fittings (Single suspension normally to be used and in important X-ings double suspension fittings to be used) in all tangent locations. In S/S fittings 3 nos. 45 KN normal disc insulators, D/S fittings 6 nos. 45 KN normal disc insulators to **be used in 33 KV line. In case of 11 KV line 2 nos & 4 nos 45 KN B&S normal insulators are to be used.**
2. In angle locations single tension fittings to be used with 4 nos. 70 KN disc insulators. In all road X-ings and other important X-ings Double Tension H/W fittings 8 nos. 70 KN disc insulators to be used **in case of 33 KV line & in 11 KV line it should be 45 KN insulators 2 nos. & 4 nos. are to be used.**
3. Suitable pre formed armoured rods should be used in all suspension fittings **in case of higher size Conductors.**
4. Guarding / pilot insulators at the sharp angle points has to be provided.
5. Four **pair** bolted type (**suitable for M-16 bolts**) tension fittings for AAA conductors and compression type tension fittings for ACSR conductors has to be used.
6. The "distribution tie " meant for pin insulator binding should be of no. 6 size and that of soft annealed wire having a minimum length of 3 mtr.
7. **Compression type jointing sleeves should be used for jointing of conductors only.**

### **9.0.2 Checking of Suspension Fitting**

- a) It shall be checked that there is no damage to any component of hardware fittings.
- b) It shall be verified that all nuts and bolts are tightened properly.
- c) It shall be made sure that all the necessary security pins (split pins) are fixed properly as per approved drawings.

### 9.0.3 Insulator hoisting

- a) Insulators shall be completely cleaned with soft and clean cloth.
- b) It shall be verified that there is no crack or any other damage to insulators.
- c) It is very important to ensure that 'R' clips in insulator caps are fixed properly. This is a security measure to avoid disconnection of insulator discs.
- d) Both Arcing horns (both at top & bottom) of each insulators string has to be provided.

**Where change of insulators** required, prior to fixing, all insulators shall be cleaned in a manner that will not spoil, injure or scratch surface of the insulator, but in no case shall any oil be used for that purpose.

#### **OR ( If specified in areas where tower structures cannot be used)**

**Pin insulators** shall be used on all poles in straight line and disc insulators on angle and dead end poles. Damaged insulators and fittings, if any, shall not be used. The insulator and its pin should be mechanically strong enough to withstand the resultant force due to combined effect of wind pressure and weight of the conductor in the span.

**The pins for insulators** shall be fixed in the holes provided in the cross-arms and the pole top brackets. 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 cross-arm before placing the bolt in the hole of cross-arms. The nut of the straps shall be so tightened that the strap can move freely in horizontal direction.

**All materials, which are to be supplied by the contractor should be procured from the approved Manufactures of SOUTHCO's only. Procurement from any suppliers will not be permitted. All the related drawings of materials have to be approved by department. All the materials has to be tested in presence of authorized representative of department as well as officers of third party engaged by Government if any also.**

### 10.0 Handling of Conductor

The Conductor will be supplied by the department from the designated stores of SOUTHCO which the contractor has to lift for the work at their cost. All cares should be taken not to damage conductor surface during transit. Necessary tools and plants for the same have to be effectively used by the agency.

#### 10.0.1 Running Out of the Conductors:

The contractor shall be entirely responsible for any damage to the pole or conductors during stringing. Care shall be taken that the conductors do not touch and rub against the ground or objects, which could scratch or damage the strands.



**10.0.2** The sequence of running out shall be from the top to down i.e. the top conductor shall be run out first, followed in succession by the side conductors. Unbalanced loads on poles shall be avoided as far as possible. When lines being erected run parallel to existing energized power lines, the Contractor shall take adequate safety precautions to protect personnel from the potentially dangerous condition.

### **10.0.3 Monitoring of Conductors during Stringing**

- a) The conductor shall be continuously observed for loose or broken strands or any other damage during the running out operations. Repair to conductors, if necessary, shall be carried out with repair sleeves. The final conductor surface shall be clean, smooth and free from projections, sharp points, cuts, abrasions, etc. The Contractor shall be entirely responsible for any damage to the poles during stringing.
- b) Conductor shall be checked constantly as it is unwound from Conductor drum for any broken, damage or loose strand. If any major defect is noticed then the defective portion has to be removed and mid span joint provided. However if the defect is of minor nature i.e. number of damaged strands is not more than 1/6<sup>th</sup> of the total strands in outer layer, a repair sleeve shall be provided.
- c) M.S. (mid span) Joint shall be provided at least 15 meters away from 33 KV line tower. All MS joints should be Compression type by providing suitable aluminium compression pipes. The compression joints should be continuous. In case of AAAC compression joints, minimum 25% over lapping with the previous compression should be done.
- d) There shall not be any Mid-Span joint over Rly / River / Main Road Crossing.
- e) Not more than one M.S. Joint shall be provided in one span for each conductor.  
Rough sagged conductors of one phase shall be simultaneously tightened by which machine fixed on tower till the desired final sag is achieved.

**N.B:- At some places single ckt. Line triangular fashion may be strung in double ckt. GI poles / GI structures with lower size conductors. Subsequently higher size conductors (Panther or 232 sq.mm AAAC) will be replaced depending on load growth.**

### **10.0.4 Stringing of AB Cables**

#### **10.0.4.1 Fixing of Suspension & Tension/ Dead end fittings to the Poles.**

The suspension clamp is to be hung on eye hook/ suspension hook, which is fixed to the pole at a minimum distance of 0.15 mt. from top end of the pole. The messenger wire of bunched cable resting on a pulley is separated from the cable by separating wedges and inserted in the conductor groove of the suspension clamp. The bolt is tightened to a torque of 20 N after which the pulley and wedges are to be removed. The cable is tied to the messenger wire with nylon tie on both sides of clamps. A hole of minimum diameter is to be made through poles for erection of suspension clamp. In case, drilling is not possible to make hole through poles, pole clamps/eye hook 50 x 6 mm flat shall be used. Eye/hook pole clamp shall be made to suite the pole width. This shall be installed as per Fig.

No. 2 (a) & 2(b) of REC Construction Standard No. E-34 for suspension clamps and as Fig. No. 2 (a) of REC Construction Standard No. E-35 for tension (Dead end) clamps.

#### **10.0.4.2 Fittings & Accessories**

The following hardware fittings and accessories shall be used to install, erect & join the aerial bunched cable.

- a) Suspension Hook (Eye-Hook) – The Contractor shall install the suspension hook (eye hook). This hook shall be used to attach the AB cable on the pole by means of a dead end clamp in terminal poles and for attaching a suspension clamp in straight lines and angle up to 90 Deg.-
- b) Suspension fittings & the corresponding eye hook shall be as per REC Construction Standard No. e – 34.
- c) Dead End fittings shall be bolted type & the corresponding eye hook shall be as per REC Construction Standard No. E-35.
- d) Nylon Tie- The contractor shall supply nylon ties. These ties shall be used for tying the conductors with the messenger wire to prevent the phase conductors from chatting against suspension clamp. The nylon tie is made of weather resistant black nylon.
- e) Connectors- The contractor shall supply connector. These shall be used as non-tension aluminum to aluminum connections for conductor joints.
- f) Plastic Covers for Connectors- The contractor shall install Plastic Covers for Connectors. These covers shall be used with aluminum/aluminum connectors to protect connectors against corrosion caused by climatic conditions.

#### **10.0.4.3 Installation of Cable**

The contractor shall be fully responsible for all activities related to installation of AB cable. His responsibilities consists of Handling of the cable Pulling of the cable Stringing of the cable Jointing of the cable

##### **Handling of AB Cable.**

The contractor shall observe following precautions while handling the AB Cable:

The cable drums must be stored and transported in an upright position. While loading/unloading, the drums shall not be thrown from transport vehicles. Cable contact with sharp articles shall be avoided. In order to prevent damage to the insulation, the cable shall not be dragged on the ground. Pulleys shall be used for this purpose. In order to prevent strands from spreading, always cut the cable with a cutter.

Use nylon ties or electrical tape to prevent the cable from spreading away from messenger wire after the cutting. Staple the end of the cable on to the drum in order to prevent loosening.

