

Ref. Enquiry No.: PE/PG/RTC/E-6394/2019

Dated: 03.03.2020

**TENDER ENQUIRY THROUGH E-PROCUREMENT
(CONDITIONAL ENQUIRY)**

SUBJECT: TENDER ENQUIRY FOR RATE CONTRACT OF SCREENED CONTROL CABLES AS PER TECHNICAL SPECIFICATION NO. PE-RC-999-507-E006, REV 00

OUR REF: TENDER ENQUIRY NO: PE/PG/RTC/E-6394/2019, DTD-03.03.2020

DUE DATE - 16.03.2020, BY 14:00PM

Dear Sir/ Ma'am,

We are pleased to invite your offer for subject package in two parts strictly as per Clause-2.0 of "Instructions to Bidders" of GCC Rev 07. Please upload your best quotation/ offer on <https://bhel.abcpurchase.com> for the requirement strictly as per schedule of price format before above mentioned due date & time. The details of the tender enquiry are as mentioned below:

Sl. No	Description for which Rate Contract is desired	Tentative Quantity	Delivery required
1	SCREENED CONTROL CABLES - Refer Technical specification no PE-RC-999-507-E006, REV 00 for detailed description.	As per BOQ cum price schedule in Annexure-I) cumulative for the Prospective Projects as per Annexure-IV	Within four (04) months from date of CAT-1 approval of Primary drawing/documents, subjected to drawing/document submission/re-submission schedule as stipulated, in case of any delay in submission/re-submission of Primary drawing/documents, then same shall be reduced from the given delivery period. Delay in BHEL's comments/approval beyond 18 days shall also be considered for delay analysis. Please refer clause no 4 of Volume ii, Section I Rev 0 Sheet 2 of 2 of Technical Specification PE-RC-999-507-E005.

Your best quotation/offer for the above requirement, in line with our terms and conditions, should be submitted online via e-procurement system. It shall be the responsibility of the bidder to ensure that the Tender is submitted on or before the due date by 2 p.m. Part-I bids shall be opened at 03:00 PM on due date through e-procurement Portal.

Detailed Tender documents can be downloaded from the following websites: -

a) www.eprocure.gov.in b) <https://bhel.abcpurchase.com> c) www.bhel.com d) www.bhelpem.com

Tender submission through e-procurement portal- Bidders may go through the Sellers' manual & Help documents provided on E-Procurement Portal website (<https://bhel.abcpurchase.com>).

E-procurement service Provider details:

M/s E-Procurement Technologies Limited, Ahmedabad

B705. Wall Street II, Opp. Orient Club, Near Gujrat college, Ellis Bridge, Ahmedabad, PIN 380 006.

Please get in touch with our service provider at the earliest for required support. The contact details of the service provider are given at: <https://bhel.abcpurchase.com/EPROC/contactus>

Note: -

1. Please note that Part Supplies offered for tender BOQ shall disqualify the bidder's offer.
2. Documents and Credential as per Technical & Financial PQR, Techno Commercial Bids and Price Bids should be uploaded on the e-procurement portal.
3. Bidders to ensure that Third party/customer issued certificates being submitted as proof of PQR qualification should have verifiable details of document/certificate issuing authority such as name & designation of Issuing Authority and its organisation contact number and email Id etc. In case the same found not available, Purchaser has right to reject such document from evaluation.
4. "This item/Package/System falls under the list of items defined in Para 3 of Ministry of Finance guideline datedt.20-09-2016 (procurement of items related to public safety, health, critical security operations and equipment's, etc.) & hence criteria of prior experience/turnover shall be same for all the bidders including start up/MSME".

Please refer GCC Rev-07 which is available on www.bhelpem.com. You are requested to kindly download the same.

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TERMS AND CONDITIONS

1. Rate contract, on PVC basis, shall be done for 2 years from placement of Rate Contract PO date with a provision for further extension after review on mutual consent.
Rate contract shall be done with 2 vendors in ratio of 70:30 value wise at L1 FOR site price for this package. Splitting of RC among 2 vendors may be changed during project ordering process if any vendor in RC is not approved by customer (i.e. BHEL may place order on any of the vendor in RC up to total applicable RC value in case of non-availability of customer approval for other vendor in RC). However, order for a project shall not be split and the same shall be informed to bidders through NIT.
2. Rate Contract will be finalized on total lump sum basis.
L1 Rates shall be counter offered to all bidders who participated in Price Bid Opening/RA for 30% value and in case acceptance of counter offer received from more than one vendor then **acceptance shall be considered as per FINAL Price Bid Opening / Reverse Auction Ranking (as applicable)**. If none accepts L1 rates, RC shall be done with L1 vendor for 100% value.
3. PVC shall be applicable for the subject package. **Base date for initial prices for this tender shall be first February' 2020.**
All bidders shall be asked to quote as per the Price Variation Formulae for Cables uploaded on BHEL PEM website on the link <https://www.bhelpem.com/Documents/GCC/Price%20Variation%20Formulae%20for%20Cables.pdf>
4. As per cl. no. 3 (b) of make in India Circular ref: No. P-45021/2/2017-PP (BE-II) dtd 29/05/2019 issued by Ministry of Commerce and Industry, Govt. of India, If L 1 bid is not from a local supplier, 50% of the order quantity shall be awarded to L 1. Thereafter, the lowest bidder among the local suppliers, will be invited to match the L 1 price for the remaining 50% quantity subject to the local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such local supplier subject to matching the L 1 price. In case such lowest eligible local supplier fails to match the L 1 price or accepts less than the offered quantity, the next higher local supplier within the margin of purchase preference shall be invited to match the L 1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on local suppliers, then such balance quantity may also be ordered on the L 1 bidder.
In such case further counter-offering for 70:30 as mentioned at point no. 1 shall not be applicable. However, if L1 bid is from local supplier or local supplier is not in the range of margin of purchase preference then further counter-offering for 70:30 shall be applicable as mentioned at point no. 1 & 2.
5. As per circular ref: No. P-45021/2/2017-PP (BE-II) dtd 28/05/18, the Margin of Purchase Preference shall be 20%.
6. For Screened Control Cable package, the package is divisible in nature and the Local content shall be minimum 100%.
7. "For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018 & 29.05.2019 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of the NIT but before finalization of contract/ PO/WO against the NIT. In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and / or local content in respect of this procurement, same shall be applicable". Vendors are requested to go through the above mentioned orders and confirm the following-
The local supplier at the time of tender, bidding or solicitation shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) that the item offered meets the minimum local content as per above mentioned orders and shall give details of the location(s) at which the local value addition is made.
8. Bidders to note the following: -
 - i. Tender Evaluation - Evaluation will be done on overall L1 (Total Cost to BHEL excluding GST) basis with necessary loading as applicable i.e. Evaluation will be on Ex Works + Freight basis for this tender.
 - In case of PBO, the loading (technical/commercial), if any, shall be added by BHEL for evaluation.

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- In case of RA, the loading (technical/commercial), if any, shall be added by bidder while submitting the bid in reverse auction portal.
- Ordering shall be done after de-loading the commercial/ technical loading from bidder's final price.
- ii. In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders. In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss / draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s). Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.
- iii. **Bidder to give single % of freight charges considering anywhere in India in the freight column. Bidders have to give same % of freight for each line item.**
- iv. Bidders to mention applicable GST rate on (total Ex. works + freight) in the specified cells of price schedule on price form at e-procurement portal. However, may please note that GST shall not be considered in evaluation.
- v. Though evaluation is on Ex Works + Freight, but there is % allocation weightage against BOQ quantity of each item which shall be used for arriving at price break up. Bidders need to give only their total ex works price for given BOQ at the specific cells that has been kept opened in the price schedule available in the e-procurement portal (Grand Total ex works price). Price mentioned anywhere else in BOQ or price uploaded anywhere else in the e-procurement portal shall not be taken in cognizance.
- vi. Rest of the prices shall be derived by BHEL in line with allocation fixed for each item. There is formula applied in price schedule form available in e-procurement portal. As soon as bidder fills the cells for Total Ex works, freight percentage and GST percentage, rest values for e.g. unit ex works – item wise, total ex works – item wise, FOR site price – item wise will filled automatically.
- vii. For better clarity to the bidders where value is to be filled is kept open in price form at e-procurement portal and for other columns it will be locked which denotes shall be derived by BHEL as per allocation fixed against each item.
- viii. HSN Code has been mentioned in Price Schedule.
- ix. Incomplete offer shall be summarily rejected.
- x. **PRE-QUALIFICATION REQUIREMENT: -**
Bidders is requested to fill up the details in "TECHNICAL AND FINANCIAL PRE-QUALIFYING REQUIREMENT" as per the conditions mentioned in the PQR (technical) and also to submit the credentials.
Bids of only those bidders shall be evaluated who meet the Technical & Financial pre-qualifying requirements (if applicable). **Bidders to ensure that Third party/customer issued certificates being submitted as proof of PQR qualification should have verifiable details of document/certificate issuing authority such as name & designation of Issuing Authority and its organisation contact number and email Id etc. In case the same found not available, Purchaser has right to reject such document from evaluation.**
"This item/Package/System falls under the list of items defined in Para 3 of Ministry of Finance guideline dated.20-09-2016 (procurement of items related to public safety, health, critical security operations and equipment's, etc.) & hence criteria of prior experience/turnover shall be same for all the bidders including start up/MSME".
- xi. Bidders to note that their bid shall be conditional subject to qualify PQR (technical & financial) by registered vendors & non-registered vendors have to qualify PQR (technical & financial) & get registered with PEM for the package.
For registration in PEM "Bidders needs to apply & get registered for subject package with PEM before P-2 (price bid opening) & hence you need to apply online for registration on PEM web portal & have to enclose acknowledgement with this effect with the bid documents else your bid may not be considered for evaluation"
- xii. This enquiry is subject to Conditions/ limits if any imposed in PMD / Vendor registration.

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- xiii. Refer Annexure I for tentative quantity of Screened Control Cables, required for prospective projects. Project list is indicative only, BHEL may ask for delivery anywhere in India for any of the project added in the prospective project/ existing projects during RC period. No minimum quantity is guaranteed by BHEL.
- xiv. Quantity variation shall be +30%.
- xv. CIF allocation is not applicable for this tender. Bidder to quote accordingly.
- xvi. Tenderers must enclose the Quality Plan in the prescribed format, for approval. Equipment will be dispatched only after Purchaser's / Owner's inspection of the hold points specified in the approved Quality Plan and issue of Material Dispatch Clearance Certificate (MDCC).
- xvii. In case of joint bidding, bidders to furnish scope matrix which should be clearly defined between them along with the offer for the complete scope.
- xviii. **Integrity pact is applicable for this tender**

IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl No.	IEM	Phone & Email
1.	Shri Arun Chandra Verma, IPS (Retd.)	acverma1@gmail.com
2.	Shri Virendra Bahadur Singh, IPS (Retd.)	vbsinghips@gmail.com

The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this pact would be a preliminary qualification. (Refer Annexure-IX for Integrity pact).

Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to the any of the IEMs mentioned in the NIT. All correspondence with the IEMs shall be done through email only.

"No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department officials whose contact details are provided above in NIT".

OTHER TERMS AND CONDITIONS

- Procurement of the subject package shall be done through e-procurement
- Offers should be uploaded in two parts online at <https://bhel.abcpocure.com> in as follows:
 - Part-I Bid: - Documents and Credential as per Technical & Financial PQR and Techno-Commercial offer (along with un-priced copy of un-priced bid and un-priced schedule of Technical-Commercial Deviation, Annexure I & II)
 - Part II Bid: - Price Bid and Priced schedule of Technical-Commercial Deviation
- Terms and conditions: -
 - Part I bid will be opened on date & time mentioned in the NIT or subsequent corrigenda/amendments, if any.
 - Techno-commercial offer of only those bidders shall be evaluated who will meet the Technical & Financial pre-qualifying requirement of the tender.**All the above Tender Documents shall automatically become a part of the Order/Contract after its finalisation.
- Vendors shall quote in accordance with the requirements mentioned in the tender documents. In case of deviations (Technical/ Commercial), the same shall be highlighted separately giving Clause references along with the Cost of withdrawal of Deviations in e-procurement portal, along with reasons for taking such deviations.

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Bidder to note all the points mentioned in "Notes" of cost of withdrawal sheet in e-procurement portal.

5. *Please note the following:*

a. *Compliance to price form available at e-procurement portal.*

b. *SCC enclosed for compliance.*

GCC enclosed for compliance. GCC Rev-07 is available on www.bhelpem.com. You are requested to kindly download the same. Bidders are requested for furnishing compliance of these documents.

6. Tenders shall be submitted strictly in accordance with the requirements of the above tender documents.
7. Standard pre-printed terms & conditions of the tenderers shall not be considered valid.
8. Validity of offer shall be as per cl.no.7(instruction to bidders) of GCC Rev 07.
9. Unsolicited fresh/revised Price Bids shall not be entertained.
10. Purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any/all tender(s) in part or full without assigning any reason whatsoever.
11. Late tenders will be rejected.
12. Definition of Terms is also enclosed. These definitions will apply to all the tender documents including this Enquiry Letter.
13. Tenders and all correspondence thereof, shall be addressed to the undersigned by name & designation and sent at the following address:

Mr. I P SINGH, DGM, CMM
M/s Bharat Heavy Electricals Ltd.,
Project Engineering Management,
Power Project Engineering Institute,
HRD & ESI Complex,
Plot No 25, Sector-16 A, Noida-201301
Kind Attn: I P SINGH/ CMM
E-MAIL: indra.pal.singh@bhel.in
Ph. No. 0120-4218749 ,09818989654

Mr. SUMEET SAHAY, DY MGR, CMM
M/s Bharat Heavy Electricals Ltd.,
Project Engineering Management,
Power Project Engineering Institute,
HRD & ESI Complex,
Plot No 25, Sector-16 A, Noida-201301
Kind Attn: SUMEET SAHAY/ CMM
E-MAIL: sumeetsahay@bhel.in
Ph. No. 0120-4213532 ,09999498202

14. **Delivery:**

Within four (04) months from date of CAT-1 approval of Primary drawing/documents, subjected to drawing/document submission/re-submission schedule as stipulated, in case of any delay in submission/re-submission of Primary drawing/documents, then same shall be reduced from the given delivery period. Delay in BHEL's comments/approval beyond 18 days shall also be considered for delay analysis. Please refer clause no 4 of Volume ii, Section I Rev 0 Sheet 2 of 2 of Technical Specification PE-RC-999-507-E005.

BHEL Drawing No	Drawing Title	Primary/Secondary	Drg Sch for Vendors
PE-V0-XXX-507-E141	TECHNICAL DATA SHEET – SCREENED CONTROL CABLES	Primary	R-0 within 14 days from PO & subsequent revisions within 10 days of comments received from BHEL. BHEL shall furnish comments / approval on each submission within 18 days from receipt.
PE-V0-XXX-507-E143	CROSS SECTION DRGS. – SCREENED CONTROL CABLES	Primary	
PE-V0-XXX-507-E916 (*)	QUALITY PLAN – SCREENED CONTROL CABLES	Primary	
PE-V0-XXX-507-E144	TYPE TEST CERTIFICATES - SCREENED CONTROL CABLES	Secondary	Within 1 week after conduction of type test

NOTE: (*) -Standard Quality Plan as enclosed in the technical specification is to be appended with cover sheet bearing document number & description as stated above. The signed & stamped copy for the same shall be submitted to BHEL without making any changes in the contents of the document

15. All other terms and conditions shall be as per GCC Rev 07 and Special Conditions of Rate Contract as per attached Annexure-IV. In the event of any contradiction in the terms and conditions mentioned, the order of preference shall be as mentioned in clause no 36 of GCTC of GCC (Rev.07).

