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Bhutan Power Corporation Limited

(An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified Company)

Registered Office, Thimphu

Procurement Services Department

Thimphu: Bhutan

BPC/PSD/Electrical Materials/2022/03/04 March 17, 2022

……

……

……

Subject: Addendum No. IV

Tender Title: Supply and Delivery of Electrical Line Materials and Substation Equipment

Reference: BPC/PSD/Electrical Materials/2022/03 dated February 11, 2022

Dear Sir/Madam,

This is to inform all the bidders that PSD, BPC would like to issue amendment against the above referred tender. The tender now consist of 12 (Twelve) lots. The additional lot consist of PVC cables. The detail commercial and technical requirements of the lot is mentioned under the BDS (Bid Data Sheet) and Schedule of Supply which are attached herewith. Moreover, with reference to bidder's queries, the detail technical specification for item 1(ACDB) of Lot 2 and detail drawings of GI 13M Telescopic Pole fittings of Lot 3 (Telescopic Pole Fittings) are also attached herewith under Schedule of Supply.

Therefore, Bidders are advised to note the changes and quote accordingly. All other terms and conditions shall remain same.

Thanking you.

Yours sincerely,

(Nim Dorji)
General Manager

DRUK HOLDING & INVESTMENTS LTD.

GROUP STANDARD BIDDING DOCUMENT

GOODS (BDS & SCC)

Tender Reference: ***BPC/PSD/Electrical Materials/2022/03 dated February 11, 2022 for the supply and delivery Electrical Line Materials and Substation Equipment***

Contents

SECTION II. BID DATA SHEET

The Bid Data Sheet (BDS) contains information and provisions that are specific to a particular bidding process. The Purchaser must specify in the BDS only information that the Instructions to Bidders (ITB) request be specified in the BDS. All information shall be provided, and no clause shall be left blank. To facilitate the preparation of the BDS, its clauses are numbered with the same numbers as the corresponding ITB clauses. This guide provides information to the Purchaser on how to enter all required information, and includes a BDS format that summarizes all information to be provided.

<table>
<tr><th>ITB</th><th>Particulars</th></tr>
<tr><td>1.1</td><td>Tender No.: BPC/PSD/Electrical Materials/2022/03 dated February 11, 2022</td></tr>
<tr><td>1.1</td><td>Tender Name: The Supply and Delivery of Electrical Line Materials and Substation Equipment.</td></tr>
<tr><td>1.1</td><td>Purchaser: Procurement Services Department, Bhutan Power Corporation Limited, Yarden Lam, Post Box No. 580, Thimphu, Bhutan.</td></tr>
<tr><td>1.1</td><td>The number and identification of Lots comprising this tender are:
<table>
<tr><th>Lot No.</th><th>Lot Description</th></tr>
<tr><td>1</td><td>11 kV ID VCB Panels and Accessories</td></tr>
<tr><td>2</td><td>Distribution Boards (AC &DC), Battery Bank and Accessories</td></tr>
<tr><td>3</td><td>Telescopic Pole Fittings</td></tr>
<tr><td>4</td><td>Conductor and Hardware Fittings</td></tr>
<tr><td>5</td><td>Fault Passage Indicator (FPI)</td></tr>
<tr><td>6</td><td>Transformer Spare Parts and Accessories</td></tr>
<tr><td>7</td><td>Miscellaneous Items for Transformer Maintenance</td></tr>
<tr><td>8</td><td>Copper Wire</td></tr>
<tr><td>9</td><td>Distribution Pillar and Termination Kit</td></tr>
<tr><td>10</td><td>HV Switching Equipment</td></tr>
<tr><td>11</td><td>ABC Cables</td></tr>
<tr><td>12</td><td>PVC Cables</td></tr>
</table></td></tr>
<tr><td>8.2</td><td>For Bid clarification purposes, the Purchaser’s address is:
Attention: The General Manager.
Address: Procurement Services Department, Bhutan Power Corporation Limited, Yarden Lam, Post Box No. 580, Thimphu, Bhutan.
Telephone number: +975-2-326289
Electronic mail address: nim.dorji@bpc.bt</td></tr>
</table>

	copy to:**psdbpc@gmail.com/kinzangwangmo@bpc.bt**
8.3	Bid Clarification request will be received on or before: Time : 17:00 hour Date : April 07, 2022
8.5	A pre-bid meeting shall **not** take place.
12.1	The Bidder shall submit with its Bid the following additional documents: a*) Copies of valid Trade License* *b) Latest Tax Clearance Certificate* *c) Compliance to Delivery Schedule*
15.1	Alternative Bids shall **not** be permitted.
16.3	The Bidder shall quote prices in **DDP** (Delivered Duty Paid), RSD, Pasakha (Place of destination) for all the lots as per incoterm 2020. Notwithstanding any possible misinterpretation/ambiguity in interpretation, it is explicitly clarified that the offered prices shall be all inclusive covering all costs including but not limited to transportation, insurance, taxes and duties and any other costs for delivery of the materials to the Purchaser at the designated place of delivery/destination.
16.3 (a) (iii)	The final destination is: Pasakha, Regional Store Divisions, Phuentsholing, Bhutan.
16.3 (b) i, ii, & iii	**The price shall be inclusive of all taxes and duties that are applicable both inside and outside the purchaser's country.**
16.5	Bids are being invited for lots
18.1	The prices quoted by the Bidder *shall not be adjustable* except under the circumstances specified under Clause 38.3 (e)
19.1, 19.2 and 19.3	Bid Prices shall be quoted in Ngultrum for goods offered from Bhutan, in Indian Rupees for goods offered from India; and in US dollar/major foreign currencies for goods offered from other Countries. Bid Prices expressed in Indian currency and US Dollars/major foreign currencies shall be accepted and evaluated in accordance to ITB 38. For bid evaluation purpose the exchange rate will be based on the Telegraphic Transfer (TT) selling rate published by the Royal Monetary Authority (RMA) of the Kingdom of Bhutan on the day of bid opening or the immediate preceding date as posted by the RMA. For bid expressed in Indian currency and US Dollars/major foreign currencies, payments shall be made in equivalent Ngultrum through banking channel and the responsibilities of payment transfer and transfer charges lie on the Suppliers.

<table>
<tr><td>20.1</td><td>Technical Specifications

The minimum technical specification (where ever required) are detailed out under respective Lot and Price schedule. Any technical deviation shall be brought out in the GTP forms for the items where GTP forms are provided and for the items where GTP forms are not required, the deviation shall be brought out in the deviation sheet provided. If the deviations are not mentioned in GTP and deviation sheet provided, the specification shall be considered as complied with the requirement.</td></tr>
<tr><td>20.2</td><td>Guaranteed Technical Specifications (GTPs) “is” required /to be offered if any
<table>
<tr><th>Item / Lot Description</th><th>Remarks</th></tr>
<tr><td>Lot 1: 11 kV ID VCB Panels and Accessories</td><td>Required Item A1</td></tr>
<tr><td>Lot 2: Distribution Boards (AC &DC), Battery Bank and Accessories</td><td>Required for item 1,2,3 &4</td></tr>
<tr><td>Lot 3: Telescopic Pole Fittings</td><td>To be Offered</td></tr>
<tr><td>Lot 4: Conductor and Hardware Fittings</td><td>To be Offered</td></tr>
<tr><td>Lot 5: Fault Passage Indicator (FPI)</td><td>Required</td></tr>
<tr><td>Lot 6:Transformer Spare Parts and Accessories</td><td>To be Offered</td></tr>
<tr><td>Lot 7: Miscellaneous Items for Transformer Maintenance</td><td>To be Offered</td></tr>
<tr><td>Lot 8:Copper Wire</td><td>To be Offered</td></tr>
<tr><td>Lot 9: Distribution Pillar and Termination Kit</td><td>Required for Item 1 &2</td></tr>
<tr><td>Lot 10: HV Switching Equipment</td><td>To be Offered</td></tr>
<tr><td>Lot 11: ABC Cables</td><td>Required</td></tr>
<tr><td>Lot 12: PVC Cables</td><td>Required</td></tr>
</table>
a) The bid for that item(s)/Lot(s) shall be rejected if the GTP required Forms are not duly filled up and submitted as specified under respective lot.

The bidders are required to duly fill up the GTP forms provided in the bidding document. The catalogue/brochures of the items shall not be considered as GTP of the item. Further, if there are discrepancies between the item catalogue/brochures and the offered GTP, then GTP shall prevail.