Do not remove the protective boards from the cable drum before the cable is pulled off the drum. While moving the drum by rolling it on ground, always roll the drum in the direction indicated by the arrow on the flange. When pulling the cable, the spinning direction must be opposite. Do not store the

drums on wet soil, sandy or humid places. Store the accessories in good order for quick easy and correct handling.

**b) Pulling the Cable.**

The principle is to pull the cable under mechanical tension so that contact with the ground or any other obstacles is avoided. The cable drum should be perfectly in alignment with line to be strung and fixed about 15-20 mts. from the holding the first pulley. Open the cover of the drum to check and ensure that the insulation is not damaged. The pulling which is sent up up-to the cable drum is about 15-20 mts from the pole holding to the last pulley.

The pulleys are directly hung to such hook on the poles. The pulley tandem is to be used on angle poles if the line is deviating more than 60° Pull the guiding rope through all the pulleys.

Normal care shall be taken to assume a smooth passage of whole cable through the pulleys, especially in the first pole and on angle poles. One worker should act s brakeman at the cable drum so that the cable is not loosened during the pulling. One worker should follow the cable going through the pulleys and stop the pulling if anything goes wrong.

**c) Stringing Operations.**

The contractor shall follow one of the following methods for stringing.

**1. Sag Method**

Fix a dead end clamp on the neutral messenger wire at the pole. The messenger shall be bent behind the clamp to ensure sufficient friction between the messenger and the clamp in the initial stays during stringing. Bind the conductor together beside the dead end clamp using a nylon tie. Hand the clamp on the hook at the end pole Rewind simultaneously the slack cable length on the cable drum. Attach the 'come along clamp' on the neutral messenger wire at the first pole of the line. Tighten the cable by the shackle or the winch when required sag/ Ground Clearance is obtained. Hand the dead end clamp on the hook and install it on the neutral messenger. Remove the come along Bind the conductors together on the messenger wire using a nylon tie Check the length of the cable needed and cut it at an appropriate point.

**2. Dynamometer Methods**

Start the operation as above up to the stage. Install the dynamo meter on the come-along clamp Tighten the cable at the required value by reading the Dynamo meter Finish the stringing as in the sag method operation.

**d) Jointing of Cables.**

Jointing of cable shall be in accordance with clause 12.3.3 of IS 1255:1993 and manufacturers special instructions given hereunder. This joining is to be done by skilled personnel. Cable Damage and Repairs: If the cable is damaged for whatever reasons, it shall be brought to the notice of the Engineer in charge and shall not be used without his approval. No joint or splice shall be made in

spans crossings over main roads, small rivers or in tension spans. Not more than one joint in the cable shall be allowed in one span.

- e) The stringing rate include rates for paving, stringing, clamping, jointing, tensioning and fitting of all necessary accessories.

#### **Final Checking, Testing and Commissioning**

After stringing have been done as approved by the Engineer in charge, to ensure that everything is complete in all respects, the works shall be thoroughly inspected keeping in view the following main points.

All the bolts and nuts should be of GI materials as per relevant IS.

The stringing of the cable has been done as per the approved sag and desired clearances are achieved. No damage, minor or major to the cable, messenger wire and accessories

The contractor shall submit a report to the above effect to the Engineer in Charge, who shall inspect and verify the correctness of the report. In case it is noticed that some or any of the above is not fulfilled, the engineer shall get such items rectified by the contractor no extra cost to the purchaser. After final checking, the line shall be tested for insulation resistance in accordance with IS 1255:1983. All arrangements for such testing or any other test desired by the Engineer-in-charge shall be done by the contractor and necessary labour, transport and equipment shall be provided by him. Any defect found out as a result of such tests shall be rectified by the contractor, forthwith at no extra cost to the purchaser.

In addition to the above, the contractor shall be responsible for testing and ensuring that the total and relative sags of the cable as within the specified tolerance. Such tests shall be carried out at selected points along the route as required by the Engineer-in-charge and the contractor shall provide all necessary equipment and labour to enable the tests to be carried out. After satisfactory test on the line and approval by the Engineer in Charge, the line shall be energized at full operating voltage before handing over. The cable shall be megger tested before and after jointing. The AB cable shall be tested for.

- i) Continuity of messenger wire and conductors
- ii) Absence of cross phasing
- iii) Insulation resistance to earth
- iv) Insulation resistance between conductors
- v) DC Resistance
- vi) Capacitance

As per IS 1255:1983 of the latest issue and as per manufacturer's instructions.

Sufficient backfilled earth covers each foundation pit and is adequately compacted.

All poles are used strictly according to final approved drawing and are free of any defect or damage whatsoever. The stringing of the conductors and earth wire has been done as per the approved sag and tension charts and desired clearances as clearly available. All conductor and messenger wire accessories are properly installed. All other requirements for completion of works such as fixing of danger plate and anti-climbing device have been fulfilled.

**GI Inter –posing RS joist** (125x75) mm of length 8 mts may be provided wherever required (This will be decided by Engineer in charge) in all town areas with RCC concrete (M-15) of 1.4 mts below existing ground level and RCC (M-15) coping of 450 mm above the ground .as per the drawing .

## **11.0 CROSSINGS**

- a) As far as possible all Railway line, telecommunication lines crossings shall be made at right angles. Scaffolding to be used during stringing operations where roads, channels, telecommunication lines, power lines and railway lines are crossing. The contractor shall co -ordinate with SOUTHCO for obtaining work permit and shut down of the concerned line. The Contractor shall be entirely responsible for the proper handling of the conductor and accessories in the field.
- b) Guarding shall be provided at major crossings, if not provided. The Guarding shall consist of GI guard cross arm of length 2.5 mtrs made out of 75x40 x6 mm channel & shall be hot dipped galvanized generally conforming to IS:2633/72. The clamps shall also be hot dipped galvanized generally conforming to IS: 2633/72. Guarding shall be erected with ground & line clearances as per the I.E. rules. The guarding shall be provided with GI wire 8 SWG for 33 KV.

## **12.0 PAINTING OF MATERIALS**

All the metal parts except G.I. parts are to be painted with two coat of red oxide and one coat of aluminum paint.

- 12.0.1** At least two coats of cold galvanized zinc rich paint having 90% zinc contents shall be applied on the welding to avoid rusting.

## **13.0 STRINGING OF CONDUCTOR**

- 13.0.1** The works include spreading of conductors without any damage and stringing with proper tension without any kinks/ damage Jumpering at cut points by using two nos., three bolted, PG claps has to be done. **No binding of two conductors with aluminium wires will be allowed.** In each and every joints three bolted very good quality PG clamps should be used wrapping of suitable aluminium tapes if required as per the decision of the EE/DE. The ground & line clearances at road crossings along roads other crossings shall be as mentioned in this specification.( which also should not be less than the relevant clearances mentioned in I.E. rules.)

- 13.0.2** While transporting conductors' drums to site, precautions are to be taken so that the conductor does not get damaged. The drum shall be mounted on cable drum support. The direction of rotation of the drum shall be according to the mark in the drum so that the conductor could be drawn. While drawing

the conductor, it shall not rub against surface causing damage. The conductor shall be passed over poles on rubberized or aluminum snatch block (pulley) mounted on the poles for this purpose.

**13.0.3** The conductor shall be pulled through come-along clamps to string the conductor between the tension locations.

**13.0.4** Conductor splices shall not crack or otherwise be susceptible to damage in the stringing operation. The Contractor shall use only such equipment / methods during conductor stringing which ensures complete compliance in this regard. All the joints including mid span joints on the conductor shall be of the compression type, in accordance with the recommendations of the manufacturer.

**13.0.5** All the joints or splices shall be made at least 15 meters away from the pole. No joints or splices shall be made in spans crossing over main roads, railways and small river spans. Not more than one joint per sub-conductor per span. After compressing the joint, the aluminum sleeve shall have all corners rounded; burrs and sharp edges removed and smoothed

The contractor shall remain fully responsible for the exact alignment of the line. If after erection, any tower is found to be out of alignment, the same shall have to be dismantled and re-erected after correction by the contractor at his own cost, risk and responsibility, including installation of fresh foundation, if felt necessary by the employer.

**NB:- 0.5% is the non-accountable allowable wastage (for both sag & wastage) will be permitted.**

**14.0.6 PIN INSULATORS**

**14.0.6.1** 11 Kv Pin Insulators: - IS-731/77 (Porcelain Insulator for O/H power lines with nominal voltage greater than 1000 volts.