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16. All the above Tender Documents shall automatically become a part of the Order/Contract after its finalization.
17. All corrigenda, addenda, amendments, time extensions, clarifications etc. to the tender will be hosted on BHEL websites only (www.bhelpem.com., www.bhel.com & <https://bhel.abcprocure.com> under subject tender reference. Bidders are requested to visit our websites from time to time to keep themselves updated. **Bidders may go through the Sellers' manual & Help documents provided on E-Procurement Portal website & obtain required Digital Signature Certificate for participating in the subject Tender.**
18. Bidders to submit their offers strictly in line with the form available at e-procurement portal.
19. Inspection shall be done by BHEL/ END CUSTOMER/Third party Agency (finalized by BHEL).
20. Foreign & indigenous bidders participating through open/limited tender will necessarily have to but class III DSCs issued by the certifying authorities in India. Basic procedure/ checklist is uploaded on www.bhel.com.
21. Non- registered bidder to submit the credentials required for Registration in BHEL PEM: -
"Online Registration Portal is operational in BHEL. Non-registered Vendors, who wish to apply for registration with BHEL-PEM, have to apply through Online Registration Portal available at www.bhelpem.com - vendor section - Online Supplier Registration. All credentials and/or documents duly signed and stamped related to registration has to be uploaded on the website and submit the application for registration. One set of hard copy of the filled-up SRF downloaded from Online Registration Portal duly signed and stamped has to be submitted."
22. Purchaser reserves the right to split up the scope of the tender enquiry and place the orders for different scope/ items with different bidders and also increase or decrease the quantity.
23. In case of RA, revised RA guidelines AA:SSP:RA:03 issued on 26.09.2016 (uploaded on http://www.bhel.com/vender_registration/pdf/Guidelines%20for%20Reverse%20Auction-2016.pdf) shall be applicable.
24. BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.
Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).
The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.
If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com)."
As a reminder to the bidders, system will flash following message (in RED Color) during the course of 'online sealed bid':

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"Bidders to submit online sealed bid less than or equal to their envelope sealed bid already submitted to BHEL"
Detailed guidelines of reverse auction 2016 are available in "information section" of [www. bhelnem.com](http://www.bhelnem.com), same are applicable for subject tender.

IMPORTANT INSTRUCTION TO BIDDERS IN CASE OF REVERSE AUCTION

- "The Bidders has to quote the Single Price (i.e. Total Cost to BHEL) in Reverse Auction. Price are to be inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, Freight as applicable, including loading (if any). De-loading (if any) shall be done in line with NIT terms.
In case of RA, if bidder fail to submit the price break up within prescribed time limit then the prices submitted by bidder in his hard bid shall be reduced proportionately for ordering purpose.
25. Various Conditions, arrived after Reverse Auction, shall be treated as follows:
Case-I (Taxes & duties and freight are identical in Reverse Auction & Conventional Price Bid)
Resolution: - Ordering shall be done on lower of the two bids (RA closing price & Conventional Price Bid). After successful completion of reverse auction L1 bidder shall be asked to submit break up in line with taxes & duties, freight quoted in their Conventional Price Bid.
Note: - Applicable taxes & duties shall be determined as per location of works of bidder".
26. If any bidder has mentioned the term Not Applicable / Not required / Not Quoted in bidding form. The bidder needs to substantiate the same. If the same item will be required in future for the system same will be supplied free of cost.
27. L1 bidder will have to submit Bank Guarantee for each POs (irrespective of value) which will be placed under the Rate Contract finalised through this tender considering RC as original contract as per format mentioned in in GCC Rev 07.

Thanking you,
Yours faithfully,
For and on behalf of BHEL

सुमीत सहाय / SUMIT SAHAY
उप प्रबंधक (सी. एम. एम.) / Dy. Manager (CMM)
भारत भारी इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electricals Ltd.
पावर सेक्टर-परियोजना इंजीनियरिंग प्रबंधन
Power Sector-Project Engineering Management
पीपीईआई भवन, एनएसआई एनएसआई कॉम्प्लेक्स
BHEL Bldg. NRD & ESI Complex,
प्लॉट नं. 25, सेक्टर-16, नोडा - 201301

(Signature of official with Name & Designation)

Enclosure:

1. Enquiry Terms & Conditions.
2. Price Schedule - Annexure-I to NIT (to be filled in e-procurement portal only)
3. Annexure IA
4. Cost of withdrawal sheet -Annexure-II to NIT (to be filled in e-procurement portal only)
5. Technical Specifications.
6. Technical PQR
7. Financial PQR
8. SCC – Annexure-III to NIT.
9. Prospective Project List – Annexure-IV to NIT
10. BOQ – Annexure-V to NIT.
11. Format for CA/Cost Auditor-certification regarding local content – Annexure- VI to NIT
12. Bank Guarantee Format – Annexure-VII to NIT.
13. Integrity Pact (IP) – Annexure-VIII to NIT
14. Annexure A – PVC Formulae

Domain :							bhel.abcprocure.com									
Parent department:							PEM Noida									
View form																
Event ID :							41786				RFQ/NIT/Enquiry no.			: E-6394/2019		
Description :							TENDER ENQUIRY FOR RATE CONTRACT OF SCREENED CONTROL CABLES AS PER TECHNICAL SPECIFICATION NO. PE-RC-999-507-E006, REV 00									
RATE CONTRACT OF SCREENED CONTROL CABLES- PRICE SCHEDULE																
PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES																
PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES																
SL NO	ITEM CODE	ITEM DESCRIPTION	DRUM LENGTH (IN METER)	HSN CODE	ORDERED QUANTITY	UOM	FORMULA FOR UNIT EX-WORKS PRICE (DULY PACKED) (INR)	UNIT EX-WORKS PRICE (DULY PACKED) (INR)	FORMULA FOR TOTAL EX-WORKS PRICE (DULY PACKED)(INR)(VALUE MENTIONED IN THE BOX X GRAND TOTAL EX WORKS QUOTED VALUE)	TOTAL EX-WORKS PRICE (DULY PACKED) (INR)	FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS	TOTAL FREIGHT CHARGES WITHOUT GST	APPLICABLE GST RATE --% ON (TOTAL EX WORKS + FREIGHT)	TOTAL GST CHARGES	TOTAL FOR SITE PRICE (DULY PACKED) (INR)	REMARKS
Small text Item No. Show	Small text Other Show	Long text Item name Show	Small text Other Show	All numbers Total rate Show	All numbers Quantity Show	Small text Unit of measurement Show	Small text Other Show	All numbers Other Show	Small text Other Show	All numbers Other Show	All numbers Techno commercial data Show	All numbers Other Show	Techno commercial data Show	All numbers Other Show	All numbers Other Show	Other Show
1	507-31116-A	1.1KV TYPE F(IO) 2P - 0.5 ARMOURED	1000	8544	80000	Metres	0.02723 * X /80000	Auto	0.02723 * X	Auto	Auto	Auto	To be filled by bidder (+no. with (..))	Auto	Auto	To be filled by bidder (Small text)
2	507-31009-A	1.1KV TYPE F(IO) 4P - 0.5 ARMOURED	1000	8544	295000	Metres	0.13242 * X /295000	Auto	0.13242 * X	Auto	Auto	Auto	To be filled by bidder (+no. with (..))	Auto	Auto	To be filled by

																bidder (Small text)
3	507-31013-A	1.1KV TYPE F(IO) 8P - 0.5 ARMOURED	1000	8544	110000	Metres	0.08326 * X /110000	Auto	0.08326 * X	Auto	Auto	Auto	To be filled by bidder (+no. with (..))	Auto	Auto	To be filled by bidder (Small text)
4	507-31001-A	1.1KV TYPE F(IO) 12P - 0.5 ARMOURED	1000	8544	75000	Metres	0.07408 * X /75000	Auto	0.07408 * X	Auto	Auto	Auto	To be filled by bidder (+no. with (..))	Auto	Auto	To be filled by bidder (Small text)
5	507-31005-A	1.1KV TYPE F(IO) 20P - 0.5 ARMOURED	500	8544	15000	Metres	0.02365 * X /15000	Auto	0.02365 * X	Auto	Auto	Auto	To be filled by bidder (+no. with (..))	Auto	Auto	To be filled by bidder (Small text)
6	507-31121-A	1.1KV TYPE F(IO) 24P - 0.5 ARMOURED	500	8544	10000	Metres	0.01892 * X /10000	Auto	0.01892 * X	Auto	Auto	Auto	To be filled by bidder (+no. with (..))	Auto	Auto	To be filled by bidder (Small text)
7	507-31025-A	1.1KV TYPE G(O) 2P - 0.5 ARMOURED	1000	8544	235000	Metres	0.06558 * X /235000	Auto	0.06558 * X	Auto	Auto	Auto	To be filled by bidder (+no. with (..))	Auto	Auto	To be filled by bidder (Small text)
8	507-31029-A	1.1KV TYPE G(O) 4P - 0.5 ARMOURED	1000	8544	240000	Metres	0.08544 * X /240000	Auto	0.08544 * X	Auto	Auto	Auto	To be filled by bidder (+no. with (..))	Auto	Auto	To be filled by bidder (Small text)
9	507-31033-A	1.1KV TYPE G(O) 8P - 0.5 ARMOURED	1000	8544	580000	Metres	0.35168 * X /580000	Auto	0.35168 * X	Auto	Auto	Auto	To be filled by bidder (+no. with (..))	Auto	Auto	To be filled by bidder (Small text)
10	507-31017-A	1.1KV TYPE G(O) 12P -	1000	8544	175000	Metres	0.13774 * X /175000	Auto	0.13774 * X	Auto	Auto	Auto	To be filled by bidder	Auto	Auto	To be filled by

		0.5 ARMoured											(+no. with (.))			bidder (Small text)
									Grand Total	Auto		Auto		Auto	Auto	
X = GRAND TOTAL EX WORKS PRICES OF ALL TEN (10) TYPES OF CABLES																
Mandatory : Yes																
Created formula(s)																
Sr. No.	Formula for						Formula									
1	UNIT EX-WORKS PRICE (DULY PACKED) (INR)						TOTAL EX - WORKS PRICE (DULY PACKED) (INR) / ORDERED QUANTITY									
2	TOTAL FREIGHT CHARGES WITHOUT GST						TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * FREIGHT CHARGES WITHOUT GST @ -- % OF TOTAL EX WORKS / 100									
3	TOTAL GST CHARGES						(TOTAL EX - WORKS PRICE (DULY PACKED) (INR) + TOTAL FREIGHT CHARGES WITHOUT GST) * APPLICABLE GST RATE -- % ON (TOTAL EX WORKS + FREIGHT) / 100									
4	TOTAL FOR SITE PRICE (DULY PACKED) (INR)						TOTAL EX - WORKS PRICE (DULY PACKED) (INR) + TOTAL FREIGHT CHARGES WITHOUT GST + TOTAL GST CHARGES									
5	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS						GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)									
6	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS						GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)									
7	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS						GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)									
8	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS						GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)									
9	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS						GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)									
10	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS						GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)									
11	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL						GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)									

	CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS	
12	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)
13	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)
14	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR)
15	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @-- % OF TOTAL EX WORKS	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_FREIGHT CHARGES WITHOUT GST @ - - % OF TOTAL EX WORKS<=100
16	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.02723
17	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.13242
18	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.08326
19	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.07408
20	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.02365
21	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.01892
22	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.06558
23	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.08544
24	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.35168
25	PRICE SCHEDULE - RATE CONTRACT OF SCREENED CONTROL CABLES_TOTAL EX- WORKS PRICE (DULY PACKED) (INR)	GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _TOTAL EX - WORKS PRICE (DULY PACKED) (INR) * 0.13774

26	TOTAL EX- WORKS PRICE (DULY PACKED) (INR)			TOTAL (TOTAL EX - WORKS PRICE (DULY PACKED) (INR))		
27	TOTAL FREIGHT CHARGES WITHOUT GST			TOTAL (TOTAL FREIGHT CHARGES WITHOUT GST)		
28	TOTAL GST CHARGES			TOTAL (TOTAL GST CHARGES)		
29	TOTAL FOR SITE PRICE (DULY PACKED) (INR)			TOTAL (TOTAL FOR SITE PRICE (DULY PACKED) (INR))		
GRAND TOTAL EX- WORKS PRICE (DULY PACKED) (INR)						
GRAND TOTAL EX- WORKS PRICE (DULY PACKED) (INR)						
Sr. No.	Description	QUANTITY	Bidder Remarks	TOTAL EX- WORKS PRICE (DULY PACKED)(INR)	TOTAL EX- WORKS PRICE (DULY PACKED)(INR) Words	FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ(INR)
Small text Item No. Show	Long text Item name Show	All numbers Quantity Hide	Other Show	Total rate Show	Long text Other Show	Techno commercial data Show
GRAND TOTAL EX WORKS	GRAND TOTAL EX WORKS PRICE FOR 10 TYPES OF CABLES = Rs X	1	To be filled by bidder (Combo Box)	To be filled by bidder (All numbers)	Auto	To be filled by bidder (All numbers)
		Grand Total		Auto		Auto
Mandatory : Yes						
Created formula(s)						
Sr. No.	Formula for			Formula		
1	TOTAL EX- WORKS PRICE (DULY PACKED)(INR)			TOTAL (TOTAL EX - WORKS PRICE (DULY PACKED) (INR))		
2	TOTAL EX- WORKS PRICE (DULY PACKED) (INR) Words			TOTAL EX - WORKS PRICE (DULY PACKED) (INR)		
3	FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ(INR)			TOTAL (FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR))		
4	GRAND TOTAL EX- WORKS PRICE (DULY PACKED) (INR)_FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ(INR)			GRAND TOTAL EX - WORKS PRICE (DULY PACKED) (INR) _FREIGHT CHARGES WITHOUT GST @ % OF GRAND TOTAL EX WORKS FOR COMPLETE BOQ (INR) >0		

- NOTE:-
1. Bidder to note that evaluation shall be on Total Ex works price + Freight. Bidder to quote grand total Ex works value of the complete package only as per the BOQ above. The item wise break up of Ex works prices (unit as well as total) for all the items in the BOQ shall be derived as per the formulae indicated above by BHEL. Bidder also need to indicate Freight and GST rate in percentage in the respective column. Freight percentage to be quoted in percentage of Ex works value considering delivery anywhere in India.
 2. The standard drum length shall be 500/1000 meters as indicated above. Tolerance on individual drum length shall be ±5%.
 3. Overall tolerance on total dispatched quantity of each size shall be (-) 2% and (+) 0% except where the total ordered quantity is one single drum length of 500/1000m, in which case it shall be -5% to 0%. Cables consumed for testing and inspection shall be to bidder’s account.
 4. For each individual cable size, one short length of not less than 200m may be accepted only in the final drum length to complete the supply (except where the total ordered quantity is one single drum length of 500/1000m). The overall tolerance limits stipulated above shall continue to apply (in case short lengths are accepted).
 5. In case of the quantities cleared by BHEL for manufacturing are manufactured and offered for inspection by successful bidder in more than one batch, BHEL reserves the right to witness type testing on all batches without any price implications.
 6. Unit price of cables quoted by bidder shall be inclusive of type test charges. No separate charges shall be payable for type tests.
 7. For Projects having additional requirements additional price implication over basic unit price shall be as per Annexure-IA to 'BOQ-cum Price Schedule'.
 8. Value is to be filled only where “to be quoted” is mentioned and for other columns where “derived” is mentioned same shall be derived by BHEL as per % allocation fixed against each item
 9. Price mentioned anywhere else in BOQ shall not be taken in cognizance.
 10. For any clarification please refer Technical Specification No--PE-RC-999-507-E006 REV 00
 11. In case of Reverse Auction, vendor has to quote their Ex Works price+ Freight
 12. Overall Quantity variation shall be +30% of contract value.

Form properties			
Price bid form	Yes	Multiple filling	No
Requires encryption	Yes	Requires document encryption	No
Requires bid supporting documents	No	Mandatory	Yes
Datatype			
Data type		Example	
Small Text		ABC etc.	
Long Text		There are many variations of passages of Lorem Ipsum available, but the majority have suffered alteration in some form, by injected humour, or randomised words which don't look even slightly believable etc.	
+No. with (.)		123, 12.30, 123.44, Zero etc., values are allowed. Minus value are not allowed.	
All Numbers		123, 1.23, -123, Zero etc.. Values are allowed.	