For convenience purpose, the GTP in Excel format is attached herewith. The GTP must be seal, sign and fill up without any alteration to its format.

b) For the item(s)/Lot(s) of which GTP forms are not provided under respective lot, the bidders are requested to submit the catalogue or drawings for individual</td></tr>
</table>

<table>
<tr><td></td><td>items or offer GTP if there is any. The offered items shall be clearly indicated in the catalogue and if there is any deviation, brought out in deviation sheet provided.</td></tr>
<tr><td>,20.3</td><td>The period of time for which the Goods are expected to be functioning (for the purpose of spare parts, special tools, etc.): Not Applicable.</td></tr>
<tr><td>21.1</td><td>Financial Capability
The Bidder shall furnish documentary evidence that it meets the financial requirement(s): Not Applicable</td></tr>
<tr><td>21.2</td><td>Experience and Technical Capacity

The Bidder shall furnish documentary evidence to demonstrate that it meets the following experience requirement(s): ISO Certificate, list of previous clients, relevant catalogues, notarized test certificates, list of past performance certificates and manufacturer's profile for all new brands that are introduced in BPC.</td></tr>
<tr><td>21.3(a)</td><td>Manufacturer's Authorization (MA) "is" required/Not Required
<table>
<tr><th>Lot Description</th><th>Remarks</th></tr>
<tr><td>Lot 1: 11 kV ID VCB Panels and Accessories</td><td>Required</td></tr>
<tr><td>Lot 2: Distribution Boards (AC &DC), Battery Bank and Accessories</td><td>Required</td></tr>
<tr><td>Lot 3: Telescopic Pole Fittings</td><td>Required</td></tr>
<tr><td>Lot 4: Conductor and Hardware Fittings</td><td>Required</td></tr>
<tr><td>Lot 5: Fault Passage Indicator (FPI)</td><td>Required</td></tr>
<tr><td>Lot 6:Transformer Spare Parts and Accessories</td><td>Required</td></tr>
<tr><td>Lot 7: Miscellaneous Items for Transformer Maintenance</td><td>Not Required</td></tr>
<tr><td>Lot 8:Copper Wire</td><td>Required</td></tr>
<tr><td>Lot 9: Distribution Pillar and Termination Kit</td><td>Required</td></tr>
<tr><td>Lot 10: HV Switching Equipment</td><td>Required</td></tr>
<tr><td>Lot 11: ABC Cables</td><td>Required</td></tr>
<tr><td>Lot 12: PVC Cables</td><td>Required</td></tr>
</table>
a) The bid for that item(s)/Lot(s) shall be rejected if the Manufacturer's Authorization is not submitted for which the Manufacturer's Authorization is required.

b) The Bidders are to mention the brand and origin of goods in the price schedule and submit the Manufacturer's Authorization accordingly.

c) The brands (restricted/preferred) are mentioned in the price schedule and bidders are to quote accordingly. Item/lots for which brands are restricted, no</td></tr>
</table>

<table>
<tr><td></td><td>alternative/ substitute brand shall be accepted and shall be considered as non-responsive for that particular item/lot.</td></tr>
<tr><td>21.3 (b)</td><td>After sales maintenance, repair, spare parts stocking and related services: are not Required, and the Bidder therefore is not required to be represented by a suitably equipped and able agent in Bhutan.</td></tr>
<tr><td>21.3 (c)</td><td>Joint Venture, Consortium (JV/C) Bids are permitted: "YES" , the number of partners forming Joint Venture, Consortium (JV/C) : Two</td></tr>
<tr><td>22.1</td><td>The Bid validity period shall be 90 days from the last date of bid submission i.e., up to July 13, 2022.</td></tr>
<tr><td>23.1</td><td>The Bidder shall furnish a bid security in the amount and currencies as shown below in favour of Director, FAS, BPC:
<table>
<tr><th>Lot Description</th><th>Amount (Nu.)</th></tr>
<tr><td>Lot 1: 11 kV ID VCB Panels and Accessories</td><td>335,000.00</td></tr>
<tr><td>Lot 2: Distribution Boards (AC &DC), Battery Bank and Accessories</td><td>61,000.00</td></tr>
<tr><td>Lot 3: Telescopic Pole Fittings</td><td>15,000.00</td></tr>
<tr><td>Lot 4: Conductor and Hardware Fittings</td><td>16,000.00</td></tr>
<tr><td>Lot 5: Fault Passage Indicator (FPI)</td><td>530,000.00</td></tr>
<tr><td>Lot 6:Transformer Spare Parts and Accessories</td><td>34,000.00</td></tr>
<tr><td>Lot 7: Miscellaneous Items for Transformer Maintenance</td><td>32,000.00</td></tr>
<tr><td>Lot 8:Copper Wire</td><td>42,000.00</td></tr>
<tr><td>Lot 9: Distribution Pillar and Termination Kit</td><td>47,000.00</td></tr>
<tr><td>Lot 10: HV Switching Equipment</td><td>128,000.00</td></tr>
<tr><td>Lot 11: ABC Cables</td><td>470,000.00</td></tr>
<tr><td>Lot 12: PVC Cables</td><td>97,000.00</td></tr>
</table>
Preferably Bid Security should be submitted for the individual lots. Combined Bid Security would be also accepted. However, if the combined Bid Security is not sufficient in terms of total amount, the offer for the entire quoted lots would be treated as non-responsive as per ITB 23 and not considered for further evaluation.

For e-bids, bidders shall submit the Bid Security in original form to Procurement Service Departments (PSD), Head Office/ Regional Store Division (RSD), Phuentsholing/RSD Gelephu on or before the deadline for the submission of bids and also upload the scan copy of bid security in the <u>www.tender.bt</u></td></tr>
</table>

23.5	The Bid Security validity period shall be valid till **August 12, 2022.**
24.1 & 25.1	In addition to the original Bid, the number of copies is: *Not Applicable*
25.2(b)	For bid submission purposes only, the Purchaser's address is*:* Attention: *The General Manager* Address: *Procurement Services Department, Bhutan Power Corporation Limited, Yarden Lam, Post Box No. 580, Thimphu, Bhutan.*
25.3	Mode of Tendering is **Single Stage – One Envelope Process.**
25.8	Bidders are required to submit e-bids through e-procurement system (www.tender.bt). Bidders have to visit website www.tender.bt for vendor registration if the vendor has not registered in the e-procurement platform and submit the bid online. The user manual for vendor registration and bidding process is available under Downloads in website www.tender.bt
26.1	The deadline for the submission of Bid is: **April 14, 2022 at 11:00 hours**
29.1	The Bid Opening shall take place at: Address: Conference Hall, Head Office, BPC, Thimphu Date : April 14, 2022 Time : 12:00 Hours Venue : BPC Conference Hall
37.1	A margin of five percent (5%) Domestic Preference ***shall not apply*.**
38.3 (a)	Evaluation will be done for: ***Lot wise*** *A lot with an alternative item price shall be rejected and that lot shall not be considered for further evaluation.* *In case some items are not quoted for a particular lot, the corporation reserves the right to cost load the highest responsive rate of other bidders for the purpose of evaluation of that lot if it was determined that the non-quoted items are not a major component of the lot or do not form an integral element of the lot. Actual order shall however be done based on the lowest rate that has been quoted in that bid package.*
38.3(e)	The adjustments shall be determined using the following criteria: (a) Deviation in Delivery schedule: *Yes* *No credit will be given to earlier delivery but Bids offering late delivery schedules (LDS) will be accepted but the Bids shall be adjusted for the purpose of the bid*

	evaluation only adding at the rate of @one (1) per cent of the bid price for each week of delay to the bid price. Bids offering delivery schedules beyond 1 (one) month of the delivery period shall be rejected. (b) Deviation in payment schedule: No (c) The cost of major replacement components, mandatory spare parts, and service: No (d) The availability in Bhutan of spare parts and after-sales services for the equipment offered in the Bid : No (e) The projected operating and maintenance costs during the life of the equipment: No (f) The performance and productivity of the equipment offered: No.
38.6	Bidders shall be allowed to quote prices for one or more lots. The price schedule must be completed without any alteration to its format.
44.2 & 45.1	The successful Bidder shall submit the performance security and sign the Contract **within fifteen** (15) days after the issuance of the Notification of Award.

SECTION V SPECIAL CONDITIONS OF CONTRACT

The following Special Conditions of Contract (SCC) shall supplement and/or amend the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail	
Reference to the GCC is made as under:	
1.1 (xviii)	Final Destination(s) is: Malbase, Pasakha, Regional Store Division, Phuentsholing, Bhutan. The Consignee is : The Chief Manager, Regional Store Division, Bhutan Power Corporation Limited, Phuentsholing, Bhutan Email: phuntshowang@bpc.bt Contact No: 17757404
1.1 (xvix)	The Purchaser is: Procurement Services Department, Bhutan Power Corporation Limited, Yarden Lam, Post Box No. 580, Thimphu, Bhutan.
3.5 (a)	The meaning of the trade terms shall be as prescribed by Incoterms. If the meaning of any trade term and the rights and obligations of the parties there under shall not be as prescribed by Incoterms, they shall be as prescribed by: *Not Applicable*
3.5(b)	The term EXW, CIF, DIP, DDP and other similar terms shall be as per the version of Incoterms 2020
5.1	The language shall be: *"English".* Supporting documents and printed literature that are part of the Contract may be in another language provided they are accompanied by a **notarised** and an accurate translation of the relevant passages in English.
7.1	For notices, the addresses shall be: For the Purchaser: Attention : The General Manager Address : Procurement Services Department Bhutan Power Corporation Limited Thimphu, Bhutan Telephone : 00975-2-326289/336046 E-mail address : *nim.dorji@bpc.bt* Copy to : *kinzangwangmo@bpc.bt/psdbpc@gmail.bt*
9	The rules of procedure for arbitration proceedings pursuant to GCC Sub-Clause 9.2 shall be as per the Alternative Dispute Resolution Act of Bhutan 2013.
13.2	The prices charged for the goods supplied and the related services performed "*shall not*" be adjustable