**14.0.6.42** 11 Kv GI Pin: - Confirming to IS-2486 Part-I/1971.

**14.0.7 DISC –INSULATORS:**

**14.0.7.1 Insulator Strings**

Sl. No.	Particulars	Single Tension string	Double Tension string
1.	No. of standard Discs (nos) 1) 11 kV	1X3	2X3
2.	Size of Disc (11 Kv)	280x170	280x170

All the above materials must conform to the schedules at C2 and C3

#### **14.0.7.2 PORCELAIN GLAZE:**

Surfaces to come in contact with cement shall be made rough by sand glazing. All other exposed surfaces shall be glazed with ceramic materials having the same temperature coefficient of expansion as that of the insulator shell. The thickness of the glaze shall be uniform throughout and the colour of the glaze shall be brown. The glaze shall have a visible luster and smooth on surface and be capable of satisfactory performance under extreme tropical climatic weather conditions and prevent ageing of the porcelain. The glaze shall remain under compression on the porcelain body throughout the working temperature range.

#### **14.0.7.3 METAL PARTS:**

Cap and Ball pins:

Twin Ball pins shall be made with drop forged steel and caps with malleable cast iron. They shall be in one single piece and duly hot dip galvanized. They shall not contain parts or pieces joined together, welded, shrink fitted or by any other process from more than one piece of material. The pins shall be of high tensile steel, drop forged and heat malleable cast iron and annealed. Galvanizing shall be by the hot dip process with a heavy coating of zinc of very high purity with minimum of 6 dips. The bidder shall specify the grade, composition and mechanical properties of steel used for caps and pins.

#### **14.0.7.4 SECURITY CLIPS:**

The security clips shall be made of phosphor bronze or of stainless steel.

#### **14.0.7.5 FILLER MATERIAL:**

Cement to be used as a filler material shall be quick setting, for curing Portland cement. It shall not cause fracture by expansion or loosening by contraction. Cement shall not react chemically with metal parts in contact with it and its thickness shall be as small and as uniform as possible.

#### **14.0.7.6 MATERIAL DESIGN AND WORKMANSHIP:**

- i) All raw materials to be used in the manufacture of these insulators shall be subject to strict raw materials quality control and to stage testing quality control during manufacturing stage to ensure the quality of the final end product. Manufacturing shall conform to the best engineering practices adopted in the field of extra high voltage transmission. Bidders shall therefore offer insulators as are guaranteed by them for satisfactory performance on Transmission lines.
- ii) The design, manufacturing process and material control at various stages be such as to give maximum working load, highest mobility, best resistance to corrosion good finish, elimination of sharp edges and corners to limit corona and radio interference voltage

#### **14.0.7.7 INSULATOR SHELL:**

The design of the insulator shell shall be such that stresses due to expansion and contraction in any part of the insulator shall not lead to deterioration. Shells with cracks shall be eliminated by temperature cycle test followed by temperature cycle test followed by mallet test. Shells shall be dried under controlled conditions of humidity and temperature.

#### **14.0.7.8 METAL PARTS:**

- b) The twin ball pin and cap shall be designed to transmit the mechanical stresses to the shell by compression and develop uniform mechanical strength in the insulator. The cap shall be circular with the inner and outer surfaces concentric and of such design that it will not yield or distort under loaded conditions. The head portion of the insulator or is under tension the stresses are uniformly distributed over the pinhole portion of the shell. The pinball shall move freely in the cap socket either during assembly of a string or during erection of a string or when a string is placed in position.
- c) Metal caps shall be free from cracks, seams, shrinks, air holes, blowholes and rough edges. All metal surfaces shall be perfectly smooth with no projecting parts or irregularities which may cause corona. All load bearing surfaces shall be smooth and uniform so as to distribute the loading stresses uniformly. Pins shall not show any macroscopically visible cracks, insulations and voids.

#### **14.0.7.9 GALVANIZING:**

All ferrous parts shall be hot dip galvanized six times in accordance with IS: 2629. The zinc to be used for galvanizing shall conform to grade Zn 99.5 as per IS: 209. The zinc coating shall be uniform, smoothly adherent, reasonably light, continuous and free from impurities such as flux ash, rust stains, bulky white deposits and blisters. Before ball fittings are galvanized, all die flashing on the shank and on the bearing surface of the ball shall be carefully removed without reducing the designed dimensional requirements.

#### **14.0.7.10 CEMENTING:**

The insulator design shall be such that the insulating medium shall not directly engage with hard metal. The surfaces of porcelain and coated with resilient paint to offset the effect of difference in thermal expansions of these materials.

##### **14.0.7.10 (a) Specific Requirement for Insulators**

**The insulators shall conform in the following specific conditions of respective IS given in the table below**



Insulator		Designation	Minimum mechanical failing load	Minimum Creepage distance
11KV	Pin	Type-B of IS731 Type-B of IS731	10 KN	320 mm
11KV	Stay	Type-C of IS 1445	88 KN	57 mm
LT	Stay	Type-C of IS 1445	44 KN	41 mm

#### 14.0.7.11 SECURITY CLIPS (LOCKING DEVICES)

The security clips to be used as locking device for ball and socket coupling shall be 'R' shaped hump type to provide for positive locking of the coupling as per IS: 2486 (Part-IV). The legs of the security clips shall allow for sore adding after installation to prevent complete withdrawal from the socket. The locking device shall be resilient corrosion resistant and of sufficient mechanical strength. There shall be no possibility of the locking device to be displaced or be capable of rotation when placed in position and under no circumstances shall it allow separation of insulator units and fitting 'W' type security clips are also acceptable. The hole for the security clip shall be countersunk and the clip shall be of such design that the eye of the clip may be engaged by a hot line clip puller to provide for disengagement under energized conditions. The force required for pulling the clip into its unlocked position shall not be less than 50 N (5 Kgs.) or more than 500N (50 Kgs.)

#### 14.0.8 LONG ROD INSULATOR

33KV Long Rod Insulator in conformity to IS: 2486 , IEC:433 & IS:731 can be used preferably in Saline affected area. The technical requirements are as under

- |  |        |
|--|--------|
| a. minimum nominal creepage distance     | 850 mm |
| b. Lightning impulse withstand voltage   | 170KVp |
| c. Wet Power Frequency withstand voltage | 75 KV  |
| d. Tensile load                          | 70KN   |

#### 15.0 FASTENERS: BOLTS, NUTS & WASHERS

- All bolts shall be of property class 5.6 and nuts of property class 5.0 IS: 1367 (Part – 3) 1991 and IS: 6639-1972 shall conform to IS: 12427, they shall be galvanized and shall have hexagonal heads and nuts, the heads being forged out of solid steel rods and shall be truly concentric and square with the shank. The shank shall be perfectly straight.
- Usually threaded bolts shall not be used, the length of bolts should be such that the threaded portion shall not extend into the place of contact of the members.

3. All bolts shall be threaded to take the full depth of the nut and threaded far enough to permit firm gripping of the members, but not any further. It shall be ensured that the threaded portion of each bolt protrudes not less than 3 mm and not more than 8 mm when fully tightened. All nuts shall fit hand tight to the point where the shank of the bolt connects to the head.
4. Spring washers shall be provided for insertion under all nuts. These washers shall be of electro-galvanized steel and of the positive lock type. Their thickness shall be 2.5 mm for 12 mm dia bolts, 3.5 mm for 16 mm dia bolts and 4.5 mm for 20 mm dia bolts.
5. The Bidder shall furnish bolt schedules giving thickness of members connected, size of bolts and nuts, the length of the shank, the length of the threaded portion of bolts, sizes of bolt holes, thickness of washers and any other special details of this nature.
6. To obviate bending stress in bolts or to reduce it to a minimum, no bolt shall connect aggregate thickness of more than three (3) times its dia.
7. Bolts at the joints shall be so staggered that nuts may be tightened with spanners without fouling.  
Step Bolt Ladders: These bolts shall be of property class 4.6 conform to IS: 6639-1972.
8. Each tower shall be provided with step bolts on one of the main legs, of not less than 16 mm diameter and 175 mm long, spaced not more than 400 mm apart and extending from about 2.5 metres above the ground level to the top of the tower. Each step bolt shall be provided with two nuts on one end to fasten the bolt security to the tower and button head at the other end to prevent the feet from slipping away. The step bolts shall be capable of withstanding a vertical load not less than 1.5 KN and shall be used as a ladder for climbing.