Combo Box

List of combo box as created with alphanumeric characters

ANNX I A TO NIT REF NO-PE/PG/RTC/E-6394/2019, DTD-03.03.2020

RATE CONTRACT OF SCREENED CONTROL CABLE

Sl. No.	Description	%age Implication of Basic Price
1	Inner sheath non FRLS in place of FRLS	(-) 2.5 %


3/3/2020
सुनील साहाय, SUMIT SAHAY,
उप प्रबन्धक (सी. एम. एम.) / Dy. Manager (CMM)
भारत हेवी इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electrics Ltd.
पावर सेक्टर-परियोजना इंजीनियरिंग प्रबंधन
Power Sector-Project Engineering Management
पीपीईआई बिल्डिंग, एचआरडी एंड ईएसआई कॉम्प्लेक्स
PPEI Bldg. HRD & ESI Complex,
प्लॉट नं. 25, सेक्टर 16 ए, नोएडा -201301

ANNX II TO NIT REF NO-PE/PG/RTC/E-6394/2019, DTD-03.03.2020
RATE CONTRACTS FOR SCREENED CONTROL CABLES

Domain : bhel.abccprocure.com

Parent department: PEM Noida

View form

Event ID : 41786 RFQ/NIT/Enquiry no. : E-6394/2019

Description : TENDER ENQUIRY FOR RATE CONTRACT OF SCREENED CONTROL CABLES AS PER TECHNICAL SPECIFICATION NO. PE-RC-999-507-E006, REV 00

COST OF WITHDRAWAL

Sr. NO	Volume	Page No.	Clause No	Technical Specification/Tender Document	Complete Description of Deviation	Cost of Withdrawal of Deviation	Reference of Price Schedule on Which cost of withdrawal of deviation is Applicable	Nature of Cost of Withdrawal	Reason for Quoting deviation	Quantity	Quoted /Not Quoted
Long text Item name Show	Other Show	Other Show	Other Show	Other Show	Other Show	Other Show	Other Show	Other Show	Other Show	All numbers Quantity Hide	Unit rate Show
Technical deviation	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	1	To be filled by bidder (All numbers)
Commercial deviation	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	To be filled by bidder (Long text)	1	To be filled by bidder (All numbers)

Mandatory : Yes

NOTES:

1. Cost of withdrawal of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.

2. All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
3. Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
4. Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawal of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable. In the absence of same, such deviation(s) shall not be considered and offer shall be considered in total compliance to NIT.
5. Bidder shall furnish price copy of above format along with price bid.
6. The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
7. Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
8. For deviations w.r.t. Credit Period, Liquidated damages, Firm prices if a bidder chooses not to give any cost of withdrawal of deviation loading as per Annexure-VII, will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawal of deviation shall be taken as NIL.
9. Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be considered.
10. All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
11. Cost of withdrawal is to be given separately for each deviation. In no event bidder should club cost of withdrawal of more than one deviation else cost of withdrawal of such deviations which have been clubbed together shall be considered as NIL.
12. In case nature of cost of withdrawal (positive/negative) is not specified it shall be assumed as positive.
13. In case of discrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.

Form properties

Price bid form	Yes	Multiple filling	No
Requires encryption	Yes	Requires document encryption	No
Requires bid supporting documents	No	Mandatory	Yes

Datatype

Data type	Example
Long Text	There are many variations of passages of Lorem Ipsum available, but the majority have suffered alteration in some form, by injected humour, or randomised words which don't look even slightly believable etc.
All Numbers	123, 1.23, -123, Zero etc.. Values are allowed.



BHEL / PEM / CMM
SPECIAL CONDITIONS OF RATE CONTRACT

ANNX III TO NIT REF NO-PE/PG/RTC/E-6394/2019, DTD-03.03.2020

SPECIAL CONDITION OF RATE CONTRACT FOR SCREENED CONTROL CABLES

1. BHEL/PEM intends to enter into Rate Contract for supply of the tendered items for a period of two years. The Rate Contract shall come into force from the date of issue of Purchase order for Rate Contract. Validity for ordering shall be two years from the purchase order for Rate Contract.
2. Details of consignee and project site information for dispatch of material shall be intimated at the time of placement of PO for specific project after finalization of RC
3. Transit Insurance is in BHEL scope
4. The items will be required against respective projects. Exact quantities and Project information shall be intimated while placing order for a specific project based on the Rate Contract.
5. The prices shall be on PVC basis during the period of two years with a provision for further extension after review on mutual consent.
6. Inspection of materials shall be carried out by BHEL/CQA and or by Customer or by an authorized agency at manufacture's works before dispatch, if required. Dispatch of material to be done, only after receipt of BHEL/Customer MDCC. It is responsibility of vendor to for obtain Material Dispatch Clearance Certificate (MDCC) from BHEL or Customer as required before dispatch of material.

Vendor shall give inspection call on BHEL-CQS web site to applicable inspection agency with a copy of inspection call to BHEL-PEM for arranging Customer participation (if applicable) in inspection / Joint inspection on the proposed date with an advance notice of 15 working days. Inspection charges shall be paid by BHEL-PEM.

Items have to be manufactured as per specification and supplied strictly in accordance with the approved BHEL / Customer's Drawings & Quality Plan. The items/ test certificate of items, which for any reason are not acceptable to BHEL / Customer, shall be required to be retested. No extra charge shall be payable on those account by BHEL.

7. Mode of dispatch shall be by road through Schedule Bank/BHEL (PEM) approved transporters.
8. This enquiry is subject to Conditions/ limits if any imposed in PMD/ Vendor registration.
9. Tentative quantity is given in enquiry.
10. Bidders to submit offer for RC of said items ONLINE via e-Procurement System only. Bidder to upload tender documents complete in all respects duly signed & stamped on each and every page by the authorized signatory of the bidder as a token of acceptance of all the terms and conditions of tender.
11. The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendor/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL web site <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud as soon as it comes to their notice.
12. All bidders to quote as per the Price Variation Formulae for Cables uploaded on BHEL PEM website on the link given below.

[https://www.bhelpem.com/Documents/GCC/Price%20Variation%20Formulae%20for%20Cables.p
df](https://www.bhelpem.com/Documents/GCC/Price%20Variation%20Formulae%20for%20Cables.pdf)

सुनील राय/03/03/2020
उप प्रबंधक (सी. प्र. ए.सी.) Dy. Manager (CMM)
भारत हेवी इलेक्ट्रिकल्स लिमिटेड/Bharat Heavy Electricals Ltd.
पावर सेक्टर-परियोजना इंजीनियरिंग प्रबंधन
Power Sector-Project Engineering Management
पीपीईआई भवन, एचआरडी एंड ईएसआई कॉम्प्लेक्स
PPEI Bldg, HRD & ESI Complex,
प्लॉट नं. 25, सेक्टर 16 ए, नोएडा - 201301
Plot No. 25, Sec. 16 A, Noida - 201301

ANNX IV TO NIT REF NO-PE/PG/RTC/E-6394/2019, DTD-03.03.2020
LIST OF PROJECTS FOR SCREENED CONTROL CABLES
(RATE CONTRACT)

S.no	TITLE	
1	2X660 MW UDANGUDI	
2	1X660 MW BHUSAWAL	
3	1X800MW VIJAYWADA	
4	1X800MW KRISHNAPATNAM	


सुनील सहाय / SUMIT SAHAY
उप प्रबंधक (सी. एम. एम.) / Dy. Manager (CMM)
भारत हेवी इलेक्ट्रिकल्स लि. / Heavy Electricals Ltd.
प्रबंधन / Management
पृष्ठ सं. / Page No.



ANNX V TO NIT REF NO-PE/PG/RTC/E-6394/2019, DTD-03.03.2020

BOQ FOR SCREENED CONTROL CABLES

RATE CONTRACT

NAME OF VENDOR - (Please fill vendor's name)

SL. NO.	ITEM CODE	ITEM DESCRIPTION	UOM	QUANTITY (IN METER)	DRUM LENGTH (IN METER)	HSN CODE	UNIT EX- WORKS PRICE (DULY PACKED) OF TOTAL EX-WORKS PRICE (INR)	FORMULA FOR TOTAL EX- WORKS PRICE (DULY PACKED) (INR)
1.0	507-31116-A	1.1KV TYPE F(IO) 2P - 0.5 ARMoured	Metres	80,000	1000	8544	0.02723 * X / 80000	0.02723 * X
2.0	507-31009-A	1.1KV TYPE F(IO) 4P - 0.5 ARMoured	Metres	2,95,000	1000	8544	0.13242 * X / 295000	0.13242 * X
3.0	507-31013-A	1.1KV TYPE F(IO) 8P - 0.5 ARMoured	Metres	1,10,000	1000	8544	0.08326 * X / 110000	0.08326 * X
4.0	507-31001-A	1.1KV TYPE F(IO) 12P - 0.5 ARMoured	Metres	75,000	1000	8544	0.07408 * X / 75000	0.07408 * X
5.0	507-31005-A	1.1KV TYPE F(IO) 20P - 0.5 ARMoured	Metres	15,000	500	8544	0.02365 * X / 15000	0.02365 * X
6.0	507-31121-A	1.1KV TYPE F(IO) 24P - 0.5 ARMoured	Metres	10,000	500	8544	0.01892 * X / 10000	0.01892 * X
7.0	507-31025-A	1.1KV TYPE G(O) 2P - 0.5 ARMoured	Metres	2,35,000	1000	8544	0.06558 * X / 235000	0.06558 * X
8.0	507-31029-A	1.1KV TYPE G(O) 4P - 0.5 ARMoured	Metres	2,40,000	1000	8544	0.08544 * X / 240000	0.08544 * X
9.0	507-31033-A	1.1KV TYPE G(O) 8P - 0.5 ARMoured	Metres	5,80,000	1000	8544	0.35168 * X / 580000	0.35168 * X
10.0	507-31017-A	1.1KV TYPE G(O) 12P - 0.5 ARMoured	Metres	1,75,000	1000	8544	0.13774 * X / 175000	0.13774 * X

NOTE:-

- The standard drum length shall be 500/1000 meters as indicated above. Tolerance on individual drum length shall be $\pm 5\%$.
- Overall tolerance on total dispatched quantity of each size shall be (-) 2% and (+) 0% except where the total ordered quantity is one single drum length of 500/1000m, in which case it shall be -5% to 0%. Cables consumed for testing and inspection shall be to bidder's account.
- For each individual cable size, one short length of not less than 200m may be accepted only in the final drum length to complete the supply (except where the total ordered quantity is one single drum length of 500/1000m). The overall tolerance limits stipulated above shall continue to apply (in case short lengths are accepted).
- In case of the quantities cleared by BHEL for manufacturing are manufactured and offered for inspection by successful bidder in more than one batch, BHEL reserves the right to witness type testing on all batches without any price implications.
- Unit price of cables quoted by bidder shall be inclusive of type test charges. No separate charges shall be payable for type tests.
- For Projects having additional requirements additional price implication over basic unit price shall be as per Annexure-IA to 'BOQ-cum Price Schedule'.
- For any clarification please refer Technical Specification No--PE-RC-999-507-E006 REV 00
- Overall Quantity variation shall be +30% of contract value.

सुमीत सहाय / SUMIT SAHAY
उप प्रबंधक (सी. एम. एम.) / Dy. Manager (CMM)
भारत हेवी इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electricals Ltd.
पावर सेक्टर-परियोजना इंजीनियरिंग प्रबंधन
Power Sector-Project Engineering Management
पीपीईआई भवन, एन.एच. ३, पश्चिम बंगाल कॉम्प्लेक्स
PPEI Bldg, NH-3, West Bengal Complex,
प्लॉट नं. ३, एन.एच. ३, कोलकाता - ७००१३०

ANNX VI TO NIT REF NO-PE/PG/RTC/E-6394/2019, DTD-03.03.2020
RATE CONTRACTS FOR SCREENED CONTROL CABLES

Letter head of CA/ Statutory auditor / Cost auditor (>Rs. 10 Cr value)

Ref:

Date:

To,

Bharat Heavy Electricals Limited

PEM, PPEI Building, Plot No 25,

Sector -16A, Noida (U.P)-201301

Subject: - Certification regarding local content

Reference: Tender Enquiry No-.....

Name of Package:

Dear Sir,

We hereby certify that items of(package name).....for.....(Project Name/Rate Contract).....offered by M/s(bidder's name)..... having its registered works at has local content of%.

Further, M/s(bidder's name)..... meets the requirement of minimum local content in line with clause no..... of NIT no..... dated..... and the Public Procurement (Preference to Make in India), Order 2017 dated-15.06.2017, 28.05.2018 & 29.05.2019.

Thanking You.

For (CA/Cost Firm Name with FRN & Seal)

Chartered/Cost Accountants

(name of Member)

(Membership no.)

(UDIN no.)


3/3/2020

ANNEXURE – VII TO NIT(E-6394/2019 Dtd.03.03.2020)

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No: _____

Date: _____

To,

NAME
& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited 1 (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at1 through its Unit at..... (name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) having its registered office at2 hereinafter referred to as the 'Vendor/Contractor/Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated3 valued at Rs 4 (Rupees)/ FC (in words) for..... 5 (hereinafter called the 'Contract') and the Vendor/Contractor/Seller having agreed to provide a Contract Performance Guarantee, equivalent to % (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we, , (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount Rs 6 (Rupees) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

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.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor/Contractor/ Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor/Contractors/Supplier shall have no claim against us for making such payment.

We the bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract/satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We BANK further agree with the Employer that the Employer 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 Contract or to extend time of performance by the said Vendor/Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Vendor/Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor/Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor/Contractor/Supplier 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.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Vendor/Contractor/Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor/Contractor/Supplier 's liabilities.

This Guarantee shall remain in force up to and including..... 7 and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor/Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the8 we shall be discharged from all liabilities under this guarantee thereafter.

[Handwritten signature]
12/2/2020

We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a. The liability of the Bank under this Guarantee shall not exceed6
- b. This Guarantee shall be valid up to7
- c. Unless the Bank is served a written claim or demand on or before..... 8 all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We,Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

Dated..... ..

For and on behalf of

Place of Issue..... ..

(Name of the Bank)

1 NAME AND ADDRESS OF EMPLOYER i.e. *Bharat Heavy Electricals Limited*

2 NAME AND ADDRESS OF THE VENDOR / CONTRACTOR / SUPPLIER.

3 DETAILS ABOUT THE NOTICE OF AWARD/ CONTRACT REFERENCE

4 CONTRACT VALUE

5 PROJECT/SUPPLY DETAILS

6 BG AMOUNT IN FIGURES AND WORDS

7 VALIDITY DATE

8 DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the vendor.
2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier/Bank issuing the guarantee.
3. In line with the GCC, SCC and contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.
4. In Case of Bank Guarantees submitted by Foreign Vendors-
 - a) From Nationalized Public Sector 1 Private Sector/ Foreign Banks (BG issued by Branches in India) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/ city or at nearest branch where the Unit (New Delhi for POs issued from PEM Noida/ PO issuing agency) is located i.e. Demand can be presented at the Branch located in the town/ city or at nearest branch where the Unit is located.
 - b) From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks** only will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ Counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at sl.no. b.1 will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

or & On behalf of Guarantee issuing bank

(Office Seal)

Name:

E-mail ID:

Contact number:

Signature
5/2/20

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi – 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

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

Section 1 – Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to

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any third person any material, immaterial or any other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant IPC/ PC Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and will await their decision in the matter.

Section 3 – Disqualification from tender process & exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors". framed by the Principal.

Section 4 – Compensation for Damages

4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/Bid Security.

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/Performance Bank Guarantee, whichever is higher.

Section 5 – Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 – Equal treatment of all Bidders/ Contractors/ Sub-contractors

6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain

responsible for any default by his sub-contractors.

6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 – Criminal Charges against violating Bidders / Contractors / Sub-contractors

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If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 –Independent External Monitor(s)

8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non-disclosure agreement.

8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations! views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal! administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.

8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.

8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organization.

8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code! Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.12 The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

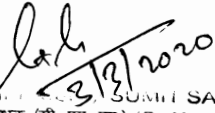
9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty! guarantee etc. should be outside the purview of IEMs.

9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as above, unless it is discharged/ determined by the CMD, BHEL.

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Section 10 – Other Provisions

- 10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.
- 10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- 10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders/ contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.