14.1	**Terms of Payment** Payments shall be made in equivalent Ngultrum to the currency quoted amount but the payment shall be made through proper banking channels and the responsibilities of payment transfer and transfer charges lie on the Suppliers. Undertaking letter from routing of payment through the Banks (if the payment is not through Letter of Credit) shall not be issued. Advance Payment: Maximum of twenty percent (20%) of the Contract Price as advance payment shall be paid after the signing of the Contract. Payment shall be made provided the Supplier presents a request for payment accompanied by an Advance Payment Security in the form of Bank Guarantee issued by a reputable financial institution acceptable to the purchaser for an amount equal to the amount of the advance payment, and shall be valid until the goods are delivered. On Acceptance: Seventy percent (70%) of the goods received shall be paid within Thirty (30) days of receipt of the goods upon the submission of a claim supported by the Acceptance Certificate issued by the Purchaser. Retention Payment: Ten percent (10%) of the Contract Price will be payable after the expiry of defects liability period (for a period not exceeding twelve months after the delivery of all materials). However, payment shall be made provided the Supplier presents a request for payment accompanied by a Retention Security in the form of Bank Guarantee issued by a reputable financial institution acceptable to the purchaser for an amount equal to the amount of retention payment and shall be valid for a period not less than twelve (12) months after delivery of all materials. If the Financial institution issuing the advance payment bank guarantee/retention security bank guarantee furnished by the Bidder is located outside the Purchaser's country, the bank guarantee shall be counter guaranteed by a correspondent financial institution located in the Purchaser's country to make it enforceable.
15.3	Tax Deducted at Source (TDS) shall be deducted as per the regulations of Ministry of Finance, RGoB, Bhutan.
16.1	The amount of the Performance Security shall be: ***Ten percent (10%) of contract value***
16.3	The types of acceptable Performance Securities are: *(i) Unconditional bank guarantee issued by a reputable financial institution acceptable to any banks in Bhutan, in the form provided for in the Contract or in any other form acceptable* *(ii) Cash warrant,* *(iii) Demand Draft, or* *(iv) Bank Transfers* If the institution issuing the Performance Security furnished by the Bidder is located outside the Purchaser's country, the Performance Security shall be counter guaranteed by a correspondent financial institutions located in the Purchaser's country to make it enforceable.

20.1	Details of Shipping and other Documents to be furnished by the Supplier are: *(i) Copies of the Supplier's invoice showing Goods description, quantity, unit price, and total amount;* *(ii) Suppliers Good Issues Note (Challan);* *(iii) Copy of import declaration form (B-Form)in Bhutan;* *(iv) Original tax paid receipt in Bhutan.* *(v) Manufacturer's or Supplier's warranty certificate;* *(vi) Packing List;* *(vii) Inspection report/Test Certificate*
22.2	Subcontracting shall be *"not allowed"*
25.1	The inspections and tests shall be: ***Applicable*** All materials shall be inspected and tested as specified in the relevant IEC or BS or IS standards. The supplier must notify the purchaser in writing within twenty (20) days in advance once the goods are fully manufactured and ready for dispatch. This should be notified to purchaser at the following address: Attention : The General Manager Address : Procurement Services Department Bhutan Power Corporation Limited, Thimphu: Bhutan. Telephone : 00975-2-336046/326289 E-mail address : *nim.dorji@bpc.bt* Copy to : *kinzangwangmo@bpc.bt/psdbpc@gmail.com* The period indicated is for deputing an inspector and has no connection with the stipulated delivery schedule. If the delay in the delivery of all or part of materials has been caused due to delay beyond the maximum allowable period in nominating inspectors by the purchaser after the inspection call has been received in writing by the purchaser, the delivery period shall be extended by the period equivalent to such delay in sending inspectors by the purchaser for the whole or part of the materials. To ensure that the goods are delivered in good condition, purchaser may call suppliers/supplier's representatives to be present for the joint inspection of the goods at the BPC warehouse and sign the joint inspection report.
25.2	Inspections and tests shall be conducted at: *Manufacturer's premises*
26.2	The packing, marking and documentation within and outside the packages shall be: The Supplier shall provide packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as per the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

	The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified under ***Common Technical Requirements*** and in any subsequent instructions ordered by the Purchaser.
27.1	Responsibility for transportation of the Goods shall be as specified in the **Incoterms 2020**. "*However, unloading of the materials at RSD, Phuentsholing, Bhutan shall be under the scope of supplier. The RSD shall issue the certificate upon acceptance of the Goods in good condition.*"
28.3	The period of validity of the Warranty shall be: Twelve (12) months from the date of acceptance of goods at the place of destination, Regional Store Division, Pasakha/Malbase, PSD, BPC, Phuentsholing, Bhutan. As a proof of performance warranty, the supplier have to deposit 10% of the supplied value in the form of Bank Guarantee acceptable to the Purchaser which shall be valid for a period not less than twelve (12) months after delivery of last consignment. Or As a proof of performance warranty, the purchaser will not release the 10% retention money to cover the defects liability period which shall be minimum of twelve months after the delivery of the last consignment. However, the payment for the retention amount shall be made provided the Supplier presents request for payment accompanied by a Retention Security in the form of Bank Guarantee issued by a reputable financial institution acceptable to the purchaser for an amount equal to the amount of retention payment and the validity of the Bank Guarantee shall be not less than twelve (12) months after the delivery of last consignment. *If the Financial institution issuing the performance warranty bank guarantee/retention security bank guarantee furnished by the Bidder is located outside the Purchaser's country, the bank guarantee shall be counter guaranteed by a correspondent financial institution located in the Purchaser's country to make it enforceable.*
28.4 & 28.5	The period for repair or replacement shall be: Three Months from the day of notification
29.1	The applicable rate for liquidated damages for delay shall be: ***0.15 % per day.*** The maximum amount of liquidated damages shall be: *10% of the contract price*
31.1	The insurance coverage shall be as specified in the Incoterms.

SECTION VII: SCHEDULE OF SUPPY

1. **Delivery and Completion Schedule**
2. **Technical Specification**

1. Delivery and Completion Schedule

The Delivery period shall be commence from the date of signing contract.

Lot Description	No. of days
Lot 1: 11 kV ID VCB Panels and Accessories	150 days
Lot 2: Distribution Boards (AC &DC), Battery Bank and Accessories	150 days
Lot 3: Telescopic Pole Fittings	150 days
Lot 4: Conductor and Hardware Fittings	150 days
Lot 5: Fault Passage Indicator (FPI)	150 days
Lot 6:Transformer Spare Parts and Accessories	120 days
Lot 7: Miscellaneous Items for Transformer Maintenance	120 days
Lot 8:Copper Wire	150 days
Lot 9: Distribution Pillar and Termination Kit	150 days
Lot 10: HV Switching Equipment	150 days
Lot 11: ABC Cables	150 days
Lot 12: PVC Cables	150 days

2. Technical Specification

Table of Content

Technical Specification for Lot 2
Item#1 (ACDB)

LV INDOOR SWITCHBOARD

LV indoor switchboard and its components shall comply with the following International Standards, including those referred to herein.

Air break switches, Air break switch disconnectors and fuse combination units, MCCBs for voltage not exceeding 1000 V AC or 1200 V DC.	IS 13947
Control switches	IS 6875/IEC 60947
Low voltage fuse	IS 13703/IEC 60269
Specification for low voltage switchgear and control gear	IS 13947/IEC 60947
Degree of protection provided by enclosures for low voltage switchgear and control gear	IS 13947/IEC 60947
Marking and arrangement for switchgear, busbars, main connections and auxiliary wiring	IS 5578/IS 11353
Code of practice for selection, installation and maintenance of switchgear and control gear	IS 10118

The technical parameters/Data sheet of LV switchboard shall be as given below:

Sr.#	**Description**	**Unit**	**Particulars**
A	**General**		
1	Type of mounting		Floor mounting
2	Rated voltage, Phase and Frequency	V, Ph, HZ	415, 3 phase (4 wire), 50 Hz.
3	Type of switchboard (brief Description)	_	Indoor, Cubicle, compartmentalized, single front and open-able both side type, fixed type
4	One minute Power Frequency withstand voltage		
a)	Power circuit	kV (rms)	3.0
b)	Control circuit	kV (rms)	2.5
5	Continuous current rating of busbars under design ambient of 30 degree celcius	Amps	300
6	Short circuit withstand for busbars and droppers (1 sec)	kA	10
7	Max. temperature of busbars, droper and contacts at continuous current rating over design ambient temperature of 40 degree Celsius	Deg. Celsius	60
8	Thickness of sheet steel in mm cold rolled (frame/Enclosure/Covers)	mm	3/2/2

9	Degree of protection of enclosure	-	IP-4X
10	Type of paint		Powder coating mat finish
11	Finish colour Shade	-	
a)	Interior & Exterior		White and RAL 7032
12	Earthing Bus		
a)	Material	-	copper
b)	Size	mm	25 x 3
13	Cable entry	-	Bottom

B	**Bus bar**		
1	Material	-	Aluminum
2	Continuous current rating under design ambient temperature	Amps	300
C	**MCCB/MCB**		
1	Type	-	Electronic/Microprocessor based for rating more than 200A. Thermal magnetic – for rating less than 200A. With overload, ground fault and short circuit protection
2	Rated voltage	V	415
3	No. of poles		Triple pole
4	Short circuit breaking capacity	kA	10
D	**Auxiliary contactor**		
1	Rated voltage of coil	V	240
2	Utilization category	-	AC3
E	**Number of Incomer**		
1	MCCB 125 A TP 35 kA with over current and earth fault protection		1 nos
F	**Number of outgoing MCB, 10 kA**		
	4 pole		
	63 A		3 nos
	32 A		4 nos
	2 pole		
	32 A		2 nos
	16 A		5 nos

The adequacy of the outgoing feeders shall be checked during detail engineering.