## **16.0 QUANTITIES AND WEIGHTS**

1. The quantities stated in Annexure – I are only provisional. Final quantities will be informed by the employer to the supplier on completion of detailed survey. However, bids will be evaluated based on quantities indicated.
2. The employer reserves the right to increase or decrease quantities at the rates quoted in the bid.
3. The unit weight of each type of tower stubs, super structure and extension be furnished by the Bidder.

## **17.0 INSPECTION**

1. The supplier shall keep the employer informed well in advance of the commencement of manufacture, progress of manufacture thereof and fabrication of various tower parts at various stages. So that arrangements could be made for inspection by the employer.
2. The acceptance of any batch of items shall in no way relieve the supplier of any his responsibilities for meeting all the requirements and intent of this specification and shall not prevent subsequent rejection if any item of that batch is later found defective.

3. The employer or his authorized representatives shall have free access at all reasonable time to all parts of the supplier's works connected with the fabrication of the material covered under the contract for satisfying themselves that the fabrication is being done in accordance with the provisions of this specification.
4. Unless specified otherwise, inspection shall be made at the place of manufacture prior to dispatch and shall be conducted so as not to interfere unnecessarily with the operation of the work.
5. Should any member of the structure be found not to comply with the approved design, it shall be liable for rejection. No member once rejected shall be resubmitted for inspection except in cases where the employer or his authorized representative considers that the defects can be rectified.
6. Defects which occur during fabrication shall be made good with the consent of and according to the procedure to be laid down by the employer.
7. All gauges and templates necessary to satisfy the employer for conducting tests shall be made available at the test site by the supplier.

The correct grade and quality of steel shall be used by the supplier. To ascertain the quality of steel the employer may at his discretion get the material tested at an approved laboratory.

#### **18.0 MATERIALS HANDLING AND INSURANCE**

The contractor shall deliver all equipment/materials against this contract to his site stores under cover of Transit Insurance to be taken in his name. Cost of such insurance is to be borne by the contractor.

Cost of transportation of all materials from contractor's store to the site of work as well as department supply items like Conductors, AB cables, Power cables, etc shall be borne by the contractor irrespective of mode of transportation and site condition.

The contractor has to bear the cost of premiums on insurance for all materials, tower accessories and total erection cost of the line including cement, rods for foundation.

It will be the responsibility of the contractor to report to the concerned Police Station about all incidents of thefts and lodge, pursue and settle all claims with Insurance Company in case of damage/loss due to theft, pilferage, flood and fire etc. and the employer of the work shall be kept informed promptly in writing about all such incidents. The loss, if any, on this account shall be recoverable from the contractor if the claims are not lodged and properly pursued in time or if the claims are not settled by the insurance company due to lapses on the part of the contractor. The contractor shall have to replenish promptly damaged, stolen tower members and accessories conductors, earth wire, hardware's etc. and repair/re-erect the damaged lines, free of cost to the employer so as to maintain the programme of work. The employer will not be responsible in any way for such loss of materials.

## 19.0 Check List

Before the line is offered for taking over and disbursement of final payment subsequent to the materials reconciliations a comprehensive format in shape of check list as shown at schedule C-4 must be filled up and signed by the executing agency.

### CHECK FORMAT

- |     |   |         |
|-----|---|---------|
| 1.  | Excavation has been done as per approved drawing of Normal soil.  | Yes/ No |
| 2.  | PCC has been done as per approved drawing.  | Yes/ No |
| 3.  | RCC has been done as per approved drawing and as per required Qty. Rods has been provided.  | Yes/ No |
| 4.  | lapping of rods has been done as per standard (Minimum 40 D).   | Yes/ No |
| 6.  | Good quality of shutters has been used.   | Yes/ No |
| 6.  | Is there any honey-combs after removal of shutters observed.  | Yes/ No |
| 7.  | If honey-combs observed, has been repaired by providing rich Concrete mixture after removal of loose ingredients.   | Yes/ No |
| 8.  | Is there any deviation in alignment related to tangent tower.   | Yes/ No |
| 9.  | Is there any deviation in verticality after concreting.( If any deviation In verticality of pole or tower, the contractor should re-cast the Foundation free of cost, otherwise it will not to be accepted) | Yes/ No |
| 10. | Is there any deviation in bi-section of angles of the Angle tower before taking up the concreting of pole or structure.   | Yes/ No |
| 11. | All the GI bolts-nuts of required size with required spring washer has been provided.   | Yes/ No |
| 12. | All the bolts-nuts has been properly tightened ( after full tight 3 Nos. threads will be projected out)   | Yes/ No |
| 13. | Cooping of required height ( in case of Urban area it is 30 cm, in Cross country it is 75 cm) has been done.  | Yes/ No |
| 14. | Painting of pole or structures has been done as per specification.  | Yes/ No |
| 15. | Split pins & "I" clips has been provided in each H/W fittings & Insulator strings.  | Yes/ No |
| 16. | All the accessories in each location has been fixed properly.   | Yes/ No |
| 17. | Bird guard has been provided in each tangent towers.  | Yes/ No |
| 18. | Anti climbing devices has been provided in each location.   | Yes/ No |
| 19. | All the jumpers has been properly tightened by providing Required nos. of PG clamps (2 nos. PG clamps has to be Provided per each side)   | Yes/ No |
| 20. | All the insulators and H/W fittings used has been free from all Defects.  | Yes/ No |
| 21. | Equal phase to phase clearance has been maintained.   | Yes/ No |
| 22. | Minimum ground clearance from bottom most conductor   | Yes/ No |

(7 mts. in cross country & 9 mts. In road crossings) has been maintained in each span.

- |     |   |                |
|-----|---|----------------|
| 23. | Curing has been done for 28 days.   | <b>Yes/ No</b> |
| 24. | Proper back filling has been done as per specification.   | <b>Yes/ No</b> |
| 25. | Required earthing has done in every locations.  | <b>Yes/ No</b> |
| 26. | Material utilization accounts has been furnished.( In each and every Bills should have material accounts of both departmental supply items And contractor's supply items, except civil items, otherwise the bills Will not accepted). | <b>Yes/ No</b> |
| 27. | Stay  | <b>Yes/ No</b> |
| 28. | Guarding at Road Crossing.  | <b>Yes/ No</b> |
| 29. | Clearance with intercepting lines.  | <b>Yes/ No</b> |
| 30. | Proper Jumpering.   | <b>Yes/ No</b> |

**TECHNICAL SPECIFICATION**  
**VOL-II**  
**FOR**  
**ASSOCIATED MATERIALS**

## TECHNICAL SPECIFICATION OF R.S Joist Pole

### Applicable Standards:

This specification covers design, manufacture, testing and supply of following R.S Joists

Slno.	Item Description	Unit	Quantity
1	11Mtr long (150x150)mm RS Joist (34.6Kg/Mtr)	No.	100
2	13Mtr long (150x150)mm RS Joist (34.6Kg/Mtr)	No.	100
3	10Mtr long (116x100)mm RS Joist (23.0Kg/Mtr)	No.	100
4	11Mtr long (116x100)mm RS Joist (23.0Kg/Mtr)	No.	100
5	13Mtr long (116x100)mm RS Joist (23.0Kg/Mtr)	No.	100

### 2.0 Standards:

The R.S Joists shall comply with the requirements of latest issue of IS – 2062 Gr – A except where specified otherwise.

### 3.0 Climatic Conditions :

The climatic conditions at site under which the store shall operate satisfactory, are as follows

Maximum temperature of air in shade	45° c
Maximum temperature of air in shade	0 c
Maximum temperature of air in shade	50° c
Maximum rain fall per annum	2000m m
Maximum temperature of air in shade	45° c
Maximum ambient temperature	45° c
Maximum humidity	100%

Av. No. of thunder storm days per annum	70%
Av. No. of dust storm per annum	20
Av. Rain fall per annum	150m m

#### 4.0 Rolled Steel Joists

The Rolled Steel joist (RSJ) support structures shall be fabricated from mild steel, grade A and in lengths dictated by design parameters .