SUMIT SAHAY,
उप प्रबन्धक (सी. एम. एम.) / Dy. Manager (CMM)
भारत हेवी इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electricals Ltd.
पावर सेक्टर-परियोजना इंजीनियरिंग प्रबंधन
For & On behalf of the Principal/Management
प्राधान्यक नवना, एचआरडी एण्ड ईएसआई कॉम्प्लेक्स
BPEI Bldg. HRD & ESI Complex,
(Office Seal) 16 ए, नोएडा - 201301
Plot No. 05, Sector 16 A, Noida - 201301

For & On behalf of the Bidder/ Contractor
(Office Seal)

Place_____

Date_____

Witness: _____
(Name & Address) _____

Witness: _____
(Name & Address) _____

	PRE-QUALIFICATION REQUIREMENTS FOR SCREENED CONTROL CABLE	PE-PQ-999-507-E016
		REVISION NO. 04 DATE 29/09/2017
		SHEET NO. 1 OF 1

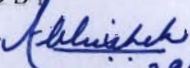
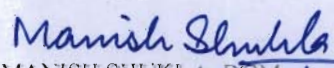
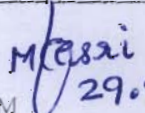
ITEMS : Screened Control Cable

SCOPE : Supply : YES; Erection & Commissioning : NO;

1.0	Vendor should be a manufacturer of screened/ instrumentation control cables.
2.0	Availability of test reports of tests on FRLS screened control cables to establish in-house Capability to carry out all routine, type acceptance as per relevant IS/ International Standards (except UV radiation & hydrolytic stability Test which can be conducted at Govt. Lab/ Govt. approved Independent lab).
3.0	Capacity of manufacturing 200 km of screened control cables per month.
4.0	Manufactured and supplied at least one (1) km of FRLS cables.
5.0	Manufactured and supplied screened control cables up to 20 pairs.
6.0	Manufactured and supplied at least 1000 Km of Screened Control cables in one or more orders and at least 200 Km in one single order.
7.0	Minimum two (2) nos. purchase orders for screened control cables shall be submitted which should not be more than five (5) years old from the date of application for registration or date of techno-commercial bid opening (as applicable) for establishing continuity in business.

Notes (General points):

1. Consideration of offer shall be subject to customer's approval of bidders, if applicable.
2. Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.
3. Any other project specific requirement shall be as per Annexure-I and bidder shall submit relevant supporting documents.
4. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
5. After satisfactory fulfillment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.

PREPARED BY  ABHISHEK, MANAGER (CONVENOR)	REVIEWED BY  MANISH SHUKLA, DGM (APPROVER)	APPROVED BY  MEENA KESRI, GM (DH)
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BHEL PEM-ELECTRICAL
PRE-QUALIFYING REQUIREMENTS FOR SCREENED CONTROL CABLE

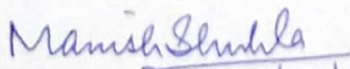
ANNEXURE - I

PROJECT SPECIFIC CRITERIA AGAINST ENQUIRY

PROJECT : RATE CONTRACT

- NIL -


Manju Singh
Sr.Engineer


Manish Shukla 19/02/2020
Sr.DGM

- On leave -
Amitpal Singh
Sr. Mgr


Debasisa Rath
DH-Electrical

Ref: PW/PE/CMM-PVC Cables Packages (Rev-02)

Dated:19/02/2019

Note: Applicable for cable tenders released on or after 14/01/2019.

Price Variation Formulae for cables -Annexure-I

1. Prices shall be variable as per price variation formulae given below (basis IEEMA).
The price variation shall be limited to + 20% of total ex-works price actually supplied (cable size wise) and -ve price variation shall be unlimited. Rates for working out price variation shall be as per rates published by IEEMA for the factors given in Annexure-II

2. Base date for prices:

Initial Price (As per IEEMA) for- Alo, Cuo, CCo, PVCCo & Feo:

Base Date shall be- 1st working day of the previous month to the date of issue of tender enquiry.

Final Price (as per IEEMA) for- Al, Cu, Cc, PVCC & Fe:

1st working day of month, one month prior to the date on which cable is notified as being ready for inspection i.e TPIA inspection call raise date on web portal.

3. Variation factor value for ALF, CuF, CCFAL, CCFCu, XLFAL, XLFCu, FeF & FeW as applicable shall be as per Technical Specification.

4. PVC shall be payable within contractual delivery period (including any extension thereto).

IEEMA table for Price variation cause for various type of cable

1. Aluminium conductor cable

S.No	Cable Type	AIF (Single core unarmoured & Multi core armoured)	AIF (Single core armoured)	CCFAI	XLFAL (Single core)	XLFAL (Multi core)	FeF	FeW	IEEMA Formula
1.	HT XLPE Power cable	ALP	H1	H2	XL3	XL4	H3	H5	$P = P_o + AIF(AL-Alo) + XLFAL(CC-CCo) + CCFAI(PVCC-PVCCo) + FeF(Fe-Feo)$
2.	LT XLPE Power Cable	ALP	P1	L2	XL1	XL1	P3	P3 (Additional)	$P = P_o + AIF(AL-Alo) + XLFAL(CC-CCo) + CCFAI(PVCC-PVCCo) + FeF(Fe-Feo)$
3.	LT PVC Power Cable	ALP	P1	P2	-	-	P3	P3 (Additional)	$P = P_o + AIF(AL-Alo) + CCFAI(PVCC-PVCCo) + FeF(Fe-Feo)$
4.	LT HRPVC Power Cable	ALP	P1	P2	-	-	P3	P3 (Additional)	$P = P_o + AIF(AL-Alo) + CCFAI(PVCC-PVCCo) + FeF(Fe-Feo)$

2. Copper conductor cable

S no.	Cable type	CuF	AIF (single core armoured)	CCFCu	XLFCU (Single core)	XLFCU (Multi core)	FeF	FeW	IEEMA Formula
1	HT XLPE Power cable	CUP	H4	H2	XL3	XL4	H3	H5	$P = P_o + CuF(Cu-Cuo) + XLFCU(CC-CCo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$
2	LT XLPE Power Cable	CUP	P4	L2	XL1	XL1	P3	P3 (Additional)	$P = P_o + CuF(Cu-Cuo) + XLFCU(CC-CCo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$

S no.	Cable type	CuF	AIF (single core armoured)	CCFCu	XLFCU (Single core)	XLFCU (Multi core)	FeF	FeW	IEEMA Formula
3	LT PVC Power Cable	CUP	P4	P2	--	--	P3	P3 (Addit ional)	$P=Po+CuF(Cu-Cuo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$
4	LT HRPVC Power Cable	CUP	P4	P2	--	--	P3	P3 (Addit ional)	$P=Po+CuF(Cu-Cuo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$
5	LT XLPE Control Cable	CUC	--	P5	--	XL2	P6	P6 (Addit ional)	$P=Po+CuF(Cu-Cuo) + XLFCU(CC-CCo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo)$
6	LT PVC Control Cable	CUC	--	P5	--	--	P6	P6 (Addit ional)	$P=Po+CuF(Cu-Cuo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo)$
7	LT HRPVC Control Cable	CUC	--	P5	--	--	P6	P6 (Addit ional)	$P=Po+CuF(Cu-Cuo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo)$
8	LT XLPE Fire Survival Power Cable	CUP	P4	L2	XL1	XL1	P3	P3 (Addit ional)	$P=Po+CuF(Cu-Cuo) + XLFCU(CC-CCo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$
9	LT XLPE Fire Survival Control	CUC	--	P5	--	XL2	P6	P6 (Addit ional)	$P=Po+CuF(Cu-Cuo) + XLFCU(CC-CCo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo)$
10	LT EPR Fire Survival Power Cable	CUP	P4	L2	--	--	P3	P3 (Addit ional)	$P=Po+CuF(Cu-Cuo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$
11	LT EPR Fire Survival Control cable	CUC	--	P5	--	--	P6	P6 (Addit ional)	$P=Po+CuF(Cu-Cuo) + CCFCu(PVCC-PVCCo) + FeF(Fe-Feo)$
12	Screened control Cable (Overall screen)	Cu POS	--	--	--	--	Fe POS	Fe POS	$P=Po+CuF(Cu-Cuo) + FeF(Fe-Feo)$
13	Screened control Cable (Individual	Cu PIS	--	--	--	--	Fe PIS	Fe PIS	$P=Po+CuF(Cu-Cuo) + FeF(Fe-Feo)$

IEEMA Table for Price Variation Clause for various types of Cables**Notes:-**

- (i) Cu POS, Cu PIS, Fe POS & Fe PIS tables shall be as per IEEMA circular No. IEEMA (PVC) /Instrumentation Cable/2014 effective from dtd 01.07.2014.
- (ii) All other tables shall be as per IEEMA circular No. 35//DIV/CAB/05/ dated 24.04.2018.

Terms used in PVC formulae:

P = Price payable as adjusted in accordance with above appropriate formula (In Rs./Km).
 Po= Price quoted/confined (in Rs./km).

1. ALUMINIUM

ALF Variation factor for aluminium.
 Al =Price of aluminium.
 Alo = Price of aluminium.

2 COPPER

CuF =Variation factor for copper.
 Cu = Price of CC copper rods.
 Cuo = Price of CC copper rods.

3.PVCc COMPOUND/POLYMER

PVCc = Price of PVC compound.
 PVCco= Price of PVC compound.
 CCFAL= Variation factor for PVC compound/Polymer for aluminium conductor cable.
 CCFCu =Variation factor for PVC compound/Polymer for copper conductor cable.

4. XLPE COMPOUND

Cc = Price of XLPE compound.
 Cco= Price of XLPE compound.
 XLFAL= Variation factor for XLPE compound for aluminium conductor cable.
 XLFCu =Variation factor for XLPE compound for copper conductor cable.

5.STEEL

Fe= Price of steel strips/steel wire.
 Feo= Price of steel strips/steel wire.
 FeF =Variation factor for steel.
 FeW=Variation factor for round wire steel armouring.



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IEEMA (PVC)/Instrumentation Cable/2014

Effective from: 1st July 2014

Material Price Variation Clause For Instrumentation Cables

The Price quoted/confirmed is based on the input cost of raw materials/components as on the date of quotation, and the same is deemed to be related to the prices of raw materials as specified in the price variation clause given below. In case of any variation in these prices, the price payable shall be subject to adjustment up or down in accordance with the formulae provided in this document.

Terms used in price variation formulae:

P Price payable as adjusted in accordance with above appropriate formula (in Rs/Km)

P₀ Price quoted/confirmed (in Rs/Km)

COPPER

CuF Variation factor for copper

Cu Price of CC copper rods. This price is as applicable on first working day of the month, one month prior to the date of delivery.

Cu₀ Price of CC copper rods. This price is as applicable on first working day of the month, one month prior to the date of tendering.

STEEL

FeF Variation factor for steel

Fe Price of Steel Strips/steel wire. This price is as applicable on the first working day of the month, one month prior to the date of delivery.

Fe₀ Price of steel strips/steel wire. This price is as applicable on first working day of the month, one month prior to the date of tendering.

The above prices and indices are as published by IEEMA vide Circular reference IEEMA(PVC)/CABLE/--/prevailing as on 1st working day of the month i.e. one month prior to the date of tendering.

The date of delivery is the date on which the cable is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

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Indian Electrical & Electronics Manufacturers' Association

IEEMA (PVC)/Instrumentation Cable/2014

Effective from: 1st July 2014

Notes

- (a) All prices of raw materials are exclusive of modvatable excise/CV duty amount and exclusive of any other central, state or local taxes, octroi, etc.
- (b) All Prices are as on first working day of the month.
- (c) The details of prices are as under:
 1. Price of CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer.
 2. Price of galvanized steel strip / steel wire (in Rs/MT) is ex-works price as quoted by the manufacturer for Round steel Wire and Flat steel strip (the relevant price of steel strip or steel wire is to be selected depending upon the type of armouring of the cable).

Price variation formula for 'Instrumentation Cables'

$$P = P_o + CuF (Cu - Cu_o) + FeF (Fe - Fe_o)$$

1. For Pair Instrumentation Over all Screen Cables

Tables References:

Cu POS Copper Factor
Fe POS Steel Factor

2. For Pair Instrumentation Individual and Over all Screen Cables

Tables References:

Cu PIS Copper Factor
Fe PIS Steel Factor

3. For Triad Instrumentation Over all Screen Cables

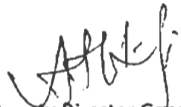
Tables References:

Cu TOS Copper Factor
Fe TOS Steel Factor

4. For Triad Instrumentation Individual & Overall Screen Cables

Tables References:

Cu TIS Copper Factor
Fe TIS Steel Factor


Deputy Director General
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Copper Factors for Instrumentation Cables - CuF

Cu POS

Pair Instrumentation Over all Screen Cables					
No. of Pairs Cable size in sq.mm	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.0142	0.0185	0.0233	0.0326	0.0500
2	0.0258	0.0345	0.0440	0.0625	0.0978
3	0.0353	0.0484	0.0626	0.0904	0.1433
4	0.0448	0.0623	0.0811	0.1183	0.1888
5	0.0578	0.0800	0.1022	0.1467	0.2356
6	0.0662	0.0926	0.1210	0.1768	0.2829
7	0.0756	0.1067	0.1378	0.2000	0.3245
8	0.0852	0.1204	0.1582	0.2327	0.3741
9	0.0933	0.1334	0.1734	0.2534	0.4134
10	0.1046	0.1485	0.1959	0.2893	0.4665
11	0.1111	0.1600	0.2089	0.3067	0.5023
12	0.1236	0.1764	0.2333	0.3452	0.5580
13	0.1289	0.1867	0.2445	0.3600	0.5912
14	0.1378	0.2000	0.2623	0.3867	0.6356
15	0.1467	0.2134	0.2800	0.4134	0.6801
16	0.1618	0.2322	0.3080	0.4573	0.7409
17	0.1645	0.2400	0.3156	0.4667	0.7690
18	0.1734	0.2534	0.3334	0.4934	0.8134
19	0.1822	0.2667	0.3512	0.5201	0.8579
20	0.1911	0.2800	0.3689	0.5467	0.9023
21	0.2000	0.2934	0.3867	0.5734	0.9468
22	0.2089	0.3067	0.4045	0.6001	0.9912
23	0.2178	0.3200	0.4223	0.6267	1.0357
24	0.2381	0.3437	0.4575	0.6813	1.1068
25	0.2356	0.3467	0.4578	0.6801	1.1246
26	0.2445	0.3600	0.4756	0.7068	1.1690
27	0.2534	0.3734	0.4934	0.7334	1.2135
28	0.2623	0.3867	0.5112	0.7601	1.2579
29	0.2711	0.4001	0.5290	0.7868	1.3024
30	0.2800	0.4134	0.5467	0.8134	1.3468
31	0.2889	0.4267	0.5645	0.8401	1.3913
32	0.2978	0.4401	0.5823	0.8668	1.4357
33	0.3067	0.4534	0.6001	0.8934	1.4802
34	0.3156	0.4667	0.6179	0.9201	1.5246
35	0.3245	0.4801	0.6356	0.9468	1.5691
36	0.3334	0.4934	0.6534	0.9735	1.6135
37	0.3423	0.5067	0.6712	1.0001	1.6580
38	0.3512	0.5201	0.6890	1.0268	1.7024
39	0.3600	0.5334	0.7068	1.0535	1.7469
40	0.3689	0.5467	0.7245	1.0801	1.7913
41	0.3778	0.5601	0.7423	1.1068	1.8358
42	0.3867	0.5734	0.7601	1.1335	1.8802
43	0.3956	0.5867	0.7779	1.1601	1.9247
44	0.4045	0.6001	0.7957	1.1868	1.9691
45	0.4134	0.6134	0.8134	1.2135	2.0136
46	0.4223	0.6267	0.8312	1.2402	2.0580
47	0.4312	0.6401	0.8490	1.2668	2.1025
48	0.4710	0.6759	0.9010	1.3410	2.2009