Accessories and fittings

a) Digital Multi function meter
b) CT and PT with fuse
c) Under Voltage relay
d) Indication lamp
e) Terminal block with 20% spare
f) Ammeter & Voltmeter with selector switch (96 mm x 96 mm)

The switchboard manufacturing shall be CNC based type and panel shall be of floor/wall mounting type. Entry for incoming and outgoing cables shall be from bottom. Busbars shall be of Aluminum. Degree of protection of the panel shall be IP 4X.

MCCB outgoing feeders of rating 200A and above shall be protected with over current, short circuit and earth fault protection (Electronic or microprocessor based) and below 200A shall be protected with over current, short circuit protection of thermo magnetic type and electromagnetic earth fault protection releases.

Busbars

The phase and neutral busbars shall be of rating indicated in the corresponding single line diagram. Busbars shall be of Aluminum and shall be provided with minimum clearances as per standards.

Bus bar shall be colour coded with coloured PVC tape at suitable intervals.

Busbar joints, if any, shall be of the bolted type with minimum 4 bolts. Spring washers shall be provided to ensure good contact at the joints. Busbars shall be thoroughly cleaned at the joints and suitable contact grease shall be applied just before making a joint.

Direct access to, or accidental contact with busbars and primary connections shall be possible. All apertures and slots shall be protected by baffles to prevent accidental shorting of busbars due to insertion of maintenances tools.

Sequences of red, yellow and blue phases and neutral for four-pole equipment shall be right and top to bottom, for horizontal and vertical layouts respectively.

Moulded Case Circuit Breaker (MCCB)

MCCBs shall be of the air break, quick make, quick break and trip free type and shall be totally enclosed in a heat resistant, moulded, insulating material housing.

MCCBs shall have a service short circuit breaking capacity equal to the ultimate short circuit capacity.

Each pole of MCCB shall have overload, short circuit and earth fault protection. Such a protection system shall be fully self-contained, needing no separate power supply. The elements shall be adjustable. Adjustments shall be made simultaneously on all poles from a common facility.

MCCB terminals be shrouded and designed to receive cable lugs for cable sizes relevant to circuit ratings.

MCCBs should be current limiting type with trip time of less than 10 msec under short circuit conditions.

The MCCB should be either 3 poles fixed type.

The MCCB shall have contact inspection facility with opening the front cover.

Miniature Circuit Breaker (MCB)

Miniature circuit breakers shall be of the thermal and magnetic tripping type, and comply with IEC 60898 and IEC 60947-2.

MCB shall be hand operated air break, quick make, and quick break type.

Operating mechanisms shall be mechanically trip-free from the operating knob to prevent the contacts being held closed under overload or short-circuit conditions.

Each pole shall be fitted with a bi-metallic element for overload protection and a magnetic element for short-circuit protection. Multiple pole MCBs shall be mechanically linked such that tripping of one pole simultaneously trips all the other poles. For motor feeders.MCB shall have type C characteristics.

The short circuit rating shall be not less than that of the system to which they are connected with a minimum of 10 kA.

Tests

All routing and acceptance test as specified in the applicable standards shall be carried out on the LVDB. Test reports for all the bought out items shall be reviewed during testing.

Miscellaneous

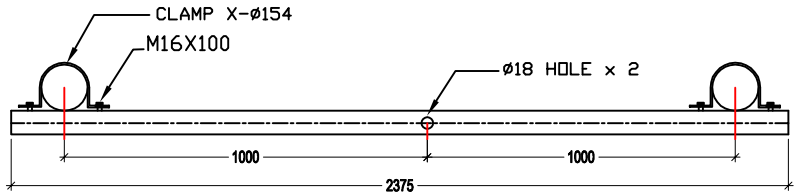
The following items shall also be included in the contractor's scope:

a) Supply, installation and commissioning of interconnecting cables between ACDB and various equipment in electrical room along with associated compression type brass cable glands, lugs etc. required to complete the works in full.

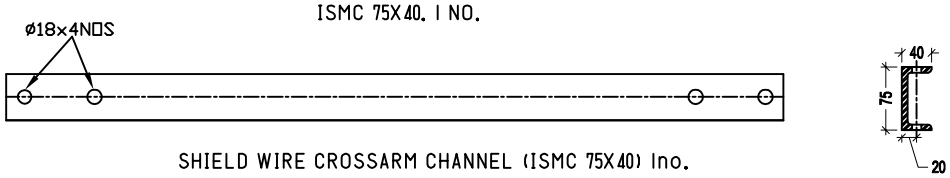
b) Terminal clamps/connectors suitable for connecting to specified size of conductor/tube/cable.

Lot 3: Telescopic Pole Fittings

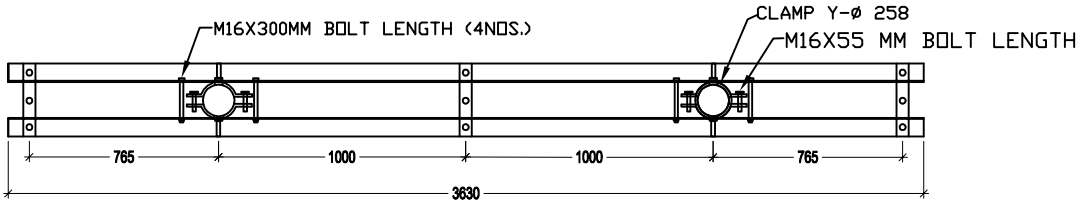
Drawings of 13 M Telescopic Pole and Fittings



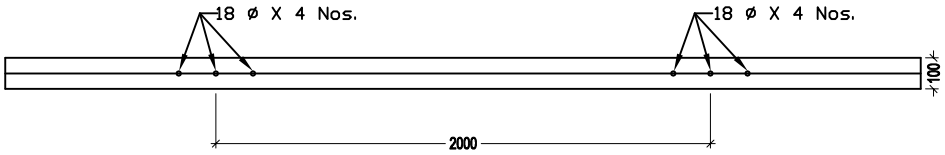
SHIELD WIRE CROSSARM ASSEMBLY
ISMC 75X40. 1 NO.



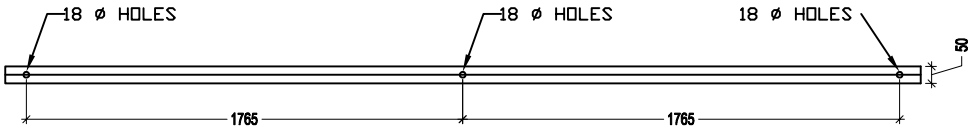
SHIELD WIRE CROSSARM CHANNEL (ISMC 75X40) 1no.