#### 4.1 MECHANICAL PROPERTIES:

Tensile Test :	Requirements as per IS:2062/ 1999 Grade-A
Yield Stress(MPa)	Min250
Tensile Strength(MPa)	Min410
$L_0=(5.65\sqrt{S_0})$ Elongation%	Min23
Bend Test	Shall not Crack



## 4.2 CHEMICAL PROPERTIES:

Chemical Composition	Requirements per IS:2062/ 1999 Grade-A
Grade	A
Chemical Name	Fe-410W A
Carbon(%Max.)	0.23
Manganese(%Max.)	1.5
Sulphur(%Max.)	0.050
Phosphorous(%Max.)	0.050
Silicon(%Max.)	0.40
Carbon Equivalent(%Max.)	0.42
Deoxidation Mode	Semi-killed or killed
Supply condition	As rolled

**4.3.** However, In case of any discrepancy between the above data & the relevant ISS, the values indicated in the IS shall prevail.

**4.4.** The Acceptance Tests shall be carried out as per Relevant ISS.

## 5.1 150x150mm & 116x100mm RS Joists:

RS Joists of Specific Weight 34.6kg/mtr and 23.0Kg/mtr with relevant length shall have to be supplied as

per IS:2062;2006 GradellAll , IS:808;1989/2001, IS1608:1995 & IS:12779-1989 and their latest amendment if any complying the required Dimension, Weight, Chemical & Mechanical properties confirming to the relevant IS, as per the Tolerance given Below.

## 5.2. APPLICABLE TOLLERANCES :

- Length of each pole = + 100mm / - 0 % As per relevant IS: 12779-1989 (With proportionate change in no of Poles)
- Specific Weight of RS Joists =  $\pm 2.5\%$  As per relevant IS: 1852/1985
- Weight for whole lot of supply for all categories =  $\pm 3.0\%$  As per relevant IS: 12779-1989 for both type of RS Joists.

## GUARANTEED TECHNICAL PARTICULARS

(To be submitted along with offer)

Particulars	Bidder's Offer	
	(150x150)mm RS Joist	(116x100)mm RS Joist
Length of Joist in Mtr with +100mm/-0% Tolerance		
Weight kg/m with $\pm 2.5\%$ Tolerance		
Sectional Area (cm <sup>2</sup> )		
Depth(D) of Section (mm) with +3.0mm/ - 2.0mm Tolerance as per IS 1852-1985		
Width (B)of Flange (mm) with $\pm 2.5\text{mm}$ Tolerance for 116 x 100 mm ISMB & $\pm 4.0\text{mm}$ Tolerance for 150 x 150 mm ISHB IS 1852-1985		
Thickness of Flange (Tf)(mm) with $\pm 1.5\text{mm}$ Tolerance		
Thickness of Web(Tw) (mm) with $\pm 1.0\text{mm}$ Tolerance		
Corner Radius of fillet or root (R1) (mm)		

Corner Radius of Tow (R2) (mm) Moment of Inertia $I_{xx}$ (cm <sup>4</sup> ) $I_{yy}$ (cm <sup>4</sup> ) Radius of Gyration (cm) $R_{xx}$ $R_{yy}$ Modulus of Section $Z_{xx}$ (cm <sup>3</sup> ) $Z_{yy}$ (cm <sup>3</sup> ) Flange Slope( $\alpha$ ) in Degree Tolerance in Dimension Distinct Non-Erasable Embossings to be made on each R.S. Joist	a)Name & Logo of the Manufacturer. b)B.I.S Logo(ISI Mark) if applicable. c)Size
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However, In case of any discrepancy between the above data & the relevant ISS, the values indicated in the IS shall prevail.

The Acceptance Tests shall be Carried out as per Relevant ISS.

The RS Joists shall be manufactured confirming to the relevant IS with Manufacturer's name/logo & B.I.S Logo if applicable embossed on it.

## EARHTING COIL

### TECHNICAL SPECIFICATION

**I. Qualification Criteria of Manufacturer:-**

The prospective bidder may source Earthing Coil from manufacturers who must qualify all the following requirements:

- a) The manufacturer must have successfully carried out Type Test of similar item from any NABL Accredited Laboratory within the last 5 years, prior to the date of submission of the bid.
- b) The manufacturer should have supplied at least 1000 no.s o electricity supply utilities / PSUs. The bidder should enclose Performance Certificates from the above users issued in the name of the manufacturer as proof of successful operation in field.

## **II. SCOPE**

The specification covers design, manufacture, testing and dispatch to the owner's stores of Earthing Coils for use in earthing of the HT & LT poles.

## **III. GENERAL REQUIREMENTS**

Earthing coils shall be fabricated from soft GI Wire Hot Dip Galvanized. The Hot Dip galvanized wire shall have clean surface and shall be free from paint enamel or any other poor conducting material. The coil shall be made as per REC constructions standard.

The Hot Dip galvanizing shall conform to IS: 2629/1966, 2633/1972 and 4826/1969 with latest amendments.

## **IV. TESTS**

### **Galvanizing Tests**

Minimum Mass of Zinc

On GI Wire used 280 cm/m<sup>2</sup>

After Coiling-266 gm/m<sup>2</sup>.The certificate from recognized laboratory shall be submitted towards mas of zinc.

### **Dip Test**

Dip test shall stand 3 dips of 1 minute and one dip of ½ minute before coiling and 4 dips of 1 minute after coiling as per IS: 4826/1979

### **Adhesion Test**

As per ISS 4826 – 1979.

## **V. DIMENSIONAL REQUIREMENT**

Nominal dia of GI Wire -4 mm (Tolerance±2.5%)

Minimum no. of turns – 115 Nos.

External dia of Coil (Min) – 50 mm

Length of Coil (Min) – 460 mm

Free length of GI Wire at one end coil (Min.) – 2500 mm

The turns should be closely bound. Weight of one finished Earthing Coils (min.) – 1.850 Kg.

**TECHNICAL SPECIFICATION**  
**11KV PIN INSULATORS & 11 KV GI PIN**

The bidder should provide the 11 KV pin insulator as per the following IS standards.

IS Standards: - IS-731, IS-3188 or the latest version as per IS.

The bidder should provide the 11 KV GI pin as per the following IS standards.

The 11 KV hot-dipped galvanized Pin shall conform to IS: 2486 (Part-I) 1971 & (Part: II)/ 1989, IS: 1363/ 1984, IS: 3063/1972 & IS: 2633/1972.

**HT & LT STAY SETS**

**TECHNICAL SPECIFICATION**

**I. Qualification Criteria of Manufacturer:-**

The prospective bidder may source Stay Sets from manufacturers only must qualify all the following requirements:

a) Manufacturer must have successfully carried out Type Test of similar item from any NABL Accredited Laboratory within the last 5 years, prior to the date of submission of the bid.

b) The manufacturer should have supplied at least 1000 sets (both HT & LT taken together) to electricity supply utilities / PSUs. The bidder should enclose Performance Certificates from the above users issued in the name of the manufacturer as proof of successful operation in field.

**II. SCOPE**

This specification covers design, manufacture, testing and dispatch of LT Stay Sets of 16 mm and HT stay sets 20 mm dia.

**III. GENERAL REQUIREMENTS**

**16 MM Dia Stay sets (Galvanized) – LT Stay Set**

This stay sets (Line Guy set) will consist of the following components:-

**Anchor Rod with one washer and Nut**

Overall length of rod should be 1800 mm to be made out of 16 mm dia GI Rod, one end threaded up to 40 mm length with a pitch of 5 threads per cm and provided with one square GI washer of size 40X40x1.6mm and one GI hexagonal nut conforming to IS:1367:1967 & IS:1363:1967. Both washer and nut to suit threaded rod of 16 mm dia. The other end of the rod to be made into a round eye having an inner dia of 40mm with

best quality welding.

**Anchor Plate Size 200 x 200 x 6 mm**

To be made out of GI plate of 6 mm thickness. The anchor plate should have at its centre 18 mm dia hole.

**Turn Buckle & Eye Bolt with 2 Nuts**

To be made of 16 mm dia GI Rod having an overall length of 450mm, one end of the rod to be threaded up to 300 mm length with a pitch of 5 threads per cm and provided with two GI Hexagonal nuts of suitable size conforming to IS:1363:1967 & IS:1367:1967. The other end of rod shall be rounded into a circular eye of 40mm inner dia with proper and good quality welding.