Copper Factors for Instrumentation Cables - CuF

Cu PIS

Pair Instrumentation Individual and Over all Screen Cables					
No. of Pairs Cable size in sq.mm	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.0133	0.0178	0.0222	0.0311	0.0489
2	0.0349	0.0437	0.0531	0.0717	0.1069
3	0.0490	0.0621	0.0763	0.1041	0.1570
4	0.0630	0.0806	0.0994	0.1389	0.2071
5	0.0800	0.1022	0.1245	0.1689	0.2578
6	0.0937	0.1200	0.1484	0.2042	0.3103
7	0.1067	0.1378	0.1689	0.2311	0.3556
8	0.1218	0.1569	0.1948	0.2692	0.4107
9	0.1334	0.1734	0.2134	0.2934	0.4534
10	0.1503	0.1943	0.2417	0.3349	0.5122
11	0.1600	0.2089	0.2578	0.3556	0.5512
12	0.1785	0.2313	0.2882	0.4001	0.6128
13	0.1867	0.2445	0.3023	0.4178	0.6490
14	0.2000	0.2623	0.3245	0.4489	0.6979
15	0.2134	0.2800	0.3467	0.4801	0.7468
16	0.2350	0.3053	0.3812	0.5305	0.8141
17	0.2400	0.3156	0.3912	0.5423	0.8446
18	0.2534	0.3334	0.4134	0.5734	0.8934
19	0.2667	0.3512	0.4356	0.6045	0.9423
20	0.2800	0.3689	0.4578	0.6356	0.9912
21	0.2934	0.3867	0.4801	0.6668	1.0401
22	0.3067	0.4045	0.5023	0.6979	1.0890
23	0.3200	0.4223	0.5245	0.7290	1.1379
24	0.3479	0.4535	0.5673	0.7911	1.2165
25	0.3467	0.4578	0.5690	0.7912	1.2357
26	0.3600	0.4756	0.5912	0.8223	1.2846
27	0.3734	0.4934	0.6134	0.8534	1.3335
28	0.3867	0.5112	0.6356	0.8846	1.3824
29	0.4001	0.5290	0.6579	0.9157	1.4313
30	0.4134	0.5467	0.6801	0.9468	1.4802
31	0.4267	0.5645	0.7023	0.9779	1.5291
32	0.4401	0.5823	0.7245	1.0090	1.5780
33	0.4534	0.6001	0.7468	1.0401	1.6269
34	0.4667	0.6179	0.7690	1.0712	1.6758
35	0.4801	0.6356	0.7912	1.1024	1.7247
36	0.4934	0.6534	0.8134	1.1335	1.7736
37	0.5067	0.6712	0.8357	1.1646	1.8225
38	0.5201	0.6890	0.8579	1.1957	1.8713
39	0.5334	0.7068	0.8801	1.2268	1.9202
40	0.5467	0.7245	0.9023	1.2579	1.9691
41	0.5601	0.7423	0.9246	1.2891	2.0180
42	0.5734	0.7601	0.9468	1.3202	2.0669
43	0.5867	0.7779	0.9690	1.3513	2.1158
44	0.6001	0.7957	0.9912	1.3824	2.1647
45	0.6134	0.8134	1.0135	1.4135	2.2136
46	0.6267	0.8312	1.0357	1.4446	2.2625
47	0.6401	0.8490	1.0579	1.4757	2.3114
48	0.6887	0.8936	1.1186	1.5587	2.4186

Steel Factors for Instrumentation Cables - FeF					
Fe POS					
Pair Instrumentation Over all Screen Cables					
No. of Pairs Cable size in sq.mm	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1490	0.1565	0.1635	0.1735	0.1930
2	0.2190	0.2335	0.2470	0.2665	0.2595
3	0.2360	0.2545	0.2690	0.2900	0.2680
4	0.2390	0.2580	0.2715	0.2945	0.2830
5	0.2630	0.2820	0.2420	0.2805	0.3155
6	0.2840	0.3160	0.2805	0.2995	0.3430
7	0.2840	0.2595	0.2805	0.2995	0.3430
8	0.3235	0.2930	0.3030	0.3315	0.3780
9	0.2805	0.3180	0.3290	0.3590	0.4205
10	0.2970	0.3215	0.3455	0.3755	0.4385
11	0.3005	0.3255	0.3490	0.3805	0.4435
12	0.3055	0.3440	0.3680	0.3880	0.4520
13	0.3265	0.3530	0.3780	0.4105	0.4785
14	0.3265	0.3530	0.3780	0.4105	0.4785
15	0.3490	0.3765	0.4015	0.4365	0.5195
16	0.3490	0.3765	0.4015	0.4365	0.5195
17	0.3590	0.4005	0.4140	0.4635	0.5470
18	0.3590	0.4005	0.4265	0.4635	0.5470
19	0.3590	0.4005	0.4265	0.4635	0.5470
20	0.3830	0.4240	0.4535	0.4920	0.5760
21	0.3830	0.4240	0.4535	0.4920	0.5760
22	0.4065	0.4520	0.4785	0.5310	0.6190
23	0.4065	0.4520	0.4810	0.5310	0.6190
24	0.4305	0.4770	0.5070	0.5595	0.6475
25	0.4305	0.4770	0.5070	0.5595	0.6475
26	0.4305	0.4770	0.5070	0.5595	0.6475
27	0.4355	0.4820	0.5245	0.5660	0.6700
28	0.4570	0.5045	0.5345	0.5895	0.6950
29	0.4570	0.5045	0.5345	0.5895	0.6950
30	0.4570	0.5045	0.5345	0.5895	0.6950
31	0.4795	0.5285	0.5595	0.6150	0.7225
32	0.4820	0.5285	0.5595	0.6150	0.7225
33	0.4820	0.5285	0.5595	0.6150	0.7225
34	0.4920	0.5520	0.5835	0.6410	0.7500
35	0.4920	0.5520	0.5835	0.6410	0.7500
36	0.4920	0.5520	0.5835	0.6410	0.7500
37	0.4920	0.5520	0.5835	0.6410	0.7500
38	0.5145	0.5760	0.6225	0.6550	0.7805
39	0.5145	0.5760	0.6225	0.6550	0.7805
40	0.5145	0.5760	0.6225	0.6550	0.7805
41	0.5395	0.6025	0.6475	0.6975	0.8230
42	0.5395	0.6025	0.6475	0.6975	0.8230
43	0.5395	0.6025	0.6475	0.6975	0.8230
44	0.5635	0.6265	0.6735	0.7250	0.8540
45	0.5635	0.6265	0.6760	0.7250	0.8540
46	0.5635	0.6265	0.6760	0.7250	0.8540
47	0.5635	0.6265	0.6760	0.7250	0.8540
48	0.5635	0.6265	0.6760	0.7375	0.8665

Steel Factors for Instrumentation Cables - FeF
Fe PIS

Pair Instrumentation Individual and Over all Screen Cables					
No. of Pairs Cable size in sq.mm	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1880	0.1980	0.2070	0.2220	0.2410
2	0.2315	0.2460	0.2595	0.2815	0.2755
3	0.2505	0.2690	0.2820	0.2495	0.2830
4	0.2645	0.2830	0.2420	0.2805	0.3155
5	0.2895	0.2730	0.2805	0.3005	0.3430
6	0.2755	0.2980	0.3005	0.3280	0.3730
7	0.2755	0.2980	0.3005	0.3280	0.3730
8	0.2980	0.3215	0.3455	0.3740	0.4230
9	0.3230	0.3490	0.3730	0.4040	0.4685
10	0.3405	0.3655	0.3765	0.4215	0.4885
11	0.3430	0.3690	0.3815	0.4265	0.4945
12	0.3490	0.3765	0.4015	0.4470	0.5160
13	0.3715	0.3990	0.4255	0.4720	0.5420
14	0.3715	0.3990	0.4255	0.4720	0.5420
15	0.3955	0.4240	0.4510	0.5020	0.5720
16	0.3955	0.4240	0.4510	0.5020	0.5720
17	0.4190	0.4495	0.4795	0.5295	0.6150
18	0.4190	0.4495	0.4795	0.5295	0.6150
19	0.4190	0.4495	0.4795	0.5295	0.6150
20	0.4445	0.4770	0.5060	0.5570	0.6450
21	0.4445	0.4895	0.5060	0.5695	0.6450
22	0.4695	0.5045	0.5345	0.5870	0.6885
23	0.4695	0.5045	0.5345	0.5870	0.6885
24	0.4970	0.5310	0.5620	0.6285	0.7210
25	0.4970	0.5310	0.5620	0.6285	0.7210
26	0.4970	0.5310	0.5620	0.6285	0.7210
27	0.5035	0.5495	0.5810	0.6360	0.7410
28	0.5135	0.5610	0.6050	0.6610	0.7690
29	0.5135	0.5610	0.6050	0.6610	0.7690
30	0.5260	0.5610	0.6050	0.6610	0.7690
31	0.5495	0.5845	0.6300	0.6885	0.7990
32	0.5495	0.5845	0.6300	0.6885	0.7990
33	0.5495	0.5845	0.6300	0.6885	0.7990
34	0.5735	0.6225	0.6585	0.7285	0.8405
35	0.5735	0.6225	0.6585	0.7285	0.8405
36	0.5735	0.6225	0.6585	0.7285	0.8405
37	0.5735	0.6225	0.6585	0.7285	0.8405
38	0.5990	0.6485	0.6850	0.7575	0.8740
39	0.5990	0.6485	0.6850	0.7575	0.8740
40	0.5990	0.6485	0.6850	0.7575	0.8740
41	0.6250	0.6775	0.7135	0.7880	0.9180
42	0.6250	0.6775	0.7135	0.7880	0.9180
43	0.6250	0.6775	0.7135	0.7880	0.9180
44	0.6485	0.7050	0.7410	0.8165	0.9495
45	0.6485	0.7050	0.7410	0.8165	0.9495
46	0.6485	0.7050	0.7410	0.8165	0.9495
47	0.6485	0.7050	0.7410	0.8165	0.9495
48	0.6485	0.7050	0.7535	0.8290	0.9620

VOLUME-II

TECHNICAL SPECIFICATION FOR SCREENED CONTROL CABLE

SPECIFICATION NO: *PE-RC-999-507-E006*

REVISION: 00



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, UP (INDIA) – 201301**



TECHNICAL SPECIFICATION FOR SCREENED CONTROL CABLES

SPECIFICATION NO. PE-RC-999-507-E006

VOLUME II

SECTION

REVISION 0

DATE: 15.02.2020

SHEET 1 OF 1

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2.	SECTION – II	
	STANDARD TECHNICAL SPECIFICATION	02
	QUALITY PLAN (ALONGWITH ANNEXURE I TO QP)	16
	TOTAL NO. OF SHEETS=	37
	(INCLUDING COVER/ SEPARATOR SHEETS)	



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COMPLIANCE CERTIFICATE

The bidder shall confirm compliance to the following by signing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.
2. There are no deviation with respect to specification other than those furnished in the 'schedule of deviations'.
3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in "BOQ-Cum-Price schedule" of the specification shall not be considered (i.e., technical description & quantities as per specification shall prevail).

BIDDER'S STAMP & SIGNATURE



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SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS



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1.0 PURPOSE

This specification is intended for finalization of rate contract between BHEL PEM and Bidder. Standard technical detail as indicated in the specification shall be agreed upon between BHEL PEM and bidder. Project specific technical detail shall be made available to the bidder along with project enquiry.

2.0 SCOPE OF ENQUIRY

- 2.1 Design, Manufacture, Inspection and Testing at Manufacturer's works, proper packing and delivery to site of Screened Control Cable conforming to this specification.
- 2.2 It is not the intent to specify herein all the details of design & manufacture of material. However, the material shall conform in all respects to high standard of design, engineering & workmanship and shall be capable of performing in continuous commercial operation at site condition.
- 2.3 Technical requirements of Screened Control Cable are indicated in Data Sheet-A & Section-II.
- 2.4 The stipulation of Data Sheet-A shall prevail in case of any conflict between the stipulations of Data Sheet-A & Section-II.

2.0 TECHNICAL:

S.No.	Reference clause No. of Section II (if any)	Specific Requirement/ Change
1.	3.1	Bidder shall confirm compliance with the BHEL Standard Quality Plan (PE-QP-999-507-E004, Rev-2) as attached with the specification without any deviations. At contract stage, the successful bidder shall submit the same QP for BHEL/ ultimate customer's approval. In case bidder has reference QP agreed with ultimate customer, same can be submitted for specific project after award of contract for BHEL/ultimate customer's approval. There shall be no commercial implication to BHEL on account of minor changes in QP during contract stage.

3.0 BILL OF QUANTITIES

The bidder to quote for items as per price schedule attached with NIT. **The quantity as mentioned in the BOQ is only for evaluation purpose.** However actual ordered quantity may vary from project to project throughout the contract.

4.0 DRAWINGS & DOCUMENTS TO BE SUBMITTED



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- 4.1 After rate contract; against specific project requirement following information shall be furnished by BHEL: -
- a) BOQ (Bill of Quantities)
- 4.2 Following documents shall be submitted for specific project requirement after placement of order for BHEL & customer's approval: -

Sl. No.	Drawing / Document Description	Drawing / Document no	Document Type
1	Technical Data sheet – Screened Control cables	PE-V0-XXX-507-E141	Primary
2	Cross-sectional Drgs.- Screened Control Cables	PE-V0-XXX-507-E143	Primary
3	Quality Plan - Screened Control Cables	PE-V0-XXX-507-E916 (*)	Primary
4	Type test certificates – Screened Control Cables	PE-V0-XXX-507-E144	Secondary

NOTE: (*)

Standard Quality Plan as enclosed in the technical specification is to be appended with cover sheet bearing document number & description as stated above. The signed & stamped copy for the same shall be submitted to BHEL without making any changes in the contents of the document

- 4.3 Drawings/documents shall be submitted through Document Management System (DMS).
- 4.4 Supplier to submit the drawing/documents submission/resubmission schedule as & when required by BHEL.



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DATA SHEET-A

1.0	Type of Cable	Flame Retardant Low Smoke Halogen (FR-LSH)
2.0	Standard applicable in general (Latest amendment to be referred if any)	IS:1554 (Part-1), IS:8130, IS:5831, , IS:3975, IS:694, SEN-SS-424-1475, Class F3, IEEE-383, IS:10810 Part 62, Cat-B, ASTMD:2843, ASTMD:2863, ASTM D 3137:81, IEC-60754-1, IEC:60332 Part-1, IEC:60332 Part-3-23, Cat-B.
3.0	Voltage Grade	1.1kV
4.0	Number of cores, cross sectional area of conductors and quantities	As per BOQ-Cum-Price Schedule
5.0	CONDUCTOR	
(a)	Material	Copper
	Grade and Class	Stranded, annealed high conductivity, Class 2 <i>Non-Compacted, Electrolytic</i> <i>Tinned</i>
(b)	Standard Applicable	IS: 8130
(c)	Shape	Circular
(d)	Min. number of strands, Dia and cross sectional area.	7, 0.3 mm (nom.) dia,of each, 0.5 sq.mm (0.8 mm conductor dia)
6.0	INSULATION	
(a)	Material	Extruded HR PVC Type-C
(b)	Standard Applicable	IS: 5831
(c)	Continuous withstand temperature	85°C
(d)	Short-circuit withstand temperature	160°C
(e)	Method of application	By extrusion; sleeve extrusion not permitted.
(f)	Nominal Thickness of insulation	0.6 mm nominal (for 0.5 sq.mm) as per IS-694
(g)	Volume resistivity (Min.)	1x10 ¹⁴ ohm-cm at 20 deg. C & 1x10 ¹¹ ohm-cm at 70 deg. C. or 1x10 ¹³ ohm-cm at 27 deg. C & 1x10 ¹⁰ ohm-cm at 85 deg. C. <i>Project specific requirement shall be informed later.</i>
7.0	LAYING OF CORES	
(a)	Min. number of twist per metre for paired cables.	16 (For 0.5 Sq.mm) / 20 (For 0.5 Sq.mm). <i>Project specific requirement shall be informed later.</i>
(b)	Maximum lay of individual twisted pair	60 (For 0.5 Sq.mm) / 50 mm (For 0.5 Sq.mm). <i>Project specific requirement shall be informed later.</i>
(c)	Diameter of core	In accordance with clause 6 (f)
8.0	IDENTIFICATION OF CORES	As per Annexure: B-I Core Identification / Pair Identification. <i>Project specific requirement or any other requirement shall be informed later.</i>