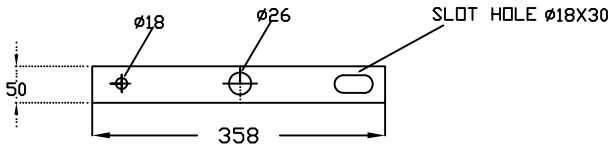
CROSS ARM CHANNEL (ISMC 100x50) 2 NOS



CROSS ARM CHANNEL (ISMC 100x50) - ELEVATION



CROSS ARM CHANNEL (ISMC 100x50) - PLAN

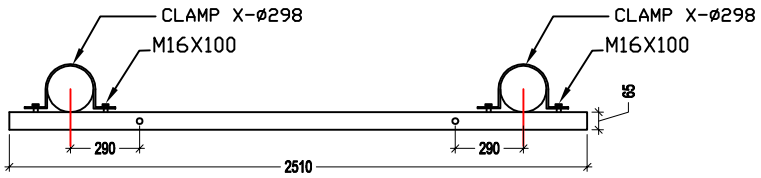


MS TENSION STRAP (50x6) - 6 NOS
M16X 185 MM BOLT LENGTH - 6 NOS

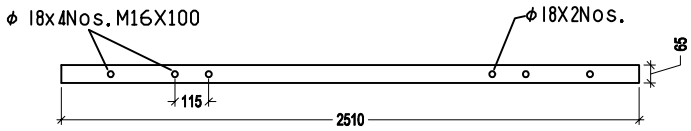
NOTES

1. DIMENSIONS AS SHOWN ARE IN mm.
2. DRAWING IS NOT TO SCALE.

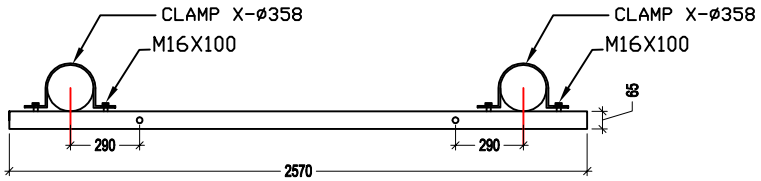
BHUTAN POWER CORPORATION LIMITED	ENGINEERING AND RESEARCH DEPARTMENT	
	TITLE : DISTRIBUTION DESIGN & CONSTRUCTION STANDARD DOUBLE POLE ASSEMBLY FOR 13 M TELESCOPIC POLE WITH GROUNDWIRE (11 kV & 33kV)	
	NAME	DATE
DESIGNED BY		
CHECKED BY		
APPROVED BY		
	DRAWING NO. BPC-ERD-2022-004	REVISION 0



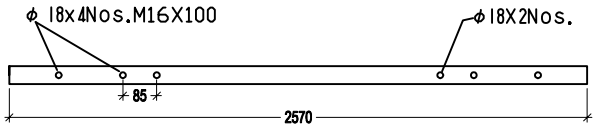
TOP CROSS BRACING ANGLE SUPPORT ASSEMBLY (ISA 65x65x6) - 1 NO



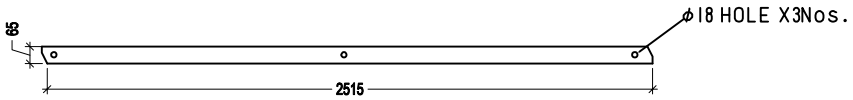
ANGLE FOR TOP CROSS BRACING SUPPORT (ISA 65x65x6) - 1 NO



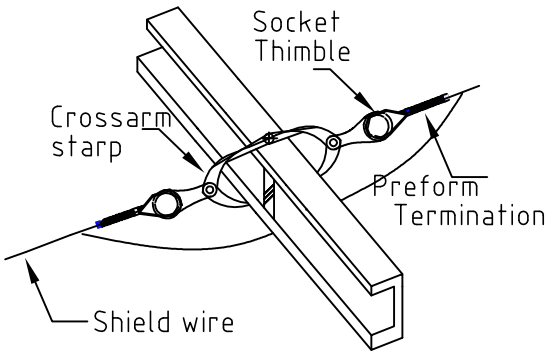
LOWER CROSS BRACING ANGLE SUPPORT ASSEMBLY (ISA 65x65x6) - 1 NO



ANGLE FOR LOWER CROSS BRACING SUPPORT (ISA 65x65x6) - 1 NO



ANGLE FOR CROSS BRACING (ISA 65 x 65 x 6) - 2 NOS



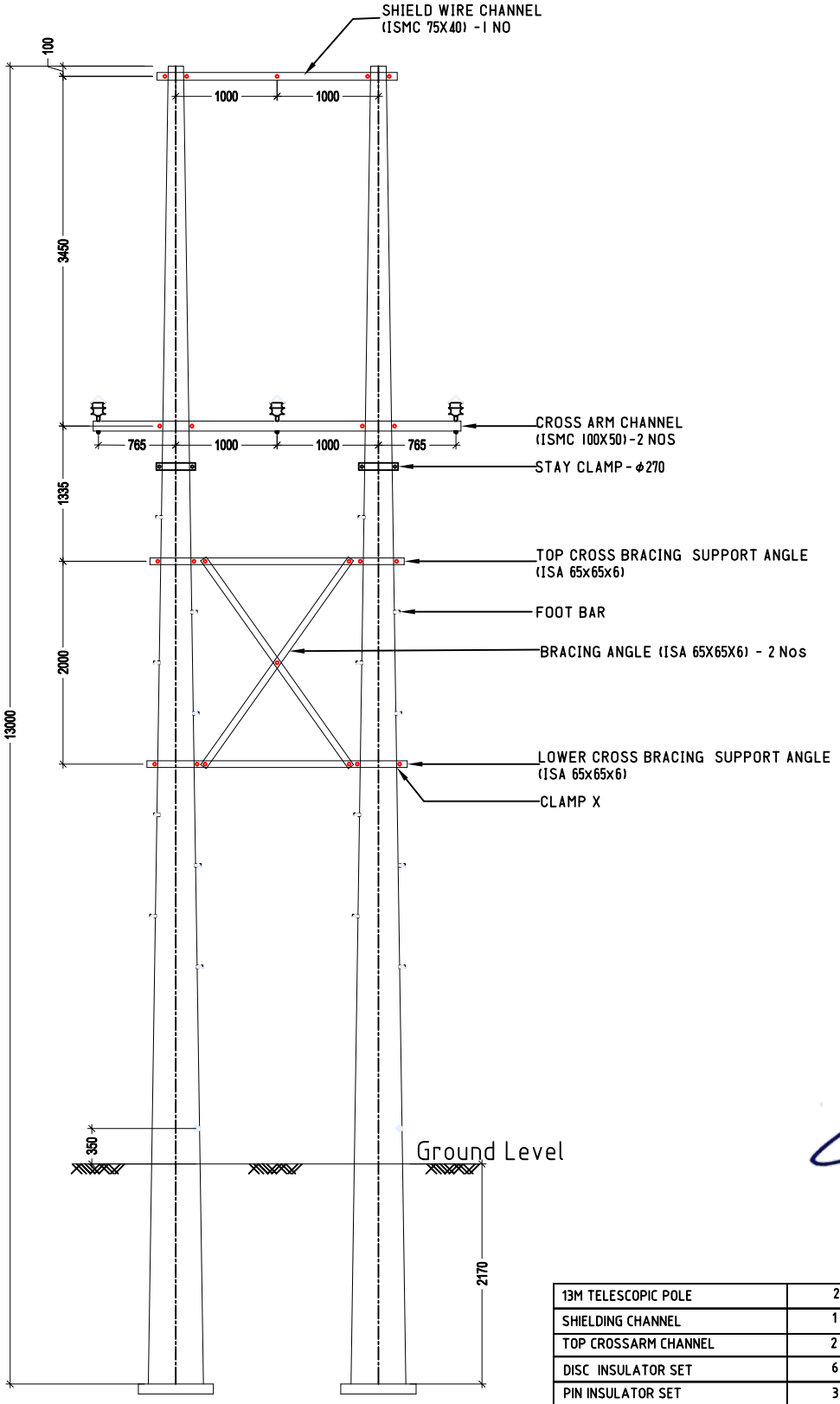
SHIELDING ARRANGEMENT ON DOUBLE POLE STRUCTURES
SHIELD WIRE CHANNEL

NOTES

1. DIMENSIONS AS SHOWN ARE IN mm.
2. DRAWING IS NOT TO SCALE.
3. LENGTH OF THE CROSS BRACING ANGLE SHALL BE DESIGNED BY THE SUPPLIER

BHUTAN POWER CORPORATION LIMITED	ENGINEERING AND RESEARCH DEPARTMENT	
	TITLE : DISTRIBUTION DESIGN & CONSTRUCTION STANDARD DOUBLE POLE ASSEMBLY FOR 13 M TELESCOPIC POLE WITH GROUNDWIRE (11 kV & 33kV)	
	DRAWING NO. BPC-ERD-2022-005	REVISION 0

	NAME	DATE
DESIGNED BY		
CHECKED BY		
APPROVED BY		



NOTES

DIMENSIONS AS SHOWN ARE IN mm.
DRAWING IS NOT TO SCALE.