**Bow with Welded Angle**

To be made out of 16mm dia GI rod. The finished bow shall have an over all length of 995 mm and eight of 450 mm, the apex or top of the bow shall be bent at an angle of 10 R. The other end shall be welded with proper and good quality welding to a GI angle 180 mm long having a dimension of 50x50x6mm. The angle shall have 3 holes of 18 mm dia each.

**Thimble**

To be made on 1.5 mm thick GI sheet into a size of 75x22x40mm and shape as per standard shall be supplied.

Average Weight of Finished 16mm Stay Sets shall be at least 7.702 KG (Minimum)

(Excluding Nuts Thimbles and Washer) 8.445 Kg. (Maximum)

**20 mm Dia Stays Sets for 33 Kv,11 KV Lines (Galvanized) HT Stay Set**

The Stay Set (Line Guy Set) will consist of the following components:

**Anchor Rod with one Washer and Nut**

Overall length of Rod should be 1800mm to be made out of 20 mm dia GI rod one end threaded up to 40 mm length with a pitch of threads per cm. And provided with one square G.I Washer of Size 50x50x1.6mm and one GI Hexagonal nut conforming to IS: 1363:1967 & IS:1367:1967. Both washer and nut to suit the threaded rod of 20mm. The other end of the rod to be made into a round eye having an inner dia of 40mm with best quality of welding. Dimensional and other details are indicated and submitted by bidders for owner's approval before start of manufacturing.

**Anchor Plate Size 300 x 300 x 8 mm**

To be made out of G.S. Plate of 8 mm thickness. The anchor plate to have at its centre 22mm dia hole.

**Turn Buckle, Eye Bolt with 2 Nuts.**

To be made of 20 mm dia G.I Rod having an overall length of 450 mm. One end of the rod to be threaded up to 300 mm length with a pitch of 4 threads per cm. The 20 mm dia bolt so made shall be provided with two G.I Hexagonal nuts of suitable size conforming to IS: 1363:1967 & IS: 1367:1967. The other end of the rod shall be rounded into a circular eye of 40mm inner dia with proper and good quality of welding. Welding details are to be indicated by the bidder separately for approval.

**Bow with Welded Channel:**

To be made out of 16mm dia G.I Rod. The finished bow shall have an overall length of 995 mm and height of 450 mm. The apex or top of the bow shall be bent at an angle of 10R. The other end shall be welded with proper and good quality welding to a G.I Channel 200 mm long having a dimension of 100x50x4.7 mm. The Channel shall have 2 holes of 18 mm dia and 22 mm dia hole at its centre as per drawing No.3 enclosed herewith.

**Thimble 2 Nos.**

To be made of 1.5 mm thick G.I sheet into a size of 75x22x40mm and shape as per standard.

**Galvanizing**

The complete assembly shall be hot dip galvanized.

**Welding**

The minimum strength of welding provided on various components of 16mm and 20 mm dia stay sets shall be 3100 kg & 4900 kg respectively. Minimum 6mm fillet weld or its equivalent weld area should be deposited in all positions of the job i.e. at any point of the weld length. The welding shall be conforming to relevant IS: 823/1964 or its latest amendment.

**Threading**

The threads on the Anchor Rods, Eye Bolts and Nuts shall be as per specification IS: 4218:1967 (ISO Metric Screw Threads). The Nuts shall be conforming to the requirements of IS: 1367:1967 and have dimension as per IS 1363:1967. The mechanical property requirement of fasteners shall conform to the proper clause 4.6 each for anchor rods and Eye bolt and property clause 4 for nuts as per IS: 1367:1967.

Average weight of finished 20 mm Stays Set: 14.523 Kg.(Min) (Excluding Nuts Thimble & Washer) :15.569 Kg.(Max.)

**IV. TESTS**

The contractor shall be required to conduct testing of materials at Govt./Recognized testing laboratory during pre-dispatch inspection for Tensile Load of 3100 Kg/4900Kg. applied for one minute on the welding and maintained for one minute for 16 mm and 20mm dia stay sets respectively.

**V. IDENTIFICATION MARK**

All stay sets should carry the identification mark of the Purchaser (SOUTHCO) applicable. This should be engraved on the body of stay rods to ensure proper identification of the materials. The nuts should be of a size compatible with threaded portion of rods and there should be no play or slippage of nuts.

Welding wherever required should be perfect and should not give way after erection.

**VI. TOLERANCES**

The tolerances for various components of the stay sets are indicated below subject to the condition that the average weight of finished stay sets of 16mm dia excluding nuts, thimbles and washers shall not be less than the weight specified above.

## **STAY WIRE (7/10 SWG) & (7/12 SWG)**

### **TECHNICAL SPECIFICATIONS**

#### **I. Qualification Criteria of Manufacturer:-**

The prospective bidder may source Stay Wire from manufacturers only who must qualify all the following requirements :

- a) The manufacturer must have successfully carried out Type Test of similar item from any NABL Accredited Laboratory within the last 5 years, prior to the date of submission of the bid.
- b) The manufacturer should have supplied at least 1000 Kg (all sizes taken together) to electricity supply utilities / PSUs. The bidder should enclose Performance Certificates from the above users issued in the name of the manufacturer as proof of successful operation in field.

#### **II. Application Standards**

Except when they conflict with the specific requirements of this specification, the G.I Stay Stranded Wires shall comply with the specific requirements of IS: 2141-1979, IS: 4826-1979 & IS: 6594-1974 or the latest versions thereof.

#### **III. Application and Sizes**

The G.I. stranded wires covered in this Specification are intended for use on the overhead power line poles, distribution transformer structures etc.

The G.I stranded wires shall be of 7/10SWG (7/3.15 mm for 11KV lines and 7/12 SWG 7/2.5 mm for LT lines standard sizes.

#### **IV. Materials**

The wires shall be drawn from steel made by the open hearth basic oxygen or electric furnace process and of such quality that when drawn to the size of wire specified and coated with zinc, the finished strand and the individual wires shall be of uniform quality and have the properties and characteristics as specified in this specification. The wires shall not contain sulphur and phosphorus exceeding 0.060% each.

#### **Tensile Grade**

The wires shall be of tensile grade 4, having minimum tensile strength of 700 N/mm<sup>2</sup> conforming to IS:2141.



### General Requirements

The outer wire of strands shall have a right-hand lay.

The lay length of wire strands shall be 12 to 18 times the strand diameter.

### Minimum Breaking Load

The minimum breaking load of the wires before and after stranding shall be as follows:

No. of Wires & Const.	Wire Dia (mm)	Min. breaking load of the Single wire before stranding (KN)	Min. breaking load of the standard wire (KN)
7 (6/1)	2.5	3.44	21.40
7 (6/1)	3.15	5.46	34.00

### V. Construction

The galvanized stay wire shall be of 7-wire construction. The wires shall be so stranded together that when an evenly distributed pull is applied at the ends of completed strand, each wire shall take an equal share of the pull. Joints are permitted in the individual wires during stranding but such joints shall not be less than 15 meters apart in the finished strands.

The wire shall be circular and free from scale, irregularities, imperfection, flaws, splits and other defects.

### VI. Tolerances

A tolerance of (+) 2.5% on the diameter of wires before stranding shall be permitted.

### VII. Sampling Criteria

The sampling criteria shall be in accordance with IS :2141.

### VIII. Tests on Wires before Manufacture

The wires shall be subjected to the following tests in accordance with IS :2141.

Ductility Test Tolerance on Wire Diameter

#### Tests on Completed Strand

The completed strand shall be tested for the following tests in accordance with IS:2141. Tensile and Elongation Test: The percentage elongation of the stranded wire shall not be less than 6%.

Chemical analysis Galvanizing Test

The Zinc Coating shall conform to "Heavy Coating" as laid down in IS:4826

**IX. Marking**

Each coil shall carry a metallic tag, securely attached to the inner part of the coil bearing the following information:

- a) Manufacturers name or trade mark
- b) Lot number and coil number
- c) Size
- d) Construction
- e) Tensile Designation
- f) Lay
- g) Coating
- h) Length
- i) Mass
- j) ISI certification mark, if any

**X. Packing**

The wires shall be supplied in 75-100 Kg. coils. The packing should be done in accordance with the provisions of IS:6594

**XI. Other Items:**

For remaining items of stay sets mentioned in the enclosed drawing, relevant applicable Indian standards shall be applicable.