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9.0	INDIVIDUALLY SCREENED	
(a)	Material	Aluminium-Mylar tape
(b)	Coverage	100%
(c)	Overlap	Minimum 25% or 30%. <i>Project specific requirement shall be informed later.</i>
(d)	Min. thickness (Micron)	28 micron
10.0	OVERALL SCREENED	
(a)	Material	Aluminium-Mylar tape
(b)	Coverage	100%
(c)	Overlap	Minimum 25% or 30%. <i>Project specific requirement shall be informed later.</i>
(d)	Min. thickness (Micron)	55 micron / 60 micron <i>Project specific requirement shall be informed later.</i>
Note: Over the individual pair screening tape two laps of 0.05 mm thick (min.) polyester tape shall be applied within minimum overlap of 25%/30%. Metallic side of the screen shall be in touch with drain wire.		
11.0	DRAIN WIRE	
	To be provided separately for individual pair shield and overall shield.	
(a)	Material	Multi stranded Annealed tinned copper drain wire.
(b)	Size (No. of strands/ Dia. of each strand)	0.5 sqmm (7/ 0.3 mm) .0.8 mm is the dia. of conductor.
12.0	BEDDING / BINDER/ TAPE	
(a)	Material	Mylar tape.
13.0	INNER SHEATH	
(a)	Material	Extruded HR PVC Type ST-2
(b)	Standard Applicable	IS: 5831
(c)	Colour	<i>Project specific requirement shall be informed later.</i>
(d)	Whether FR-LSH Applicable	YES
(e)	Thickness of inner sheath	As per Table-4 of IS: 1554 (Part-1)
(f)	Fillers	Acceptable
(g)	Material of fillers (if permitted)	Same as inner sheath (with moisture resistant / non-hygroscopic properties)
(h)	Method of application for multi-core cables:	
(i)	With fillers	<i>Pressure/Vacuum extruded</i>
(ii)	Without fillers	<i>Pressure extruded</i>
14.0	RIP CORD	A non-hygroscopic and non-wicking non-metallic cord
15.0	ARMOUR	
(a)	Applicable	YES
(b)	Material:	<i>Galvanised Steel Round Wire, as per BOQ-Cum price schedule.</i> <i>Galvanised Steel Formed Wire/Strip, as per BOQ-Cum price schedule.</i> conforming to (i) Type 'a' / 'b' as per Table-5 of IS 1554-I and (ii) IS 3975 as per project requirements.
(c)	Standard Applicable	IS: 1554 (Part-1) Table-5 and IS:3975
(d)	Minimum Coverage	90%



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(e)	Gap between armour wires	Shall not exceed one armour wire space (No cross-over/ over-riding)
(f)	Breaking load of joint	95 % of normal armour
(g)	Method of jointing	Welding
16.0	OUTERSHEATH	
(a)	Material	Extruded HR PVC Type ST2
(b)	Standard Applicable	IS: 1554 (Part-1) & IS: 5831
(c)	Colour	<i>Black/ Grey for Overall screened cable (G type) & Light blue/ Black/ Grey' for Individual & overall screened cable (F type)</i> <i>Project specific requirement shall be informed later.</i>
(d)	Whether FR-LSH	Yes
(e)	Method of application	Extruded
(f)	Thickness of outer sheath	As per IS: 1554 Part-1 (i.e. Min thickness shall be 1.24 mm)
(g)	Other properties	Resistant to water, oil, acid, alkali, termite & rodent attack
(h)	Marking	<i>Cable size (cross section area and no. of pairs), voltage grade, Type of Insulation e.g. HRPVC, FRLS, Manufacturer's name and/ or trade name, and year of manufacture @ 5m (by embossing) 'BHEL-PEM' and 'CUSTOMER' Name @5m (by embossing)</i> <i>Progressive sequential length marking @ 1m. (by Printing / embossing)</i> <i>Further customer specific marking requirement (if any) shall be informed later.</i>
17.0	FR-LSH CHARACTERISTICS	
(a)	Oxygen index	Min 29 (As per ASTM D 2863)
(b)	Temperature index	Min. 250°C at oxygen index value of 21 (As per ASTM D 2863)
(c)	Acid gas generation	Max. 20% by weight (As per IEC-60754-1)
(d)	Smoke density rating	Not more than 60% (As per ASTM D 2843). Area under coverage
(e)	Flammability Test	
(i)	Flammability test for single cable	YES, As per: IEC-60332 Part-1
(ii)	Flammability test for bunched cables	YES, As per: IEC-60332 Part-3-23, CAT-B
(iii)	Flammability test as per IEEE: 60383	YES
(iv)	Flammability test as per IS-10810 Part 62, Cat B	YES
iv)	Swedish Chimney test SEN-SS-424-1475-F3	YES
18.0	<i>Anti-rodent and Termite repulsion Test</i>	YES
19.0	Special Tests	
(a)	Hydrolytic Stability Test	No (Refer Clause no 3.4 of Section-II). <i>Project specific requirement shall be informed later</i>
(b)	Ultraviolet Radiation Test	No (Refer Clause no 3.4 of Section-II). <i>Project specific requirement shall be informed later</i>
20.0	TOLERANCE ON OVERALL DIAMETER	+ 2mm max. over the declared value in Technical datasheet.



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21.0	VARIATION IN DIA & OVALITY AT ANY CROSS SECTION	Maximum 1 mm
22.0	CABLE DRUM DETAILS	
(a)	Material Type	Non-returnable wooden drums, as per IS 10418
(b)	Standard drum length	1000 metres: upto and including 12 Pairs. 500 metres: above 12 pairs.
(c)	Tolerance on drum length	±5%
(d)	Painting	Entire surface to be painted
(e)	Construction Details	Clause no 4.2 of Section-II of this technical specification
(f)	Particular details on Drum	Clause no 4.3 of Section-II of this technical specification. Further customer specific marking requirement (if any) shall be informed later.
(g)	Outermost layer	To be covered with waterproof polyethylene.

23.0 TECHNICAL PARAMETERS (C & I) As per Tables below:		
Parameter	0.5 mm ² (IS & OS) type-F	0.5 mm ² (OS) type-G
Mutual Capacitance (max.) at 0.8 kHz, nF/Km	120	100
Conductor Loop Resistance (max.), Ohm/Km	78 (tinned)	78 (tinned)
Insulation Resistance (min), M Ohm/ Km	100	100
Cross Talk attenuation (min) at 0.8kHz, dB	60	60
Characteristic impedance (max.) at 1/0.8 * kHz	320	340
Attenuation (max.) at 1 kHz db/Km	1.2	1.2
Capacitance unbalance (max), pF/500m *	400	400

Note:

1. Cable parameters indicated above are at 20 degC (+/- 3 degC)
2. *Project specific requirement shall be informed later

24.0	TEST VOLTAGE & DURATION	
(a)	High Voltage Test, AC Tests	
(i)	Core to core	2 kV (max.) for 1 minute (max.)
(ii)	Core to shield	2 kV (max.) for 1 minute (max.)



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CABLES

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ANNEXURE: B-I

CORE IDENTIFICATION / PAIR IDENTIFICATION



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ANNEXURE: B-I (A)

The cable cores shall be colour coded as mentioned below:

PAIR	CORE	COLOUR
1st	1st	Blue
1st	2nd	Red
2nd	1st	Grey
2nd	2nd	Yellow
3rd	1st	Green
3rd	2nd	Brown
4th	1st	White
4th	2nd	Black

Each four pair is laid to form one unit and wound with Mylar tape. The cores of each unit shall then be identified by colour bands for cables of more than 4-pair. Eg. All eight cores of the first unit shall have a single band of pink color (preferably rose pink).

Unit No No.	COLOUR OF BANDS	BAND MARKS
1.	PINK	= === ==
2.		= ===== ==
3.		= ===== ==
4.		= ===== ==
5.	ORANGE	= === ==
6.		= ===== ==
7.		= ===== ==
8.		= ===== ==
9.	VIOLET	= === ==
10.		= ===== ==
11.		= ===== ==
12.		= ===== ==

The dimension L (distance between the markings) shall be limited to 50 mm. The bands shall be neat and cover at least 2/3 of the periphery of the core.

Eg: A grey wire having 3 orange bands is the first core of the second pair of the Seventh unit.

Band markings shall not be easily erasable and shall also meet Bleeding and Blooming Test and colour fastness to water test requirement as per relevant standard.



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Annexure-BI (B)BS 5308-2:2009

Table C.1 Identification of cable pairs other than two-pair cables without individual pair screens (quads)

Pair no.	a-wire	b-wire	Pair no.	a-wire	b-wire
1	White	Blue	26	Red-Blue	Blue
2	White	Orange	27	Red-Blue	Orange
3	White	Green	28	Red-Blue	Green
4	White	Brown	29	Red-Blue	Brown
5	White	Grey	30	Red-Blue	Grey
6	Red	Blue	31	Blue-Black	Blue
7	Red	Orange	32	Blue-Black	Orange
8	Red	Green	33	Blue-Black	Green
9	Red	Brown	34	Blue-Black	Brown
10	Red	Grey	35	Blue-Black	Grey
11	Black	Blue	36	Yellow-Blue	Blue
12	Black	Orange	37	Yellow-Blue	Orange
13	Black	Green	38	Yellow-Blue	Green
14	Black	Brown	39	Yellow-Blue	Brown
15	Black	Grey	40	Yellow-Blue	Grey
16	Yellow	Blue	41	White-Orange	Blue
17	Yellow	Orange	42	White-Orange	Orange
18	Yellow	Green	43	White-Orange	Green
19	Yellow	Brown	44	White-Orange	Brown
20	Yellow	Grey	45	White-Orange	Grey
21	White-Blue	Blue	46	Orange-Red	Blue
22	White-Blue	Orange	47	Orange-Red	Orange
23	White-Blue	Green	48	Orange-Red	Green
24	White-Blue	Brown	49	Orange-Red	Brown
25	White-Blue	Grey	50	Orange-Red	Grey

NOTE Except in the case of bi-colour extrusion, the colour indicated first is known as the base colour, and is:

a) the extruded colour; and

b) the colour with the greater area of exposure on the finished wire.

Pair identification shall be provided with numbers at interval of not more than 250mm.



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Annexure-BI (C)

The cable cores shall be colour coded as mentioned below:

Pair	Core	Colour
1 st	1 st	Blue
1 st	2 nd	Red
2 nd	1 st	Grey
2 nd	2 nd	yellow
3 rd	1 st	Green
3 rd	2 nd	Brown
4 th	1 st	White
4 th	2 nd	Black

Each four pair is laid up to from one unit and wound with Mylar Tape. The cores of each unit shall then be identified by numbering for cables of more than 4-pair.

Eg. All eight cores of the first unit shall have " 1/one" printed on each core in Black/ White colour

Unit no.	Colour of Number Printing	Number printed on core
1	BLACK on WHITE core. WHITE on all other cores	1/One
2		2/Two
3		3/Three
4		4/Four
5		5/Five
6	BLACK on WHITE core. WHITE on all other cores	6/Six
7		7/Seven
8		8/Eight
9	BLACK on WHITE core. WHITE on all other cores	9/Nine
10		10/Ten
11		11/Eleven
12		12/Twelve

The dimension L (distance between the markings) shall be limited to 50 mm. The number marking shall be neat. eg. A grey wire having " 7/Seven" number printed on the core is the first (1st) core of the second (2nd) pair of the Seventh unit.

For Black & White cores Printing:-

Black on White Core

White on all Other Cores



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DATA SHEET-C

S.No.	Particulars	Unit	Description
1	Manufacturer's name	-	
2	Reference design standards	-	
3	Conductor size	sq. mm	
4	Rated Voltage	V	
5	Number of pairs	No.	
6	Cable suitable for both earthed & unearthed system	-	
7	Conductor		
	a) Material	-	
	b) Reference Standard	-	
	c) Grade	-	
	d) No. of strands	No.	
	e) Diameter of strands (nom.)	mm	
	f) Approx. dia of conductor	mm	
	g) Cross Section area	sq. mm	
8	h) Maximum conductor resistance per Km at 20°C	ohm	
	Insulation		
	a) Reference Standard	-	
	b) Material composition	-	
	c) Application	-	
	d) Minimum thickness	mm	
	e) Nom.Thickness	mm	
	f) Max. thickness	mm	
	g) Minimum volume resistivity as per IS 5831	Ohm cm	
	h) Dielectric constant	-	
9	i) Maximum conductor temperature withstand capacity	°C	
	j) Core diameter including insulation	mm	
	Core laying		
	a) Whether cores/pairs are twisted.	-	
	b) Minimum no. of twists per meter.		
10	c) Maximum lay of twist	mm	
	d) Identification of cores/pairs	-	
10	Individual Shield		



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	a) Material	-	
	b) Thickness of tape	micron	
	c) Coverage/ Overlap	%	
	d) Noise interference better than	dB	
11	Drain wire for individual shield		
	a) Reference standard	-	
	b) Size (No. of strands x dia. of each strand)	sq. mm (no. x mm)	
	c) Material	-	
	d) Resistance of drain wire per km at 20 deg.C	ohm	
12	Overall shield		
	a) Material	-	
	b) Thickness of tape	mm	
	c) Coverage/Overlap	%	
	d) Noise interference better than	dB	
13	Drain wire for overall shield		
	a) Reference standard	-	
	b) Size (No. of strands x dia. of each strand)	sq. mm (no. x mm)	
	c) Material	-	
	d) Resistance per Km (with shield) at 20°C	Ohm/ km	
14	a) Fillers: Material (if applicable)		
	b) Bedding Material		
15	Inner sheath		
	a) Material, type and standard	-	
	b) Whether FRLS	-	
	c) Colour	-	
	d) Method of application	-	
	e) Thickness (min)	mm	
16	Armour		
	a) Material,	-	
	b) Formed wire / round wire		
	c) Minimum Coverage	%	
	d) Method of jointing	-	
	e) Breaking load of joint	-	
	f) Size (approx.) of strip	mm	
	g) Dia of armour	mm	
	h) No. of wires/ strip.	No.	
17	Outer sheath		
	a) Reference standard	-	
	b) Material	-	
	c) Minimum thickness of sheath	mm	



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	d) Calculated dia under outersheath	mm	
	e) Oxygen index (as per ASTM D 2863)	-	
	f) Temperature index (in deg. C as per ASTM D 2863)	deg. C	
	g) Maximum acid gas generation as per IEC754-1	%	
	h) Maximum smoke density rating as per ASTM D 2843	%	
	i) Colour of outer sheath	-	
18	Dia over laid-up core	mm	
19	Dia under armour	mm	
20	Dia above armour	mm	
21	Overall diameter of cable	mm	
22	Tolerance on overall diameter	mm	
23	Weight of		
	Copper (conductor & drain wire)	Kg/ km	
	PVC (insulation, sheath & fillers)	Kg/ km	
	Armour	Kg/ km	
	Cable (approx.)	Kg/ km	
24	Cable parameters at 20°C(+/-3 deg. C)		
	a) Conductor resistance (max)	Ohm/ km	
	b) Insulation resistance (min)	M-Ohm/ km	
	c) Mutual capacitance at 0.8KHz (max)	nF/ km	
	d) Cross talk at 0.8KHz (min)	dB	
	e) Attenuation at 1 KHz (max)	dB/ km	
	f) Characteristic impedance at 1 KHz (max)	Ohm	
25	Continuous operating temp. (deg.C)	deg. C	
26	(a) Relevant IS standard including Part & category for Flame retardance of complete cable	-	
	(b) Relevant IEC standard including Part & category for Flammability of complete cable		
27	Whether complete cable passes Swedish Chimney test as per SEN 4241475 (F3)	-	
28	Identification		
	a) Length of cable marked at every mtr.	-	
	b) FRLS marked at every 5 mtrs	-	
	c) Each core of the pair numbered	-	
	d) Conductor identification details for pairs	-	
	e) Details of cable markings	-	
29	Test voltage		
	a) High voltage test/ Dielectric Strength		
	i) Voltage (KV), Core - Core	kV	
	ii) Duration	min	
	b) High Voltage test		



TECHNICAL SPECIFICATION FOR SCREENED CONTROL CABLES

SPECIFICATION NO. PE-RC-999-507-E006

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	i) Voltage (KV), Core - Screen	V	
	ii) Duration	min	
	c) Resistance to direct current test (applicable for 225 V cable as per VDE)	-	
	Voltage	V	
	Duration	hrs/days	
30	Min bending radius	No. x OD	
31	Ovality at any cross section	mm	
32	Variation of dia through out cable length	mm	
33	Cable cross-sectional drawings for each type of cable furnished		
34	i) Length of single coil in a drum	M	
	ii) Marking on drum	-	
	iii) Seasoned wood drum provided	-	
	iv) Both ends of cable to be sealed with PVC/ Rubber caps to prevent water/ moisture ingress	-	
	v) Gross weight (approx.)	kg.	
	vi) Net weight (approx.)	kg	
35	Type test procedures as per BHEL Technical Spec. and other relevant standards enclosed.	-	
36	Anti termite & rodent test	-	



TECHNICAL SPECIFICATION FOR
SCREENED CONTROL CABLES

SPECIFICATION NO. PE-RC-999-507-E006

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SECTION-II

STANDARD TECHNICAL REQUIREMENTS



TECHNICAL SPECIFICATION FOR SCREENED CONTROL CABLES

SPECIFICATION NO. PE-RC-999-507-E005

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1.0 CODES AND STANDARDS

- 1.1 The material shall comply with all currently applicable safety codes and statutory regulations of India as well as of the locality where the material is to be installed.
- 1.2 The design, material, construction, manufacture, inspection and testing of Screened Control Cable shall conform to the latest revision of relevant standards as per Data Sheet-A.
- 1.3 In case of conflict between the applicable reference standard and this specification, this specification shall govern.