DESCRIPTION	QTY	MATERIAL
13M TELESCOPIC POLE	2	GS
SHIELDING CHANNEL	1	GS
TOP CROSSARM CHANNEL	2	GS
DISC INSULATOR SET	6	PORCELAIN
PIN INSULATOR SET	3	PORCELAIN
CLAMP WITH NUTS & BOLTS	8	GS
BRACING ANGLE SET	1	GS
STAY CLAMP SET	2	GS

BHUTAN POWER CORPORATION LIMITED

ENGINEERING AND RESEARCH DEPARTMENT

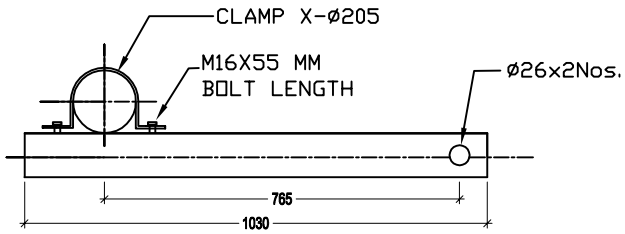
DISTRIBUTION DESIGN & CONSTRUCTION STANDARD

DOUBLE POLE ASSEMBLY FOR 13 M TELESCOPIC POLE WITH GROUNDWIRE (11 kV & 33kV)

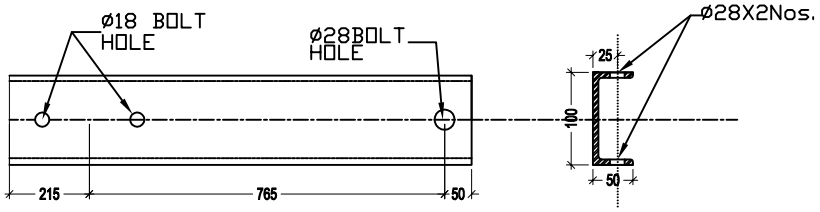
	NAME	DATE
DESIGNED BY		
CHECKED BY		
APPROVED BY		

DRAWING NO. BPC-ERD-2022-003

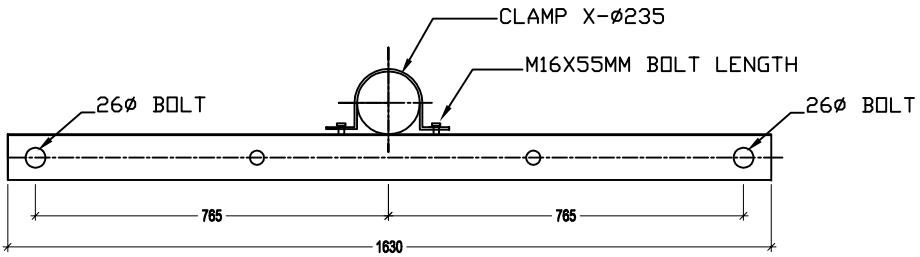
REVISION 0



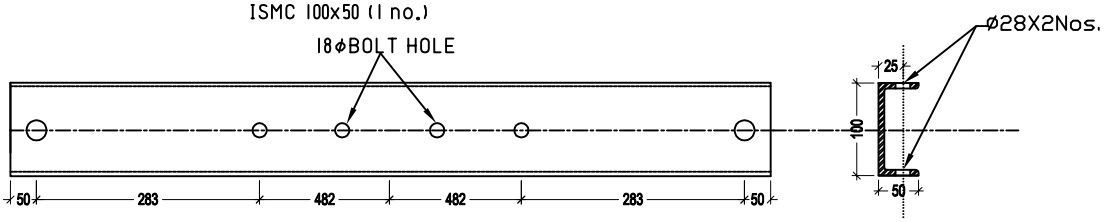
TOP CROSS ARM ASSEMBLY
ISMC 100x50 (1 no)



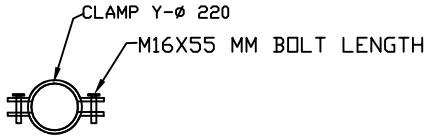
TOP CORSS ARM CHANNEL (ISMC 100x50x1030) - 1 NO



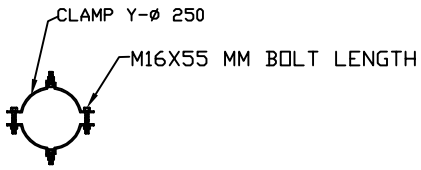
LOWER CROSS ARM ASSEMBLY
ISMC 100x50 (1 no.)



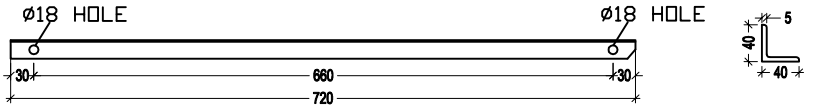
LOWER CROSS ARM CHANNEL (ISMC 100x50x1650) - 1 NO



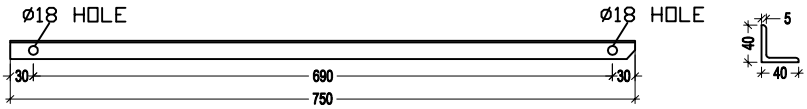
FULL CLAMP Y (A)



FULL CLAMP Y (B)



BRACING ANGLE FOR TOP CROSS ARM (ISA 40x40x5) - 1 NO



BRACING ANGLE FOR BOTTOM CROSS ARM (ISA 40x40x5) - 2 NO

NOTES

1. DIMENSIONS AS SHOWN ARE IN mm.
2. DRAWING IS NOT TO SCALE.
3. LENGTH OF THE BRACING ANGLE SHALL BE DESIGNED BY THE SUPPLIER

BHUTAN POWER CORPORATION LIMITED

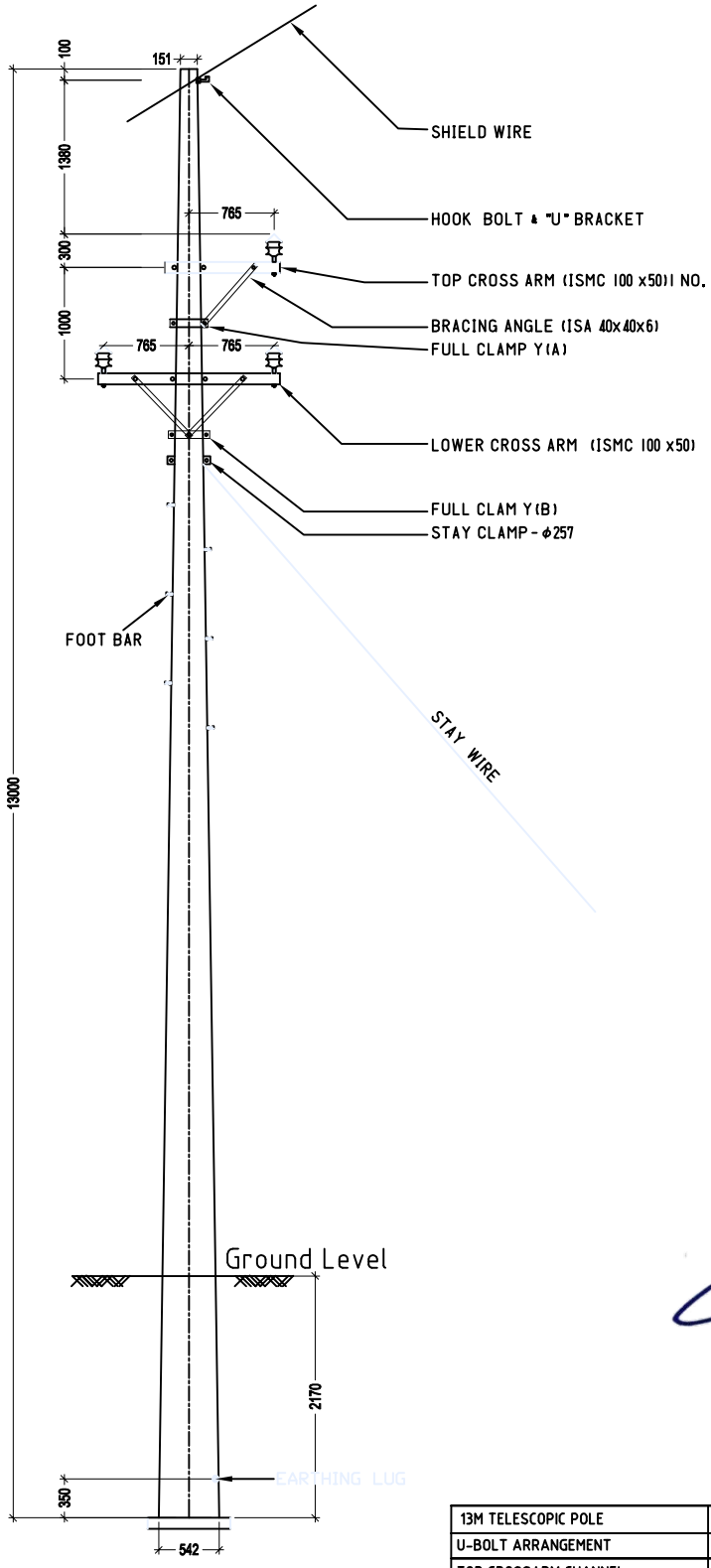
ENGINEERING AND RESEARCH DEPARTMENT

SINGLE POLE ASSEMBLY FOR 13 M TELESCOPIC POLE WITH GROUNDWIRE (11 kV & 33kV)

	NAME	DATE
DESIGNED BY		
CHECKED BY		
APPROVED BY		

DRAWING NO. BPC-ERD-2022-002

REVISION 0



NOTES

1. DIMENSIONS AS SHOWN ARE IN mm.
2. DRAWING IS NOT TO SCALE.
3. PROVIDE 18MM DIA THROUGH HOLE AT 100MM BELOW THE POLE TOP FOR FIXING THE HOOK BOLT & U-BRACKET

DESCRIPTION	QTY	MATERIAL
13M TELESCOPIC POLE	2	GS
U-BOLT ARRANGEMENT	1	GS
TOP CROSSARM CHANNEL	1	GS
LOWER CROSSARM CHANNEL	1	GS
PIN INSULATOR	3	PORCELAIN
CLAMP WITH NUTS & BOLTS	4	GS
STAY CLAMP	1	GS

BHUTAN POWER CORPORATION LIMITED

ENGINEERING AND RESEARCH DEPARTMENT

SINGLE POLE ASSEMBLY FOR 13 M TELESCOPIC POLE WITH GROUNDWIRE (11 kV & 33kV)

	NAME	DATE
DESIGNED BY		
CHECKED BY		
APPROVED BY		

DRAWING NO. BPC-ERD-2022-001

REVISION 0

Lot 12- PVC Cables.