**GI WIRE 6 SWG & GI WIRE 8 SWG**

**TECHNICAL SPECIFICATIONS**

**I. Qualification Criteria of Manufacturer:-**

The prospective bidder may source GI Wire from manufacturers only who must qualify all the following requirements:

- a) The manufacturer must have successfully carried out Type Test of similar item from any NABL Accredited Laboratory within the last 5 years, prior to the date of submission of the bid.
  
- b) The manufacturer should have supplied at least 1000 Kgs. (all sizes taken together) to electricity supply utilities / PSUs. The bidder should enclose Performance Certificates from the above users issued in the name of the manufacturer as proof of successful operation in field.

**II. SCOPE**

This specification covers manufacture, testing and supply of hot dip galvanized MS solid wire of sizes 6 SWG (5 MM) & 8 SWG (4 MM) diameters.

**III. APPLICABLE STANDARDS  
ZINC**

Zinc shall conform to grade Zen 98 specified in IS 209& IS: 4826-1979 with up to date amendments.

#### **ZINC COATING**

Zinc coating shall be in accordance with IS: 4826-1979 for heavily coated hard quality.

#### **GALVANISING**

Galvanizing shall be as per IS: 2629-1966, IS 4826-1979 with up to date amendments

#### **UNIFORMITY OF ZINC COATING**

Uniformity of zinc coating shall be as per IS: 2633-1972 with up to date amendments

#### **TENSILE PROPERTIES**

The tensile strength of the wire after galvanizing shall be between 55-95 Kg/sq.mm ensuring MS wire mechanical properties as per IS-28:1972 8.1 to 8.3.

#### **FREEDOM FROM DEFECTS**

As per IS: 2629-1966 & 4826-1979 & with up to date amendments be ensured

#### **IV. MATERIAL**

The mild steel wire shall have chemical composition maximum sulphur- 0.055%, phosphorous -0.055%, Carbon 0.25%.

#### **V. TESTS**

During the process of manufacturer/fabrication and all tests for chemical, mechanical, galvanizing as per IS- 280-1979, IS1521-1972, IS-1755-1961, IS: 6745-1972 & 4826-1979 shall be carried out. The certificate towards, chemical composition shall be submitted for each lot offered for inspection.

The following tests shall be conducted in presence of the representative of the purchaser:

Visual physical inspection and measurement of specified dimension

Coating test as per IS: 1755-1961, IS 2629-1966, IS: 2633-1972, IS: 4826-1969

Adhesion test as per IS: 1755-1961, IS: 2629-1966, IS: 2633-1972, IS: 4826-1969,& IS:6745-1972

Tensile strength and breaking load and elongation determined as per IS: 1521-1972 with up to date amendments

#### **VI. PACKING & MARKING**

Packing shall be as per IS: 280-1979 and each coil shall be between 50-100 kg. marking shall be as per IS:280-1972.

**EYE BOLT FOR GUARDING**  
**TECHNICAL SPECIFICATIONS**

**GENERAL REQUIREMENTS:**

M20 eye bolts (120 mm long) shall preferably be of drop forged manufacture and shall be supplied complete with full thread and two full nuts.

Eye bolt shall be manufactured from steel to ISO 272, 885, 888, 4759/1 and shall meet the requirements for mechanical properties detailed in ISO 272, 885, 888, 4759/1.

Where a welding process is used in manufacture, each eye bolt shall be individually proof tested by the manufacture in accordance with ISO 272, 885, 888, 4759/1 to 125% of its safe working tensile load that is to 48kN. The safe working tensile load shall be the ultimate axial tensile strength divided by the factor of safety of 2.5.

The eye shall be permanently and legibly stamped with the letter METRIC in letters not less than 3mm high. The safe working load of any eye bolt is that load which may be safely carried in an axial direction. If loaded in any other direction the safe working load is reduced and reference shall be made to the following table for safe working load of M20 eye bolts and eye nuts.

**ALUMINIUM BINDING WIRE**

**TECHNICAL SPECIFICATION**

**SCOPE:**

Scope covers manufacture, testing and supply of 3.53 mm dia Aluminium Binding Wire as per IS 398.

**MATERIALS:**

The material comprising the wire shall have the following chemical composition:

Aluminium 99.5% minimum Copper, silicon and iron 0.5% maximum

The surface of the wire shall be smooth and free from all irregularities and imperfections.

Its cross sections shall closely approximate that of true circle.

**Characteristics of Aluminium Binding wire**

Diameter of wire			Cross sectional area of nominal dia. Wires (mm)	Weight of wire kg/km	Breaking Load (kN)
Minimum	Nominal	Maximum			
3.15	3.53	3.55	9.787	26.45	1.57

## **Inspection and Tests**

The following routine checks and tests shall be carried out on 10% of the coils of aluminium binding wire. If any one sample fails to pass any one of the test nominated for that wire, then samples shall be taken from every coil in the consignment and any coil from which a sample proves defective shall be rejected. On no account shall any rejected material be presented for test again unless with the written approval of, and under conditions determined by the Purchaser.

## **Physical properties**

The surface of the finished wires shall be checked to ensure that it is smooth , free from all irregularities, imperfections and inclusions and that its cross section approximates closely that of true circle.

The wire shall be checked to ensure that its diameter and weight are within the values given I the table above characteristic of a aluminium binding wire.

## **Ultimate tensile strength**

When tested on a standard tensile testing machine, the value obtained for the ultimate tensile stress shall not be less than 1.57kN

## **Wrapping test**

The wire shall withstand one cycle of a wrapping test as follows:

The wire shall be closely wrapped round a wire of its own diameter form a close helix of eight turns. Six turns shall then be unwrapped and again closely rewrapped in the same direction as the first wrapping. The wire shall not break or crack when subjected to this test.

## **Packing & Delivery**

The aluminium binding wire shall be delivered in 30m coils, with a permitted tolerance of +5%.Random or non standard lengths shall not be permitted.

Each coil shall be adequately guarded against damage due to transportation and handling and shall have an outer layer of tightly wound polythene tape or be contained in a suitable, transparent plastic bag.

The internal diameter of the wound coil shall not be such as to result in a permanent set in the conductor.

The coils shall be contained in non returnable wooden cases, with a gross weight not in excess of 300 kg. The number of coils contained shall be marked on the outside of each case.

## **TECHNICAL SPECIFICATIONS**

### **11 KV “V” CROSS ARM, BACK CLAMP FOR “V” CROSS ARM & POLE TOP BRACKET (F CLAMP)**

#### **8.0 CROSS ARMS**

Cross Arms should be made by using 100x50x6 mm GI. channel. For both 33 KV &11 KV system. Cross Arms made out of M.S. angle shall not be used.

In tower type poles (GI) all the X-arms are part of the structure.

#### **8.0.1 Qualification Criteria of Manufacturer:-**

The prospective bidder may source the above items from manufacturers who must qualify the following requirements:

The manufacturer should have supplied at least 1000 no.s (of each item) to electricity supply utilities / PSUs.

The bidder should enclose Performance Certificates from the above users issued in the name of the manufacturer as proof of successful operation in field.

**a)** Hot Dip Galvanised Cross arms and Pole Top Brackets for both 11KV construction at intermediate and light angle pole shall be fabricated from grade 43A mild steel of channel section and for heavy angle poles, end poles and section poles fabricated from grade 43A mild steel of angle section. The grades of structural steel shall conform to IS – 226: 1975.

**b)** The 11 KV ‘ V ’ Cross arm shall be made out of 100x 50x5.6. mm MS Channel of ( 9.56 kg/mtr weight) .

The Back Clamp for both 11KV shall be made out of 75 x 10 MS Flat and shall be suitably designed to fit PSC Pole 9 Mtr x 300 Kg , 8 Mtr x 200 Kg.

**c)**The Pole Top Bracket (F Clamp) shall be made out of75 x 10 MS Flat suitably designed to fit PSC Pole 9 Mtr x 300 Kg for 11 KV.

Except where otherwise indicated all dimensions are subject to the following tolerances:

Dimensions up to and including 50mm:+1mm: and dimensions greater than 50mm: +2%

All steel members and other parts of fabricated material as delivered shall be free of warps, local deformation, unauthorized splices, or unauthorized bends. Bending of flat strap shall be carried out cold. Straightening shall be carried out by pressure and not by hammering.

Straightness is of particular importance if the alignment of bolt holes along a member is referred to its edges.