2.0 TECHNICAL REQUIREMENTS

- 2.1 Screened Control Cable shall be supplied as per technical particulars specified in Data Sheet – A.

3.0 QUALITY ASSURANCE, TESTING & INSPECTION

- 3.1 Bidder shall confirm compliance with the BHEL Standard Quality Plan (PE-QP-999-507-E004, Rev-1) as attached with the specification without any deviations. At contract stage, the successful bidder shall submit the same QP for BHEL/ ultimate customer's approval. In case bidder has reference QP agreed with ultimate customer, same can be submitted for specific project after award of contract for BHEL/ultimate customer's approval. There shall be no commercial implication to BHEL on account of minor changes in QP during contract stage.
- 3.2 All materials shall be procured, manufactured, inspected and tested by vendor/ sub-vendor as per approved Quality Plan.
- 3.3 Type testing, routine / acceptance testing and special testing requirements shall be as per Annexure –I to QP. Charges for all these tests for all the equipment & components shall be deemed to be included in the bid price (except UV Radiation & Hydraulic Stability test).
- 3.4 The charges of UV Radiation test & Hydrolytic Stability test (if applicable) shall be reimbursed extra at actual against original money receipt of Govt. Lab. (CPRI/ ERDA etc).
- 3.5 Cost of cables consumed for testing shall be to bidder's account.

4.0 PACKING

- 4.1 Cables shall be supplied in non-returnable drums. Material of cable drums shall be wooden.
- 4.2 For wooden drums, all wooden parts shall be manufactured from seasoned wood treated with copper naphthenates / zinc naphthenates (refer IS: 401) and anti-termite. The surface of the drum and the outer most cable layer shall be covered with water proof cover. Both the ends of the cables shall be properly sealed with heat shrinkable PVC/ rubber caps secured by 'U' nails so as to eliminate ingress of water during transportation, storage and erection. Dimensions of wooden drums shall be as per IS 10418. All ferrous parts shall be treated with suitable rust protective finish or coating to avoid rusting during transit and storage. BIS certification mark shall be stamped on each cable drum.



TECHNICAL SPECIFICATION FOR SCREENED CONTROL CABLES

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- 4.3 Each drum shall carry manufacturer's name or trade make, purchaser's name, address and contract no., Type of cable & voltage grade, Year of manufacture, Type of insulation e.g. HRPVC item no., No. of pairs and size of cables & Type, Cable code e.g. FRLS, No. of length on drum, if more than one, length of cable and net gross weight stencilled on both sides of drum. A tag containing same information shall be attached to the leading end of the cable. An arrow & suitable accompanying wording shall be marked on one end of the reel indicating the direction in which it should be rolled.



MANUFACTURER/
SUPPLIER NAME & ADDRESS

BIDDER/
CUSTOMER :
PROJECT :
ITEM: SCREENED CONTROL
CABLES

QUALITY PLAN

SPEC. NO :
PO NO.:

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DATE:
DATE:

SECTION: II
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SL NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1	2	3	4	5	6	7	8	9	D M C N	

INSTRUCTIONS:

- Cable manufacturer to maintain records to show co-relation of raw materials to finished cables i.e. raw material batch/ lot no. should be traceable to the final cable drum number or batch no.
- Cable manufacturer to maintain all quality records identified as per all QP stages enumerated below whether it is identified for BHEL verification or witness or not.

1.0	RAW MATERIAL														
1.1	Copper Rods/ Wires (For Conductor & drain wire)	GENERAL:													
		1. Physical properties	MA	Physical Tests	Sample/Batch	Sample/Batch	IS 613	IS 613	Inspection Report/ Test Cert.	P/ V	V	-			
		2. Elec. Properties	MA	Electrical Tests	Sample/Batch	Sample/Batch	-do-	-do-	-do-	P/ V	V	-			
		SPECIFIC CHECKS:													
		a) Make	MA	Verify	100%	100%	Manufacturer approved source	Manufacturer approved source	COC/ Test Cert.	P	V	-			
		b) Grade	MA	-do-	-do-	-do-	IS 613	IS 613	-do-	P	V	-			

ENGINEERING				QUALITY				BIDDER/SUPPLIER				FOR CUSTOMER REVIEW & APPROVAL							
Sign & Date		Name		Sign & Date		Name		Sign & Date		Name		Doc No:		Sign & Date		Name		Seal	
Prepared by: <i>Manish</i>		Manish		Checked by: <i>Manish</i>		Manish		Seal				Reviewed by: <i>Manish</i>							
Reviewed by: <i>Manish</i>		Manish		Reviewed by: <i>Manish</i>		Manish		Seal				Approved by: <i>Manish</i>							



MANUFACTURER/
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QUALITY PLAN

SPEC. NO :
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QF NO.: PE-QF-999-507-E004, REV 02.

DATE:

PO NO.:

DATE:

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SL NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY				REMARKS
1	2	3	4	5	6	7	8	9	*	**				
					M	C/N			D	M	C	N		
		c) Resistivity	MA	Electrical Tests	Manufacturer std.		IS 613	IS 613	-do-	P	V	-		
1.2	PVC Compound (for insulation)	GENERAL: 1. Physical Properties 2. Elec. Properties SPECIFIC CHECKS: a) Make b) Type/ Grade c) Shelf life/ Storage condition	MA	Physical Tests	Sample/Batch	Sample/Batch	IS 5831	IS 5831	Inspection Report/ Test Cert.	P/ V	V	-		
			MA	Electrical Tests	Sample/Batch	Sample/Batch	-do-	-do-	-do-	P/ V	V	-		
			MA	Verify	100%	100%	Manufacturer approved source	Manufacturer approved source	COC/ Test Cert.	P	V	-		
			MA	-do-	100%	100%	Approved datasheet	Approved datasheet	-do-	P	V	-		
			MA	-do-	100%	100%	Compound Manufacturer std.	Compound Manufacturer std.	-do-	P	V	-		
1.3	Screen / Tapes/ Binders	1. Make 2. Dimension 3. T.S. & Elongation	MA	Verify	100%	100%	Manufacturer approved source	Manufacturer approved source	TC & IR	P/ V	V	-		
			MA	Measure ment	Manufacturer std.	Manufacturer std.	Manufacturer datasheet/ Approved datasheet	Manufacturer datasheet/ Approved datasheet	TC & IR	P/ V	V	-		
			MA	Physical Tests	-do-	-do-	Manufacturer datasheet	Manufacturer datasheet	-do-	P/ V	V	-		

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Reviewed by:	MAHAR	MAHAR	Reviewed by:	MAHAR	MAHAR	Reviewed by:	MAHAR	MAHAR	MAHAR		



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		CUSTOMER :		QP NO.: PE-QP-999-507-E004, REV 02.		DATE:
		PROJECT:		PO NO.:		DATE:
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SL NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY				REMARKS
1	2	3	4	5	6	7	8	9		D	M	C	N	
		4. Chem. & Phys. Properties	MA	Chemical & Physical Tests	-do-	-do-	Manufacturer std.	Manufacturer std.	-do-		P/	V	-	
1.4	Fillers (as applicable)	1. Make	MA	Verify	100%	100%	Manufacturer approved source	Manufacturer approved source	COC/Test certificate		P/	V	-	Filler material chosen shall be compatible with the temperature rating of the cable and shall have no deleterious effect on any other component of the cable
		2. Flame retardant & moisture resistant. (as applicable)	MA	Chemical/ Environ.	-do-	-do-	Appd. Data Sheet	Appd. Data Sheet	-do-		P/	V	-	
1.5	Galvanised steel wire/strip for Armour (if applicable)	GENERAL :												
		1. Make	MA	Verify	Manufacturer std.	Manufacturer std.	Manufacturer approved source	Manufacturer approved source	Inspection Report/ Test Cert.		P	V	-	
		2. Dimension	MA	Measurement	-do-	-do-	Appd. Data Sheet	Appd. Data Sheet	-do-		P/	V	-	
		3. Phy and Elec. Properties	MA	Physical & Electrical Tests	Sample*	Sample*	-do-	-do-	-do-		P/	V	-	* Sample from each armour size/Batch/ Lot
		4. Galvanization Quality	MA	Galv. Tests	-do-	-do-	IS 3975	IS 3975	-do-		P/	V	-	

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Reviewed by:	Sign & Date	Name	Reviewed by:	Sign & Date	Name			Approved by:	Sign & Date	Name					



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SL NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY				REMARKS
					M	C/N				D	M	C	N	
1	2	3	4	5			7	8	9	*	**			
1.6	PVC compound for Sheath	GENERAL : 1. Physical properties 2. Elec. Properties 3. FRLS Properties (as applicable) SPECIFIC CHECKS : a) Make b) Type/ Grade c) Shelf life/ Storage condition	MA	Physical Tests	Sample/Batch	Sample/Batch	IS 5831	IS 5831	Inspection Report/ Test Cert.		P/ V	V	-	
			MA	Electrical Tests	Sample/Batch	Sample/Batch	-do-	-do-	-do-		P/ V	V	-	
			CR	Chemical/ Environ.	Sample/Batch	Sample/Batch	Approved datasheet	Approved datasheet	-do-		P/ V	V	-	
			MA	Verify	100%	100%	Manufacturer approved source	Manufacturer approved source	COC/ Test Cert.		P	V	-	
			MA	-do-	-do-	-do-	Approved datasheet	Approved datasheet	-do-		P	V	-	
			MA	-do-	-do-	-do-	Compound Manufacturer std.	Compound Manufacturer std.	-do-		P	V	-	
1.7	Wooden drums	1. Phy. & Constructional checks 2. Anti-termite treatment	MA	Visual	Mfr's Plant Std.	Mfr's Plant Std.	IS 10418	IS 10418	Inspection Report/ Test Cert.		P	V	-	
			MA	Chem.	-do-	-do-	Mfr's Plant Std.	Mfr's Plant Std.	COC		P	V	-	
1.8	Steel drums (if applicable)	1. Dimension	MA	Meas.	Mfr's Plant Std.	Mfr's Plant Std.	Approved dng	Approved dng	Inspection Report/ Test Cert.		P	V	-	

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SL NO.	COMPONENT & OPERATION S	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE CRITERIA	FORMAT OF RECORD	AGENCY				REMARKS
					M	C/N				D	M	C	N	
1	2	3	4	5	6		7	8	9	*	**			
		2. Surface finish	MA	Visual	-do-	-do-	Surface shall be smooth	Surface shall be smooth	Inspection Report		P	V	-	
2.0	IN PROCESS													
2.1	Wire Drawing & Annealing.	1. Size 2. Surface finish	MA MA	Dimensional Visual	Mfr's Plant Std. -do-	Mfr's Plant Std. -do-	Approved datasheet Surface shall be smooth	Approved datasheet Surface shall be smooth	Inspection Report		P	V	-	
2.2	Tinning (Conductor or drain wire)	1. Size 2. Chemical test for tinning	MA CR	Dimensional Chemical	Plant Mfg. Std. -do-	Plant Mfg. Std. -do-	Mfr's Plant Std. IS 10810 - 4	Mfr's Plant Std. IS 8130	-do-		P	V	-	(Applicable only for tin-coated copper conductor and drain wire)
2.3	Stranding of wires	1. No. of wires 2. Resistance 3. Sequence, lay length & Direction 4. Surface Finish	MA CR MA MA	Counting Electrical Visual, Meas Visual	Mfr's Plant Std. -do- one Sample each size/lot 100%	Mfr's Plant Std. -do- one Sample each size/lot 100%	Approved datasheet -do- Mfr. Std Surface shall be smooth	Approved datasheet -do- Mfr. Std. Surface shall be smooth	-do- -do- -do-		P P P	V - -	- - -	

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Reviewed by:	Sign & Date	Name	Checked by:	Sign & Date	Name

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SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N			*	D	M	C	N	
1	2	3	4	5	6		7	8	9		10			
		5. Dimension	MA	Measurement	one Sample of each size/lot	one Sample of each size/lot	Appd. Data Sheet	Appd. Data Sheet	-do-		P	-	-	
2.4	Core Insulation (No repair permitted)	1. Surface finish	MA	Visual	100%	100%	Free from bulging burnt particles lumps, cuts & Scratches.	Free from bulging burnt particles lumps, cuts & Scratches.	Inspection Report		P	V	-	
		2. Insulation thickness (Min./Max.)	CR	Measurement	one Sample of each size/lot	one Sample of each size/lot	Appd. data sheet	Appd. data sheet	-do-		P	-	-	
		3. Concentricity #	CR	Measurement	-do-	-do-	Mfr's Std.	Mfr's Std.	Inspection Report		P	V	-	# To be checked at starting & finish end of Extruded Length
		4. Dia over insulation	MA	Measurement	-do-	-do-	Appd. data sheet	Appd. data sheet	-do-		P	-	-	
		5. Core identification	MA	Visual	100%	100%	Appd. data sheet	Appd. data sheet	-do-		P	-	-	
		6. TS & % Elongation	MA	Mechanical	100%	100%	IS 1554/ IS 5831	IS 1554/ IS 5831	-do-		P	-	-	

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Reviewed by:	Signature	Pradyaksha	Reviewed by:	Signature	KUNAL CHANDHI
	Signature	MANISH		Signature	RUTAJA

Sign & Date	Seal

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SL NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS	
1	2	3	4	5	6		7	8	9	*	**			
					M	C/N					M	C	N	
		4. Colour					Appd. Data Sheet	ppd. Data Sheet						
2.7	Armouring (if applicable)	1. No. of wires/Strips	MA	Counting	At the start of the process	At the start of the process	Mfr's Std	Mfr's Std	-do-		P	-	-	
		2. Size of wire/ Strip	MA	Measurement	-do-	-do-	Appd. Data Sheet	Appd. Data Sheet	-do-		P	-	-	
		3. Lay Direction	MA	Visual	-do-	-do-	Mfr's Std	Mfr's Std	-do-		P	-	-	
		4. Lay Length	MA	Visual, Meas.	At the start of the process	At the start of the process	-do-	-do-	-do-		P	-	-	
		5. Coverage	MA	Measurement	-do-	-do-	Appd. Data Sheet	Appd. Data Sheet	-do-		P	-	-	
		6. Dia over armour	MA	Measurement	-do-	-do-	-do-	-do-	-do-		P	-	-	
2.8	Outer Sheath Extrusion	1. Surface Finish	MA	Visual	100%	100%	-	Free from Bulging, Burnt particles, lumps, cuts & scratches	-do-		P	-	-	
		2. Sheath thickness	CR	Measurement	One sample of each size/lot	One sample of each size/lot	Approved Data sheet	Approved Data sheet	-do-		P	-	-	

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SL NO.	COMP ONENT & OPER ATION S	CHARACTERISTICS	CLA SS	TYPE OF CHECK	QUANTUM OF CHECK		REFERE NCE DOCUME NT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N				D	M	C	N	
1	2	3	4	5			7	8	9	*	**			
		3. Dia over outer sheath	MA	Measurem ent	-do-	-do-	Appd. Data Sheet	Appd. Data Sheet	-do-		P	-	-	
		4. Marking/ Colour / Embossing	MA	Visual	100%	100%	Appd. Data Sheet	Appd. Data Sheet	-do-		P	-	-	Sequential be done by printing marking shall
		5. TS & % Elongation	MA	Mechanical	100%	100%	IS 5831/IS 10810 part 7	IS 5831	-do-		P	-	-	
3.0	Final Inspect ion (Intern al)	Routine Test (Refer Note-H)	CR	Electrical test & Measurem ent	100%	100%	#	#	-do-		P	V	V	# Refer Annexure- A to QP.
4.0	Final Inspecti on (Extern al)	1. Finish & Length (Cable & cable drum)	MA	Visual, Measurem ent	One drum in each lot	One drum in each lot	Appd. Data Sheet	Free from Bulging, Burnt particles, lumps, cuts & scratches/ Approved data sheet	Inspecti on Report		P	W	W	

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QUALITY

BIDDER/SUPPLIER

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							Approved by:	Sign & Date	Name	

25/11/2020

MANUFACTURER/
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QUALITY PLAN

SPEC. NO.:

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SL NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C/N				D	M	C	N
1	2	3	4	5	6		7	8	9	*	**		
		2. Dimensions	MA	Measurement	As per std.	As per std.	Appd. Data sheet	Appd. Data sheet	Inspection Report		P	W	W
		3. Armouring - Coverage	MA	Measurement	-do-	-do-	-do-	-do-	-do-		P	W	W
		4. Marking/Colour/ pair identification (Cable & cable drum)	MA	Visual	-do-	-do-	-do-	-do-	-do-		P	W	W
		5. Acceptance Tests (Refer Note-H)	CR	Phy & Elect. Tests	#	#	#	-do-	-do-		P	W	W
		6. Type & FRLS Tests (Refer Note-H)	CR	Measurement	#	#	#	Appd. Data sheet	-do-		P	W	W
													# Refer Annexure-A to QP.