1.0 Scope

This specification covers the design, manufacture and testing of cables at manufacture's work before dispatch, packing and transportation to BPC stores.

2.0 Design Criteria

2.1 Standards

The cables under this specification shall comply with the requirements of latest edition of the following standards including amendments:
IEC: 60183, 60227,60502, 60885, 50480 IS (Indian standards): 1554 (Part-I) IS: 1753 IS: 3961 Part-II IS: 3975IS: 4905, IS:5831, IS: 7098 (Part- III), IS: 7098 (Part-II), IS: 7098 (Part-I), IS: 8130, IS: 10418, IS: 10810, ASTMD 2863, IEEE-383, IEC-332 (Part-I), IEC-754 (Part-I), ASTMD – 2843, SS-4241475, (Swedish standard)

2.2 Cable Design

i) The cables shall be suitable for installation in a monsoon area having 100% relative humidity and low temperature which is likely to accelerate rusting in steel. However for the reference ambient temperature may be taken as 40^0 C with the relative of 100%. The galvanizing of steel armour has to be of the highest quantity for such an ambient condition.

ii) The cable shall operate with the following requirements.

a) Maximum continuous conductor temperature and allowable conductor temperature during short circuit shall be taken as 70^oC and 160^oC respectively for PVC insulated and 90^oC and 250^oC respectively in case of XLPE insulated cable.

b) Frequency variation $\pm$ 5%, voltage variation $\pm$ 10% and combined frequency and voltage variation of $\pm$ 10%.

iii) Amongst the various standards given above, for design, stringent conditions specified in the above standards shall be applicable.

2.3 General Technical Requirement

i) The cables shall be suitable for laying in racks, ducts, covered trenches, conduits and underground buried installation with chances of flooding by water.

ii) Cables shall be designed to withstand mechanical, electrical and thermal stresses developed under steady state and transient operating conditions.

iii) The aluminium/copper wires used for manufacturing the cables shall be true circular in shape before stranding and shall be of uniformly good quality free from defects. All aluminium used in the cables shall be of H2 grade.

iv) Aluminium conductor used in power cables shall have tensile strength of more than 100N/sq. mm. The conductor of control cables shall be manufactured from plain annealed copper. All the conductors shall be multi-stranded.

v) PVC insulation shall be suitable for continuous conductor temperature of 70°C and short circuit conductor temperature of 160°C. XLPE insulation shall be suitable for continuous conductor temperature of 90°C and short circuit conductor temperature of 250°C.

vi) The cable cores shall be laid up with fillers between the cores wherever necessary. It should not stick to insulation and inner sheath. All the cables, other than single core un-armoured cable shall have distinct extruded PVC inner sheath black in colour as per IS 5831.

vii) The fillers and inner sheath shall be of non-hygroscopic flame retardant material shall be softer than insulation and outer sheath shall be suitable for the operation temperature of the cable.

viii) The armouring shall be of galvanized steel as follows:

Calculated nominal size & diameter of cable under armour	Type of armour
a) Upto 13 mm	1.4 mm dia GS wire
b) Above 13 up-to 25 mm	0.8 mm thick GS strip/1.6 mm dia GS wire
c) Above 25 up-to 40 mm	0.8 mm thick GS strip/2.0 mm dia GS wire
d) Above 40 up-to 55 mm	1.4 mm thick GS strip/2.5 mm dia GS wire
e) Above 55 up-to 70 mm	1.4 mm thick GS strip/3.15 mm dia GS wire
f) Above 70 mm	1.4 mm thick GS strip/4 mm dia GS wire

The gap between armour wire/strip shall not exceed one armour wire/strip space and there shall be no cross over/over-riding of armour wire/strip. The minimum area of coverage of armouring shall be 90%. The breaking load of armour joint shall not be less than 95% of that of armour wire/strip. Zinc rich paint shall be applied on armour joint surface.

ix) Suitable chemicals shall be added to the outer sheaths of all cables to protect them from rodent and termite attack. These chemicals shall not have any harmful effect on the human being.

x) The normal current rating of all PVC insulated cables shall be as per IS-3961 and should suit the duty requirements for which it is intended.

xi) Outer sheath shall be of PVC black in colour for power cables and grey in colour for control cables.

xii) Cores of the cables of up-to 5 cores shall be identified by colouring of insulation. Following colour scheme shall be adopted:

1	core -	Red, Black, Yellow & Blue
2	core -	Red & Black
3	core -	Red, Yellow & Blue
4	core -	Red, Yellow, Blue & Black
5	core -	Red, Yellow, Blue, Black & Grey

xiii) For reduced neutral conductors the core shall be black.

xiv) For cables having more than 5 cores, core identification shall be done by numbering insulation of core sequentially, starting by number 1 in the inner layer (e.g. say for 10 core cable, core numbering shall be from 1 to 10). All the numbers shall be of same colour, which shall contrast with the colour of insulation. The colour of the insulation for all the cores shall be grey only. The numerals shall be legible and indelible. The numbers shall be repeated at regular intervals along the core, consecutive numbers being inverted in relation to each other. When number is a single numeral, a dash shall be placed underneath it. If the number consists of two numerals, these shall be disposed one below the other and a dash placed below the lower numeral. The spacing between consecutive numbers shall not exceed 50 mm.

xv) In addition to manufacturer's identification on cables as per IS/IEC, following marking shall also be embossed over outer sheath.

a) Cable size and voltage grade.

b) Sequential marking of length of the cable in meters at every one meter.
The embossing shall be progressive, automatic, on line and marking shall be legible and indelible.

xvi) Allowable tolerance on the overall diameter of the cables shall be $\pm$ 2 mm maximum, over the declared value in the technical data sheets.

xvii) In plant repairs to the cables shall not be accepted.

xviii) Identification of cores - the insulated cores of HT and LT power cables shall be identified by coloured code. The control cables shall have identification by means if indelible printing of numbers on its cores at intervals not more than 75 mm. At least 20% cores shall be kept as spares in the multi core control cables.

3.0 General Constructional Requirements

3.1 General

The power cables, control cables, PVC cables are required for the power supply, control and protection of various equipment.

3.2 Type Of Cable

The cable shall be multi core/single core (XLPE), PVC and any polymeric/elastomeric insulation type as specified in the Price Schedule.

3.3 Conductor

The cable conductor shall be made from stranded copper/aluminium to form compact conductor having a resistance within the limits specified in IS: 8130.
All the cables of size 25mm^2 and above shall have sector shaped conductors. The minimum no. of strands in conductor shall be 7 (seven) except as otherwise specified. Power cables shall be of stranded aluminium conductor with a minimum size 6 mm^2 and the control cables shall be stranded copper (electrolytic) conductor with a minimum size of 2.5 mm$^{2.}$

3.4 Conductor (Shield)

The conductor having a semi-conducting screen shall ensure perfectly smooth profile and avoid stress concentration. The conductor screen shall be extruded in the same operation as the insulation; the semi-conducting polymer shall be cross-linked for XLPE cables.

3.5 Insulation

The insulation of the cable shall be extruded type and shall be designed and manufactured for the specified system voltage. The manufacturing process shall ensure that insulation shall be free from voids. The insulation shall withstand mechanical and thermal stresses under steady state and transient operating conditions. The extrusion method should give very smooth interface between semi-conducting screen and insulation. The insulation of the cables shall be of high standard quality. The minimum volume resistivity of the PVC insulation of all the PVC insulated cables shall be 1 x 10^{14} ohm cm at 27^0 C and 1 x 10^{11} ohm cm at 70^0 C.

3.6 Insulation Shield

In cables to confine electrical field to the insulation, a non-magnetic semi-conducting shield shall be put over the insulation. The insulation shield shall be extruded in the same operation as the conductor shield and the insulation by triple extrusion/process. The cable insulation shield shall be strippable. Metallic screening of appropriate size as per the cable fault level given in this specification shall be provided. Copper tape shall be wrapped helically with 100% coverage. Appropriate shall be 0.04mm.