Holes and other provisions for field assembly shall be properly marked and cross referenced. Where required, either by notations on the drawing or by the necessity of proper identification and fittings for field assembly, the connection shall be match marked. A tolerance of not more than 1mm shall be permitted in the distance between the center lines of bolt holes.

The holes may be either drilled or punched and, unless otherwise stated, shall be not more than 2mm greater in diameter than the bolts. When assembling the components force may be used to bring the bolt holes together (provided neither members nor holes are thereby distorted) but all force must be removed before the bolt is inserted. Otherwise strain shall be deemed to be present and the structure may be rejected even though it may be, in all other respects, in conformity with the specification.

The back of the inner angle irons of lap joints shall be chamfered and the ends of the members cut where necessary and such other measures taken as will ensure that all members can be bolted together without strain or distortion. In particular, steps shall be taken to relieve stress in cold worked steel so as to prevent the onset of embitterment during galvanizing.

Similar parts shall be interchangeable.

Shapes and plates shall be fabricated and assembled in the shop to the greatest extent practicable. Shearing flame cutting and chipping shall be done carefully, neatly and accurately. Holes shall be cut, drilled or punched at right angles to the surface and shall not be made or enlarged by burning. Holes shall be clean-cut without torn or ragged edges, and burrs resulting from drilling or reaming operations shall be removed with the proper tool.

Shapes and plates shall be fabricated to the tolerance that will permit field erection within tolerance, except as otherwise specified. All fabrication shall be carried out in a neat and workmanlike manner so as to facilitate cleaning, painting, galvanizing and inspection and to avoid areas in which water and other matter can lodge.

Contact surfaces at all connections shall be free of loose scale, dirt, burrs, oil and other foreign materials that might prevent solid seating of the parts.

## **8.0.2 Fabrication has to be made as per drg. of ' V ' X-arm, Back clamp & ' F ' clamp.**

### **GALVANISING**

All type of cross arms back clamps, F clamps & stay clamps shall be hot dip galvanized, are as following:

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 to Service Condition 4. The zinc coating (610 gms per sq.mt) 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.

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.

Before pickling, all welding, drilling, cutting, grinding and other finishing operations must be completed and all grease, paints, varnish, oil, welding slag and other foreign matter completely removed.

All protuberances which would affect the life of galvanizing shall also be removed.

**The weight of zinc deposited shall be in accordance with that stated in Standard IS 2629 and shall not less than 0.61kg/m<sup>2</sup> with a minimum thickness of 86 microns for items of thickness more than 5mm, 0.46kg/m<sup>2</sup> (64 microns) for items of thickness between 2mm and 5mm and 0.33kg/m<sup>2</sup> (47 microns) for items less than 2mm thick.**

Parts shall not be galvanized if their shapes are such that the pickling solutions cannot be removed with certainty or if galvanizing would be unsatisfactory or if their mechanical strength would be reduced. Surfaces in contact with oil shall not be galvanized unless they are subsequently coated with an oil resistant varnish or paint.

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.

**In no case the repair of galvanisation on site will be permitted.**

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.

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 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.

### **8.0.3 Fixing of Cross Arms**

After the erection of supports and providing guys, the cross-arms are to be mounted on the support with necessary clamps, bolts and nuts. The practice of fixing the cross arms before the pole erection should be followed.

## **6.0 PIN INSULATORS**

11 KV Pin Insulators: - IS-731 (Porcelain Insulator for O/H power lines with nominal voltage greater than 1000 volts.

11 KV GI Pin: - Confirming to IS-2486.

## **TECHNICAL SPECIFICATIONS**

### **M.S BOLTS, NUTS & WASHERS**

All bolts and nuts shall conform to IS-6639/ 1972.

All bolts and nuts shall be galvanized. All bolts and nuts shall have hexagonal heads, the heads being truly concentric, and square with the shank, which must be perfectly straight.

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/ 1967.

## **MILD STEEL CHANNEL & ANGLE**

### **TECHNICAL SPECIFICATIONS OF MILD STEEL CHANNEL & ANGLE**

1.00.00

#### **SCOPE**

This specification covers design, manufacture, testing and dispatch to owner's stores of M.S. Channel & Angle for use in structures in distribution system.

2.00.00

#### **APPLICABLE STANDARD**

Materials shall conform to the latest applicable Indian standards. In case bidders offer steel section and supports conforming to any other international specifications which shall be equivalent or better than IS, the same is also acceptable.

<b>Sl.No.</b>	<b>Standard No.</b>	<b>Title</b>
1	IS: 2062 Grade 'A'	Quality Specification for M.S.Angles, M.S.Channel
2	IS: 2062	Chemical and Physical composition of material
3	IS: 1852	Rolling and Cutting Tolerances for Hot Rolled Steel products

3.00.00 **GENERAL REQUIREMENTS**

3.01.00 **Raw material**

The Steel Sections shall be re-rolled from the BILLETS/INGOTS of tested quality as per latest version of IS: 2830 or to any equivalent International Standard and shall be arranged by the bidder from their own sources.

The Chemical composition and Physical properties of the finished material shall be as per the equivalent standards.

Chemical Composition and Physical Properties of M.S. Angles, M.S. Channels, and M.S. Flat conforming to IS: Conforming to IS: 2062/84

3.02.00 **Chemical Composition**

3.02.01 **Chemical composition For Fe 410 WA Grade**

- 1 C - 0.23% MAX
- 2 Mn - 1.5% MAX
- 3 S - 0.050% MAX
- 4 P - 0.050% MAX
- 5 Si - 0.40% MAX
- 6 CE (Carbon Equivalent)- 0.42% MAX

3.04.00 **Mechanical Properties**

- 1. Tensile strength Kgf/mm<sup>2</sup> - 410
- 2. Yield stress Min. for thickness/diameter
  - < 20 mm - 26 Kgf/mm<sup>2</sup> OR 250 N/ mm<sup>2</sup>
  - 20-40 mm - 24 Kgf/mm<sup>2</sup> OR 240 N/ mm<sup>2</sup>
  - > 40 mm - 23 Kgf/mm<sup>2</sup> OR 230 N/ mm<sup>2</sup>
- 3. Elongation % - 23%

4. Bend Test (Internal Dia) - Min-3t  
(t—is the thickness of the material).

3.05.00 **Tolerance**

Variation in ordered quantity for any destination and overall ordered quantity be only to the extent of  $\pm 2\%$ .

Rolling and weight tolerances shall be as per version of IS: 1852 or to any equivalent International Standard.

4.00.00 **TEST**

Steel Section shall be tested in IS approved Laboratory or Standard Laboratory the Bidder country having all facilities available for conducting all the test prescribed in relevant IS or IEC or to any equivalent International Standard or any recognized and reputable International Laboratory or Institutions.

The bidders are required to specifically indicate that;

They hold valid IS (or equivalent IEC) License.

Steel Section offered are bearing requisite IS certification or equivalent marks.

The bidders are required to submit a copy of the valid IS (or equivalent IEC) License clearly indicating size and range of product against respective ISS or any equivalent International Standards along with their offer.

5.00.00 **MARKING**

It is desirable that the bidder should put his identification marks on the finished material. The mark shall be in "legible English letter" given with marking dies of minimum 18 mm size.

6.00.00 **INSPECTION AND TEST CERTIFICATES**

The material to be supplied will be subject to inspection and approval by the purchaser's representative before dispatch and/or on arrival at the destination. Inspection before dispatch shall not however, relieve the bidder of his responsibility to supply the Steel Sections strictly in accordance with the specification.

The purchaser's representative shall be entitled at all reasonable time during manufacture to inspect, examine and test at the bidder's premises the materials and workmanship of the steel section to be supplied.

As soon as the steel Section are ready for testing, the bidder shall intimate the purchaser well in advance , so that action may be taken for getting the material inspected. The

material shall not be dispatched unless waiver of inspection is obtained or inspected by the purchaser's authorized representative.

Test certificates shall be in accordance with latest version of the relevant Indian Standards or any equivalent International Standard.

The acceptance of any batch/lot shall in no way relieve the bidder of any of his responsibilities for meeting all the requirements of the specification and shall not prevent subsequent rejection of any item if the same is later found defective.

**NB: - ALL THE MATERIALS TO BE SUPPLIED ON TURN-KEY SHOULD OF IS/ REC STANDARD.**