NOTES: -

(A) JOINTS IN CONDUCTOR AND ARMOUR SHALL BE AS PERMITTED BY IS 8130 & IS 1554-1 RESPECTIVELY.

(B) NO REPAIR OF CORE INSULATION PERMITTED.

(C) CABLE ENDS SHALL BE SEALED

(D) RECORD OF RAW MATERIAL, PROCESS & ALL STAGES SHALL BE CERTIFIED BY VENDORS QC. AND ARE LIABLE TO AUDIT CHECK BY PURCHASER.

BHEL			
ENGINEERING		QUALITY	
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Sign & Date		Seal	
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Reviewed by:		Name	
Approved by:		Seal	

	ANNEXURE - I TO QP	CUSTOMER:	PROJECT TITLE: RATE CONTRACT	SPECIFICATION NUMBER: PE-RC-999-507-E005
		BIDDER/VENDOR:	QUALITY PLAN NUMBER : PE-QP-999-507-E004, R1	SPECIFICATION TITLE:
	Page 1 of 5	SYSTEM	ITEM: SCREENED CONTROL CABLES	DOC. NO.

TYPE/ ACCEPTANCE/ ROUTINE TEST REQUIREMENTS

A. Type Test Conduction:

- Tests for which "T" is indicated in the 'Test Conduction Required As' column below shall be conducted as Type Test.
- Sampling:
 - Type tests (except for Sl. no. b & c below) to be conducted on one size (2P, 4P etc.) of each type (F or G type)/ lot.
 - Electrical & C&I tests to be conducted on each size of each type of cables /lot.
 - FRLS & Flammability tests to be conducted only on one sample/ lot, irrespective of size/type.

B. Acceptance Test Conduction:

- Tests for which "A" is indicated in the 'Test Conduction Required As' column below shall be conducted as Acceptance tests.
- Sampling:
 - Acceptance tests (except for Sl. no. b & c below) for every lot shall be as per Appendix-B (Clause 15.2.2) of IS: 1554 Part-I.
 - Electrical & C&I tests to be conducted on each size of each type of cables /lot.
 - FRLS & Flammability tests to be conducted only on one sample/ lot, irrespective of size/type.

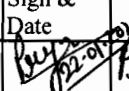
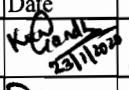
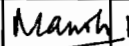
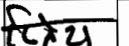
C. Routine Test Conduction:

- Tests for which "R" is indicated in the 'Test Conduction Required As' column below shall be conducted as Routine tests.
- Sampling:
Routine testing shall be conducted in line with the applicable standards and as per the Manufacturing Quality Plan approved for the project for every lot offered for inspection.

D. ADS: Approved datasheet.

NOTE: LOT shall be defined as per IS: 1554 Part-1.

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
1.0	Tests for Conductor				
I.	Annealing test	For copper conductor only	T, A	IS 10810 Pt 1	<u>In process records shall be furnished to inspector at the time of inspection.</u>

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		P. S. SINGH	Checked by:		KUNAL GANDHI
Reviewed by:		MANISH MANDSH	Reviewed by:		R. K. JAISWAL

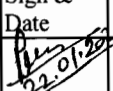
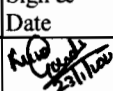
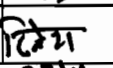
BIDDER/ SUPPLIER	
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FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

23/1/2020

	ANNEXURE - I TO QP	CUSTOMER:	PROJECT TITLE: RATE CONTRACT	SPECIFICATION NUMBER: PE-RC-999-507-E005
		BIDDER/VENDOR:	QUALITY PLAN NUMBER : PE-QP-999-507-E004, R1	SPECIFICATION TITLE:
	Page 2 of 5	SYSTEM	ITEM: SCREENED CONTROL CABLES	DOC. NO.

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
II.	Tin coating test (for tinned copper)	For copper conductor only	T, A	IS 10810 Pt 4	
III.	Resistance test	For Al/Cu	T, A, R	IS 10810 Pt 5	
IV.	Diameter test	For conductor	T, A	ADS	
2.0	Tests for Armour Wires/Strips				
I.	Measurement of dimensions	Applicable for Aluminium wire & GS wire/Strip	T, A	IS 10810 Pt 36	
II.	Tensile test	Applicable for Aluminium wire & GS wire/Strip	T, A	IS 10810 Pt 37	
III.	Elongation at break test	Applicable for GS wire/Strip only	T, A	IS 10810 Pt 37	
IV.	Torsion test	For GS round wire only	T, A	IS 10810 Pt 38	
V.	Winding test	For GS strip only	T, A	IS 10810 Pt 39	
VI.	Resistivity test	Applicable for Aluminium wire & GS wire	T, A	IS 10810 Pt 42	
VII.	Uniformity of Zinc coating test	For G. S. wires/Strip only	T, A	IS 10810 Pt 40 , IS: 2633	
VIII.	Mass of Zinc coating test	For G. S. wires/Strip only	T, A	IS 10810 Pt 41	
3.0	Physical Tests for PVC Insulation, PVC sheath.				
I.	Test for thickness & Eccentricity	Applicable for PVC insulation, PVC inner sheath & PVC outer sheath	T, A	IS 10810 Pt 6	
II.	Tensile strength and elongation test at break	Applicable for PVC insulation & PVC outer sheath	T, A	IS 10810 Pt 7	
(a)	Before ageing		T, A	IS 10810 Pt 7	
(b)	After ageing		T, A	IS 10810 Pt 7	
III.	Ageing in air oven	For PVC insulation & PVC outer sheath	T	IS 10810 Pt 11	
IV.	Loss of mass in air oven test	For PVC insulation & PVC outer & Inner sheath	T	IS 10810 Pt 10	

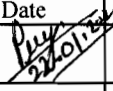
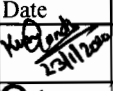
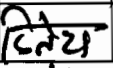
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ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Bejanku	Checked by:		KUNAL GANDHI
Reviewed by:	Mamsh	MANISH	Reviewed by:		RUTAJA

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

	ANNEXURE - I TO QP	CUSTOMER:	PROJECT TITLE: RATE CONTRACT	SPECIFICATION NUMBER: PE-RC-999-507-E005
		BIDDER/VENDOR:	QUALITY PLAN NUMBER : PE-QP-999-507-E004, R1	SPECIFICATION TITLE:
	Page 3 of 5	SYSTEM	ITEM: SCREENED CONTROL CABLES	DOC. NO.

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
V.	Hot deformation test	For PVC insulation & PVC outer & Inner sheath	T	IS 10810 Pt 15	
VI.	Heat shock test	For PVC insulation & PVC outer & Inner sheath	T	IS 10810 Pt 14	
VII.	Shrinkage test	For PVC insulation & PVC outer & Inner sheath	T	IS 10810 Pt 12	
VIII.	Thermal stability test	For PVC insulation & PVC outer sheath	T	IS 1554-1	
IX.	Bleeding & Blooming test	Applicable for PVC insulation & PVC outer sheath	T	IS 10810 Pt 19	
X.	Cold bend test	For PVC insulation & PVC outer & Inner sheath	T	IS 10810 Pt 20	
XI.	Cold impact test	For PVC insulation & PVC outer & Inner sheath	T	IS 10810 Pt 21	
XII.	Colour fastness to water	For PVC insulation & PVC outer sheath	T	IS 10810 Pt 18, Appendix-A of IS: 5831	
4.0	Tests for Al-Mylar Shield				
I.	Continuity test	For Al-Mylar shield	T, A	Plant Standard	
II.	Shield thickness	For Al-Mylar shield	A	ADS	
III	Overlap test	For Al-Mylar shield	A	ADS	
IV	Constructional details, dimensions	For Al-Mylar shield	A	ADS	
V	Visual, surface finish+	For Al-Mylar shield	A	Plant Standard	
VI	Overall coverage	For Al-Mylar shield	A	Plant Standard	
VII	Noise interference test.	For Al-Mylar shield	A	ADS	
5.0	Tests for Drain Wire				
I.	Annealing test	For copper conductor only	T, A	IS 10810 Pt 1	<u>In process records shall be furnished to inspector at the time of inspection.</u>

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Beiyanda	Checked by:		KUNAL GANDHI
Reviewed by:	Mainsi MANDH		Reviewed by:		R K JAIN

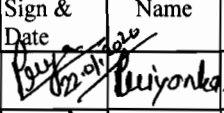
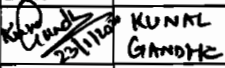
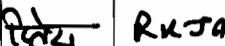
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Sign & Date	
Seal	

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Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

23/11/2020

	ANNEXURE - I TO QP	CUSTOMER:	PROJECT TITLE: RATE CONTRACT	SPECIFICATION NUMBER: PE-RC-999-507-E005
		BIDDER/VENDOR:	QUALITY PLAN NUMBER : PE-QP-999-507-E004, R1	SPECIFICATION TITLE:
	Page 4 of 5	SYSTEM	ITEM: SCREENED CONTROL CABLES	DOC. NO.

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
II.	Tin coating test (for tinned copper)	For copper conductor only	T, A	IS 10810 Pt 4	
III.	Resistance test	For Cu Conductor	T, A, R	IS 10810 Pt 5	
IV.	Diameter test	For conductor	T, A	ADS	
6.0	FRLS Tests				
I.	Oxygen index test	For PVC outer sheath & Fillers only	T, A	IS 10810 Pt 58 / ASTM D 2863	Applicable for Inner Sheath if the same is indicated in Datasheet-A
II.	Smoke density test	For PVC outer sheath & Fillers only	T, A	ASTM D 2843	
III.	Acid gas generation test	For PVC outer sheath & Fillers only	T, A	IS 10810 Pt 59 / IEC-754-1	
IV.	Temperature Index Test	For PVC outer sheath only	T	IS 10810 Pt 64 / ASTM D 2863	
7.0	Flammability Tests				
I.	Flammability test for bunched cables	For complete cable	T, A	IS 10810 Pt 62 / IEC-60332 (Part-3-23, CAT B).	Test & Category applicable as indicated in Datasheet-A
II.	Flammability test for single cable	For complete cable	T, A	IS: 10810 Pt 61 / IEC:60332 Part-1	
III.	Swedish chimney test	For complete cable	A	SEN SS 424 1475 (Class F3)	
IV.	Flammability test	For complete cable	A	IEEE: 60383	
8.0	Electrical Tests				
I.	High Voltage Test	For complete cable	T, A, R	IS: 10810 Pt 45	
II.	Insulation Resistance Test (Volume resistivity method)	For complete cable	T, A, R	IS: 10810 Pt 43	
III.	L/R Ratio	For complete cable	A, R	BS:5308 Part II	
IV.	Spark Test	Online Process during Extrusion of Insulation	Online	BS:5308 Part II	

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Manish Manish	Checked by:		KUNAL GARG
Reviewed by:		Manish Manish	Reviewed by:		R.K. JAISWAL

BIDDER/ SUPPLIER	
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Seal	

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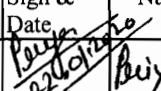
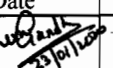
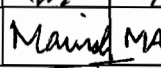
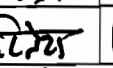
23/1/2020

	ANNEXURE - I TO QP	CUSTOMER:	PROJECT TITLE: RATE CONTRACT	SPECIFICATION NUMBER: PE-RC-999-507-E005
		BIDDER/VENDOR:	QUALITY PLAN NUMBER : PE-QP-999-507-E004, R1	SPECIFICATION TITLE:
	Page 5 of 5	SYSTEM	ITEM: SCREENED CONTROL CABLES	DOC. NO.

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
V.	Thermal ageing test	For complete cable	T	IS-1554 Pt-I	
9.0	C&I Tests				
I.	Cross talk	For complete cable	T, A	ADS	
II.	Attenuation	For complete cable	T, A	ADS	
III.	Characteristic Impedance	For complete cable	T, A	ADS	
IV.	Mutual capacitance	For complete cable	T, A, R	ADS	
V.	Noise interference	For complete cable	T, A	ADS	
10.0	Anti-rodent and Termite Repulsion test	For PVC outer sheath only	A	Refer Note	Test applicable as indicated in Datasheet-A
11.0	Anti-Fungal Test	For PVC outer sheath only	A	Self-certification by vendor for anti-fungal property.	Same shall be applicable as per the project requirement to be furnished later.
12.0	Special Tests				
I.	Hydrolytic Stability	For complete cable	A ^(*)	ASTM D 3137	Test applicable as indicated in Datasheet-A
II.	Ultraviolet Test	For complete cable	A ^(*)	BS EN ISO 4892-2	

**** These tests shall be conducted on one sample for the entire contract and duration of these tests shall be 14 days.**

Note: Few chippings of PVC compound are slowly ignited in a porcelain dish in a muffle furnace at about 600 deg. C. The resulting ignited ash is boiled with a little ammonium acetate solution (10%). A drop of aqueous sodium sulphide solution is placed on a thick filter paper and it is allowed to soak. The spot is touched with a drop of above extract. A black spot indicates the presence of anti-termite & rodent compound (lead).

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Prayanka	Checked by:		KUNAL GANDHI
Reviewed by:		MANISH	Reviewed by:		R K JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

23/1/2020



PRE - QUALIFYING REQUIREMENTS

ENQUIRY NO:

PROJECT:

RATE CONTRACT

PACKAGE:

SCREENED CONTROL CABLES

CRITERIA FOR EVALUATION - FINANCIAL :

Average annual financial turnover during the last Three Financial Years should not be less than
Rupees Four Crore Twenty Four Lakh(s) Only

Amount (in Rs.)
Rs.4,24,00,000.00

Notes:-

a) The bidder has to submit financial accounts (audited, if applicable comprising of Audit report, Balance Sheet, Profit & Loss A/c Statement and Notes/Schedules pertaining to Turnover/Sales/Revenue), for last three years (or from the date of incorporation, whichever is less) as on tender due date to review the above criteria. In case the incorporation of vendor is less than 3 years, average annual financial turnover shall be calculated based on available information as below:-

i) If the accounts are available for ≤ 1 Financial Year, the Average Annual Turnover shall be calculated based on available information divided by 1 (One).

ii) If the accounts are available for >1 but ≤ 2 Financial Years, the Average Annual Turnover shall be calculated based on available information divided by 2 (Two).

iii) If the accounts are available for >2 but ≤ 3 Financial Years, the Average Annual Turnover shall be calculated based on available information divided by 3 (Three).

b) Foreign bidder is to submit a latest report from reputed third party business rating agency like Dun & Bradstreet, Credit reform etc. in addition to the documents mentioned at point (a) above for review of above criteria.

c) Other Income shall not be considered for arriving at Annual Turnover/Sales. For evaluation purpose, Turnover figure excluding taxes shall be considered.

d) For evaluation of foreign bidder, exchange rate (TT selling rate of SBI) as on scheduled date of tender opening (Part-I bid in case of two part bid) shall be considered.