3.7 Sheath

The sheath shall be suitable to withstand the site conditions and the desired temperature. It shall be of adequate thickness and applied by a continuous process

to produce a sheath of consistent quality free from all defects. PVC sheath shall be extruded.

i) The conductor screen, XLPE insulation and insulation screen shall all be extruded in one operation by 'Triple Extrusion' process to ensure perfect bonding between the layers. The core identification shall be by coloured strips or by printed numerals.

ii) The inner sheath shall be applied over the laid up cores by extrusion and shall conform to the requirements of type ST2 compound of IS: 5831. The extruded inner sheath shall be of uniform thickness.

iii) The outer sheath of the cables shall be applied by extrusion over the armouring and shall be of PVC compound conforming to the requirements of type ST2 compound of IS: 5831. The thickness of outer sheath shall be as per amendment no.1 of table 5 of IS: 7098 Part-2 (Column 3 & 5 for both armoured and un-armoured cables).

iv) The dimensions of the insulation, inner sheath and armour materials shall be governed by values given in Tables 2, 3 & 4 (Method 3) of IS: 7098 Part-II.

3.8 Armour

Hard drawn aluminium wire armouring/galvanized steel tape/wire armouring shall be used for single core and multi core cable, respectively. The hard drawn aluminium wire for armour shall be of H4 grade, as per IS: 8130 (having tensile strength above 150 N/mm^2). The diameter of the aluminium wire shall be as per the table for the dimensions of the galvanized steel wire armour given in the relevant standard.

3.9 Serving/Cutter Sheath

Extruded PVC serving as per IS: 5831 or as specified otherwise shall be applied over the armouring with suitable additives to prevent attack by rodent and termites. All serving must be given anti-termite treatment.

3.10 Construction

Cable shall have suitable fillers laid up with the conductors to provide a substantially circular cross section before the sheath is applied. Fillers shall be suitable for the operating temperature of the cable and compatible with the insulating material. All materials shall be now, unused and of finest quality. Workmanship shall be neat, clean and of highest grade.

(a) 33kV and 11 kV System – Power Cable

The cable shall be 33 kV and 11 kV (earthed system) grade, heavy duty, stranded aluminium conductor, XLPE insulated, provided with conductor screening and insulation screening, galvanized steel wire/strip armoured, extruded PVC of Type ST2 outer sheathed, as per system requirement, wherever these cables are needed. The cables shall conform to IS: 7098 (Part II) or IEC 60502-2.

(b) 415V System
The cable shall be 1.1 kV, grade, heavy duty, stranded aluminium conductor, PVC Type-A Insulated galvanized steel, wire/strip armoured, extruded PVC type STI outer sheathed.

(c) Control Cables
The cable shall be 1.1 kV grade, heavy duty, multi core stranded (7 wires) tinned copper (annealed) conductor, PVC Type-A insulated, galvanized steel wire/strip armoured, flame retardant low smoke (FPLS) extruded PVC of type-ST1 outer sheathed. The following sizes shall be used.

4.0 Cable Drums

4.1 LV and control cables shall be supplied in non-returnable wooden drums. HV cables shall be supplied in a steel drum. The covers with wood is acceptable. The wood used for construction for the drum shall made from hard wood, be properly seasoned, sound and free from defects. Wood preservative shall be applied to the entire drum.

4.2 Bidder shall indicate in the offer the standard length for each size of power and control cable which can be furnished on one drum. The cable length per drum shall be subject to tolerance of ± 0.5% of the standard drums length. The bidders shall take into consideration the wastages in the pricing and quote accordingly. IS tolerance shall not be applicable.

However the cable drums shall be selected so those through joints are eliminated. Typical drum lengths shall be as follows:

a)	33/11kV grade Power Cables up to 300 sq.mm	250 m
b)	1.1 kV grade cables:	
--	Including and above 240 mm^2	250 m
--	Below 240 mm^2 size and up to 150 sq.mm	500 m
--	Below 150 mm^2 size and up to 50 sq.mm	1000 m
--	Below 35 mm^2 sizes	2000 m

4.3 A layer of PVC sheet shall be applied to the surfaces of the drums and over the outer most cables layer. A clear space of at least 40 mm shall be left between the cables and the logging.

4.4 Each drum shall have the following information stencilled on it in indelible ink:

i. Contract/specification No.
ii. Name and address of the consignee
iii. Makers name and address
iv. Drum No.
v. Size of cable, code name and length of cable in meter
vi. Gross weight of the drum with protective lagging including cable
vii. Weight of the empty drum with protective lagging.

viii. Net weight of the cable.
ix. Arrow marking of unwinding position of the cable end, lot number.

4.5 Packing shall be sturdy and adequate to protect the cables from any injury due to mishandling or other conditions encountered during transportation handling and storage. Both cable ends shall be sealed with PVC/Rubber caps so as to eliminate ingress of water during transportation, storage and erection.

5.0 Minimum Technical Requirements.

5.1 Underground Distribution Cable

The standard 33 kV & 11 kV cable for underground distribution is cross-linked polyethylene insulated, PVC sheathed, cable manufactured to IS 7098 Part II or IEC 60502-2. Cables shall be steel wire or steel tape armoured for more than 1 core whereas for single core, armouring shall be aluminium wire or aluminium tape.
The current carrying capacity of buried cables depends on the installation conditions, such as the thermal resistance of the soil and the presence of other cables. Manufacturers provide cable ratings for cable installed under defined conditions, which may not reflect the actual installation conditions in a particular situation. In order to provide for these uncertainties, the maximum design current for any underground cable should generally be limited to 90% of the ratings.

5.2 400 V Cable

BPC's standard 400 V underground cable is aluminium conductor, PVC insulated, PVC sheathed, manufactured to IS 1554 (Part I). Cables are four or two core with the neutral conductor having the same cross sectional area as the phase conductors. Cables shall be steel wire or steel tape armoured for more than 1 core whereas for single core, armouring shall be aluminium wire or aluminium tape.

5.3 Low Voltage Overhead Service Cable

Low voltage overhead service cable shall be 650/1100 V two core or four core stranded copper conductor, PVC insulated, with high conductivity hard drawn copper conductors. The cable shall have an extruded PVC sheath in accordance with IEC 60502-1.

Single core copper cable with a neutral screen is an acceptable alternative to the twin conductor cable currently used. For three phase supplies three core plus neutral screen cable may be used. Neutral screen cable is considered safer for overhead service drops because the neutral conductor completely surrounds the phase conductor.

Guaranteed Technical Particulars

LOT 12: PVC Cables

			Bidders to fill up						
SL. No.	Parameters	Units	Arm. Al. Cable PVC Insulated (Item no. 1-7)						
			4C x 25 sq.mm	4C x 50 sq.mm	4C x 70 sq.mm	4C x 95 sq.mm	4C x 150 sq.mm	4C x 300 sq.mm	4C x400 sq.mm
1	Manufacturer								
2	Applicable Standards								
3	Rated voltage	kV							
4	System Voltage	kV							
5	Maximum current carrying capacity								
6	Short circuit capacity of conductor								
7	**Conductor**								
	Material								
	Crossectional Area								
	Whether Stranded?								
8	**Insulation**								
	Material								
	Thickness	mm							
9	**Inner Sheath**								
	Material								
	Whether Extruded or Wrapped?								
	Thickness	mm							
10	**Outer sheath**								
	Material								
	Thickness	mm							
11	**Armour**								
	Material								
	Thickness	mm							
12	Details of screen, if any								
13.0	Total overall diameter	mm							
14	**Test Voltage**								
	Five minute power frequency withstand voltage	kV/5min							
15	Type of cable end sealing								
16	**Cable drums**								
	Dimensions	mm							
	Weight	kg							
	Nominal length per drum	mtr							

Price Schedule

Lot 3: Telescopic Pole fittings							
SL#	**Description**	**UoM**	**Qty**	**Technical Specification**	**Brand and Country of Origin**	**Unit Rate in DDP (Nu.)**	**Amount in DDP (Nu.)**
A	**13 M Telescopic Pole Fittings**						
1	Shielding arrangement on single pole with U-type connector and other accessories.	Set	51	Refer the detail drawings of the fittings issued via Addendum IV			
2	Shielding arrangement on double pole with clamps, cross-arm channel, cross-arm strap and other accessories.	Set	40				
3	Top cross-arm assembly for H-frame complete with clamps, nuts, bolts and other accessories.	Set	40				
4	Cross brace arm assembly for H-frame with clamps, nuts, bolts and other accessories	Set	40				
B	**11.2 M Telescopic Pole Fitting**						
1	33kV double pole X-brace 11.2m Tele pole	Set	11	Refer TS and Drawing			
Total Lot Amount (Nu.)							

Price Schedule

Lot 12: PVC Cables						
Sl#	**Material**	**Unit**	**Qty**	**Brand and Country of Origin**	**Unit Rate in DDP (Nu.)**	**Total Amount in DDP(Nu)**
1	Arm. Al Cable 4Cx25sqmm PVC Insulated	M	350			
2	Arm. Al Cable 4Cx50sqmm PVC Insulated	M	250			
3	Arm. Al Cable 4Cx70sqmm PVC Insulated	M	2920			
4	Arm. Al Cable 4Cx95sqmm PVC Insulated	M	250			
5	Arm. Al Cable 4Cx150sqmm PVC Insulated	M	510			
6	Arm. Al Cable 4Cx300sqmm PVC Insulated	M	2242			
7	Arm. Al Cable 4Cx400sqmm PVC Insulated	M	250			
Total Amount (Nu)